SAN STORM WATER MANAGEMENT PLAN

June 2015
Amended January 2019

San Diego County
Regional Airport Authority
PO BOX 82776
San Diego, CA 92138
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www.san.org

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

BACK OF COVER

SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

INTER-OFFICE COMMUNICATION

Date: June 27, 2003

To: Thella F. Bowens
President/CEO

From: Ted Sexton
Vice President, Operations

Subject: Authorization to Sign National Pollutant Discharge Elimination System (NPDES) Documents

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NPDES Permits (including General NPDES Permits) require submission of various reports and certifications, which must be prepared and signed by a principal executive office or duly authorized representative. A person is a duly authorized representative if: (1) the authorization is made in writing by the executive officer and (2) a copy of the authorization is retained as part of the permit records for each facility. The authorized representative must be the individual or position having overall responsibility for environmental matters.

This is to request your approval, evidenced by your signature below, authorizing the Director of Environmental Affairs for the Authority to serve as the duly authorized representative for purposed of executing all documents related to the NPDES Permit requirements.

Thella F. Bowens
President/CEO
San Diego County Regional Airport Authority

30 June '03
Date

Cc: Paul Manasjan, Director, Environmental Affairs
Zane Gresham, Morris & Foerster

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Storm Water Management Plan

February 2017

Signed Certified Statement

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Date: 2/27/17

Signature:

Printed Name: Brendan Reed

Title: Director of Environmental Affairs

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EXECUTIVE SUMMARY

Amendment 2 to the San Diego County Regional Airport Authority (Authority) Storm Water Management Plan (SWMP) was developed during the period from January 2018 to January 2019, with final updates completed in January 2019. The amendment reflects incorporation of language to prohibit over-irrigation, as requested by the California Regional Water Quality Control Board, San Diego Region (RWQCB) following an audit performed in August 2016. Other amendments include updates to the Water Quality Improvement Plan (WQIP) strategies following submittal of the WQIP Annual Reports, and updates to the Jurisdictional Runoff Management Program (JRMP) and the Storm Water Pollution Prevention Plan (SWPPP).

The Authority was created by state legislation to operate the San Diego International Airport (SAN), and to lead the regional strategic air transportation planning effort. As of January 1, 2003, the Authority became the new owner and operator of SAN, a role previously held by the San Diego Unified Port District. Because of this transfer of responsibility, the Authority was required to obtain its own coverage under the appropriate permits and to prepare the associated documentation required as part of the National Pollutant Discharge Elimination System (NPDES) permit program of the Clean Water Act.

This SWMP was prepared by the Authority in accordance with the requirements of two NPDES storm water permits:

- California State Water Resources Control Board Water Quality Order No. 2014-0057-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, *General Permit for Storm Water Discharges Associated with Industrial Activities* (Industrial Permit); and

- RWQCB, Order No R9. 2013-0001, as amended by Order No. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, *NPDES and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Municipal Permit).

Pursuant to these permits, this document serves as a SWPPP in terms of the Industrial Permit and a JRMP document in terms of the Municipal Permit. WQIP goals and strategies also have been incorporated into the SWMP, as part of the JRMP. The permits requiring these documents and the relationships between them are shown in Figure ES.1.

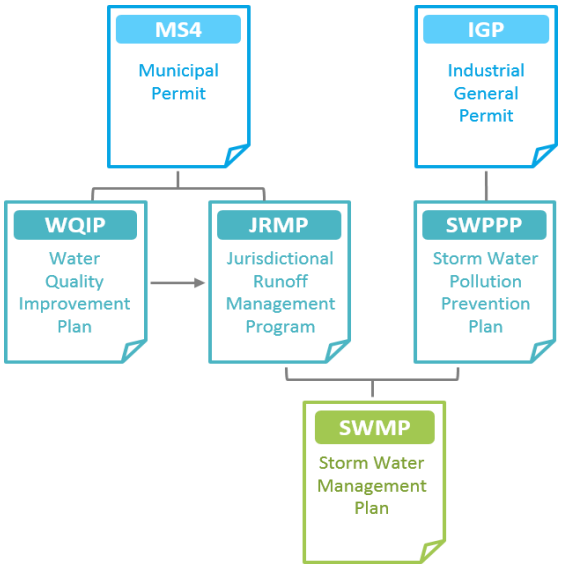

Figure ES 1. Relationship between Permit Required Documents and Storm Water Management Plan

The Authority is subject to the requirements of the Industrial Permit because it operates SAN. Airports that include maintenance, cleaning, and deicing operations require coverage under the permit; however, only those portions of the facility involved with operations associated with industrial activity are required to be addressed. For example, those involved with mechanical repairs, fueling, deicing, etc. The Industrial Permit requires a Permittee to develop a SWPPP for the facility that is covered by the permit, which identifies and evaluates sources of pollutants from the industrial activities at that facility and identifies, describes, and implements best management practices (BMPs) to reduce or prevent the discharge of those pollutants.

The Authority is subject to the Municipal Permit because it owns and operates an MS4 and the RWQCB has determined that coverage under this local permit is the most appropriate method of regulating the Authority's MS4 discharges (rather than coverage under the statewide general small MS4 permit or an individual permit). The Municipal Permit requires an agency listed under the Municipal Permit (Copermittee) to develop comprehensive programs, collectively referred to as a JRMP, to reduce and eliminate the pollutants entering and discharging to its storm drain systems. JRMPs are required to address numerous aspects of a Copermittee's operations, including the management of the lands under its jurisdiction, and approval of development, maintenance, and education. A Copermittee is also required to identify BMPs that must be implemented for the Copermittee's areas and activities, including, among others, industrial, commercial, and construction areas and activities under the Copermittee's jurisdiction.

Because the requirements of the two permits overlap so extensively, the Authority has chosen to address the documentation requirements of the two permits in a single, comprehensive document, namely, this SWMP.

The SWMP addresses the Municipal Permit requirements of the JRMP document by serving as an informational document that provides a written account of the overall program to be conducted by the Authority to comply with the Municipal Permit. It complies with the Industrial Permit requirements of a SWPPP by describing potential pollutant sources, the BMPs implemented to address them, and other Industrial Permit requirements.

The various sections of this document and the permit requirements that they address are summarized below. The organization of these sections is based on a standardized format developed and agreed upon by the Municipal Permit Copermittees and storm water management approaches that have been developed as guidance by the Copermittees, the County of San Diego's Project Clean Water, and the U.S. Environmental Protection Agency. However, compared with the other Copermittees and MS4 communities, the Authority is unique in that it has no residential uses and owns all of the land under its jurisdiction; therefore, this SWMP is different with respect to organization and approach. It has also been adapted to reflect reorganization under the 2013 Municipal Permit and has been updated to incorporate strategies from the WQIP for the San Diego Bay Watershed Management-Area, developed under Provision B of the Municipal Permit.

The SWMP includes the following elements:

- **Executive Summary** – In response to the reporting requirements of the Municipal Permit, the SWMP contains an Executive Summary, which clearly and concisely describes the purpose and major elements of the SWMP.

- **Signed Certified Statement** – The SWMP contains a signed certified statement that addresses the certification requirements of the Industrial Permit and Municipal Permit.

- **Introduction, Section 1.0** – This section briefly describes the Authority and its environmental setting, and provides regional and general vicinity maps and the Authority's legislative background. The section also outlines the component of this SWMP and describes the storm water drainage system at SAN.

- **Administrative and Legal Procedures, Section 2.0** – This section identifies the departments and staff that conduct urban runoff management activities. The purpose of this section is also to identify and describe relevant legal authorities and enforcement tools.

- **Non-Storm Water Discharges/Illicit Discharge Detection and Determination, Section 3.0** – This section addresses Provision E.2 of the Municipal Permit and Section III of the Industrial Permit, including identifying all potential authorized and unauthorized non-storm water discharges, BMPs in place to control or eliminate those discharges, reporting of illicit discharges, spill response and prevention measures, dry weather monitoring, and inspection and enforcement.

- **Development Component, Section 4.0** – This section addresses the Development Planning Component for New Development and Redevelopment requirements in Provision E.3 of the Municipal Permit. It discusses the Authority's development and environmental review processes and the incorporation of storm water management into those processes, and enforcement procedures.

- **Construction Component, Section 5.0** – This section addresses the Construction Component requirements in Provision E.4 of the Municipal Permit, including the description of approval processes, inventory and prioritization of construction activities, implementation of construction BMPs, and inspection and enforcement.

- **Municipal and Commercial Component, Section 6.0** – This section addresses the requirements of the municipal and commercial components in Provision E.5 of the Municipal Permit, including an inventory and prioritization of municipal and commercial activities and areas, characterization of potential pollutant sources from these activities and areas, implementation of BMPs, and inspection and enforcement.

- **Industrial Component, Section 7.0** – This section addresses the requirements of the Industrial Components in Provision E.5 of the Municipal Permit and Sections X.D.1, X.D.2, X.F, X.G.1, X.G.2, and X.H.1 through 4, of the Industrial Permit, including the pollution prevention team, an inventory and prioritization of industrial activities and areas, characterization of potential pollutant sources from these activities and areas, authorized and unauthorized non-storm water discharges, implementation of BMPs, exceedance response actions, and inspection and enforcement.

- **Residential Component, Section 8.0** – There are no residential land uses or activity areas within the Authority's jurisdiction. For this reason, the SWMP contains no discussion of activities conducted by the Authority relative to the Residential Component of the Municipal Permit.

- **Public Participation and Education Component, Section 9.0** – This section addresses the training requirements of the Industrial Permit and the requirements in Provision E.7 of the Municipal Permit. It discusses education for Authority staff, airport tenants, and the public, as well as mechanisms for the public to participate in the implementation of the Authority's SWMP.

- **Fiscal Analysis Component, Section 10.0** – This section addresses the requirements of Provision E.8 of the Municipal Permit, including methods to secure funds for storm water programs, the strategy for developing a Fiscal Analysis, and annual reporting.

- **Effectiveness Assessment Component, Section 11.0** – As required by the Municipal Permit, this section discusses a strategy to assess the effectiveness of the Authority's SWMP through water quality assessments, various levels of program assessment, and program review and modification. It also includes assessments of monitoring results required to fulfill the requirements in Section XII of the Industrial Permit.

- **Reporting, Section 12.0** – This section outlines reporting required by the Municipal Permit, including JRMP and WQIP annual reports and updates, and the Industrial Permit, including Annual and Exceedance Response Action reports.

- **Modifications to the SWMP, Section 13.0** – The section provides the modifications made to the previous SWMP to meet the requirements of the new Municipal Permit and the new Industrial Permit.

- **Conclusions and Recommendations, Section 14.0** – This section is included in response to Municipal Permit Attachment B requirements.

- **References, Section 15.0** – This section provides a list of documents referred to during the preparation of this SWMP.

- **Appendices** – The appendices to the SWMP contain supporting information such as Authority regulations, detailed BMP information, the Authority's BMP Design Manual, and monitoring programs. Of specific relevance to permit requirements, Appendix D (Monitoring Programs) addresses the Monitoring Program requirements of Section X.I of the Industrial Permit and the dry and wet weather monitoring requirements of the Municipal Permit.

TABLES

FIGURES

APPENDICES

Acronym/Abbreviation	Definition
303(d) list or listed	Clean Water Act Section 303(d) list of impaired water bodies
°F	degrees Fahrenheit
ACP	alternative compliance project
ADC	Airport Design and Construction
AFFF	aircraft firefighting foam
Air Ops	Airside Operations
Annual Evaluation	Annual Comprehensive Facility Compliance Evaluation
AOA	aircraft operations area
ARFF	Airport Rescue and Fire Fighting Facility
ASBS	Area of Special Biological Significance
AST	aboveground storage tank
ATCT	Air Traffic Control Tower
Authority	San Diego County Regional Airport Authority
Authority Board	San Diego County Regional Airport Authority Board of Directors
Basin Plan	Water Quality Control Plan for the San Diego Basin
BAT	best available technology economically achievable
BCT	best conventional pollutant control technology
BMP	best management practice
BOD	biological oxygen demand
CASQA	California Stormwater Quality Association
CDO	Cease and Desist Order
CEDEN	California Environmental Data Exchange Network
CEO	Chief Executive Officer
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
COD	chemical oxygen demand
Copermittee	An agency listed under the Municipal Permit Provision B.1
CRDC	Centralized Receiving and Distribution Center
DAR	Duly Authorized Representative
DO	dissolved oxygen
DQO	data quality objective
DSA	disturbed soil area
EIR	Environmental Impact Report
ELG	Effluent Limitation Guideline
ERA	Exceedance Response Action
ERP	Enforcement Response Plan
ESA	Environmentally Sensitive Area
FAA	Federal Aviation Administration
FBO	Fixed-Base Operations
FMD	Facilities Management Department
FOD	foreign object damage
FSF	Fuel Storage Facility
GIS	geographic information system
GPS	Global Positioning System

Acronym/Abbreviation	Definition
GSE	ground support equipment
HA	hydrologic area
HAS	hydrologic sub-area
HU	hydrologic unit
HVAC	heat, ventilation, and air conditioning
IDDE	illicit discharge detection and elimination
Industrial Permit	SWRCB Water Quality Order No. 2014-0057-DWQ, NPDES General Permit No. CAS000001, General Permit for Storm Water Discharges Associated with Industrial Activities
IPM	integrated pest management
JAL	Japan Airlines
JRMP	Jurisdictional Runoff Management Plan
LEED	Leadership in Energy and Environmental Design
LID	low-impact development
LRP	Legally Responsible Person
MB	method blank
MBAS	Methylene Blue Active Substance
MEP	maximum extent practicable
MS	matrix spike
MS4	municipal separate storm sewer system
MSD	matrix spike duplicate
MSGP	Multi-Sector General Permit
Municipal Permit	RWQCB Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region
MWWD	Metropolitan Wastewater Department
NAICS	North American Industry Classification System
NAL	numeric action level
NEC	No Exposure Certification
NGO	non-governmental organization
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSWD	non-storm water discharge
OWS	oil-water separator
P&EAD	Planning and Environmental Affairs Department
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDP	Priority Development Project
PGA	pollutant-generating activity
PIT	Project Intake
Port of San Diego	San Diego Unified Port District

Acronym/Abbreviation	Definition
QISP	Qualified Industrial Storm Water Practitioner
QSE	qualifying storm event
QSP	Qualified SWPPP Practitioner
QTA	quick turn-around
RARE	Rare, Threatened, or Endangered Species Beneficial Use
RCC	Rental Car Center
Responsible Party	A San Diego Bay Watershed Management Area Copermittee named in the Municipal Permit Provision B.1
RFF	Remote Fueling Facility
RON	remain-overnight
ROWD	Report of Waste Discharge
RPD	relative percent difference
RWQCB	California Regional Water Quality Control Board, San Diego Region
SAN	San Diego International Airport
SMARTS	Storm Water Multiple Application and Report Tracking System
SIC	Standard Industrial Classification
SPCC	Spill Prevention, Control, and Countermeasure
SSMP	Strategic Stormwater Master Plan
Standard Format	Standardized Format for Jurisdictional Urban Runoff Management Plan
Subchapter N	40 Code of Federal Regulations Chapter I Subchapter N
SUSMP	Standard Urban Storm Water Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWQMP	Storm Water Quality Management Plan
SWRCB	California State Water Resources Control Board
TMDL	total maximum daily load
TPH	total petroleum hydrocarbon
TSS	total suspended solids
TTWQ	threat to water quality
UPS	United Parcel Service Co.
USEPA	United States Environmental Protection Agency
UST	underground storage tank
WDID	Waste Discharge Identification
WMA	Watershed management area
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Plan
WQE	Water Quality Equivalency
WQIP	Water Quality Improvement Plan
WTAP	weather-triggered action plan

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1.0 INTRODUCTION

1.1 BACKGROUND

The San Diego County Regional Airport Authority (Authority) was established by the California Legislature as a local regional government entity with authority to operate the San Diego International Airport (SAN), a role previously the responsibility of the San Diego Unified Port District (Port of San Diego). Among various other duties, the San Diego County Regional Airport Authority Act (Assembly Bill 93, 2001) provided language in the Public Utilities Code that granted the Authority the responsibility for developing and managing all aspects of the airport facilities that it operates. Relevant sections of the Public Utilities Code were amended by the Legislature in 2002 (Senate Bill 1896) to establish the date on which responsibility for airport management would be transferred from the Port of San Diego to the Authority, to ensure that trusteeship of the lands underlying the airport were retained by the Port of San Diego, and to modify the responsibilities of the Authority. The amendments required the Port of San Diego to execute a 66-year lease with the Authority that transferred title and ownership of all real property interests and improvements, including above and below ground utilities, to the Authority. The legislative amendments also made the Authority responsible for all applications to other governmental agencies and for all approvals, permits, authorizations, or agreements of any kind affecting or relating to the property governed by the lease. As such, the Authority is responsible for managing storm water at the airport and for complying with laws, regulations, and permits related to storm water management activities.

This introductory section outlines the purpose of this document, provides an overview of the Authority and the Authority's obligations to manage storm water runoff at the airport, and presents the environmental setting of the airport.

On January 1, 2003, the Authority became the owner and operator of SAN and was required to obtain coverage under the applicable sections of the National Pollutant Discharge Elimination System (NPDES) permit program of the Clean Water Act and to prepare any associated documentation that was required.

The Port of San Diego was first required to manage storm water runoff at SAN by NPDES Permit No. CAS0108758, which established storm water management requirements through the California Regional Water Quality Control Board, San Diego Region (RWQCB) Order No. 90-42 for the municipal separate storm sewer system (MS4) owned and operated by the County of San Diego, the incorporated cities within San Diego County, and the Port of San Diego. NPDES Permit No. CAS0108758 was first renewed in 2001 by RWQCB Order No. 2001-01. With the creation of the Authority and the transfer of SAN operations to the Authority in January of 2003, the RWQCB determined that the Authority itself was now subject to NPDES Permit No. CAS0108758. As such, the RWQCB amended Order No. 2001-01 and required the Authority to implement the storm water management activities required by the permit and to prepare and submit the appropriate documentation. In August of 2003, the Authority submitted the SAN Storm Water Management Plan (SWMP) as documentation of permit compliance. NPDES Permit No. CAS0108758 was renewed again by RWQCB Order No. R9-2007-0001 in 2007, which specifically named the Authority as a Permittee. The municipal NPDES permit was most recently reissued in 2013 by RWQCB Order No. R9-2013-0001 (NPDES Permit No. CAS0109266), as amended by RWQCB Order No. R9-2015-0001 and R9-2015-0100. The Authority is again named as a Permittee. This document is presented to fulfill the Jurisdictional Runoff Management Plan (JRMP) requirements of this permit.

Since 1992, operations at SAN have also been subject to NPDES Permit No. CAS000001, a state-wide General Permit to Discharge Storm Water Associated with Industrial Activity, established by California State Water Resources Control Board (SWRCB), Water Quality Order No. 91-13-DWQ. Certain activities are defined as "industrial activities' subject to NPDES Permit No. CAS000001, and those defined activities include, among others, aircraft maintenance, cleaning, and deicing operations. Thus, certain activities at SAN require coverage under the permit. The permit requires a Permittee to develop a Storm Water Pollution

Prevention Plan (SWPPP) for the facility that identifies and evaluates sources of pollutants arising from industrial activities and that identifies and describes the best management practices (BMPs) implemented to reduce or prevent the discharge of those pollutants. At that time, the Port of San Diego filed a Notice of Intent (NOI) to comply with NPDES Permit No. CAS000001 (see Appendix A). NPDES Permit No. CAS000001 was subsequently renewed in 1997 by SWRCB Order No. 97-03-DWQ. In September of 2002, with the transfer of SAN from the Port of San Diego to the Authority scheduled for January 1, 2003, the Port of San Diego filed a Notice of Termination from permit compliance for SAN and listed the Authority as the new facility operator (Appendix A). In March of 2003, the Authority filed a NOI to comply with SWRCB Order No. 97-03-DWQ (Appendix A), and in August of 2003 prepared the SAN SWMP to comply with the permit. CAS000001 was most recently renewed in 2014 by SWRCB Order No. 2014-0057-DWQ, which became effective on July 1, 2015. This document is presented to fulfill the SWPPP requirements of this permit.

Presently, as the owner and operator of SAN, the Authority is subject to the requirements of the following two NPDES storm water permits:

- RWQCB Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, *NPDES and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region* (Municipal Permit), and
- SWRCB Water Quality Order No. 2014-0057-DWQ, NPDES General Permit No. CAS000001, *General Permit for Storm Water Discharges Associated with Industrial Activities* (Industrial Permit).

In regard to Industrial Permit compliance, the primary Standard Industrial Classification (SIC) code for the site is 4581 Airports, Flying Fields, and Airport Terminal Services, and the Waste Discharge Identification (WDID) number for SAN under the Industrial Permit is 937I018035.

1.2 PURPOSE AND OBJECTIVES

As the owner and operator of the MS4 or storm drain system, the Authority is subject to the Municipal Permit and as the operator of SAN, the Authority is also subject to the Industrial Permit.

Required documents of the Municipal Permit are as follows:

- JRMP:
  - A collection of all jurisdictional runoff management operations and activities developed and implemented by the Authority;
  - A comprehensive program to reduce and eliminate pollutants entering and discharging from its storm drains;
  - Required BMPs to eliminate storm water pollution from activities and areas within its jurisdiction, including municipal, industrial, commercial, construction and new development/redevelopment areas and activities; and
  - Public participation and public education programs directed at storm water pollution prevention.
- Water Quality Improvement Plan (WQIP):
  - To target resources to address highest and focused priority water quality issues and not "all pollutants, all of the time" (https://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/wqip.html);

- Developed through collaborative efforts by the Authority with other agencies listed under the Municipal Permit (Copermittees) within the San Diego Bay watershed management area (WMA), which includes Pueblo San Diego, Sweetwater, and Otay, to identify and describe:
  - Highest and focused priority pollutants or water quality conditions and their sources;
  - Goals and strategies to address those pollutants or conditions;
  - Time schedules associated with achieving goals and implementing strategies; and
  - Monitoring and assessment to evaluate progress and adapt program.

Required documents of the Industrial Permit are as follows:

- SWPPP: identifies and evaluates sources of pollutants from industrial activities at SAN and identifies, describes, and implements BMPs to reduce or prevent the discharge of those pollutants.

Because the requirements of the Municipal Permit and the Industrial Permit overlap so extensively, the Authority has chosen to address the documentation requirements of the two permits with a single, comprehensive document, namely this SWMP. As an informational document providing a written description of the overall runoff management program conducted by the Authority, the SWMP addresses the Municipal Permit requirements for a JRMP. The SWMP also complies with the Industrial Permit requirements for a SWPPP, since it also describes potential pollutant sources at SAN and the BMPs implemented to address them.

This document has been prepared to update the June 2015 version of the SWMP in accordance with NPDES Permit No. CAS0109266 (Municipal Permit) as renewed in June 2013 by RWQCB Order No. R9-2013-0001 and amended by Order Nos. R9-2015-0001 and R9-2015-0100, and NPDES Permit No. CAS000001 as renewed in April 2014 by SWRCB Order No. 2014-0057-DWQ, which was effective from July 1, 2015. The SWMP incorporates storm water management approaches that have been developed as guidance by the Municipal Permit Copermittees, the U.S. Environmental Protection Agency, the California Stormwater Quality Association (CASQA), and others. In addition, this SWMP incorporates the output from several elements of a special project conducted by the Authority in 2005 and 2006 entitled the Storm Drainage System BMP Program, enhanced and updated by strategies and BMPs outlined in the WQIP.

Several completed and ongoing environmental programs at SAN have informed this document, including a hydrology assessment; a hydraulic analysis and tidal surge study; a biannual Site Audit; a chemical emergency response evaluation; a Catastrophic Fuel Release Evaluation; the development of a new Storm Water Sampling Plan for SAN; and a BMP Recommendations Report. Many of the documents produced from these elements of the program are mentioned, discussed, or incorporated into this SWMP, as well as other subsequent documents. Finally, the SAN SWMP seeks to present information in a manner that is intended to facilitate understanding by Authority staff and SAN tenants.

This update to the SWMP meets the requirements of Provision E of the renewed Municipal Permit. The SWMP is intended to reduce the discharge of pollutants from the Authority's MS4 to the maximum extent practicable (MEP) and to prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. This update to the SWMP also meets the requirements of the Industrial Permit, including the requirement to implement BMPs that control potential pollutant discharges using best available technology economically achievable (BAT) for toxic and non-conventional pollutants and using best conventional pollutant control technology (BCT) for conventional pollutants.

SWMP ORGANIZATION

The content and organization of the SWMP is based, in large part, on a standardized format developed and agreed upon by the Municipal Permit Copermittees ("Standardized Format for Jurisdictional Urban Runoff Management Plan" (Standard Format), as submitted to the RWQCB on July 24, 2007) to address sections D,

G, H, I.1 and 5, and J.1a of the 2007 Municipal Permit. This standardized format has been modified to include elements of the renewed Municipal Permit; therefore, there are some differences between the original Standard Format and the layout of this document. The content and organization of the SWMP is briefly summarized below.

There are aspects of the SWMP that likely vary significantly from the JRMPs prepared by other Copermittees. These variations are due in part to the unique aspects of the Authority's governance, as well as the airport's unique geographic setting. While these factors will be discussed elsewhere in the SWMP, where applicable, the Authority is unique in comparison to most of the other Copermittees in that: a) the Authority controls all land uses through property leases or use agreements; b) there are no residential uses within the Authority's jurisdictional area; c) there are no hillsides within the Authority's jurisdictional area; and d) the SWMP incorporates SWPPP requirements of the Industrial Permit. The SWMP includes the following elements:

- **Executive Summary** – a clear and concise description of the purpose and major elements of the SWMP.
- **Signed Certified Statement** – a signed statement addressing the certification requirements of both the Industrial Permit and Municipal Permit.
- **Introduction** – an outline of the purpose of the document, an overview of the Authority and the Authority's obligations to manage storm water runoff at the airport, and a presentation of the environmental setting of the airport.
- **Administrative and Legal Procedures** – an identification of all departments and staff that conduct urban runoff management activities. This section also identifies and describes all relevant legal authorities.
- **Non-Storm Water Discharges/Illicit Discharge Detection and Elimination (NSWDs/IDDE)**– an identification of all potential NSWDs, and the BMPs in place to control or eliminate those discharges (as required by Section E.2 of the Municipal Permit and Sections III and IV of the Industrial Permit). Also, a description of mechanisms for reporting illicit discharges, spill prevention and response measures, and inspection and enforcement activities (as required by Section E.2 of the Municipal Permit and Sections X and XI of the Industrial Permit).
- **Development and Planning Component** – a description of the Authority's development and environmental review processes and the incorporation of storm water management elements into those processes (as required by Section E.3 of the Municipal Permit).
- **Construction Component** – a description of the approval processes, methods of generating an inventory and the prioritization of construction activities, the BMPs required to address construction activities, and construction activity inspection and enforcement (as required by Section E.4 of the Municipal Permit).
- **Municipal and Commercial Components** – a description of methods of generating an inventory and prioritization of municipal and commercial activities and areas, characterization of potential pollutant sources from these activities and areas, the BMPs required to address municipal and commercial activities, and inspection and enforcement (as required by Section E.5 of the Municipal Permit).
- **Industrial Component** – a description of methods of generating an inventory and prioritization of industrial activities and areas, characterization of potential pollutant sources from these activities and areas, the BMPs required to address industrial activities, and inspection and enforcement (as required by E.5 of the Municipal Permit). This section also presents the bulk of documentation required by Section X of the Industrial Permit regarding the development and implementation of a SWPPP.

- **Residential Component** – a brief explanation of the non-existent residential land uses or activity areas within the Authority's jurisdiction and the absence of storm water management program elements relative to the Residential Component (Section E.5) of the Municipal Permit.
- **Education and Public Participation Component** – a description of the program elements designed to address both the training requirements of the Industrial Permit and the education requirements of the Municipal Permit (Section E.7). The section discusses education for Authority staff, as well as tenants and the public. Also, a description of the mechanisms in place to enable the public to participate in the implementation of the Authority's SWMP.
- **Fiscal Analysis Component** – a description of the methods to secure funds for storm water programs, program expenditures and budgets, and the strategy for developing standardized fiscal analysis and annual reporting.
- **Effectiveness Assessment** – a discussion of the strategy to assess the effectiveness of the Authority's SWMP through water quality assessments, various levels of program assessment, WQIP assessments, and program review and modification.
- **Reporting** – a description of the reporting requirements under the renewed Municipal Permit and Industrial Permit.
- **Modifications to the SWMP** – an outline of the modifications made since the March 2008 version of the SWMP to meet the requirements of the renewed Municipal Permit and Industrial Permit.
- **Conclusions and Recommendations** – a discussion of any key conclusions or recommendations derived as a result of updating the SWMP in response to the renewed Municipal Permit and Industrial Permit.

1.3 ENVIRONMENTAL SETTING

SAN is located in San Diego County (see Figures 1 and 2) just north of downtown San Diego. The airport covers approximately 661 acres and operates as a domestic and international commercial airport. Airport operations at SAN currently include two main airline terminals, a fixed-base operations (FBO) facility, one main runway area, taxiways, and ancillary support facilities (including an aircraft fuel storage facility, a remote fueling facility, air cargo facilities, ground support facilities and operations areas), a wash-rack, overnight airplane parking areas, and the Airport Rescue and Fire Fighting Facility (ARFF). Figure 3 shows the layout of SAN, including boundaries, major structures, surrounding areas, direction of storm water flow, and surface waters.

SAN is located within the Pueblo San Diego hydrologic unit (908.00) of the RWQCB San Diego Basin Plan (1994). More specifically, SAN is located in the San Diego Mesa hydrologic area (908.20), Lindbergh hydrologic sub-area (HAS 908.21). The climate of the area is typical of the southern California coastal region. The adjacent Pacific Ocean has a moderating effect on temperatures. The average temperature is 71 degrees Fahrenheit (°F) with temperature extremes ranging from 40°F in the winter months to 80°F in the summer months. While the amount of rainfall varies year to year, the San Diego coastal area, has an average annual rainfall of about 11 inches, with the greatest rainfall occurring during the winter months. The rainy season in San Diego is considered to be October through May. Precipitation is sparse during the summer months. Occasionally, strong dry and northeasterly Santa Ana winds descend the mountain slopes to the east producing wind speeds in excess of 50 miles per hour over localized sections of the San Diego Basin, usually below canyons. The highest winds at SAN are in association with the winter and spring storms that invade southern California from the Pacific Ocean. During the summer months, low clouds, known as the "marine layer," are common in the late night and early morning hours due to the proximity to the Pacific Ocean.

Approximately 85 to 90 percent of the SAN property is covered by impervious surfaces consisting mainly of buildings and paved areas. The soils underlying SAN are generally undifferentiated bay deposits and

hydraulic fill material originating from San Diego Bay. The soil is described as undetermined in the Soil Hydrologic Groups map in the San Diego County Hydrology Manual. The elevation of SAN ranges from approximately 10 to 25 feet above mean sea level.

Storm water from SAN drains to San Diego Bay, portions of which are currently on the Clean Water Act Section 303(d) list of impaired water bodies (303[d] listed) for impacts due to polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), chlordane, lindane, indicator bacteria, and metals, as well as benthic community effects and sediment toxicity. The 2010 303(d) list includes copper as a pollutant impacting water quality in the marinas along Harbor Island and PCBs as a pollutant impacting water quality throughout the San Diego Bay. Runoff from the airport commingles with runoff from other sources and discharges into the waters along Harbor Island. There are four Toxic Hot Spots in San Diego Bay, one of which (namely, the Downtown Anchorage, near the foot of Grape Street) is located near outfalls associated with runoff commingled from SAN and other sources. In 2014, this area was the subject of Investigative Order R9-2014-0007, issued by the RWQCB. The SWRCB has designated San Diego Bay in its entirety as having Rare, Threatened, or Endangered Species (RARE) beneficial use in the San Diego Basin Plan (1994). Both the Sweetwater Marsh National Wildlife Refuge and the South Bay Unit of the San Diego National Wildlife Refuge are considered Areas of Special Biological Significance (ASBS), but neither is within close proximity to SAN.

1.4 OVERVIEW OF SITE DRAINAGE AND THE MS4

The majority of surface water runoff from SAN is conveyed via sheet flow into gutters and storm drain inlets. The storm water conveyance system consists of 15 outfall basins. Each basin is comprised of sub-basins that route flow to different sections of the infrastructure. The total system consists of approximately 192,000 linear feet of pipe and approximately 550 inlets discharging through 15 outfalls. Storm drain pipe sizes vary in diameter, according to their location in the storm drain system, from 4 to 84 inches in diameter. Storm water runoff flows from SAN through the storm water conveyance system and discharges through Outfalls 01 through 11 into San Diego Bay to the south of the airport, and Outfalls 12 through 15 into the Navy Boat Channel portion of San Diego Bay to the west. Flow in the majority of the storm drain system is intermittent and dependent on the amount of rainfall and subsequent runoff. Those portions of the MS4 that are closest to San Diego Bay receive seawater infiltration during high tides.

The Authority has recently completed several improvements to address environmental sustainability, storm water quality, and water conservation. The Centralized Receiving and Distribution Center (CRDC), completed in 2012, helps reduce traffic on the surrounding roadways by centralizing all truck deliveries of food, beverage, retail, and other goods. The Green Build, completed in August 2013, was the largest project in the history of the airport, expanding Terminal 2 with 10 new gates and adding a dual-level roadway for arrivals and departures. This project earned the Authority a Leadership in Energy and Environmental Design (LEED) Platinum certification, making the airport home to the first LEED Platinum certified commercial terminal in the world. The Fixed-Base Operator Complex project, completed in August 2014, constructed a bigger, more environmentally friendly FBO facility and is also expected to achieve LEED Platinum certification. The new developments also include many low-impact development (LID) BMPs, as detailed in the drainage basin descriptions.

Below is a detailed description of each drainage basin located on the SAN property:

DRAINAGE BASIN 1

In the past, Drainage Basin 1 was occupied by the FBO facility serving general aviation aircraft (as opposed to regularly scheduled commercial passenger airlines). Following the North Side Improvements renovating and moving the FBO, this Drainage Basin now encompasses just a portion of the FBO public parking lot. Storm water runoff from adjacent properties, to the east of SAN, flows in a westerly direction into Drainage Basin 1.

DRAINAGE BASIN 2

Following SAN drainage investigations and map updates, it was determined that Drainage Basin 2 was integrated with Drainage Basin 1, as the flows at the far eastern end of the runway (which contains a storm drain inlet and part of the vehicle service road that circles the perimeter of the airfield) were actually draining to the same outfall in Drainage Basin 1. Drainage Basin 2 in the SWMP maps was removed. Drainage Basin 2 used to include a lavatory waste disposal facility connected to the sanitary sewer, but this facility has been moved to Drainage Basin 8.

DRAINAGE BASIN 3

Drainage Basin 3 includes a portion of the Rental Car Center (RCC) and the FBO. The RCC spans two drainage basins, approximately one third of the parking garage structure is in drainage basin 3, with the remaining two-thirds in drainage basin 5. The RCC provides passenger automotive transportation to airport customers at one convenient location; it includes a parking garage that can house up to 5,000 vehicles, a customer service area, and a vehicle service station (quick turn around [QTA] area). Only light maintenance is performed at the QTA area, activities include washing and fueling vehicles, oil changes, and tire rotations. Fuel, oil, and car wash solution are stored on site to perform vehicle maintenance. The RCC was classified as having no potential pollutant sources because the industrial activities performed on site are under the protected cover of the parking garage structure and pose no threat of exposure to storm water. As a result, they initially obtained a No Exposure Certification (NEC) and had their own ID number. Amendment No. 1 incorporated the RCC under the Authority's WDID number and permit coverage. No sampling occurs in the RCC's operating area because of its previously held NEC. The RCC's NEC ID number was 9 37NEC002567, though this has since been nullified because the RCC is now under the Authority's WDID number. To obtain an NEC from the SWRCB, an industrial site must be able to claim no exposure for eleven categories. These categories include residuals from machinery, materials/products from past activity, material/product loading/unloading, open/deteriorated/leaking containers, waste material, residuals from ventilation, residuals from spills/leaks, material handling equipment, outdoor storage, private roads/railways, and processed wastewater.

The FBO includes two office buildings, 5 hangars used for a passenger area, a cafe, storage for small corporate jets and private aircraft, and an area for aircraft maintenance. Aircraft lavatories are serviced by Signature and the lavatory waste is disposed of at the triturator. New LID BMPs were installed at the FBO as part of the North Side Improvements, including eight sections of permeable pavement with infiltration trenches, five bioswales, and one Contech Stormfilter. It also encompasses parts of the runway, taxiway and least tern nesting areas, and part of the airfield perimeter vehicle service road. Small aircraft are sometimes parked alongside the vehicle service road just south of the FBO. The area also includes aircraft parking and loading/unloading areas, aircraft refueling truck parking, and a vehicle and equipment maintenance shop with a hazardous waste accumulation area.

DRAINAGE BASIN 4

Drainage Basin 4 is a small area in the southeastern portion of SAN encompassing parts of the southern taxiway areas and vehicle service road. The drainage basin also includes the nesting area for an endangered species of seabird, the California least tern and a vehicle parking area containing a proprietary drain inlet filter BMP.

DRAINAGE BASIN 5

A large portion of Drainage Basin 5 is utilized for vehicle parking, the RCC, and a public long-term parking lot. It also encompasses parts of the runway, taxiway, least tern nesting areas, and portions of the vehicle service road. Drainage Basin 5 contains the majority of the operational area for three cargo carriers; the cargo carrier areas include loading/unloading materials, container storage, some vehicle and equipment maintenance, and office space. The southern edge of Drainage Basin 5 now extends to Harbor Drive and contains parking areas (with various newly installed BMPs, such as proprietary drain inlet filter BMPs), and

the runway generator area where two 500-gallon diesel aboveground storage tanks (ASTs), a couple of small buildings, and an Authority materials storage area are located. Storm water runoff from adjacent properties to the north of SAN flows in a southerly direction into Basin 5.

DRAINAGE BASIN 5A

Drainage Basin 5A is a small, newly re-developed portion of Drainage Basin 5 that contains drainage from the entrance of the Transportation Network Company and cell phone lots, as well as drainage from part of the entrance to the employee lot and taxi hold lot. Activities are primarily commercial vehicle parking and Transportation Network Company parking.

DRAINAGE BASIN 6

The northeastern side of Drainage Basin 6 contains a portion of the operational area for three air cargo carriers; activities performed by the cargo carriers in this area include loading/unloading cargo onto their airplanes, and container storage. Aircraft, vehicle, and equipment fueling and maintenance are also conducted here. The Aircraft Fuel Storage Facility (FSF) is located on the northwest side of the drainage basin. There are two 1-million-gallon jet fuel ASTs within secondary containment located at the FSF. This facility is equipped with a 12,000-gallon oil-water separator (OWS) plus an 8,000-gallon holding tank to treat fuel spills. There are also jet fuel, diesel, and gasoline loading and unloading areas with spill containment, an equipment pad with spill containment, gasoline and diesel underground storage tanks (USTs), and a foam equipment building with a 1,500-gallon AST containing a 3% aqueous foam concentrate. Although located on the opposite side of the runway from the FSF, Drainage Basin 6 also includes the airport Remote Fueling Facility (RFF) used to dispense fuel from the FSF to mobile aircraft refueling tanker trucks. The mobile refueling tanker trucks have the capacity to hold from 750 to 15,000 gallons, depending on the size of truck. The fuel reaches the RFF dispensers via an underground pipeline from the FSF. The RFF has four single-position refueler loading islands with spill containment, an OWS, one 3,000-gallon underground reclaimed fuel tank, and a 12,000-gallon capacity blind sump used to capture storm water runoff at the dispenser islands.

Between the FSF and the air cargo carrier area is an Authority equipment and materials storage area, referred to as the "boneyard," which provides storage for various parts and equipment. The boneyard is just north of the Air Traffic Control Tower (ATCT). The 90 Day Facility was put into service in 2016 and is the designated storage area for both solid waste and hazardous waste accumulation before waste is properly disposed. The 90 Day Facility is located between the ATCT and CRDC. Adjacent to the boneyard is the CRDC serving as a central delivery location for food, beverage, retail and other goods. This facility was constructed with several proprietary trench drain filter and grate inlet skimmer BMPs. The ARFF is located to the south of the FSF. The ARFF station participates in fire fighting vehicle and equipment testing at least once per year on a large concrete pad called the north ramp area, just to the east of the ARFF facility. The north ramp area drains through two 25,000-gallon OWSs. Also located in Drainage Basin 6 are portions of the runway, taxiways, and the vehicle service road. Solid waste from runway rubber removal are disposed of in the dewatering bin, located just east of the ATCT. Wastewater from the runway rubber removal, power washing of sidewalks, daily ramp scrubbing, and aircraft cleaning are disposed in the wash rack located in Basin 8. Ramp sweeping solid waste is dumped at the lined lowboy west of the ATCT and the waste water is disposed at the wash rack. A contractor is responsible for disposal of waste and waste water generated in both the lowboy and the dewatering bin.

This drainage basin also includes the old Commuter Terminal ramp area and new parking lots in the southern portion of the drainage basin. The Commuter Terminal now serves as the Authority Administration Building and no longer has flights arriving or departing. The ramp area is used occasionally for aircraft maintenance, equipment storage, and cargo related operations. Near the old Commuter Terminal are 140 and 190 gallon capacity diesel ASTs for the generators. A portion of the old Commuter Terminal ramp drainage is directed towards a storm drain inlet equipped with a 5,000-gallon capacity OWS. The parking lots were constructed with several new treatment control and LID BMPs including hydrodynamic separators, permeable asphalt

strips, and a high-rate media filter. Storm water runoff from adjacent properties, those to the north of SAN, flows in a southerly direction into Basin 6.

DRAINAGE BASIN 7

Drainage Basin 7 includes Menzies (formerly Aircraft Services International Group), the old Commuter Terminal short-term parking lot and access road, Authority offices and parking lot, part of the airport RFF, a former aircraft wash rack, a vehicle wash rack, ground support equipment (GSE) maintenance and storage areas, a fuel truck parking area that drains into a 3,000-gallon OWS, and a secondary cargo area where outdoor loading and unloading of cargo occurs. Equipment, parts, vehicles, materials and trash storage areas, as well as a hazardous waste accumulation area are all located in this drainage basin. The aircraft wash rack was removed in 2016. All equipment used for the wash rack was removed, and the site was restored to the previous state before the wash rack was installed. During a rain event, no washing occurs and the drainage is switched to the storm drain system, via an automatic rain-event-triggered valve. The vehicle wash rack drains to a small sump which is connected to the sanitary sewer.

DRAINAGE BASIN 8

The eastern portion of Drainage Basin 8 contains a trash compactor, recycling compactor, and a compost compactor. This area is used by the Authority, the airlines, and other tenants to dispose of trash, recyclables, and compost. The trash compactor, recycling compactor, and compost compactor are located within a bermed area. Drainage in the bermed area is discharged to the sanitary sewer. The Facilities Management Department (FMD) constructed a new sanitary sewer inlet at the bermed area in fall 2018, removed some sections of the old berm and extended the berm to prevent any illicit discharges (from power washing at the trash compactor/recycling compactor bermed area) to reach a storm drain. Additionally, a metal wall was constructed to prevent any overspray leaving the area. Washing is only permitted by FlagShip, which maintains the trash compactor area and washes trash and recycling tippers/bins. All wash water is discharged into the sanitary sewer.

To the north of the trash compacter area is a bermed vehicle and equipment wash rack, which has a closed loop system for collecting and recycling the rinse water, and aircraft lavatory waste disposal area (triturator). Drainage from both areas is directed to the sanitary sewer.

To the south of the trash compactor area is parking for the secondary cargo area. West of this parking area is the Terminal 1 gate and ramp areas and building. Fueling, maintenance, de-icing, lavatory servicing, washing, and loading/unloading of passenger aircraft occur at the main terminal ramp. Approximately 350,000 gallons of jet fuel is brought to the Terminals 1 and 2 ramp area daily by the mobile refueling tankers and loaded by positive lock hose into the aircraft. There is also a 250-gallon diesel AST located on the roof of the terminal building. Aircraft maintenance equipment, vehicles, deicing fluids, hazardous waste accumulation areas, trash dumpsters, parts, and flammable materials storage lockers containing mainly oils and lubricants are stored under overhangs and around jet ways and gates in this area. One 3,000-gallon grease receptacle, plus several grease traps and smaller grease containers, are located next to the Terminal building to trap and/or collect grease from the airport restaurants. The receptacles and traps are linked to the sanitary sewer and are serviced regularly. The wastewater and grease from cleaning of the units are transported off site for processing and disposal to the sanitary sewer or to a landfill.

Drainage Basin 8 also encompasses parts of the runway, taxiway, vehicle service road, a generator and 425-gallon gasoline AST to the north of the vehicle service road on the north side of the runway and southwest of the ARFF facility. This drainage basin also includes the Terminal 1 short-term parking lot.

DRAINAGE BASINS 9, 10, 11, AND 14

Runoff from the Terminal 2 public short-term parking lot and access roads, as well as the majority of the terminal building, is captured in four drainage basins: 9, 10, 11, and 14 spanning from the east to the west, where the new dual-level roadway for arrivals and departures has been constructed as part of the Green

Build. Drainage Basin 9 also includes office buildings, the central heating, ventilation, and air conditioning (HVAC) building and power plant building, equipment fueling, maintenance, and storage areas, and other materials and waste storage areas. Drainage Basins 9, 10, and 11 include the Terminal 2 Parking Plaza, which was completed in May 2018. The Terminal 2 Parking Plaza contains a 7.6-acre capture and reuse facility that captures 100% of the storm water drainage from an 85th-percentile of the 2-year storm event and routes it to the central HVAC building and power plant building. Drainage Basin 14 includes office buildings.

New storm water BMPs were installed in the Terminal 2 parking lots as part of the Green Build, including an acre of pervious pavers and bioswales, and three high-rate media filters.

DRAINAGE BASIN 12

The Terminal 2 East gate and ramp areas and part of the terminal building are located in Drainage Basin 12 and have very similar activities and storage as in the Terminal 1 gate and ramp areas in Drainage Basin 8 (described above). The Terminal 2 area has one 6,000-gallon and one 5,000-gallon grease receptacle, plus several grease traps. The OWS previously located northwest of Gate 41 is no longer in service. Trash dumpsters are present at Terminal 2 West and in between Terminal 2 West and East. Four emergency generators are located near the terminal areas, with a substation and 500-gallon diesel AST located at the west end of the runway. There are also two 240-gallon diesel ASTs located near Terminal 2.

DRAINAGE BASIN 13

Drainage Basin 13 is a small area in the far northwestern section of SAN, which covers the western end of the taxiway and portion of the vehicle service road. SAN's Engineered Material Arresting System, designed to prevent aircraft overruns, is also in Drainage Basin 13. Storm water runoff from adjacent properties, to the north of SAN, flows in a southerly direction into Basin 13.

DRAINAGE BASIN 15

Drainage Basin 15 encompasses the Terminal 2 West gate and ramp areas and part of the terminal building and has very similar activities as Drainage Basin 12. Drainage Basin 15 has one 5,000-gallon and two 2,000-gallon grease receptacles as well as several grease traps located alongside the terminal. A 250-gallon diesel AST is located alongside the terminal building, with an additional 1,000 gallons of diesel storage available within the generator. Drainage Basin 15 also includes aircraft overnight parking. As part of the Green Build, a high-rate media filter and 1.75 acres of permeable artificial turf were added on the airfield at the far western end of Drainage Basin 15.

2.0 ADMINISTRATIVE AND LEGAL PROCEDURES

This section identifies and describes the Authority departments and staff that conduct and/or oversee activities related to SWMP implementation and urban runoff management. This section also addresses the roles and responsibilities of these departments and individuals as required by Provision E.3.e.(b) of the Municipal Permit and Section X.D.1 of the Industrial Permit. Enforcement response procedures can be defined differently, per Provision E.6.d.(1) of the Municipal Permit, and are described for each component in Sections 3.0, 4.0, 5.0, 6.0, and 7.0 of this SWMP.

2.1 DEPARTMENT ROLES AND RESPONSIBILITIES

In June 2015, the Authority filed an NOI to comply with the Industrial Permit. The Authority has elected to assume a lead role with regard to the Industrial Permit. Airport tenants that conduct industrial activities are also subject to the requirements of the Industrial Permit and must comply with the Authority direction regarding storm water management at SAN. This approach (1) conforms to federal regulations, (2) was the preferred option of the SWRCB, and (3) allows for implementation of consistent storm water pollution prevention measures throughout the entire airport site. This approach provides for consistency in the programs that the Authority has developed and implemented to comply with the requirements of both the Industrial Permit and the Municipal Permit.

Several Authority departments share responsibility for the implementation of the SAN SWMP, specifically: the Planning and Environmental Affairs Department (P&EAD), FMD, the Airside Operations Department, the Terminal Operations Department, the Airport Design and Construction (ADC) Department, the Aviation Security and Public Safety Department, and the Revenue Management Department. The Harbor Police Department is also available to assist with enforcement as necessary. The Directors and key staff members from these departments are integral for efforts to eliminate and reduce pollutants in the storm water that discharges from SAN. Together, they ensure that the Authority complies with the NPDES Permits.

The P&EAD assumes a lead role in performing the following tasks required by the Industrial Permit:

- Conducting meetings with and training of appropriate stakeholders;
- Ensuring the proper implementation of required BMPs;
- Conducting wet and dry season monitoring;
- Conducting wet weather storm water sampling;
- Conducting annual facility inspections of all industrial areas and activities;
- Preparing and submitting an annual report to the RWQCB;
- Uploading the SWPPP section of the SWMP into the Storm Water Multiple Application and Report Tracking System (SMARTS) database;
- Submitting monitoring results onto SMARTS; and
- Revising and updating the SWPPP/SWMP annually, or as necessary.

The P&EAD also assumes a lead role in ensuring that the following tasks are conducted as required by the Municipal Permit:

- Prohibiting all identified illicit discharges;
- Prohibiting and eliminating illicit connections to the MS4;

- Controlling the discharge of spills, dumping, or disposal of materials other than storm water into the storm drain system at SAN;
- Controlling the contribution of pollutants in discharges of runoff associated with industrial and construction activity;
- Requiring compliance with Authority ordinances, permits, contracts, or orders related to storm water management and/or control, and using escalating enforcement mechanisms as necessary to ensure compliance;
- Controlling the contribution of pollutants from one portion of any shared MS4 to another portion of the MS4 through interagency agreements among Copermittees;
- Conducting all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits;
- Requiring the use of BMPs to prevent or reduce the discharge of pollutants into the MS4 to the MEP;
- Requiring and/or preparing documentation of the effectiveness of BMPs implemented to reduce the discharge of pollutants into the MS4 to the MEP;
- Preparing WQIP reports and assessments in coordination with other San Diego Bay WMA Responsible Parties (Responsible Parties);
- Providing the SWMP, WQIP, Annual Reports, and monitoring results to the public; and
- Informing the public of WQIP and SWMP updates and public comment periods or meetings.

The Director of the P&EAD has been duly authorized by the President/Chief Executive Officer (CEO) of SAN as the position having responsibility for overall operation of facilities and activities regulated by the Industrial Permit and Municipal Permit. As such, the Director of the P&EAD signs and certifies all reports and other information required by an NPDES Permit or requested by the United States Environmental Protection Agency (USEPA), SWRCB, or RWQCB.

The FMD conducts many of the municipal activities described in Section 6.0 of this SWMP. The Airside Operations Department staff and FMD staff are generally first on scene for spills and other facility maintenance and repair issues. The P&EAD assumes responsibility for determining the need for and reporting, as necessary, any significant incidents of noncompliance to the appropriate agencies. Planning and Noise Division of P&EAD and the ADC are generally responsible for project planning, design, and approval, with assistance as necessary from the P&EAD. The Terminals Operations Department helps the P&EAD coordinate activities with the airport tenants and service providers. The P&EAD, the Airside Operations Department, and the Terminals Operations Department generally assume responsibility for assisting airport tenants and service providers in maintaining compliance with the Industrial Permit and Municipal Permit. These departments help Authority staff and airport tenants formulate and implement BMPs to prevent storm water contamination from their operational areas/activities.

Table 2-1 presents the departments with roles and responsibilities for implementing various elements of the SAN SWMP. Table 7-1 in Section 7.0 presents the key Authority personnel, listed by department, directly involved with or assisting in the implementation of the SWMP. Figure 8 presents the Authority's organizational chart.

Table 2-1. Authority Departmental Roles and Responsibilities for SWMP Implementation

SWMP Element/Program/Activity	P&EAD – Environmental Affairs	P&EAD - Planning & Noise Mitigation	Facilities Management	Airside & Terminal Operations	Airport Design and Construction	Aviation Security and Public Safety
Administration	P					
Reporting	P	S	S	S	S	
Water Quality Monitoring	P					
Water Quality Sampling	P					
Illicit Discharge Detection and Elimination	P	S	S	S	S	S
Education and Outreach	P					
Public Participation	P	S		S		
Program Assessment	P					
Fiscal Analysis	P					
Engineering/Design	S				P	
Development Planning/Review/Approval	S	P		S	S	
Construction Inspection/Oversight	P				S	
Municipal Facilities Maintenance/Oversight	S		P			
Airfield Activities Oversight	S			P		S
Terminal Activities Oversight	S			P		S
Industrial/Commercial Activities Inspection/Oversight	P		S	S		
Enforcement	P			S	S	

P= primary responsibility
P&EAD = Planning and Environmental Affairs Department
S = supporting responsibility
SWMP = Storm Water Management Plan

Numerous airport tenants conduct a variety of airport-related support functions at SAN and this SWMP addresses the industrial and commercial activities conducted by these tenants. All tenants and airport service providers with a SIC of air transport or related services are considered Copermittees with the Authority on the Industrial Permit. As such, they play a role in ensuring effective implementation of the SAN SWMP. Tenancy agreements between the Authority and airport tenants contain clauses that require the Airport tenant

to abide by all Authority, local, state, and federal laws and regulations. It is the airport tenants' responsibility to comply with the Industrial Permit and to respond to Authority requests for permit information regarding tenants' facilities, operations, or activities. Each airport tenant or service provider conducting industrial or commercial activities and operations is furnished a copy of this SWMP and is obligated to comply with its requirements. Airport tenants and service providers are also responsible for ensuring that hired contractors or subcontractors comply with the SWMP.

In its management role for the implementation of the SAN SWMP, the Authority ensures that airport tenants comply with the requirements of both the Industrial Permit and the Municipal Permit. Airport tenants that implement their own storm water management programs are still required to comply with the SAN SWMP for operations/activities conducted within the boundaries of SAN.

2.2 LEGAL AUTHORITY

On September 20, 2002, the Authority Board of Directors (Authority Board) adopted Resolution No. 2002-02 amending the Authority Codes to include Section 8.70 to 8.79, known as the "San Diego County Regional Airport Authority Storm Water Management and Discharge Control" and the "Storm Water Code" (Article 8.70).

The Storm Water Code sets forth uniform requirements and prohibitions for dischargers and places of discharge to the storm water conveyance system, and receiving waters, necessary to adequately enforce and administer all laws and lawful standards and orders or special orders, that provide for the protection, enhancement, and restoration of water quality. With respect to environmental and economic considerations, the Authority seeks to reduce pollution entering San Diego Bay from storm water discharges and to protect and promote the public health, safety, and general prosperity of its tenants and the public, and to protect the natural resources and environment by attaining the following objectives as stated in the Storm Water Code:

- Reduce storm water runoff pollution;
- Reduce NSWDs to the storm water conveyance system and receiving waters to the MEP;
- Comply with all federal and state laws, lawful standards, and orders applicable to storm water and urban runoff pollution control;
- Prohibit any discharge that may interfere with the operation of, or cause damage to, the storm water conveyance system, or contribute to the impairment of the beneficial use or violation of a water quality objective of the receiving waters;
- Prohibit illegal discharges and illicit connections to the storm water conveyance system and receiving waters, including prohibiting over-irrigation as an illegal discharge; and
- Develop and implement effective educational outreach programs to educate the public, Authority employees, and tenants on issues of storm water and urban runoff pollution prevention.

The Storm Water Code provides for the prevention, control, treatment, diversion, and regulation of discharges to the storm water conveyance system and receiving waters, through a program of education and enforcement of general and specific prohibitions and requirements. The Storm Water Code applies to all dischargers and places located on property within the Authority's jurisdiction that discharge storm water or non-storm water into any storm water conveyance system or receiving waters. The Authority's President/CEO or his or her designee administers, implements, and enforces the provisions of the Storm Water Code.

Any person violating any of the provisions or failing to comply with the mandatory requirements of the Storm Water Code is guilty of a misdemeanor unless such violation or failure is declared to be an infraction by the Code.

In August 2016, the RWQCB audited the Authority's SWMP to assess whether the Authority storm water management program was in compliance with the requirement of the 2013 Municipal Permit for the active and effective implementation of the over-irrigation prohibition. The 2013 Municipal Permit was significantly changed, compared to previous permits, with the removal of irrigation runoff as a non-prohibited NSWD, provided that it was not identified as a significant source of pollutants, in which case it was required to implement appropriate controls to reduce the discharge of pollutants to the MEP. However, the RWQCB identified NSWDs associated with over-irrigation as a significant source of pollutants to receiving waters, hence included it as a prohibited NSWD in the 2013 Municipal Permit. In the RWQCB Audit Report, they found the Authority had not updated its municipal ordinance to reflect the requirements of the MS4 Permit amended in 2015. In response to the audit report finding, the Authority Board adopted Resolution No. 2018-0053, as outlined above to highlight the prohibition of over-irrigation and identification of over-irrigation as an illegal discharge.

2.2.1 CERTIFICATION OF LEGAL AUTHORITY

Attached at the front of this SWMP is the authorization from the Authority's President/CEO to assign the Director of the P&EAD as the Duly Authorized Representative (DAR) [40 Code of Federal Regulations (CFR) 122.22(b)] i.e., the position having responsibility for overall operation of facilities and activities regulated by the Industrial Permit and Municipal Permit, and a signed, certified statement [40 CFR 122.22(d)] from the DAR, as required by Municipal Permit Attachment B, Provision 1.k. As such, the Director of the P&EAD signs and certifies all reports and other information required by an NPDES Permit or requested by the USEPA, SWRCB, or RWQCB.

2.3 ENFORCEMENT

The Authority's P&EAD staff members (and other appropriate Authority staff members) are required to inspect Authority, airport tenant operations/activities, and construction areas and activities for compliance with all storm water pollution prevention requirements. If an incidence or evidence of noncompliance is observed, the inspector has the authority to enforce storm water pollution prevention requirements by implementing the Authority Storm Water Code. An escalation in enforcement is typically applied by Authority staff to stop and correct incidents of noncompliance, as described below.

Depending on the severity of the violation, enforcement can range from a verbal warning to civil and/or criminal court actions. In addition, if the noncompliance is the result of negligence by Authority staff, the enforcement action may include disciplinary action. If the noncompliance is a result of negligence by a contractor to the Authority, the enforcement action could range from a verbal warning to withholding of contract payment, assessment of fines, civil and/or criminal court actions. The Authority enforcement program seeks to accomplish the following goals:

- Limit environmental impacts resulting from noncompliant activities or conditions;
- Educate the regulated community (Authority staff, airport tenants and service providers, and contractors);
- Promote compliance with laws and regulations;
- Return violators to compliance in a timely manner;
- Initiate and conclude enforcement activities in a timely manner;
- Penalize violators, as appropriate, and deprive violators of any significant benefit gained from violations;
- Prevent any business from having an unfair business advantage through noncompliance; and

- Treat similar airport tenants, service providers, and contractors equally and consistently with regard to the same types of violations.

The Authority employs several enforcement mechanisms and penalties to ensure compliance with its ordinances. The levels of enforcement and associated penalties are typically issued and escalated at the discretion of the enforcement officer with consideration of relevant circumstances regarding the violation.

The P&EAD will conduct follow-up inspections to determine whether corrective actions have been taken in accordance with the corrective action orders, the Authority's ordinances, and the minimum BMP requirements. Escalating enforcement procedures, which provide flexibility in the establishment of appropriate compliance time frames, are implemented as needed. The procedures for escalated enforcement specific to each component are described in their corresponding sections (Sections 3.7, 4.9, 5.6, 6.10, and 7.0). If a significant and/or immediate threat to water quality (TTWQ) is observed, appropriate actions will be taken to require the responsible party to immediately cease the discharge and/or correct the situation.

Sections 2.3.1 through 2.3.9 discuss typical escalating enforcement procedures.

2.3.1 VERBAL WARNINGS

A common initial method of requesting corrective action and enforcing compliance is a verbal warning from the inspector to the responsible party. Verbal warnings are often sufficient to achieve correction of the violation, often while the inspector is present. The inspector will notify the responsible party and the facility/operation supervisor of the violation and will document the violation and the notification to the project supervisor in the inspection file. A specific time frame for correcting the problem and a follow-up inspection date will be documented by the inspector. In judging the degree of severity, the inspector may also take into account any history of similar or repeated violations by the responsible party at this or other sites.

2.3.2 WRITTEN WARNINGS

If the deficiency noted in a verbal warning is not corrected by the next inspection, or if the severity of the violation is such that a verbal warning is not considered sufficient, a written notice will be issued that describes the infraction that is to be corrected, the time frame for correction, and the date for a follow-up inspection. A copy of the notice should be given to the responsible party and facility/operation supervisor and placed in the inspection file. If the violation has been corrected to the satisfaction of the inspector, the inspector will document compliance in the inspection file.

2.3.3 DISCIPLINARY ACTIONS

If an Authority employee is responsible for the noncompliant activities, the Authority may choose to take disciplinary actions against the employee in accordance with established procedures.

2.3.4 ENFORCEMENT OF CONTRACTS, LEASES, OR USE PERMITS

If a contractor or developer is performing contract work for the Authority, the Authority may use the provisions within the contract to correct noncompliant activities or conditions. The Authority generally adds language into all contracts that gives the right to refuse payment, stop work (without time penalties), or revoke the contract if the contractors' performance does not comply with appropriate permits, laws, regulations, and ordinances. Similarly, for tenant projects, the Authority may use provisions within the lease or use permit to correct noncompliant activities or conditions. This mechanism is typically preferred to other legal actions.

2.3.5 CEASE AND DESIST ORDER

If the deficiency noted in an initial warning is not corrected by the follow-up inspection, or if the severity of the violation is such that a warning is not considered sufficient, a Cease and Desist Order (CDO) may be issued. A warning may be insufficient if, for example, there is a significant and/or immediate TTWQ. CDOs are administrative orders issued to cease and desist all activities that may cause or contribute to a violation and to stop illegal discharges and/or illicit connections. CDOs typically require compliance within a designated time frame and remedial or preventive actions to prevent the violation from recurring. Conditions that might warrant such action include observation of runoff from an industrial or commercial area or activity that is not reasonably controlled by protective measures or observation of a failure in BMPs that results in or potentially results in a release of pollutants to a degree that may substantially degrade water quality.

2.3.6 NOTICE AND ORDER TO CLEAN, TEST, OR ABATE

These are written and/or verbal orders to perform activities listed in the Authority's Storm Water Code. Activities may include development of a SWPPP, BMP implementation, testing, monitoring, and/or mitigation.

2.3.7 FINES

Costs or fines associated with pollution detection and abatement, in addition to other penalties, are the responsibility of the property owner or tenant.

2.3.8 CIVIL AND CRIMINAL COURT ACTIONS

Civil and criminal court actions may be taken under Section 8.76 of the Storm Water Code, the State Porter Cologne Water Quality Act, or the Federal Clean Water Act.

Section 8.76(d) of the Storm Water Code makes a violation either a misdemeanor offense or an infraction, at the discretion of the Executive Director. Infractions are punishable by a fine not to exceed $100 for the first violation and $250 for the second violation of the same provision within a year of the first violation. Third violations are misdemeanor offenses subject to a fine and/or imprisonment.

The Authority may use civil and/or criminal court action under the Porter-Cologne Water Quality Act, the Federal Clean Water Act, or other applicable statute as an enforcement mechanism. Civil and criminal court actions under the State Porter-Cologne Water Quality Act may result in fines ranging from $100 to $15,000 per day per violation and $10 to $20 per gallon of polluted discharge. Penalties under the Federal Clean Water Act may result in fines ranging from $2,500 to $50,000 per day per violation and/or one to three years of imprisonment for first offenders. Repeat offenders face double the penalties.

2.3.9 BONDING REQUIREMENTS AND LIENS

An authorized enforcement official may use any means allowed by law to establish a lien against the owners' or tenants' property or establish bonding requirements to ensure that a violation is corrected and penalties and /or abatement, pollution detection, or administrative costs are recovered.

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3.0 NON-STORM WATER DISCHARGES/ILLICIT DISCHARGE DETECTION AND ELIMINATION

3.1 INTRODUCTION

This update to the Authority SWMP is in response to the requirements of the Municipal Permit and Industrial Permit. The Authority prohibits all types of NSWDs into its MS4 unless the discharge is authorized by a separate NPDES permit, or identified as not being a source of pollutants and all appropriate BMPs are implemented to prevent impacts to storm water quality. The Authority is required by both the Municipal Permit and Industrial Permit to eliminate unauthorized or illicit NSWDs. If the Authority identifies an NSWD as a significant source of pollutants to the waters of the United States (receiving waters), both permits require the Authority to prohibit the discharge. Although certain NSWDs are authorized under the Industrial Permit if the Authority, in its SWPPP, (1) identifies the sources of pollution that potentially affect the quality of authorized NSWDs, and (2) describes and ensures the implementation of BMPs to reduce or prevent pollutants in authorized NSWDs using BAT and BCT, the Authority will implement the discharge prohibitions in the Municipal Permit that are deemed stricter than the Industrial Permit, unless a separate NPDES Permit is obtained for certain NSWDs.

Section 3.0 addresses the requirements in Municipal Permit Provisions D.2.b, D.4.b(1), E.2, and E.7.a and Industrial Permit Sections III, IV, VI, X.G.e, X.H.1 and XI.A for NSWDs and IDDE.

The provisions of the Municipal Permit require the Authority to:

- D.2.b—Develop an MS4 Outfall Discharge Monitoring Program to detect discharges from MS4 outfalls during dry weather. The monitoring program requirements include field screening and non-storm water persistent flow monitoring. Section 3.4.4 and Appendix D-2 have been prepared to address this requirement.
- D.4.b.(1)—Assess and report on the effectiveness of the MS4 Outfall Discharge Monitoring Program in effectively reducing, eliminating, or prohibiting NSWDs and illicit discharges, and identify any modifications needed to increase the effectiveness of the program. Section 3.5 and Appendix D-2 have been prepared to address this requirement.
- E.2.a—Establish an IDDE program, in accordance with the WQIP strategies, to actively seek and eliminate illicit discharges and connections to the storm drain system. This program provides a framework for the detection, investigation, follow-up, and elimination of reported violations. The program is designed to be adaptive and to allow the Authority to periodically assess data, re-evaluate areas of concern, and concentrate control methods and corrective actions as necessary in those areas. Municipal Permit Provision E.2.a requires all NSWDs to be treated as an illicit discharge unless the discharge is (1) authorized under a separate NPDES permit, (2) identified as not being a source of pollutants and all appropriate BMPs are implemented to prevent impacts to storm water quality, such as the use of BMPs designed to prevent these discharges from contacting pollutants, reduce the flow or volume of the discharges, or prevent these discharges from reaching the storm drain system. Section 3.2 and Appendix D-2 have been prepared to address this requirement.
- E.2.b—Update its MS4 inventory and drainage area map to include all areas of the MS4 that are owned, operated, or maintained by the Authority; locations of discharge inlets and all outfalls; known connections with other MS4s; any segments of receiving water within the Authority's jurisdiction that are affected by its MS4 discharges; and locations of any outfalls with non-storm water persistent flow, identified during outfall field screening. Authority employees and contractors are encouraged to be vigilant in identifying and reporting illicit discharges and connections during daily activities. Reporting should include a public hotline and email address to receive reports. The Authority should designate and implement response procedures for illicit discharges to prevent discharges from

reaching the MS4, including control of spills, prevention of seepage from sanitary sewers to the MS4, and coordination with other upstream Copermittees to prevent illicit discharges from entering the MS4 within the Authority's jurisdiction. Sections 3.2, 3.3.4, and 3.4 have been prepared to address this requirement.

- E.2.c—Implement a strategy for field screening the MS4 within its jurisdiction to detect NSWDs and connections to the MS4. Section 3.3 and Appendix D-2 has been prepared to address this requirement.
- E.2.d—Develop a timeline and prioritization for responding to reports or observations of NSWDs or illicit discharges, using the criteria detailed in Municipal Permit Provision E.2.d.(1). These criteria include whether or not pollutants are (1) classified as highest or focused priority pollutants in the WQIP; (2) listed on the 303(d) list for the receiving water; (3) used within the Authority's jurisdiction; (4) causing an exceedance to a Numeric Action Level (NAL), or (5) posing a threat to human health or the environment. The Authority must implement investigation procedures to determine the validity of each report, prioritize responses, respond and investigate, attempt to identify the source of the discharge, assess and reclassify discharges if necessary, and maintain records of the report and actions taken. The Authority is also required to implement procedures to eliminate illicit discharges and connections to its MS4 by enforcing its legal authority and implementing the Enforcement Response Plan (ERP) required under Municipal Permit Provision E.6. A summary of the NSWDs and illicit discharges, investigations, and actions to eliminate the discharges must be included in the WQIP. Sections 3.2 and 3.4 have been prepared to address this requirement.

The Industrial Permit requires the Authority to:

- III.—Effectively prohibit all NSWDs, with the exception of those authorized by the Industrial Permit or by other NPDES permits. Section 3.1 has been prepared to address this requirement.
- IV.A—Ensure that all authorized NSWDs, as listed in Industrial Permit Section IV.A, meet the conditions described in Industrial Permit Section IV.B. Section 3.1 has been prepared to address these requirements.
- IV.B—Ensure that any authorized NSWDs do not violate the San Diego Basin Plan, applicable water quality standards, or any applicable Authority ordinance or code, and implement BMPs to reduce or prevent pollutants in authorized NSWDs as well as the flow or volume of those discharges to the MEP, by using BAT/BCT. The Authority should conduct monthly visual observations of authorized NSWDs to ensure effective BMP implementation and report all authorized NSWDs in the Industrial Annual Report. Sections 3.3.4 and 7.5.3 have been prepared to address this requirement.
- VI—Ensure that authorized NSWDs, once they reach receiving waters, do not contribute to water quality impairments, cause exceedances in water quality standards, threaten human health or the environment, or contain pollutants that contribute to overall pollution or public nuisance. Sections 3.3.1 and 7.5.4 have been prepared to address this requirement.
- X.G.e—Evaluate the facility to identify all NSWDs, including their sources and drainage areas. The Authority is required to evaluate all drains connected to the MS4 and describe the process by which all unauthorized NSWDs have been eliminated. The Authority is also required to include in this SWMP the source, quantity, frequency, characteristics, and drainage areas of all NSWDs, and whether they are authorized or unauthorized. Sections 7.7 and 7.8.4.2 have been prepared to address this requirement.
- X.H.1—Implement and maintain a minimum set of BMPs to prevent spills and illicit discharges from entering the storm drain system and to minimize authorized NSWDs. Sections 3.1, 3.2, and 7.7.4 have been prepared to address this requirement.
- XI.A—At least once per month during daylight hours of a dry weather period, visually observe each drainage area, including all industrial operational areas and equipment and material storage areas, for authorized or unauthorized NSWDs and the associated BMPs and their effectiveness. These monthly

visual observations and facility inspections actively seek to detect and eliminate illicit discharges, and help determine the effectiveness of BMPs in minimizing and controlling authorized NSWDs. Sections 3.3.4 and 7.8.4.2, and Appendix D-1 have been prepared to address this requirement.

3.1.1 NON-STORM WATER DISCHARGES

NSWDs are addressed as illicit discharges unless they are identified as a discharge authorized by a separate NPDES permit, or identified as a category of NSWDs or flows that are addressed pursuant to the following requirements from the Municipal Permit Provision E.2:

- NSWDs to the MS4 from the following categories are addressed as illicit discharges unless the discharge has covered or meets the exception criteria under NPDES Permit No. CAG919003 (Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:
  - Uncontaminated pumped ground water;
  - Discharges from foundation drains;
  - Water from crawl space pumps; and
  - Water from footing drains.
- NSWDs from water line flushing and water main breaks to the MS4 are addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 are addressed as illicit discharges, unless the discharges have covered under a separate NPDES Permit.
- NSWDs to the MS4 from the following categories that are addressed as illicit discharges only if the Authority of the RWQCB identifies the discharge as a source of pollutants to receiving water:
  - Diverted stream flows;
  - Rising ground water;
  - Uncontaminated ground water infiltration to MS4s;
  - Springs;
  - Flows from riparian habitats and wetlands;
  - Discharges from potable water sources;
  - Discharges from foundation drains; and
  - Discharges from footing drains.
- NSWDs to the MS4 from the following categories are controlled by the requirements given below through Authority ordinances, codes, or requirements, or similar means. NSWDs to the MS4 from the following categories not controlled by the requirements given below through Authority ordinances, codes, or requirements are addressed as illicit discharges:
  - Air conditioning condensation:
    - The discharge of air conditioning condensation should be directed to landscaped areas or pervious surfaces, or to the sanitary sewer, where feasible.

  - Firefighting discharges to the MS4 are addressed as illicit discharges only if the Authority or the RWQCB identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, are addressed, at a minimum, as follows:
    - Non-emergency firefighting discharges:
      - Building fire suppression system maintenance discharges (e.g., sprinkler line flushing) to the MS4 are addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4; and
      - Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) are addressed by a program, to be developed and implemented by the Authority, to reduce or eliminate pollutants in such discharges from entering the MS4.
    - Emergency firefighting discharges:
      - The Authority will develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

- If the Authority or RWQCB identifies any category of NSWDs listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category is prohibited through the Authority ordinances, codes, and requirements and addressed as an illicit discharge. Alternatively, the Authority may propose controls to be implemented for the category of NSWDs as part of the WQIP instead of prohibiting the category of NSWDs, and implement the controls if accepted by the RWQCB as part of the WQIP:
  - Over-irrigation is identified by the RWQCB as a pollutant source to receiving water.
- Where feasible and priorities and resources allow, the Authority reduces or eliminates NSWDs listed under Provisions E.2.a.(1)-(4) into its MS4, unless an NSWD is identified as a discharge authorized by a separate NPDES permit.

3.1.2. SOURCE CHARACTERIZATION AND CONTROL MEASURES

The Authority addresses all NSWDs into the MS4 as illicit discharges, unless the discharge is authorized by a separate NPDES permit, or identified as not being a source of pollutants and all appropriate BMPs are implemented to prevent impacts to storm water quality, such as the use of BMPs designed to prevent these discharges from contacting pollutants, reduce the flow or volume of the discharges, or prevent these discharges from reaching the storm drain system. The Authority conducts regular inspections to ensure that these BMPs are properly and fully implemented. The BMPs required by the Authority for the NSWDs identified above are discussed in this section. Monitoring and reporting of all NSWDs as required by the applicable permits are described in Appendix D-1 and D-2 and Section 12.0.

Potential NSWDs at SAN include these sources: groundwater, water from crawl space pumps and footing drains, air conditioning and cooling plant condensation and mist, landscape irrigation, potable water flushing, eye wash station testing, water fountains, hose bibs, fire hydrant and sprinkler system flushing, non-emergency and emergency firefighting flows, and tidal intrusion into the MS4. The list of source characterization for each potential NSWD is described below and their compliance with the Municipal Permit or another NPDES Permit.

GROUNDWATER, WATER FROM CRAWL SPACES, AND FOOTING DRAINS

The elevation and proximity of SAN in relation to San Diego Bay creates a relatively shallow groundwater table, generally approximately 10 to 15 feet below the ground surface, with depth to groundwater increasing to the northeast, away from San Diego Bay. Groundwater elevations vary around SAN and fluctuations occur during and following periods of heavy rain. The shallow groundwater tends to infiltrate into below-grade structures at the airport, including utility vaults, below-grade crawl spaces, footing drains, and the storm drain system itself.

While rising groundwater, groundwater infiltration to the MS4, and any water pumped from footing drains above the groundwater table have not been identified as significant sources of storm water pollution by the Authority or the RWQCB, in addition to the standard airport-wide BMPs described in Appendix B, the following common-sense BMPs are generally applicable to these types of NSWDs:

- Verify that the discharge does not originate from an area of known environmental contamination;
- Conduct a visual, olfactory inspection of the discharge to check that the discharge is free of obvious, observable pollutants;
- Prevent the discharge from contacting pollutants in the path of the discharge; and
- Prevent discharges from entering the storm water conveyance system, if possible, by diverting the flow to a landscaped area, a pervious area, an impervious area where the discharge can evaporate, an OWS, or the sanitary sewer.

AIR CONDITIONING AND COOLING PLANT CONDENSATION

Air conditioners are located throughout the Authority and are used for environment and equipment cooling. Condensate is regularly discharged from air conditioners, although most discharge rates are extremely low, and air conditioning condensate in passenger boarding bridges in drainage basins 8, 12 and 15 is captured and reused in power washing activities (in 2017, approximately100,000 gallons of condensate were captured this way from 16 different passenger boarding bridges). Air conditioner condensate may contact contaminants if allowed to flow through areas where significant materials, oil from parking lots, sediment, trash, and construction debris may potentially be carried into the storm drain system by the discharge.

The cooling plant in the Terminal 2 Parking Plaza (Drainage Basin 9) upgraded as a part of the Green Build construction project includes four electric centrifugal chillers, four cooling towers with condenser water pumps for individual tower bypass, and a primary, secondary, and tertiary chilled water system to improve cooling of the airport terminals. These cooling devices dispense water through mist, evaporation, and blowdown, which may collect on rooftops and adjacent structures. Cooling towers generally evaporate 3 gallons of water per minute for every 100 tons of cooling. Metals and debris from rooftops may potentially be carried into the storm drain system by the condensate mist.

The Terminal 2 Parking Plaza Harvest and Reuse Facility opened in June 2018 and captures 100% of the storm water drainage from an 85th-percentile of the 2-year storm event that falls on the7.6-acre parking structure and routes the water to the Central Utility Plant for use in the cooling towers.

In early 2019, the Authority will begin construction on a storm water capture and reuse system that will capture approximately 80% of average annual storm water runoff from approximately 200 acres of the 661-acre Authority property. Built in 3 phases, the capture and reuse system will include an underground and aboveground storm water conveyance system, underground storage facilities, treatment facilities, pump station(s), a distribution system, and underground infiltration facilities. At final build-out, the system will provide a total storage capacity of nine million gallons and allow for capture and reuse or infiltration of approximately 39 million gallons of storm water per year. The overall goals of the project are to 1) mitigate storm water discharges of zinc and copper into San Diego Bay; 2) develop on-site sources of water to meet

on-site non-potable water demand; and (3) integrate flexibility to address long-term storm water liabilities and meet water stewardship goals of the Authority.

Incidental air conditioning and cooling tower condensate has been identified as an illicit discharge only when they are not controlled using the standard airport-wide BMPs requirements described in Appendix B and the following BMPs applicable to air conditioning and cooling plant discharges:

- Monitor and control the amount of blow-down water or water lost to evaporation. To ensure the most efficient use of water, cooling towers can be equipped with automatic blowdown control systems or water flow meters to monitor water loss;
- Keep a log to track the make-up and blowdown quantities, conductivity, and cycles of concentration to detect leaks, excessive blowdown, or deterioration;
- Properly maintain the air conditioners and cooling towers to help reduce the amount of condensate discharged. Monitor water usage in cooling towers to track water loss and efficiency;
- Capture and reuse air conditioning condensate as appropriate; and
- Prevent the discharge from contacting surface pollutants in the path of the discharge.

Prevent discharges from entering the storm water conveyance system, if possible, by diverting the flow to a landscaped area or other pervious surface, an impervious area where the discharge can evaporate, an OWS or other treatment control or LID BMP, or the sanitary sewer.

LANDSCAPE IRRIGATION

Landscape irrigation constitutes a small portion of the potable water usage at SAN, (6 million gallons in 2012, before completion of xeriscaping), due in part to the limited landscape acreage (approximately 18 acres) in drainage basins 1, 3, 5, 6, 7, 8, 9, 10, and 11 and the use of xeriscaping to help reduce the need for irrigation, including planting indigenous and drought-tolerant plants. For example, water-intensive shrubs were replaced with turf and drought-tolerant trees in front of the Terminal 1 check-in building. SAN has also used a satellite water-tracking system to determine the airport's watering needs; this system is expected to save approximately 9 million gallons of water each year. Approximately 2 acres of bioswales and 1.25 acres of bioretention swales were installed as part of SAN's Green Build LID projects. Additional LID features were installed at the Signature Aviation FBO and RCC. Five bioswales were installed at Signature, and six bioretention basins were installed at the RCC. These areas will require additional landscaping and irrigation. Over-irrigation was identified by the RWQCB as a pollutant source to receiving water. The Authority prohibits over-irrigation discharges because they have been found to be a source of pollutants such as nutrients, bacteria, pesticides and sediment.

- **Landscape Irrigation**: The Authority prohibits over-irrigation discharges because they have been found to be a source of pollutants such as nutrients, bacteria, pesticides and sediment. The hotline number to report incidents or complete an over-irrigation report is provided on the P&EAD storm water page. Concerns regarding over-irrigation can also be provided on the Authority's contact us page (https://www.san.org/Travel-Info/Contact-Us). BMPs are implemented to prevent these discharges, as outlined below:
  - Utilize native plants to reduce the need for irrigation and fertilization. Perform soil analysis seasonally to determine appropriate fertilization requirements and minimize the use of chemical fertilizers.
  - Apply pesticides, herbicides, and fertilizers as needed and in accordance with manufacturer instructions to maximize the utility of the product and minimize the potential for product residue to contact irrigation runoff. Do not use pesticides or herbicides if a rain event is expected. Do not apply pesticides or herbicides during periods of high wind.

- Combat weeds by hand pulling when feasible. Use herbicides only as a last resort.
- Properly dispose of landscaped materials in the garbage or compost. If immediate disposal is not feasible, store landscaped materials and vegetation debris in areas that are covered or otherwise protected from wind and rain dispersal.
- Avoid exposed soils by revegetating or temporarily covering these areas.
- Do not water during a rain event or at least 48 hours following a rain event.
- Employ water conservation practices, such as:
  - Water a maximum of two days per week.
  - Limit watering days to Mondays and Fridays. Exceptions include:
    - Irrigation with a landscape permit;
    - Erosion control; and
    - Landscape establishment following a disaster.
  - When using a standard sprinkler system, limit watering duration to 5 minutes between the hours of 4:00 pm to 10:00 am from November 1 to May 31 and 6:00 pm to 10:00 am from June 1 to October 31.
  - When available, use recycled or reclaimed water for landscaping purposes.
  - Use automatic sprinkler timers. Automatic sprinklers, when properly set, minimize runoff by turning off the system at the appropriate intervals.
  - Where automatic sprinkler timers are not used, periodically observe the area being watered.
  - Conduct weekly observations to identify and correct damaged sprinkler systems and to adjust sprinkler heads. The landscaped or vegetated LID areas should also be observed for prevention of over-watering and runoff.
  - Assess the soil moisture and depth and utilize the Authority's satellite water-tracking system to determine accuracy of irrigation schedules.
  - Use water delivery rates that do not exceed the infiltration rate of the soil, but instead minimize ponding and runoff and allow water to infiltrate into the soil.
  - If a rain event is predicted, temporarily turn off sprinkler systems or use smart controllers to avoid over-watering and runoff.
  - Avoid overspray outside of the landscaped areas and adjust irrigation systems to prevent overspray, minimize or eliminate runoff, and prevent contact with surface pollutants.
  - Use micro-irrigation systems (e.g., drip irrigation).
  - Use a control nozzle if watering by hand to avoid runoff.
  - Avoid placing, storing, or parking equipment and vehicles in areas being irrigated to minimize the potential for runoff caused by blocking the spray or water delivery patterns. In this way, the potential for inadvertent runoff to contact pollutants is precluded.

POTABLE WATER, HOSE BIBS, AND EYE WASH STATIONS

Each of the airline passenger loading/unloading gates at Terminals 1 and 2 (drainage basins 8, 12 and 15) features a potable water supply cabinet with a hose to dispense potable water to the aircraft. Proper use and maintenance of the water cabinets requires potable water to be flushed from the system and if possible, flushed water should be captured for non-potable reuse or reduced to a minimum flushing time onto the ramp area.

- A drinking water fountain was installed outside of the Terminal 2 West baggage claim area. The water is contained and is pumped back through the back-flow system, where it is treated for algae. The water fountain is flushed directly into the sanitary sewer annually.
- Hose bibs are installed around the perimeter of the terminals for connection to hoses. Hose bibs can be locked and use is limited. These hose bibs provide the opportunity for NSWDs.
- Eye wash stations are located outside most gates along Terminals 1 and 2 for emergency purposes. This equipment requires monthly testing, during which water is released onto the ramp.

Water discharged from these sources may contact contaminants if allowed to flow through areas where significant materials, oil, sediment, trash, and construction debris may potentially be carried into the storm drain system by the discharge. Control measures to address the potential for potable water flushing, drinking water fountain leaks, hose bibs, and eye wash station testing to transport pollutants to receiving waters are described below:

- Minimize flushing time and volume of water released;
- Do not perform flushing activities near storm drains or in a manner that discharges water directly to a storm drain, but rather flush water in a manner and direction that allow the water to pond on the surface and evaporate without ever reaching a storm drain;
- Capture and reuse released potable water, where possible;
- Flush water to a landscaped area, or other pervious surface, if possible; and
- Flush water in a manner and direction that prevents the discharge from contacting surface pollutants in the path of the discharge.

Further BMPs applicable to hose bibs and eye wash stations include the following:

- Lock hose bibs to limit excessive usage;
- Post signs at hose bibs to discourage use;
- Inspect eye wash stations when necessary and release only minimal water so that it evaporates before reaching the storm drain; and
- Inspect eye wash stations and hose bibs for signs of leaking.

FIRE HYDRANT FLUSHING

The City of San Diego Water Department generally maintains the water mains and fire hydrants at SAN. However, Allied Aviation performs annual flush testing of fire hydrants in its operating area, (Drainage Basin 6) and the Authority FMD responds to minor leaks and breaks throughout the airport. Fire hydrant or fire response system flushing must be addressed as illicit discharges only if the Authority or RWQCB identifies it as a significant source of pollutants, as detailed by the Municipal Permit Provision 2.E.a. It is considered an authorized discharge under the Industrial Permit only if the discharge meets the conditions provided in Section IV.B. Since fire hydrant flushing has the potential to transport pollutants to receiving waters if the discharge is allowed to flow through areas where significant materials, oil, sediment, trash, and construction debris may potentially be carried into the storm drain system, BMPs will be implemented to

reduce or eliminate pollutants in such discharges from entering the MS4. BMPs are implemented to minimize contact between pollutants and flows, minimize the potential for erosion from any nearby landscaped areas, and use treatment control BMPs, where applicable, to treat the discharge to remove pollutants before entering the MS4. The City of San Diego Water Department flushes fire hydrants at SAN once per year. Allied Aviation's annual flushing activities are performed in a bermed area and nearby storm drains are covered. All waste water and foam is contained and collected for off-site disposal.

- **Fire Suppression System Installation, Maintenance, and Testing**: Potable water that has been left to stand in a building fire suppression system has a significant potential to carry pollutants, especially over time, as the water tends to stagnate and undergo various physical and chemical changes. As such, the Authority requires the following BMPs be implemented to address the discharge of this type of water:

  - Obtain the proper permit(s) from the City of San Diego Metropolitan Wastewater Department (MWWD) to discharge the water directly to the sanitary sewer.
  - Discharge the water directly into a tanker truck for proper disposal off site.
  - Capture the discharge in a holding tank or lined, bermed area or sump of sufficient capacity to store the water prior to discharge to an on-site sewer under proper permit(s) from MWWD or prior to transferring the water to a tanker truck for proper disposal off site. In addition, berm or block storm drains located close to or within the test area to prevent any risk of seepage into the MS4.
  - Direct flows to nearby landscaped or pervious area to infiltrate or evaporate during dry weather.
  - Direct flows to a contained area and collect using a wet vacuum or equivalent, and properly dispose of collected water. Remove any residue in contained area and do not perform during rain events.

NON-EMERGENCY FIREFIGHTING FLOWS

The ARFF and Allied Aviation (in Drainage Basin 6), and RCC (in Drainage Basins 3 and 5) are the only facilities at SAN that operate and maintain fire suppression systems and/or perform firefighting activities. Non-emergency firefighting flows at SAN generally fall into two categories: (1) discharges from building fire suppression systems during installation, maintenance, or testing; and (2) discharges of potable water and/or potable water mixed with firefighting foaming agents from the ARFF rigs during firefighting practice drills and other exercises. Quantities and frequencies involved are outlined below. Allied Aviation maintains fire suppression systems surrounding oil storage areas and regularly tests the foam-to-water ratio of their equipment. Once potable water has been left to stand in building fire suppression systems or mixed with foaming agents, the water becomes contaminated and serves as a transport mechanism for pollutants. Discharges of potable water from the ARFF equipment during firefighting practice drills and equipment testing have the potential to transport foaming agents or other pollutants to receiving waters if the discharge is allowed to flow through areas where significant materials, oil, sediment, trash, and construction debris may potentially be carried into the storm drain system. Ocean Blue is contracted to monitor and clean after drills.

Not all the activities conducted at the ARFF station that generate NSWDs are considered non-emergency firefighting flows. Non-emergency firefighting flows that have the potential to transport pollutants to receiving waters include potable water that has been mixed with firefighting foaming agents, or potable water discharged from the ARFF rigs during firefighting practice drills and other exercises. Fire hydrants will be used only to fight fires and to maintain human health and safety. Routine vehicle and equipment cleaning is conducted either at the SAN wash rack or in a nearby permeable area. The RCC has a certified contractor test the sprinkler and FM200 fire suppression system quarterly and annually. The FM200 fire suppression system is installed in the computer room, and a sprinkler system is installed throughout the facility. The Authority requires the implementation of various BMPs to address these types of activities.

The Authority allows non-emergency firefighting equipment testing to be performed, but prohibits the discharge of non-emergency firefighting flows, which consist of potable water mixed with foaming agents, to the MS4. The proper disposal of non-emergency firefighting flows is discussed below:

1) Firefighting Foam Discharge

While firefighting equipment is tested annually at Allied Aviation's FSF, the test is conducted using water only and the water is discharged into storm drains connected to the on-site OWS. At the FSF foam house, the test ports inside the house are used to test the water-to-foam ratio; however, no foam discharge is created in this process. During all equipment and facility testing, the test area is bermed and all waste water is collected and disposed of off site.

Firefighting foam testing is performed only by ARFF. ARFF performs its testing once per year north of the north ramp, using approximately 1,000 gallons of water and 50 gallons of 3 percent foaming agent. Although the entire north ramp drainage area is connected to OWSs, these systems are used only as a back-up fail-safe. The slit drainage trench is blocked off from the storm drain system by sandbags prior to conducting the foam test, allowing the foam to be captured in the slit trench, but preventing the foam from entering the storm drain. All of the foam is then vacuumed into a tanker truck and properly disposed of to an on-site sanitary sewer under the proper permit from the MWWD.

2) Firefighting Training

Firefighting training typically involves discharges of potable water from the ARFF rigs. These discharges may transport storm water pollutants when allowed to contact contaminants lying in the path of the discharge. As such, in addition to the standard airport-wide BMPs described in Appendix B, the following BMPs are generally applicable to firefighting training discharges:

- Pre-plan training exercises to allow integration of structural BMPs to control runoff;
- Use lower gallon per minute nozzle settings;
- Use fog streams for short durations and change the direction of discharge as frequently as possible;
- Avoid training activities and discharges near storm drains and do not discharge water directly to a storm drain;
- Discharge water in the direction of landscaped or pervious areas whenever possible;
- Discharge water in a manner and direction that allows the water to pond on the surface and evaporate without ever reaching a storm drain;
- Utilize techniques for storm drain inlet protection when possible;
- Remove debris from adjacent curbs or inlets when possible;
- Prior to training, inspect the training area to avoid transporting debris to the storm drain system through flows produced during training;
- Utilize techniques for berming or diking the discharge to allow evaporation whenever possible;
- Utilize techniques for velocity reduction (energy dissipaters) when possible;
- Utilize techniques for sediment control in training whenever possible;
- Discharge water in a manner and direction that maximize either or both the time and/or distance required for the discharge to reach the storm drain system, such that the potential for evaporation is also maximized; and

- Discharge water in a manner and direction that prevents the discharge from contacting surface pollutants in the path of the discharge.

TIDAL INTRUSION

Many of the outfalls from the storm drain system at SAN are submerged during high tides and even during low tides, allowing water from San Diego Bay to travel upstream in the storm water conveyance system. The tidal waters have the potential to transport back downstream to the receiving water any pollutants that have accumulated in the SAN storm water conveyance system. Pollutants from industrial operations, residue from spills of significant materials, construction debris, sediment, and oil from parking lots and streets have the potential to collect in the storm water conveyance system. Tidal intrusion has been identified as a source of water quality impact to receiving waters only when pollutants are allowed to accumulate in the SAN storm water drain system and then be carried downstream by the receding tidal flow. To prevent these potential impacts, the Authority regularly inspects and cleans the storm drain system to reduce potential pollutants from coming into contact with tidal flows. The Authority's monthly inspection program is more fully described in Section 7.8.4. Control measures to address the potential for tidal intrusion to transport pollutants to receiving waters are described below:

- Perform monthly and additional ad hoc inspections of the MS4.
- Perform annual inspection of all storm water conveyance systems. Daily, inspect the sump by the trash compactor, OWS near the Menzies fueling facility, and storm drain near the California Least Turn nesting areas.
- Perform annual cleaning of all OWSs and underground storm drain pipes, quarterly cleaning of drop inlet, curb inlet, trench drains, slit drains, and high priority catch basins located near terminal areas. Additional storm drains are cleaned as needed on the basis of year-round ad hoc inspections, monthly and after each storm event during the wet season.
- Install and maintain screens in front of curb inlets on the southern side of SAN. Additional screens will be installed as necessary.
- Keep accurate logs on cleaning and maintenance of the storm drain system.
- Maintain a clean and waste-free facility by using foreign object damage (FOD) buckets, performing frequent dumpster service, and cleaning all dumpsters, compactors, and trash haulers.

A full description of BMPs in place at SAN to prevent or eliminate prohibited water discharges is in Appendix B. Examples of the potential sources of prohibited discharges at SAN and corresponding BMPs to prevent them include:

- **Aircraft and Vehicle Washing**: Washing of equipment, vehicles, and aircraft is to be performed at designated wash areas where wash water is collected, recycled, or connected to an approved sanitary sewer connection. The designated wash areas at SAN include in the Wash Bay Facility, Menzies wash rack, and the RCC. The Wash Rack operated by American Airlines was removed in 2016. The Wash Bay Facility and Menzies wash area are both bermed and all flow is directed to a sump, an OWS, or the sanitary sewer. The Menzies wash area drains to the sanitary sewer. Rental vehicles are washed in the RCC's QTA area, located in the parking garage structure. The car washes within the RCC structure have a closed loop system where the water drains to an OWS, is treated using reverse osmosis, and reused within the car wash. Additionally, there is no threat of an unauthorized NSWD because this activity is performed within the RCC structure which is covered and is not exposed to storm water. The use of a control nozzle on all hoses is recommended to minimize the amount of water used. According to City of San Diego water conservation measures, vehicles, equipment, and aircraft should be washed only during the following time increments:
  - November 1 to May 31: 4:00 pm to 10:00 am; and

  - June 1 to October 31: 6:00 pm to 10:00 am.

- **Erosion/Sediment Transport**: The amount of exposed soils at SAN should be minimized to the extent possible. For areas where soil is exposed, temporary erosion and sediment control measures can be used to minimize erosion of exposed soils and to minimize the potential for sediment transport (i.e., erosion control blankets, mulch, gravel bags, fiber rolls, and silt fences). These temporary BMPs require regular inspection and maintenance or replacement to check their effectiveness.
- **Aboveground Storage Tanks**: All ASTs are equipped with built-in cement secondary containment. ASTs used and maintained by the Authority are inspected daily by FMD and maintenance is performed as needed. The Authority ensures that all tenants perform inspection, maintenance, and safety protocols as required under their Use and Occupancy Permit if their operations require the use of ASTs.
- **Vehicle, Equipment and Material Leaks or Spills**: Preventive employee and tenant training, inspections, and vehicle and equipment maintenance activities are conducted regularly to reduce the potential for leaks and spills. All fuel operators are required to perform monthly testing of all fueling equipment. A full description of the Authority's spill prevention and cleanup program is located in Section 3.2.3. Ten OWSs serve as a precautionary capture method for leaks and spills. Each installed OWS has an alarm system. If the oil reaches a certain level, or oil leaks to the ground, an alarm goes off. The capacities of the OWSs range from 3,000 to 40,000 gallons, depending on the respective loads anticipated in each area. If a spill occurs and must be diverted to an OWS, the person(s) who caused the spill is (are) responsible for cleaning out the OWS once the spill has been contained and the threat removed. The OWSs are inspected by the P&EAD and maintenance is conducted as needed.
- **Debris Accumulation**: Sweeping at SAN is conducted using mechanical and regenerative air sweepers. Roadway sweeping is conducted 5 days per week and daily sweeping is conducted within the aircraft operations area, including ramps, parking lots, perimeter roads, and construction areas. Each ramp area is on rotation throughout the week so that terminal and taxiway areas are swept at least once per week. As part of the SAN ramp-walk program, FMD inspects and sweeps up against each building every month.

3.2 ILLICIT DISCHARGE DETECTION AND ELIMINATION

As defined in the Municipal Permit, an illicit discharge is "any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities." Washwater, sediment, spilled chemicals, and other pollutants allowed to enter the storm drain system may contribute to the degradation of the local water quality. Releases from the sanitary sewer or private laterals can allow pathogens, ammonia, detergents, and other contaminants to enter the storm drain system. Over-irrigation can mobilize nutrients, bacteria, pesticides and sediment.

Illicit connections are defined as "…any manmade conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge…" These connections provide pathways for pollutants to enter the storm drain system. Improperly installed or defective rain diversion systems or devices that release pollutants into the storm drain system will also be considered illicit connections. A complete evaluation and characterization of all NSWDs, their sources, and drainage areas is included in Section 7.7.3.

The IDDE program incorporates several elements of the Authority's storm water management program to develop a comprehensive approach to preventing, detecting, and eliminating illicit discharges. Inspection, maintenance, and enforcement activities contribute to the identification of illicit discharges and the elimination of those detected. Often, when an illicit discharge is detected as a part of an inspection or maintenance program, it can be eliminated before it potentially affects a receiving water. Authority regulations prohibit illicit discharges, including over-irrigation. The Authority code can require a responsible

party to conduct abatement activities to eliminate an illicit discharge, or allow the Authority to conduct those activities itself at the cost of the responsible party. NSWD and IDDE enforcement programs are discussed below in Section 3.4.

Authority staff and airport tenants play an important role in the detection of illicit discharges. Education and outreach efforts for Authority staff and airport tenants are directed at storm and non-storm water pollution prevention, including the detection and elimination of illicit discharges. Education programs for the Authority staff are described in Section 9.0.

The Authority's dry weather monitoring programs or IDDE components are described in Appendix D-1 and D-2 of this SWMP. The following section discusses those IDDE program elements that are not described in Appendix D-1 and D-2.

3.2.1 PUBLIC REPORTING OF ILLICIT DISCHARGES AND CONNECTIONS

Public reporting mechanisms are an effective way to promote the reporting of illicit discharges. To meet the requirements of Provisions E.2.b.(3) and F.4 of Municipal Permit, the Authority promotes four primary mechanisms for reporting complaints or concerns regarding unauthorized NSWDs: (1) the Authority P&EAD main telephone line (619-400-2782) and webpage (http://www.san.org/Airport-Projects/Environmental-Affairs); (2) the Authority Contact Us webpage (https://www.san.org/Travel-Info/Contact-Us) (3) the SAN public reporting hotline (619-400-2710) and e-mail contact environmental@san.org) for reporting NSWDs and illicit discharges; (4) the County of San Diego storm water hotline (888) 846-0800 and online complaint reporting forum (http://www.projectcleanwater.org/html/complaints.html), and (5) the THINK BLUE Hotline at (619-235-1000) and webpage (www.sandiego.gov/thinkblue) operated by the City of San Diego, which is available Monday through Friday, 8:00 a.m. to 5:00 p.m. and provides a voice mail message for 24-hour access in both English and Spanish. The hotline operators forward complaint information, as appropriate, to the Authority P&EAD for investigation and follow-up. The City of San Diego also offers an online storm water service request help line through which the public can report a violation through cell phone texts or the online mapping tool.

The Authority's SAN Communication Center storm water hotline is a 24-hour telephone line that allows Authority staff and airport tenants to report complaints or concerns regarding landscape runoff, broken sprinklers, or other issues relating to over-irrigation and unauthorized NSWDs. This reporting mechanism is promoted by including the telephone number on the back of SAN Security ID Badges that are issued at SAN. An over-irrigation reporting form is also available on the SAN P&EAD webpage and on the Authority Contact Us webpage (https://www.san.org/Travel-Info/Contact-Us).

Each call or email message that is forwarded to the Authority through these public reporting mechanisms is handled as an incoming complaint and entered into the Web-based database as a unique incoming record. The report includes the date the violation was reported, a description of the violation, its location, the SAN personnel notified, and whether or how the issue was addressed. All reported incidents, along with a description of how each one was investigated and/or resolved, will be summarized in the Annual Report required by the Municipal Permit.

3.2.2 TRASH POLLUTION PREVENTION

Litter and illegal dumping can be significant sources of pollutants if allowed to reach the storm drain. Trash can be transported in runoff and accumulates at storm drains or inlets. As of December 2018, the Authority must comply with the State of California's Trash Order No. R9-2017-0077, which requires the implementation of the Trash Amendments, or Resolution 2015-0019, the Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash, and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. The Trash

Order prohibits trash from entering waterways via the storm water conveyance system. In response to the Trash Order, the Authority has increased street sweeping, launched education programs on trash/litter/FOD, and installed devices on storm drains to help prevent these materials from entering the storm drain system. The Authority's FOD Management Plan (Appendix J) helps ensure compliance with the Trash Order.

A central element of the Trash Order is a land-use based compliance approach that targets high trash-generating areas. Within this are two alternative compliance tracks:

- Track 1: Permittees install, operate, and maintain a network of certified Full Capture Systems to capture trash in the storm drains, located in priority land use areas for municipal systems, and the entire facility for industrial and commercial permit holders.
- Track 2: Permittees install, operate, and maintain any combination of controls (structural and/or institutional) anywhere in their jurisdiction as long as they can demonstrate that their system performs as well as Track 1 (i.e., Full Capture Systems Equivalency).

The Authority chose to implement Track 1 based on analysis of the priority land use areas, multiple NPDES permit requirements, and anticipated projects to address the water quality goals and objectives at SAN set forth in the San Diego Bay WQIP.

The Authority's compliance with Federal Aviation Administration (FAA) regulations prohibits trash and debris from being present in the aircraft operations area and thus prevents trash from reaching the MS4. The FOD Program is consistent with the Trash Order's outright prohibition of trash and debris for areas subject to Industrial General Permit requirements.

SAN currently implements the following measures aligned with the FAA regulations and guidance:

- Designation of a FOD program manager to oversee implementation and adherence to the FOD Program.
- Prohibition of any dumping or littering of trash within the Authority's jurisdiction, as follows from the Authority Code Article 7: Safety and Security (https://www.san.org/airport-authority/codes-policies):
  - Authority Code §7.41 (a). It shall be unlawful for any person to dump any material or throw garbage, offal, rubbish, litter, sewage, refuse, or foreign material of any kind upon any lot, tract of land, street, alley, lane, court, sidewalk, or place under the jurisdiction of the Authority without the written permission of the Authority's Executive Director or his or her designee (the "Executive Director").
  - Authority Code §7.41 (b). It shall be unlawful for any occupant, lessee, tenant, or licensee of any premises within said area to place, or allow to be placed, or allow to remain on any premises within said area such garbage, offal, rubbish, litter, sewage, refuse, or foreign material of any kind without the written permission of the Executive Director.
- Regulation of litter, refuse, and FOD generated by airport staff, tenants, and contractors through the Authority Rules and Regulations document (Sections 2.3, 3.4.9, and 4.3 of Attachment 3 of the FOD Management Plan, updated in 2018), as follows:
  - No person shall transport litter or refuse without covering the materials being transported;
  - All tenants providing receptacles for litter or refuse shall provide adequate covers to ensure against any leaking, dripping, sifting or otherwise escaping of any materials;
  - Every person depositing garbage, debris, or refuse in any unauthorized location shall clean up the deposited material immediately in an effective manner;

  - All tenants shall keep their leased areas and adjacent areas clean and free of rubbish and trash;
  - Every person with access to the aircraft operations area shall keep the aprons, ramps, and grounds of SAN free of all FOD;
  - Every tenant providing a trash container at SAN (e.g., cans, dumpsters, compactors) shall ensure that the container is covered, checked frequently, and emptied as necessary to prevent spillover of trash; and
  - No person shall establish a break area (tables, chairs, trash can, etc.) on the ramp without prior approval from the Authority.

- Daily self-inspections for identification and removal of FOD—the Authority's Airport Safety Self-Inspection Checklist is provided in Attachment 3 of the FOD Management Plan.
- Removal of FOD from the airport environment once FOD is detected.
- Provision of FOD buckets for continuous "clean-as-you-go" debris collections at all terminal loading areas.
- Weekly sweeping of each terminal and taxiway with a mechanical sweeper.
- Power washing and vacuuming activities at least quarterly or as-needed to capture trash and debris.
- Monthly inspections to identify potential pollutants, including identifying FOD and ensuring that trash cans and dumpsters are covered.
- Interaction with staff and tenants during monthly inspections to identify and discuss trash issues.
- Ramp walks every month, alternating between Terminal 1 and Terminal 2 to inspect for and remove FOD.
- Annual storm water and spill (including trash spill) training for all staff and tenant management, highlighting trash issues as a potential storm water pollutant.
- Annual FOD prevention training curricula for Authority personnel.
- Evaluation of the amount and kind of FOD during characterization studies.
- Maintenance of FOD documentation for program design and assessment.

The Authority's Web-based database will be employed to track incidents of intentional littering or dumping. During monthly visual observations, inspectors will identify (if known) the illegal dumping hot spots, patterns and types of occurrence, mode of dumping, reporting mechanism, and known or suspected source or responsible party in the Web-based database. If large amounts of debris are found in a tenant's operational area, a warning is provided and the tenant has three days to address the issue.

3.2.3 SPILL PREVENTION, REPORTING, AND RESPONSE

The Authority has programs and procedures to prevent, respond to, contain, and clean up all sewage and other spills that may impact the storm drain system, as required by Provision E.2.b.(4) of the Municipal Permit. Many of the same programs and procedures are implemented as a requirement of Section X.H.1.c of the Industrial Permit. Potential pollution sources were evaluated, and descriptions are included in Section 7.7.3.

3.2.3.1 Spill Prevention

SANITARY SEWERS

As discussed in Section 6.4 of the SWMP, the Authority's preventive and corrective sanitary sewer maintenance programs focus heavily on those areas of known problems or concerns. Known problem areas typically consist of the lines immediately downstream of food services, which have a tendency to be impacted by grease. For all locations, the Authority provides for or requires the food service provider (as a requirement of the lease) to conduct the minimum of annual routine monitoring, inspection, and cleaning. Wastewater from restaurants moves through three grease interceptors before entering the sanitary sewer system. Grease interceptors are maintained and cleaned every 1 to 2 months. When system malfunctions do occur, such as stoppages, the cause of the problem is investigated and analyzed. Maintenance schedules are then adjusted accordingly. If necessary, repairs are initiated by Authority maintenance crews or food service provider, as appropriate. If appropriate, the infrastructure component is referred for repair or replacement by maintenance crews. Larger, more complex issues generally become recommendations for capital improvement projects as part of the Authority budget planning and approval process (Section 10.0).

OTHER SPILLS

Refueling and equipment maintenance activities utilize jet fuel, aviation gas, automotive fuel, hydraulic oils, oil, deicing fluids, degreasers, and other solvents. Because of the intensity of use, there is a higher possibility of significant spills of jet fuel. Jet fuel is stored in ASTs at the FSF and distributed via pipeline to the RFF. The USEPA requires facilities with "an aggregate aboveground oil storage capacity greater than 1,320 U.S. gallons or a completely buried storage capacity greater than 42,000 U.S. gallons" (USEPA, 2015) to develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan. Every tenant who must file a SPCC Plan with the USEPA is also required to file a copy with the P&EAD. Tenants must also contract a hazardous materials emergency response and cleanup services provider and provide the information to the SAN Communication Center and the P&EAD. Aircraft fueling is performed by a fleet of fuel trucks (containing several hundred gallons of fuel) operated by two refueling operations. The fuel trucks operate on the ramp areas of the main terminals, the FBO building, the air cargo area, and the overnight aircraft parking areas. The Authority requires the implementation of spill response BMPs, secondary containment, frequent inspection and maintenance of vehicles, equipment, and storage containers, and proper labeling and dating of material containers. Spills from tenants are reduced through the required use of BMPs, education, and enforcement of relevant regulations for the storage and usage of hazardous materials.

3.2.3.2 Spill Reporting

In the event of a spill, the responsible party (Authority staff or airport tenant) is required to contact SAN Communication Center (619-400-2710) in all cases, and ARFF if the spill (1) presents a fire hazard, (2) is an immediate human health hazard, (3) is over 10 feet in length or 50 square feet in area, (4) has a source that is continuous, and/or (5) cannot be cleaned immediately. If a vehicle or equipment spill or leak reaches a storm drain or inlet and cannot be controlled or cleaned with on-site personnel and equipment, the person(s) causing the spill must report it to SAN Communication Center, the Harbor Police, the National Response Center, and the State of California Office of Emergency Management Agency. If the Authority determines that the incident endangers human health or the environment, then the Authority will provide verbal notification to the RWQCB within 24 hours from the time that the Authority becomes aware of the circumstances. The verbal report will include any unanticipated bypass or upset that exceeds any applicable effluent limitations and any violation of a maximum daily discharge limitation for pollutants listed in the permit to be reported within 24 hours. Within 5 days of the time that the Authority becomes aware of the circumstances, the Authority will provide the RWQCB with a written submission containing a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, whether the noncompliance has not been corrected, and the anticipated amount of time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Authority will include a summary of the spill, its source, and the elimination procedures in the WQIP Annual Report,

which includes a JRMP Annual Report form, as required by Provision F.3.b.(3) of the Municipal Permit. Any instances of noncompliance will be identified and explained in the Industrial Annual Report Compliance Checklist, as required by Section XVI.B.2 of the Industrial Permit.

3.2.3.3 Spill Response

Each tenant, contractor, or Authority staff member responsible for any spill of sewage or other material is also responsible for immediately responding to that spill. Immediate response to a spill helps to prevent an unauthorized release to the storm drain system and to prevent further contamination of storm water runoff due to spill residuals on the surface. The appropriate spill response includes carrying out appropriate notification procedures, stopping the source of the spill, containing the spill, implementing the proper cleanup procedures, immediately and properly disposing of the spilled materials and other items used for the cleanup, and maintaining records.

Each facility/operation that utilizes, stores, and/or generates hazardous materials is responsible for creating spill response procedures and ensuring that their employees are properly trained in those procedures. The Municipal and Industrial Permits require the preparation of spill response procedures, and those procedures are described below and in the "Spill Prevention, Control, and Cleanup" BMP (SR01) provided in Appendix B. Each airline tenant is responsible for maintaining spill response equipment in its terminal gate area. Spill response equipment includes absorbent materials, shovels, brooms, gloves, and other necessary items. In addition to spill response equipment maintained by the airline tenants and the fuel vendors, the Authority has established, and strategically located on the airfield, four spill response trailers with an adequate inventory of spill response equipment to respond to any spills, including a worst-case incident. Authority staff and airport tenant education and outreach efforts highlight the existence and intended use of these spill response trailers.

SMALL SPILL CLEANUP PROCEDURES

Small spills of jet fuel, automotive fuel, hydraulic oil, lube oil, or lavatory wastes are generally efficiently cleaned up using bulk absorbent material. Absorbent is used as a dike to prevent spill migration into the storm drain system and is also used to absorb any ponded material. All waste sorbent and waste material should be stored in a Department of Transportation-approved drum that is properly labeled with the contents, generation date, and facility contact information.

LARGE SPILL CLEANUP PROCEDURES

In the case of a large spill, the responsibility for initial action remains with the party responsible for the spill. In the case of a large fuel or sewage spill, a systematic and controlled response is especially vital. The following procedures can be used as guidelines for responding to a large spill of fuel or petroleum products, and sewage spills. These activities should be performed as appropriate considering the details of the spill:

- Stop the source:
  - Shut off valves on aircraft or refueler trucks;
  - Install plugs in ruptured tanks or vale fittings;
  - Relocate leaking vehicle to nearby area of secondary containment; and
  - Transfer fuel into other vessels, tanker trucks, etc.
- Perform notifications:
  - Tenants Contact SAN Communication Center (619-400-2710) and SAN Rescue and Firefighting Facility (619-231-5204);
  - Harbor Police (619-686-8000); and

  - National Response Center (800-424-8802 or 202-267-2675), as necessary or required by law.
- SAN Operations Contact:
  - Authority P&EAD (619-400-2782);
  - California Department of Fish and Game/Office of Spill Prevention and Response 24-hour hotline (916-445-9338) or CalTip line (888-334-2258), as necessary or required by law;
  - State of California Office of Emergency Management Agency (800-852-7550 or 916-845-8911);
  - U.S. Coast Guard (619-683-6495), as necessary or required by law;
  - RWQCB (619-516-1990), as necessary or required by law; and
  - USEPA Office of Emergency Services (800) 300-2193, as necessary or required by law.
- Contain and absorb the spill:
  - Prevent the spill from reaching the storm drain.
  - Turn on emergency shutoff valves if they are installed in the nearby storm drains.
  - Create dikes with absorbent or other material.
  - Plug storm drain inlets with rubber mats and tarps and collect ponded materials by vacuum truck, drum-mounted vacuum, squeegee roller, or other means. If the spill is too large to control or if it reaches the storm drain, the person responsible for the spill should immediately contact a Hazardous Materials Contractor.
- Protect San Diego Bay, as necessary, by installing barrier booms and/or absorbent booms at the storm drain outfall and monitoring outfall for signs of release.
- Ensure that emergency diversion to a storm drain is conducted only on the north ramp or the Terminal 2 West ramp where the storm drains have approved separation devices. The responsible party must clean and remove the spilled fluids from the separation device once the spill has been controlled and the surrounding area has been cleaned.
- Make follow-up notifications and submit reports, as necessary, to agencies necessary or required by law.

INCIDENT COMMAND SYSTEM IMPLEMENTATION

Several Authority staff members have been trained in the application of incident command systems for large-scale emergency incidents, such as a large fuel or sewage spill. The responsible party may voluntarily relinquish control of spill response responsibilities to a federal, state, or local agency appropriately prepared to respond, and the responsible party should not hesitate to do so when requested by such an agency. In situations where the release threatens public safety and property damage by fire, explosion, or vapor levels, or if structural collapse is imminent, the SAN ARFF Department has overall authority to control response actions. Only after the immediate threat to life and property has been abated and the ARFF has relinquished exclusive site control will the responsible party enter the incident command system structure. The incident command system will be used to apply control in any emergency response where multiple agencies are involved. Where appropriate, the responsible party may be requested to participate in various aspects of the incident command system.

3.3 DRY WEATHER MONITORING PROGRAMS

The Authority conducts or participates in urban runoff monitoring programs to meet the requirements of both the Industrial Permit and the Municipal Permit. Several of these programs help to identify NSWDs and illicit

discharges and their potential sources within the Authority's jurisdiction. The Authority can also utilize the data collected through monitoring efforts to identify and eliminate illicit discharge sources.

As required by Provision B of the Municipal Permit, the Authority is collaborating with the County of San Diego, Port of San Diego, and the cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego (collectively, the San Diego Bay WMA Responsible Parties) to develop, implement, and report on the San Diego Bay WQIP, which includes goals and strategies to reduce pollutant discharges from MS4 outfalls in the San Diego Bay WMA during wet and dry weather. The monitoring programs described below were developed to prevent NSWDs to the MS4 and to meet water quality goals outlined in the WQIP. In addition, the dry weather visual observations as required by the Industrial Permit, are carried out monthly to identify sources of NSWDs, BMP implementation, and elimination and reduction of NSWDs, including over-irrigation.

The following urban runoff monitoring programs were developed to meet the requirements of Provision D of the Municipal Permit. The monitoring programs implemented at SAN by the Authority are described in Appendix D-2.

3.3.1 RECEIVING WATER MONITORING

As required by Provision D.1 of the Municipal Permit, the Copermittees developed a receiving water monitoring program to characterize the long-term trends in receiving water quality and determine whether management strategies are effective. The long-term receiving water monitoring station designated by the Copermittees is the Sweetwater River Mass Loading Station. This site has been monitored by the Copermittees since 2001 because it represents the conditions and water quality of the WMA. Field observations, field measurements, laboratory analytical chemistry, and toxicity testing are conducted at this site during three dry weather events each year. In addition, bioassessment and hydromodification monitoring events are each conducted once during the Municipal Permit term in accordance with the requirements in the Municipal Permit. Section 5.3 of the WQIP provides further information about the monitoring program.

3.3.2 REGIONAL MONITORING

The Copermittees are required to participate in regional monitoring programs, including the Storm Water Monitoring Coalition and Southern California Bight Regional Monitoring programs. The Copermittees have chosen to participate in the Southern California Bight '13 Regional Monitoring Program, Storm Water Monitoring Coalition Stream Survey, Hydromodification Regional Monitoring Program, and San Diego County Beach Water Quality Monitoring Program.

3.3.3 SEDIMENT QUALITY MONITORING

The Copermittees will perform sediment quality monitoring in accordance with the requirements of the Municipal Permit Provision D.1.e.(2). A Sediment Monitoring Plan is included in the WQIP.

3.3.4 MS4 OUTFALL MONITORING

Under Provision D.2 of the Municipal Permit, the Authority will monitor MS4 outfalls during dry weather to assess MS4 outfall discharges for their potential contributions to receiving water quality and to assess the effectiveness of jurisdictional urban runoff management programs. Detailed information about jurisdictional and regional MS4 outfall monitoring programs is provided in the San Diego Bay WQIP and the Authority's program is described additionally in Appendix D-2.

The Authority has developed a Dry Weather Analytical Monitoring Program to encompass both Industrial and Municipal Permit requirements for monitoring dry weather discharges. The dry weather monitoring activities conducted at SAN are summarized below and described in further detail in Appendix D-1 and D-2.

SELECTION OF OUTFALLS

Two major outfalls within the Authority's jurisdiction have been selected. These two outfalls are tidally influenced and cannot be screened safely at the outfall. Therefore, nearby upstream locations were selected as proxies to provide adequate coverage of the entire drainage areas of those two outfalls. The monitoring locations were selected as far downstream as possible to capture as many areas with industrial activities and sources of potential illicit discharges as possible and to provide adequate coverage of those storm drain lines. The storm drain system outfall monitoring locations have been added to the existing dry weather monitoring locations, along with additional locations in new or redeveloped drainage areas, or those added to comply with new Industrial Permit requirements. Monitoring locations were established to isolate particular land uses, drainage areas, and areas of concern on the basis of historical data.

A storm drain system map was created in geographic information system (GIS) 9.0 to depict the storm drain system, the 15 drainage basins, and the monitoring locations. The storm drain system map is used in source investigations and satisfies the requirements of Provision E.2.b.(1). of the Municipal Permit. During the dry weather monitoring, the storm drain system map is checked for accuracy, and corrections and changes are made accordingly.

DRY WEATHER MS4 OUTFALL DISCHARGE FIELD SCREENING

The Authority conducts dry weather field screening and analytical monitoring in accordance with Provision D.2 of the Municipal Permit to identify water quality problems that may result from any of the NSWDs described in Sections 3.1. Field screening will be conducted at the 2 major MS4 outfalls within the Authority's jurisdiction, as well as at 17 compliance locations and outdoor industrial equipment and storage areas to identify any unauthorized and authorized NSWDs, as required under the Industrial Permit (Section XI.A.1.a).

NON-STORM WATER PERSISTENT FLOW MS4 OUTFALL DISCHARGE MONITORING

Observations and analytical data will be collected twice annually at each outfall monitoring station experiencing persistent flow, if any, during dry weather periods to detect which NSWDs impact receiving water quality. Appendix D-2 of this document describes the MS4 outfall monitoring program. Field monitoring and laboratory analysis procedures, including a list of constituents, equipment required, and quality assurance measures are included in Appendix D-1.

INDUSTRIAL DRY WEATHER VISUAL OBSERVATIONS

The Authority conducts monthly visual observations of all drainage areas within SAN for the presence of unauthorized NSWDs and any authorized NSWDs and their sources, as described in Section 7.8.4.2. As a prohibited or unauthorized NSWD, over-irrigation will be inspected for during these dry weather visual observations. The objective of the monthly inspections is to identify sources of NSWDs and to check that BMPs are being properly implemented and are effective, and to prevent or eliminate unauthorized discharges.

3.3.5 SPECIAL STUDIES

The Municipal Permit, Provision D.3.a.(1), requires Copermittees to select special studies to fill in data gaps and provide further information for better management and elimination of pollutants. The Municipal Permit specifically requires:

- At least two special studies related to highest priority water quality conditions for each WMA; and
- One special study to address the pollutants and/or stressors impacting receiving waters within the San Diego region.

The Authority will take part in regional special studies identified in the WQIP, Section 5.3. The Authority will also implement a source identification special study specific to its Focused Priority Conditions.

The Authority will implement a source identification study to determine the potential pollutant-generating activities and areas that contribute the highest concentrations of copper and zinc as part of a special study required under Provision D.3.a.(1) of the Municipal Permit. As part of this study, the Authority will prepare and analyze a report characterizing copper and zinc and the activities and areas that are potential sources. The report will help the Authority target sources of these constituents and develop actions to eliminate or minimize the source activity. A Source Identification Monitoring Plan will also be prepared. The monitoring plan will support the identification of pollutant-generating activities, quantify the potential loadings from particular activities or areas, and prioritize sources of discharge(s).

3.4 FOLLOW-UP AND ENFORCEMENT

Source investigations are conducted by the Authority when an illicit discharge is detected or suspected, and the source of the illicit discharge is not readily identifiable. The purpose of these investigations is to locate the source of an illicit discharge so that necessary measures required to eliminate the illicit discharge can be implemented. This section has been prepared to meet the requirements in Provision E.2.d of the Municipal Permit. Section 3.4.3 provides a detailed description of the Authority's ERP.

3.4.1 FOLLOW-UP SOURCE INVESTIGATION PROCEDURE

The Authority will encourage staff, contractors, and developers to assist in identifying and reporting illicit discharges and connections to SAN Communication Center if observed during daily activities. The investigation action criteria for dry weather monitoring results were developed by the Copermittees and are provided in Appendix D-2. Additionally, the Municipal Permit now includes non-storm water action levels. Within two business days of receiving dry weather field screening or laboratory results that exceed any action levels, the Authority will conduct an investigation to identify the source or provide a rationale for why the discharge does not pose a TTWQ and does not require further investigation. The trash assessment information collected may also provide the Authority with useful information in regard to problem areas or activities. Source investigations will typically be conducted by the Authority's P&EAD monitoring personnel. In some cases, other on-site Authority personnel may conduct a source investigation. If a source investigation reveals an upstream source outside of SAN's jurisdiction, the Authority will notify and work with responsible Copermittees to eliminate the source.

In some cases, the mere existence of flows in a portion of the storm drain system or the noticeable increase in dry weather flows at a certain location may trigger a source investigation. The Authority's monitoring personnel will use their judgment and experience in making these and similar decisions in the field on the basis of site-specific observations. The steps taken to identify and eliminate an illicit discharge are described in Appendix D-2.

Follow-up investigations are typically conducted by the Authority under the following circumstances:

- Report of an illicit or suspected illicit discharge and over-irrigation reports through the SAN hotline, to the Communication Center, or to P&EAD;
- Exceedance of field or analytical action levels;
- Ceasing of the discharge prior to arrival at the point of observation or during a source investigation, and inability to determine the source without the discharge;
- Insufficient information produced during source investigations to locate the source or provide enough evidence to identify a responsible party;

- An order issued by the Authority to a responsible party and a follow-up investigation necessary to ensure that the responsible party has complied with the required abatement actions; and
- An area or activity identified as having a high potential for the occurrence of an illicit discharge and, therefore, periodic follow-up visits to ensure that future discharges are rapidly identified and eliminated.

3.4.2 DOCUMENTATION AND REPORTING

Source investigations should be documented using photographs, detailed notes on observations, completed field observation sheets when applicable, discussions or decisions made, and other information relevant to the investigation. This information could be useful for future investigations and for possible future resolution of illicit discharges for which sources were unidentified. Documentation is also used in support of enforcement actions. The Authority will document and keep a record of the investigation in the Authority's Web-based database. The investigation summary (included in the WQIP Annual Report) will include:

- The location of the violation, the hydrologic subarea, the impacted receiving water body, the point of discharge from the MS4;
- The initial source of information which triggered investigation;
- The date and method through which the information was received;
- The date of the investigation;
- The corrective action or enforcement procedures implemented;
- If any follow-up investigations were conducted and the dates and results of each investigation;
- The identified or suspected source of the discharge;
- Any known or suspected incidents that may relate to the source of the discharge; and
- Final results of the investigation.

If a source could not be identified after a thorough investigation, a complete report will still be generated and will include a plan to improve the investigation procedure if the same discharge is observed or reported in the future. If the discharge reoccurs and the source is still unidentified through source investigations, the discharge will be considered an illicit discharge and the SWMP will be updated to evaluate the common and suspected sources of the illicit discharge.

If the source of an illicit discharge is considered natural in origin and conveyance, the discharge and source will be documented and all data and evidence in support of this conclusion will be provided to the RWQCB to demonstrate that the discharge is natural and does not require further investigation.

Sampling for field screening or laboratory analysis should be done when deemed appropriate by the investigator. In many cases, once the source is identified, the makeup of the illicit discharge can be determined by a survey of the source and, therefore, analysis may not be necessary. However, in other cases, analysis of samples may be evidence to support enforcement actions.

All documentation and other information relevant to source investigations should collected by or be turned over to the P&EAD. The department will handle, retain, and track files pertaining to the various illicit discharge investigations, and whether or not a responsible party has been identified. The department will also determine whether the discharge is an isolated incident that will be addressed through enforcement procedures, or whether the category of discharge should be prohibited as an illicit discharge, as specified in Provision E.2.a.(6) of the Municipal Permit.

A summary of the NSWDs and illicit discharges and connections identified during investigations will be included in the WQIP Annual Report in accordance with the requirements of Provision F.3.b.(3) of the Municipal Permit. Additional details on information that will be provided in the WQIP Annual Report are included in Section 12.1. In summary, the illicit discharge and source investigation section of the report will include:

- The known or suspected sources causing or contributing to the highest priority water quality conditions within the WMA;
- BMPs or additional programs implemented to address these sources;
- Education programs implemented to notify the public of the sources of discharge;
- Frequency and description of inspections implemented to determine if the source(s) has(have) been eliminated;
- Enforcement actions and/or incentives implemented to eliminate the source(s); and
- The optional strategies that the Authority plans to implement to prohibit NSWDs and illicit discharges in accordance with Municipal Permit Provision B.3.b.

3.4.3 ENFORCEMENT

The Authority is authorized to enforce prohibitions of illicit discharges and illicit connections and to ensure that the requirements for authorized NSWDs are met to maintain compliance with the Municipal and Industrial Permits, the Authority Rules and Regulations, the Storm Water Code (Article 8), this SWMP, and any contracts and leases. As required by Provision E.6 of the Municipal Permit, the Authority has established an ERP to enforce its legal authority to achieve compliance and respond to reports of violations or noncompliance with the above documents. Provision E.1.a. of the Municipal Permit requires the Authority to prohibit illicit discharges, including over-irrigation, and connections to the MS4, control the discharge of spills, dumping, or dumping of materials other than storm water into the MS4, control through interagency agreements the contribution of pollutants from one portion of the MS4 to another, utilize enforcement mechanisms, and carry out inspections and monitoring of tenants, contractors, developers, and employee operations and activities to ensure compliance. Municipal Permit Provision E.6 requires the use of necessary escalating enforcement measures and should be in compliance with the strategies in the WQIP. The Authority is authorized to inspect and, if necessary, issue corrective actions, notifications, or written warnings or fines appropriate to the level of violation.

The Authority has increased tenant BMP inspections from quarterly to monthly. Ad hoc inspections are also performed. Inspections will focus on pollutant generating areas and activities, and tenants will be encouraged to improve and increase BMP implementation through a graphic scoring system. A detailed list of BMPs evaluated during tenant inspections is included in Appendix B.

Violations are determined based on noncompliance with Authority rules and regulations, permit requirements, provisions in the Storm Water Code, or applicable laws and regulations. Any violations noted during a site inspection by the P&EAD inspector will be discussed on site if appropriate personnel are available, be reported as outlined in Section 3.4.2, and be recorded in the Web-based database. Immediate action will be taken to stop or control active prohibited discharges, spills, or obvious illicit discharges. Issues concerning over-irrigation are directed to FMD to address. FMD are available on a 24/7 basis to respond to over-irrigation incidents. Field screening and monitoring of other NSWDs, as outlined in Appendix D-2, will be conducted to prioritize responses and follow-up investigations. The inspection report will detail the corrective actions required, the timeframe in which corrective actions must be completed, and any enforcement actions issued.

The enforcement mechanisms used by the Authority are listed below. The Authority generally obtains compliance using the first four mechanisms listed. The remaining enforcement mechanisms can be used, as

necessary, to increase the severity of penalties and to compel compliance as soon as possible. Violations are required to be corrected within a minimum of 30 days after the violations are identified, or prior to the next predicted rain event, whichever is sooner. If the responsible party requires more than 30 days to correct the violation, the rationale must be described in the Authority's Web-based database and approved by P&EAD.

1) Verbal and written warnings;
2) Written notices of violation;
3) Written notices to clean, test, or abate;
4) Orders to cease and desist (stop work orders);
5) Fines;
6) Denial or revocation of permits and approvals;
7) Administrative and criminal penalties;
8) Bonding requirements; and
9) Liens.

The Authority's ERP for IDDE has two main levels of enforcement, with escalating enforcement measures utilized as necessary on a case by case basis, using the professional judgment of the Authority inspector. The Authority has the discretion to initiate or escalate enforcement using any enforcement mechanism available, depending on the nature of the violation or discharge, the effect on water quality, and the degree of cooperation or response time of responsible parties. Further information on enforcement activities used by the Authority is provided in Section 2.3. The general escalated enforcement process is outlined below:

- Enforcement Level 1 is initiated by the finding of BMP deficiencies. The responsible party is contacted and the inspector provides a verbal warning to fix the observed violation. The notification will also be documented in the Web-based database so that the responsible party and interested parties are aware of the violation. The responsible party can then notify the inspector via the Web-based database when the corrective action has been completed. If the inspector determines that the violation is severe enough that a verbal warning is not sufficient, a written notice will be issued to the responsible party. The written notice documents the violation, the time frame for correction, and the date of follow-up inspection. The written notice will be provided to the responsible party and the facility/operation supervisor. If the violation is resolved within the time frame, the inspector will document compliance and save the inspection information in the inspection file.
- Enforcement Level 2 is initiated when the noncompliant activity or violation may impact water quality, human health, or the environment (i.e. prohibited discharge). A written notice to clean, test, or abate, and/or a CDO is used to initiate enforcement and compliance is expected within 24 hours. If a CDO is issued, the recipient must cease and desist all activities that cause or contribute to illegal discharges or remove illicit connections. A notice and order to clean, test, and abate is a written or verbal order to perform the activities listed in the Authority's Storm Water Code. Penalties and fines may be issued if administrative authority is ineffective and the violation continues.

If the noncompliance resulted in a spill or discharge, the party responsible for the discharge is responsible for conducting cleanup measures appropriate to the degree of the spill or discharge, or if needed, for contacting the appropriate emergency response or cleanup contractor. Enforcement tools are being built into the Authority's web-based database, whereby over-irrigation will be automatically identified as an issue for escalated enforcement.

Contractors and developers are required to abide by the Authority documents, permits, rules, and regulations while working within airport operational areas. The Authority may use provisions within the contract to correct any noncompliant activities. The Authority may also employ this mechanism for tenants that are under lease or use permits.

3.5 MONITORING PROGRAM ASSESSMENTS

The following assessments will be conducted in accordance with the requirements outlined in the Municipal Permit, Provision D.4.

RECEIVING WATER ASSESSMENTS

The Copermittees will assess the condition of receiving water quality, including a review of data collected during long-term receiving water monitoring, regional monitoring programs, and sediment quality monitoring. These assessments will be included in the Report of Waste Discharge (ROWD), as required under Provision F.5.b of the Municipal Permit. Additional information on receiving water assessments is provided in Section 5.3 of the WQIP.

NON-STORM WATER MS4 OUTFALL DISCHARGE ASSESSMENTS

The Authority will review the data collected during the MS4 outfall discharge monitoring programs at least once during the term of the Municipal Permit. Assessments of the data collected during the MS4 Outfall Receiving Water Monitoring Program will be made to assess the overall effectiveness of the IDDE program. These assessments will be included in the WQIP Annual Report (Provision F.3.b.(3) and ROWD. Additional information on MS4 outfall assessments is provided in Section 5.3 of the WQIP.

SPECIAL STUDIES ASSESSMENTS

The Authority will work with the other Copermittees to assess the effectiveness of the special studies established regionally and within each WMA. The Copermittees will report the results of the special studies assessments and identify any necessary modifications to the WQIP. Additional information on regional monitoring program and special studies effectiveness assessments is provided in Section 5.3 of the WQIP.

3.6 ILLICIT DISCHARGE DETECTION AND ELIMINATION COMPONENT PROGRAM REVIEW AND MODIFICATION

The Authority has reserved this section to identify and document future changes to the IDDE Component of the SWMP. In an effort to support the iterative approach and adaptive management process of the WQIPs, updates will be made to the WQIP as the IDDE programs are modified in response to findings during effectiveness assessments. As required under the Municipal Permit Provision B.5, the WQIP will be assessed during preparation of the ROWD. New sources of NSWDs and illicit discharges may be discovered through the approaches described in Section 3.0. The WQIP goals and strategies to meet required pollutant reductions may need to be modified as a result of findings or reports made during these programs. Section 13.0 of this SWMP details the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal Permit.

- Updates were made to the NSWDs/IDDE Component, Section 3 in December 2017 and January 2019 to incorporate over-irrigation prohibitions and add details on the FOD Management Program at SAN. The outline of potential NSWDs at SAN were reorganized in Sections 3.1.1 – 3.1.2.

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4.0 DEVELOPMENT AND PLANNING COMPONENT

4.1 INTRODUCTION

Section 4.0 of this SWMP addresses requirements in Provisions E.3.a through E.3.f of the Municipal Permit that the Authority has determined are relevant to the Development and Planning Component. As listed below, these Provisions require the Authority to:

- B.3.b.(4).(b)—Develop a list of candidate projects as part of the Watershed Management Area Analysis (WMAA) that could be used as alternative compliance options in place of implementing on-site structural BMPs for Priority Development Projects (PDPs). Project applicants may choose to fund, contribute funds to, or implement one of the candidate projects identified in the WMAA. Section 4.6 was prepared to address this requirement.
- E.3.a.—Require all development projects within SAN's jurisdiction to implement general BMP requirements and specific source control and LID BMPs, where applicable and feasible, into the planning process. Section 4.5.1 and Section 4.5.2 were prepared to address this requirement.
- E.3.b— Determine which development projects fall under the Municipal Permit's definition of a PDP and require the implementation of on-site structural BMPs. The previous Standard Urban Storm Water Mitigation Plan (SUSMP) in Appendix C has been replaced with the BMP Design Manual for BMP design, development, and implementation in accordance with Provision F.2.b (update occurred in February 2016).
- E.3.c.(1)—Ensure that PDPs implement structural BMPs that meet the type and performance requirements of the Municipal Permit. Section 4.5.3 and Appendix C were prepared to address this requirement.
- E.3.c.(2) —Require implementation of on-site BMPs for PDPs to manage hydromodification impacts. As discussed in Section 4.5; however, the Authority PDPs are exempt from this requirement, because storm water runoff from Authority PDPs discharges to an enclosed embayment.
- E.3.c.(3)—Consider the allowance for PDP applicants to propose and fund, contribute funds to, or implement an alternative compliance project (ACP) that has or has not been identified in the WMAA. Section 4.6 was prepared to address this possibility.
- E.3.c.(4)—Submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted. Section 4.5.3 and Appendix C were prepared to address this requirement.
- E.3.c.(5)—Verify that infiltration BMPs do not cause or contribute to an exceedance of applicable groundwater quality objectives. Infiltration BMPs must meet the design criteria required in the Municipal Permit. Section 4.5 was prepared to address this requirement.
- E.3.d—Develop a BMP Design Manual to replace the SUSMP and implement the new manual within 180 days of completion. Section 4.7 was prepared to address this requirement. The SUSMP was followed until it was replaced by the BMP Design Manual in February 2016 (Appendix C).
- E.3.e—Implement an approval, verification, and inspection program that requires structural BMPs on all PDPs and confirms that the BMPs are designed, constructed, and maintained to remove pollutants in storm water to the MEP. Section 4.8 was prepared to address this requirement.
- E.3.f—Implement an ERP to enforce the legal power of the Authority to achieve compliance with the requirements of the Municipal Permit, as applicable, for all development projects. Section 4.9 has been prepared to address this requirement.

4.2 LAND USE PLANNING

During the Authority's land use planning and project review process, and prior to project approval and/or permit issuance for all PDPs, the Authority prescribes the requirements necessary for project improvement to ensure that discharges of pollutants from the project and to the MS4 will be prevented, eliminated, or reduced to the MEP; will not cause or contribute to a violation of water quality standards; and will comply with Authority ordinances, and the Municipal Permit. The Authority's planning and development project review process incorporates appropriate storm water management controls into standard conditions of approval, use permits, lease agreements, and other project approval mechanisms, as outlined below.

4.2.1 MASTER PLAN

A Master Plan for SAN was adopted by the Authority Board on May 1, 2008. The Master Plan documents the Authority's planning process for SAN and provides guidance for development of the airport to meet continued passenger, cargo, and operations growth. The goal of the Master Plan is "to provide a financially and environmentally responsible guideline for future Airport development that will accommodate forecast aviation demand and remain adaptable to either a short-term or long-term future for the existing Airport site based on the results of the Airport Site Selection Program" (San Diego County Regional Airport Authority, 2008). All Development Projects implemented as a result of the Master Plan are subject to this SWMP.

The Authority prepared the SAN Master Plan to guide the development of SAN to the year 2030. The project's main components are:

- Ten new jet gates at Terminal 2: Addition of 10 gates to accommodate more travelers. (Completed in 2013.)
- Additional parking for remain-overnight aircraft: Additional parking for remain-overnight (RON) aircraft to increase the efficiency of airport operations by eliminating the need to taxi aircraft from one side of the runway to the other. (Completed in 2013.)
- Second-level roadway at Terminal 2: A second-level roadway to provide separate departure and arrival areas at Terminal 2 and so relieve the previous congestion associated with the dual arrival and departure location. (Completed in 2013.)
- Parking structure: A new structure to provide additional options for passengers and greeters to park their vehicles for short-term trips. (Completed in 2018.)
- Taxiway improvements on the northern and southern sides: Taxiway improvements to increase the flow of aircraft traffic by efficiently lining up aircraft waiting to take off.
- SAN Park Pacific Highway: Reconstruction and relocation of the SAN Park Pacific Highway. (Completed in 2014.)
- Access road: Construction of a new access road for easier access to North Area facilities. (Completed in 2015.)
- New general aviation facilities: Replacement of the general aviation facilities with new terminals, hangars, access roads, and aprons on 12.4 acres of SAN property. (Completed in 2013.)
- Reconstruction of taxiways: Reconstruction of Taxiways C and D with new apron hold pads and taxiways.
- North Side building improvements: Construction of new, enhanced buildings to improve operations, including a Receiving and Distribution Center and a rental car operation and storage facility. (Completed in 2016.)

- Roadway improvements: Expansion of current roadways to improve traffic and access to the northern side of the airport (Completed in 2016).

The 2018 Airport Development Plan is the next master-planning phase for SAN and identifies improvements that will enable the airport to meet demand through 2035. The Draft Environmental Impact Report (EIR) was released July 2018, and the Final EIR is planned to be released in late 2019. The EIR is a comprehensive study of all potential impacts on the environment resulting from proposed improvements to SAN, project alternatives, and enhancements to travel experiences for San Diego County residents and visitors. It ensures that actions being taken are in the best interest of surrounding communities and the environment. The EIR covers potential impacts on aesthetics, air and water quality; archaeological and historical issues; impacts on endangered species, the coastal zone, wetlands, and coastal resources; toxic and hazardous waste issues; potential noise and light pollution; and all cumulative effects on the environment as well. As part of the California Environmental Quality Act (CEQA), the EIR is an objective, full-disclosure report meant to inform the public about any and all possible impacts on the environment and to seek input on alternatives to reduce the impacts. The EIR is available to the public on the SAN website at http://www.san.org/Airport-Projects/Environmental-Affairs.

The Authority's Strategic Stormwater Master Plan (SSMP) was a 3-part study that begun in 2015 and was intended to develop a comprehensive airport-wide strategic master drainage plan that includes evaluations of storm water quantity, quality, reuse, and recommended infrastructure. Phase II of the SSMP (2017) first identified storm water capture and reuse as a feasible means to address several storm water quality and quantity concerns. The SSMP/Capture and Reuse Project was finalized August 10, 2018, and represents the third and final phase (Phase III) of the SSMP. The analysis detailed in Phase III of the SSMP was performed to verify the conclusions of the Phase II SSMP (2017) and to further develop and validate the design of the system. As outlined in Phase III, the required size for each underground storage tank depends largely on the following parameters: 1) rainfall quantity, 2) tributary area, 3) runoff volumes, 4) required storage capacity, 5) pumping/discharge rates, and 6) overflow rates.

In the WQIP Fiscal Year 2018 annual report, storm water capture and reuse was updated from being an optional strategy to a jurisdictional strategy. In 2018, the Terminal 2 Parking Plaza Harvest and Reuse Facility opened and captures 100% of the rainfall runoff from an 85th-percentile 2-year storm event that falls on the 7.6-acre parking structure and routes the water to the Central Utility Plant for use in the cooling towers. In early 2019, the Authority will begin construction of a storm water capture and reuse system that will capture approximately 80% of average annual storm water runoff from approximately 200 acres of the 661-acre Authority property.

SUSTAINABILITY POLICY

On November 13, 2017, the Authority officially signed the Airports Sustainability Declaration, which is a voluntary and non-binding agreement that calls for airports to develop, implement and expand initiatives to improve the sustainability and resilience of airports and their surrounding communities.

The Authority adopted its Sustainability Policy (Policy 8.31) on February 7, 2008 and updated the policy on January 3, 2019. The Sustainability Policy reviews SAN's primary organizational strategies and sustainability goals, describes ways in which these goals are being met currently at SAN, and evaluates areas where there is room for improvement. The Sustainability Policy commits the Authority to these sustainable practices:

- Affirm commitment to regulatory compliance, continuous improvement, accountability and transparency in environmental, social and economic performance through the development of formal sustainability reports on a regular basis;
- Actively participate in local and regional sustainability partnerships and strongly encourage and promote sustainable practices both in the aviation industry and the region;

- Proactively address greenhouse gas emissions and the impacts of climate change through SAN operations, planning and development decisions;
- Review and evaluate all new programs and projects in terms of addressing all three pillars of sustainability, in a balanced, holistic and measurable approach;
- Analyze the life cycle operating costs and impacts of the Authority's facilities, operations and services, using a Total Cost of Ownership approach to determine project feasibility economic sustainability;
- Adopt the standards set forth by the United States Green Building Council's LEED and/or other green design and construction standards as guiding criteria for achieving sustainable design in the development and remodeling of SAN facilities;
- Apply the three pillars of sustainability, LEED, and other green construction criteria as a significant factor when reviewing tenant development/redevelopment projects and provide incentives to encourage sustainable design features;
- Develop language within all new leases, agreements and contracts that supports the Authority's sustainability initiatives;
- Require the Authority's lessees and contractors to comply with the terms and conditions of their agreements pertaining to sustainability;
- Establish a work environment that maximizes the Authority's employee assets and stimulates an atmosphere of innovation, productivity, pride, and a personal commitment to sustainability; and
- Take a leadership role in sustainability initiatives that strengthen the social well-being and community relationships with visitors, Airport stakeholders and the public the Authority serves.

Section 4.3.3 describes how sustainability goals are incorporated into new and redevelopment efforts. Annual Sustainability Reports that highlight activities and accomplishments in the 5 strategic areas of focus (Community, Customer, Employee, Financial and Operational) are publicly available at http://sustain.san.org/.

4.2.2 SOURCE CHARACTERIZATION

Pollutants found or expected in SAN runoff can vary according to land use, as indicated by Table 4-1.

Table 4-1. Anticipated and Potential Pollutants Generated by Land Use Type at SAN

Priority Project Category	General Pollutant Categories								
	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash and Debris	Oxygen-Demanding Substances	Oil and Grease	Bacteria and Viruses	Pesticides
Commercial Development	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Industrial	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Fueling Facilities			X	X	X	X	X		
Streets, Roads	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)

X = anticipated

P = potential

(1) A potential pollutant if on-site landscaping exists.

(2) A potential pollutant if the project includes uncovered parking areas.

(3) A potential pollutant if land use involves food or animal waste products.

(4) Including petroleum hydrocarbons.

(5) Including solvents.

4.3 DEVELOPMENT PROJECT REVIEW PROCESS

All development projects at SAN undergo a review as part of the project approval process, as described below. This SWMP requires that all development projects provide BMPs to minimize to the MEP the introduction of pollutants of concern to the storm water conveyance system that may significantly impact receiving waters. The Authority's environmental review process ensures a comprehensive evaluation of water quality and cumulative impacts, identifies appropriate measures to avoid, minimize, and mitigate those impacts, and ensures sustainable design features and LEED criteria are incorporated, where possible, into development projects. As part of this process, the P&EAD evaluates the project application to ensure that all applicable documentation has been submitted. All project documents must be submitted to the proper departments for verification and approval, as described in the sections below.

4.3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The Authority staff members use the CEQA and the CEQA Guidelines to evaluate projects for approval. CEQA requires that the Authority first evaluate the effects of the proposed project on the environment through an initial environmental review. All phases of project planning, implementation, and operation are considered in the environmental review. The CEQA Guidelines, issued by the State of California Governor's Office of Planning and Research contain the "Environmental Checklist Form" (Appendix G), which is a model checklist for use in determining whether the effects of a proposed project on the environment are exempt, mitigatable, or significant. The Authority has adopted the checklist as part of its environmental review process. The checklist is incorporated into an assessment of the environmental impacts of the project, for which the Authority prepares a brief report as necessary with the project description, location, environmental setting, potential for impacts, and ways to mitigate significant impacts, if any and as applicable. The initial environmental review is used by the Authority to assess whether to prepare a Negative Declaration, Mitigated Negative Declaration, or EIR.

A Negative Declaration or Mitigated Negative Declaration is prepared if it is determined that there is no potential for significant impacts or if the project proponent revises the project to include BMPs or other enforceable conditions that will mitigate any identified significant impacts, respectively. The Negative Declaration or Mitigated Negative Declaration includes a description of the project, project name, legal description, project applicant, and findings.

Alternatively, an EIR is prepared if the Authority determines that the project may have a significant effect (as defined by CEQA) on the environment. Projects that clearly require an EIR may skip the initial environmental assessment and be moved directly to the EIR process. An EIR describes the project, analyzes its significant environmental effects (including water quality impacts), discusses ways to mitigate or avoid the effects, and incorporates public comments.

The Authority's approval to execute a development project is typically a discretionary act. The Authority also coordinates with federal agencies (typically the Federal Aviation Administration) on the review process under the National Environmental Policy Act.

Authority staff in the Airport Planning and Noise Mitigation Department use the following questions pertaining to hydrology and water quality to evaluate the potential storm water impacts of any particular project.

Would the Project:

- Violate any water quality standards or waste discharge requirements?

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?
- Result in an increase in pollutant discharges to receiving waters, considering water quality parameters such as temperature, dissolved oxygen, turbidity, and other typical storm water pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment nutrients, oxygen-demanding substances, and trash)?
- Result in significant alteration of receiving water quality during or following construction?
- Result in increased impervious surfaces and associated increased runoff?
- Create significant adverse environmental impact on drainage patterns because of changes in runoff flow rates or volumes?
- Be a tributary to an already impaired water body as listed on the 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired?
- Be a tributary to environmentally sensitive areas (ESAs) (e.g., RARE beneficial use areas, ASBS, etc.)? If so, can it exacerbate already-existing sensitive conditions?
- Have a potentially significant environmental impact on surface water quality of either marine, fresh, or wetland waters?
- Have a potentially significant adverse impact on groundwater quality?
- Cause or contribute to an exceedance of applicable surface water or groundwater receiving water quality objectives or degradation of beneficial uses?
- Impact aquatic, wetland, or riparian habitat?

4.3.2 APPLICATION OF CALIFORNIA COASTAL ACT

Discretionary projects proposed at SAN may require a coastal development permit in conformance with the California Coastal Act. If the Authority determines that a project requires a coastal development permit, an application is prepared and submitted to the California Coastal Commission. The California Coastal Act contains water quality and watershed-related policies with which coastal development projects must comply. The Authority proposes project alternations or mitigation measures to be consistent with these policies for development projects that require a coastal development permit, which are then reviewed, revised as appropriate, and approved by the Coastal Commission.

4.3.3 SUSTAINABILITY

The Authority intends for all new construction at SAN to be LEED certified. The Authority is committed to building and operating sustainably, and strives to protect the wide variety of natural resources that exist at SAN's location on San Diego Bay. In terms of reducing impacts from storm water to the MEP, all development projects during the review process need to demonstrate their commitment to the following goals:

- Reducing waste and recycling;

- Conserving water;
- Lowering their impact on air quality;
- Using sustainable building methods (applying LEED criteria); and
- Promoting green infrastructure.

Design and construction incorporate "green" design principles, such as use of LID BMPs, as outlined in the following section and Appendix C, and use recycled materials and renewable resources. Most construction material waste from development projects is recycled and reused on site. The Authority has developed language in new leases, agreements, and contracts that supports the Authority's sustainability initiatives and requires lessees and contractors to comply with all terms and conditions of their agreements pertaining to sustainability.

4.3.4 POST-CONSTRUCTION STORM WATER MANAGEMENT

The Authority developed a SUSMP under the previous Municipal Permit for projects that are determined to be PDPs. According to Provision E.3.d of the 2013 Municipal Permit, the SUSMP (now replaced by the BMP Design Manual under the 2013 Municipal Permit) continued to be implemented by the Authority until the new BMP Design Manual was developed in February 2016. The Authority worked with other Copermittees to develop the new regional Model BMP Design Manual in compliance with Provision E.3.d of the Municipal Permit. Once it was approved by the RWQCB, the Authority replaced the previous Authority SUSMP with the new Authority BMP Design Manual, which is based on the Model BMP Design Manual but tailored to meet the requirements of the Authority (see Appendix C).

The Authority's previous SUSMP described procedures to identify pollutants and conditions of concern for each PDP. To properly classify pollutants of concern, each PDP had to identify the receiving waters to which the project would discharge, list any and all pollutants for which the receiving waters were impaired using the most recent 303(d) list, and then compare the list of pollutants for which the receiving waters were impaired with the pollutants anticipated to be generated by the project. The Authority also had to evaluate each PDP for conditions of concern (that is, conditions with the potential to permanently impact downstream channels and habitat integrity). The Authority could, if required, request a drainage report to include all or a subset of the following items to conduct its evaluation: the relevant hydrologic and environmental factors, geotechnical concerns and mitigation measures, a field reconnaissance to observe and report downstream conditions and the area's susceptibility to erosion or habitat alteration, and rainfall runoff characteristics from the project area developed for 2-year and 10-year frequencies. The Authority's previous SUSMP was included in older versions of this SWMP in Appendix C, but has now been replaced with the new BMP Design Manual in Appendix C, as mentioned above.

4.3.5 TENANT AND AUTHORITY DEVELOPMENT PROJECTS

The BMP Design Manual addresses updated on-site post-construction storm water requirements for Standard Projects and PDPs, and provides updated procedures for planning, preliminary design, selection, and design of permanent storm water BMPs based on the performance standards presented in the Municipal Permit (see Section 4.7 below and Appendix C). The BMP Design Manual guides project applicants, for both Authority and tenant developments, including the representatives responsible for preparation of the Storm Water Quality Management Plans (SWQMPs), and P&EAD personnel responsible for review of these plans.

New development and redevelopment projects are conducted by two major categories of project proponents: projects conducted by tenants of the airport (hereafter referred to as "tenant projects") and projects conducted by the Authority itself (hereafter referred to as "Authority projects" or "capital projects"). The Authority has a different project approval process for each of these two project proponent categories and these differences are reflected in the Authority BMP Design Manual project review and approval processes.

The Authority BMP Design Manual approval process, including roles and responsibilities of Authority departments, is described below and in Appendix C for both tenant and Authority projects.

4.3.5.1 Tenant Projects

Whenever an airport tenant desires to make surface or subsurface improvements or perform new construction, reconstruction, modification, or demolition, the tenant must submit a request for approval to the Terminals and Tenants Department prior to commencing work. The request must be accompanied by plans and specifications that indicate the nature and extent of the proposed work and conform to Authority policies and all relevant laws, ordinances, rules, and regulations. The plans may include references to specific sections or parts of the Uniform Building Code or other applicable codes, ordinances, or laws. The Terminals and Tenants Department, in conjunction with the ADC, assigns a project manager to evaluate the project application for completeness and to coordinate technical review with the other Authority departments. The P&EAD must determine whether the BMP Design Manual requirements are applicable to the project, as described in Section 1.2 of the BMP Design Manual. For both Standard Projects and PDPs, in order for the project application to be considered complete, the project proponent must submit a SWQMP with the project application in accordance with the Authority BMP Design Manual describing how the project will meet the Manual requirements. The P&EAD reviews the finalized project plans and documents to ensure that all environmental requirements are met.

The approval of a SAN tenant project becomes part of the lease or part of a use and occupancy permit once all documents in the project application have been approved. Any CEQA mitigation measures or conditions of approval required by the review process of these departments become part of the lease or use permit and may be adopted by the Authority Board as a CEQA Mitigation Monitoring and Reporting Program. Sustainability and LEED criteria commitments are also incorporated. Authority review does not substitute for any other required applicable City, County, or Federal development permits. Written approval must be obtained from the Authority before development may begin, regardless of the scope of work.

4.3.5.2 Authority Projects

Whenever an Authority department desires to make surface or subsurface improvements or to perform new construction, reconstruction, modification, or demolition, the project sponsor, proponent, or manager must submit appropriate information to the Authority's Executive Team. The Authority's Executive Team evaluates each development project on the basis of its financial funding capacity and prepares a development program with the accepted projects. The Airport Planning and Noise Mitigation Department and P&EAD assess the environmental impacts of the program. P&EAD must determine whether the current BMP Design Manual requirements are applicable to the project, as described in Section 1.2 of the BMP Design Manual. For both Standard Projects and PDPs, in order for the project submittal to be considered complete, the submittal must include a SWQMP in accordance with the Authority BMP Design Manual describing how the project will meet the Manual requirements. Once reviewed by the relevant Authority departments, the development program is submitted to the Authority Board for approval. The Authority Board evaluates the development program and determines whether the program will be included as part of the Authority's budget. Any mitigation measures or conditions of approval required by the review process of these departments become part of the project design, contract, and/or implementation and are formalized, as necessary, as a CEQA Mitigation Monitoring and Reporting Program adopted by the Authority Board at the time of project approval. Again, commitments to sustainability or LEED initiatives are also incorporated into the project design and contracts.

4.4 PRIORITY DEVELOPMENT PROJECTS

PDPs are defined as proposed land development projects for which the Authority must impose specific requirements and structural BMPs. PDPs at SAN are further described in the Authority's BMP Design

Manual (Appendix C). Municipal Permit Provision E.3.b includes the following criteria for determination of a PDP:

- New development projects that create 10,000 cumulative square feet or more of impervious surfaces;
- Redevelopment projects that create and/or replace 5,000 cumulative square feet or more of impervious surface if the existing site has 10,000 square feet or more of impervious surfaces;
- New or redevelopment projects that create 5,000 cumulative square feet or more of impervious surfaces for use by restaurants, parking lots, and streets, roads, highways, and freeways; hillside development projects are not applicable to SAN;
- New and redevelopment projects that create or replace 2,500 cumulative square feet or more of impervious surfaces which discharge directly to an ESA;
- New development projects that support automotive repair shops or retail gasoline outlets;
- New or redevelopment projects that disturb one or more acres of land and are expected to generate pollutants post-construction; and
- Some development projects may be exempt from being defined as a PDP by the Authority if they meet one or more of the following conditions:
  - New or retrofit paved sidewalks that are designed to divert storm water runoff to vegetated or permeable areas, be hydraulically disconnected from impervious streets or roads, or include permeable pavements or surfaces in accordance with USEPA Green Streets guidance; and
  - Retrofitting or redevelopment of existing paved alleys, streets, or roads that are designed in accordance with the USEPA Green Streets guidance.

As stated in Section 4.3.4, the definitions of a PDP contained in the new BMP Design Manual (adopted in February 2016) are now followed, replacing the old PDP definitions in the previous SUSMP document.

4.5 BEST MANAGEMENT PRACTICES

The Authority requires that all development projects ensure that pollutant discharges and runoff flows are reduced to the MEP and that receiving water quality objectives are not violated. Proposed new development projects are required to incorporate BMPs into project plans in order to obtain approval. As required by Municipal Permit Provision E.3.a.(1), all development project plans must incorporate BMPs that remove pollutants from runoff as close to the source as possible and that do not create a nuisance or pollution associated with vectors. All development projects are required to implement source control and LID BMPs. Structural BMPs are required for any development projects which meet the requirements in Provision E.3.b. of the Municipal Permit, as discussed below.

4.5.1 SOURCE CONTROL BMPS

Source control BMPs are designed to reduce the contact between pollutants and storm water runoff and include land use and planning practices designed to reduce the potential for contamination at the source of pollution. Detailed source control BMPs are included in Appendix B and in the BMP Design Manual in Appendix C.

The Authority, as required by Provision E.3.a.(2) of the Municipal Permit, requires the following source control BMPs for all development projects where applicable and feasible:

- Prevention of illicit discharges to the MS4;
- Storm drain system stenciling and signage;

- Protection of outdoor material storage, trash storage, and work areas from rainfall, run-on, runoff, and wind dispersal; and
- Minimization of pollutant generation.

4.5.2 LOW-IMPACT DEVELOPMENT BEST MANAGEMENT PRACTICES

LID BMPs incorporate natural landscapes or resources and engineered, small-scale hydrologic controls into new or redevelopment projects to mimic pre-development hydrologic conditions, thereby reducing runoff and pollutants carried to the MS4. Instructions for identifying and implementing LID BMPs, also referred to as Site Design BMPs, are included in the BMP Design Manual (Appendix C). The Authority, as required by Provision E.3.a.(3) of the Municipal Permit, requires the following LID BMPs to be implemented for all development projects where applicable and feasible:

- Preserve or restore natural reservoirs and drainage corridors;
- Implement buffer zones for natural water bodies where feasible, or other buffers such as access restrictions where buffer zones for natural water bodies are not feasible;
- Conserve natural areas, vegetation, and soils within the development project footprint.
- Minimize the width of streets, sidewalks, and parking lot aisles as feasible, considering public safety;
- Minimize the impervious footprint;
- Minimize soil compaction to landscaped areas;
- Disconnect impervious surfaces with interspersed pervious areas;
- Implement landscaped or pervious areas to enhance infiltration, retention, and treatment of runoff;
- Implement collection areas or devices located at, or close to, the point where storm water initially meets the ground;
- Implement permeable materials in low-traffic areas where feasible;
- Incorporate native or drought-tolerant landscaping; and
- Harvest or reuse precipitation to both reduce runoff and minimize water usage.

4.5.3 STRUCTURAL BMPS

Development and redevelopment projects determined to be a PDP must include plans to implement structural BMPs in addition to the Source Control and LID BMPs, to meet the structural BMP performance requirements of Provision E.3.c of the Municipal Permit. There are special considerations for redevelopment PDP projects, namely that if they result in the creation or replacement of impervious surface in an amount less than 50 percent of the surface area of the previously existing development, then the structural BMP performance requirements apply only to the creation or replacement of impervious surface and not to the entire development. However, if the redevelopment results in creation or replacement of impervious surfaces greater than or equal to 50 percent of the surface area, structural BMP performance requirements apply to the entire development.

Structural BMPs must be designed to retain on-site pollutants contained in the volume of storm water runoff produced from a 24-hour, 85th percentile storm event (design capture volume). Additional information on structural BMP design, implementation, verification, and maintenance is contained in the BMP Design

Manual in Appendix C. If BMPs that retain full design capture volume are considered technically infeasible, the following alternatives may be implemented:

- Biofiltration BMPs may be designed with the appropriate hydraulic loading rate to maximize storm water retention and pollutant removal; to prevent erosion, scour, and channeling within the BMP; and to be sized according to the requirements in the BMP Design Manual.
- If biofiltration is not technically feasible, then flow-through treatment control BMPs can be used to treat runoff, mitigate for the design capture volume not reliably retained on site, and meet the size and design requirements in the BMP Design Manual to remove pollutants from storm water to the MEP. Flow-through treatment control BMPs should be ranked with high or medium pollutant removal efficiencies for the expected pollutants of concern, and a feasibility analysis should be conducted by the Authority if the flow-through BMP has low removal efficiency.

If the project proponent chooses to implement infiltration BMPs to meet the structural BMP requirements, the infiltration device(s) must not cause or contribute to an exceedance in applicable groundwater quality objectives and must meet the following design criteria, according to Provision E.3.c.(5) of the Municipal Permit, unless the project proponent demonstrates that one or more of the criteria are not necessary to protect groundwater:

- Runoff must undergo pretreatment prior to infiltration;
- Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality;
- Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;
- The vertical distance from the base of the infiltration BMP to the seasonal high groundwater mark must be at least 10 feet; this vertical distance criteria can be reduced in cases where the groundwater basins do not support beneficial uses (as is the case at SAN), as long as groundwater quality is maintained;
- The soil through which infiltration will occur must have physical and chemical characteristics adequate for proper infiltration durations and treatment of runoff for the protection of groundwater for beneficial uses; and
- The development will not occur in areas of industrial, light industrial, or other activities that pose a high TTWQ, unless source control BMPs are implemented to prevent exposure or the runoff from these activities is treated or filtered to remove pollutants prior to infiltration.

The BMP Design Manual provides instructions for selecting, sizing, and designing infiltration BMPs.

In accordance with Municipal Permit Provision E.3.c.(2)(d)(ii), the Authority is exempt from the Municipal Permit requirement to implement hydromodification BMPs to manage post-project runoff conditions at SAN, because storm water runoff from the airport discharges to an enclosed embayment (namely, San Diego Bay). This is further discussed in the WMAA, which is included in the San Diego Bay WQIP.

4.6 BMP DESIGN MANUAL

As described in Section 4.3.4, the Authority continued to use the SUSMP previously contained in Appendix C until the new BMP Design Manual was developed and replaced it (the new Appendix C). All development projects (Standard Projects and PDPs) are required to minimize the introduction of pollutants of concern to the storm water conveyance system to the MEP to reduce any significant impacts on the receiving water. This objective can be most effectively achieved by using a combination of Site Design, Source, and treatment or structural control BMPs. The Authority's BMP Design Manual (Chapter 4) describes the selection and design criteria for the Source Control and LID BMPs (required for all development projects),

and the additional treatment control or structural BMPs required to be implemented at PDPs (Chapters 5-7). For PDPs, the Authority's BMP Design Manual outlines the method for selecting structural storm water BMPs to be used on the project to maximize the removal of the pollutant(s) of concern identified on the project site, and per Municipal Permit requirements.

The Authority is implementing the new BMP Design Manual, replacing the previous SUSMP requirements, as from February 2016 onwards, to continue to address post-construction urban runoff pollution from new development, priority development, and redevelopment projects. The following changes required by the new Municipal Permit Provisions E.3.d.(1) through (5) have been incorporated into the new BMP Design Manual:

- Updated procedures to determine the nature and extent of storm water BMP requirements for potential development and redevelopment projects, including all applicable source control, LID, and structural BMPs; design procedures and requirements for structural BMPs; and any requirements specific to phased projects for both private development (tenant) and public improvement (Authority) projects;
- Updated procedures for identifying the expected pollutants and conditions of concern, based on receiving water quality; pollutants or conditions that cause or contribute to the highest priority water quality conditions identified in the WQIP; the land use type of the project and the pollutants associated with the land use; and the pollutants predicted to be present at the site;
- Updated performance requirements and procedures for designing structural BMPs;
- Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and
- Alternative compliance criteria, if permitted, for PDPs.

4.6.1 STORM WATER QUALITY MANAGEMENT PLAN

Standard Projects and PDP projects that are subject to the new BMP Design Manual must submit a SWQMP to P&EAD. The SWQMP will replace the Urban Storm Water Mitigation Plan previously required by the SUSMP. The SWQMP for all developments must demonstrate how source control and site design (or LID) BMPs have been incorporated and implemented. The SWQMP for PDPs must also include the following information:

- Documentation of the planning and decision process for structural BMP selection;
- Calculations used for design of structural BMPs that demonstrate that applicable performance standards have been met;
- General operation and maintenance requirements of the selected structural BMPs; and
- Maintenance mechanisms and responsibilities selected for long-term operation and maintenance of the structural BMPs.

Standard Projects, or projects that are not defined as a PDP and are not subject to PDP requirements, as well as PDPs, will submit checklists that verify that all source control and site design BMPs have been considered and implemented when feasible and include copies of all relevant plan sheets that demonstrate BMP implementation. The following checklist templates are included as appendices in the BMP Design Manual to be used in development of both a Standard Project and a PDP SWQMP:

- Applicability of Permanent, Post-Construction Storm Water BMP Requirements;
- Project Type Determination Checklist;
- Site Information Checklist for Standard (or PDP) Projects;

- Source Control BMP Checklist; and
- Site Design BMP Checklist.

The P&EAD evaluates the project SWQMP as part of the initial project review process to ensure that the project plans comply with BMP Design Manual and Municipal Permit requirements.

PDP BMP IMPLEMENTATION AND OVERSIGHT

PDP and structural BMP verification and inspection are conducted by the Authority to ensure that all design, construction, and maintenance requirements have been met.

4.7 STRUCTURAL BMP APPROVAL AND VERIFICATION

All PDP applications must meet the structural BMP performance requirements of Provision E.3 of the Municipal Permit, as outlined in the BMP Design Manual. Prior to occupancy of each PDP, P&EAD, together with a project proponent engineer, inspects each structural BMP to verify that it has been constructed in compliance with all specifications, plans, permits, and ordinances, and records verification and approval of the structural BMPs in the Web-based database. Initial BMP verification inspections are separate from the regular operation and maintenance inspections for each BMP.

4.7.1 PDP INVENTORY

The Authority has incorporated a development inventory into the Web-based database for tracking and approval of all developments including PDPs. If applicable, the SWQMP can be uploaded and the type and location of structural BMPs can be recorded in the database. The database currently includes, or will be updated to include, the project PDP, address and hydrologic subarea, descriptions of structural BMPs (if applicable), date(s) of construction, responsible parties for construction and structural BMP maintenance, BMP maintenance inspection dates and results, and corrective actions taken and associated resolutions, when applicable.

PDPs with structural BMPs are prioritized for inspection and follow-up as shown in Table 4-2.

Table 4-2. PDP Prioritization Criteria

PDP Priority	Authority Criteria
High	PDPs with expected pollutants that are listed as highest or focused priority pollutants for the Authority in the San Diego Bay WQIP.
Low	PDPs with expected pollutants that are not listed as highest or focused priority pollutants for the Authority in the San Diego Bay WQIP.

PDP = Priority Development Project
WQIP = Water Quality Improvement Plan

The Authority reserves the right to revise its methodology for determining PDP inspection priority for any project as necessary. P&EAD considers the following additional factors when revising PDP structural BMP inspection priorities, as follows:

- Receiving water quality;
- Number and sizes of structural BMPs;
- Likelihood of operation and maintenance issues of structural BMPs;
- Land use and expected pollutants generated; and

- Compliance record.

4.7.2 PDP STRUCTURAL BMP MAINTENANCE VERIFICATIONS AND INSPECTIONS

The Authority's approval of a development project includes the requirement to properly operate and maintain any structural BMPs that are constructed. The P&EAD verifies annually that structural BMPs are adequately maintained and continue to operate effectively to remove pollutants in storm water to the MEP. This verification is accomplished through inspection or self-certification.

Structural BMPs constructed by the Authority as part of a capital improvement project are maintained by the FMD. The P&EAD inspects and the FMD maintains these structural BMPs in accordance with the manufacturer's recommendations. The P&EAD records inspections and the FMD records maintenance of these BMPs. Before October 1 of each year, the P&EAD inspects either the FMD documentation of inspection/maintenance or the structural BMPs themselves or both.

Structural BMPs constructed by tenants are generally maintained by tenants, unless the Authority and the FMD have assumed responsibility under the terms of the tenant's lease or some other mechanism. Structural BMPs constructed by tenants are either inspected by P&EAD annually before October 1 or the tenant is allowed to self-certify inspection and maintenance. Structural BMPs associated with PDPs designated high priority by the Authority will not be eligible for self-certification and will be inspected by P&EAD directly. Tenants who have been authorized by P&EAD to perform their own inspections and maintenance of structural BMPs are required to submit documentation and self-certification that inspection and maintenance were performed prior to October 1.

Any decision to increase the frequency of inspections of structural BMPs will be made by P&EAD on a case-by-case basis and will be dependent on the type of operations occurring outdoors at the PDP, type of BMPs installed, frequency of storms, and past experience from inspecting structural BMPs.

4.8 ALTERNATIVE COMPLIANCE PROGRAM

The Municipal Permit allows the Copermittees to implement an alternative compliance program in lieu of structural control BMPs for a PDP on an individual jurisdictional level, if they so choose. Provision E.3.c.(3) of the Municipal Permit and Section 1.8 of the Authority's BMP Design Manual in Appendix C outline the requirements and conditions for establishing such programs. Provision E.3.c.(3)(b) also allows the Authority to approve a PDP that proposes to fund, contribute to, or implement an ACP, provided that the Authority determines that implementation of the ACP will have a greater overall water quality benefit for the WMA than fully complying with the performance requirements of Provision E.3.c.(1) on site, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

The Authority's BMP Design Manual, updated February 2016, addresses post-construction urban runoff pollution from new development and redevelopment projects, including Section 1.8, which outlines possible pathways for an alternate compliance program at SAN. As previously described, all proposed ACPs must prepare a SWQMP (which should include construction plans and water quality credits earned under the alternative compliance program) for review and approval by the Authority. In order to determine those credits, in December 2015, the RWQCB issued a Water Quality Equivalency (WQE) Guidance Document that provides standards and guidelines to determine whether a proposed ACP would achieve a water quality benefit that is greater overall than a PDP. This Guidance Document states that "credit systems require review and acceptance by the RWQCB prior to their implementation." In 2018, the Authority began development of a Credit Trading Framework with the purpose of providing a framework for implementing water quality credit trading at SAN.

The Authority's WQE Credit Trading Framework relies on the WQE Guidance Document as a basis for outlining the methods that project applicants and the Authority could use to bank, track, and trade water

quality credits for development projects within the SAN jurisdiction. Water quality credits would be calculated per the Region 9 WQE Guidance Document and could be used to partially or wholly satisfy pollutant control requirements for a proposed PDP through an ACP.

The types of credits to be traded by the Authority per the WQE Guidance Document would be storm water pollutant control credits (water quality credits). The Authority intends to submit the WQE Credit Trading Framework to the RWQCB for approval in 2019.

4.9 DEVELOPMENT AND PLANNING ENFORCEMENT

All project proponents involved in development or improvement planning are responsible for ensuring that project applications meet the requirements of the Municipal and Industrial Permits, Authority Rules and Regulations, Storm Water Code (Article 8), SWMP, BMP Design Manual, project permits and approvals, and contracts and leases. As required under Provision E.6 of the Municipal Permit, the Authority has developed an ERP to enforce its legal authority to achieve compliance. This section describes the ERP as it applies to development and planning projects at the SAN.

Violations are determined on the basis of noncompliance with established codes, regulations, permits, and approvals for development projects at the SAN. The enforcement mechanisms used by the Authority are listed below. The Authority generally obtains compliance using the first four mechanisms listed here. The remaining escalated enforcement mechanisms can be used, as necessary, to increase the severity of penalties and to compel compliance as soon as possible:

- Verbal and written warnings;
- Written notices of violation;
- Written notices to clean, test, or abate;
- Order to cease and desist;
- Fines;
- Denial or revocation of permits and approvals;
- Administrative and criminal penalties;
- Bonding requirements;
- Liens; and
- Program review and modification.

The Authority's ERP for development and planning activities have two levels of enforcement. The general enforcement process is outlined as follows:

- Enforcement Level 1 is initiated if a project moves forward with construction or development activities before the project application has been approved or in a manner that has not been approved or if the responsible party fails to perform and document BMP inspections or self-verification inspections. The developer or responsible party is issued a verbal and/or written notification of the finding to initiate enforcement. Corrective actions are expected to be submitted and/or verified through re-inspection within 30 days of the verbal or written notice. If the corrective actions require a longer time period than 30 days, the Authority employee or tenants will provide an explanation to the P&EAD inspector and a suggested timeframe for completion, which the P&EAD inspector will either agree upon, or reject and provide a preferred timeframe. The Authority or tenants must document the corrective action taken by responding to P&EAD through the Authority's web-based database. The Authority or tenants who cannot complete corrective actions in the time required must explain in

detail through the web-based database the specific causes of delay and propose a schedule for compliance. P&EAD has the sole discretion to grant an extension or pursue escalated enforcement. All corrective actions, as well as the time periods allowed and dates of actual completion, are recorded in the web-based database.

- Enforcement Level 2 is initiated when a prohibited off-site discharge occurs. A written notice to clean, test, or abate or an order to cease and desist (stop work order), is used to initiate enforcement and compliance is expected within 24 hours. If the violation is not corrected, the Authority or tenants must attend a mandatory meeting with the Director of the P&EAD to discuss the reasons for failing to comply and the means of resolving the issue.

4.10 DEVELOPMENT AND PLANNING MODIFICATIONS

The Authority has reserved this section to identify and document changes made to the Development Planning Component of the SWMP. Section 13.0 of this SWMP details the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal and Industrial Permits. Changes are listed below:

- The previous SUSMP in Appendix C has been replaced with the BMP Design Manual in February 2016, and language in this section has been updated accordingly.
- Standard Projects and PDP projects subject to the BMP Design Manual must submit a SWQMP to the P&EAD. The SWQMP replaced the Urban Storm Water Mitigation Plan previously required by the SUSMP, as of February 2016.
- The following checklist templates are included in the BMP Design Manual to be used in development of a Standard Project and a PDP SWQMP: Applicability of Permanent, Post-Construction Storm Water BMP Requirements, Project Type Determination Checklist, Site Information Checklist for Standard (or PDP) Projects, Source Control BMP Checklist, and Site Design BMP Checklist (see Appendix C).
- Updates were made to Section 4, the Development and Planning Component, in January 2019, following finalization of the Strategic Master Drainage Plan and change in the storm water capture and reuse WQIP strategy from an optional to a jurisdictional strategy.
- The discussion of Alternative Compliance, Section 4.8, has been updated in January 2019.

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5.0 CONSTRUCTION COMPONENT

5.1 INTRODUCTION

This update to the Authority SWMP is in response to the requirements of the 2013 Municipal Permit. All Copermittees are required to reduce discharges of pollutants in storm water from construction sites to the MEP and to effectively prohibit NSWDs from construction sites into the MS4.

The SWMP update process included internal meetings and a workshop to incorporate comments from key stakeholders. Municipal Permit Provision F.2.a encourages the Authority "to seek public and stakeholder participation and comments early and often during the development of this document." Final proposed updates must be submitted to the RWQCB concurrently with the submittal of the final WQIP for various watersheds. Section 5.0 has been revised to include the San Diego Bay WQIP strategies and goals submitted to the RWQCB in June 2015.

This section addresses the requirements in Municipal Permit Provisions E.4 and E.7.a that are relevant to the construction component. As listed below, these provisions require the Authority to:

- E.4.a—Require the development of a pollution control plan, a construction BMP plan, and/or an erosion and sediment control plan prior to obtaining a permit to begin construction. The Authority must confirm that the plans achieve full compliance with (1) local ordinances; (2) the Municipal Permit; and (3) the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ) (the Construction General Permit [CGP]). Section 5.4 has been prepared to address this requirement.
- E.4.b—Maintain an inventory of all construction sites and identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The Authority is required to maintain and update, at least quarterly, a watershed-based inventory of all construction projects that have been issued a local permit that allows ground-disturbing or soil-disturbing activities that can potentially generate pollutants in storm water runoff. The Authority is also required to identify all construction sites within its jurisdiction that represent a high threat to downstream water quality. These designations must consider site locations within a hydrologic subarea where sediment is known or suspected to contribute to high-priority water quality conditions identified in the WQIP; sites within the same hydrologic subarea and tributary to a 303(d)-listed waterway; sites adjacent to, or discharging to, a receiving water within an ESA; or other sites determined by the Authority or the RWQCB as a high TTWQ. Section 5.2 has been prepared to address this requirement.
- E.4.c—Implement, or require the implementation of, effective BMPs to reduce discharges of pollutants into storm water from construction sites to the MEP and to effectively prohibit NSWDs from construction sites into the MS4. These BMPs must be site-specific, seasonally appropriate, and construction-phase appropriate. Section 5.3 has been prepared to address this requirement.
- E.4.d—Inspect construction sites to require and confirm compliance with local permits and the Municipal Permit. Priority for site inspections must consider TTWQ pursuant to Provision E.4.b. Inspections must be planned and conducted at the appropriate frequency for each phase of construction. Based upon inspection findings, the Authority must implement follow-up actions to confirm site compliance. Construction inspections must assess compliance with applicable permits, BMP implementation and maintenance, and the adequacy and effectiveness of BMPs. Construction inspections must make visual observations of NSWDs, sediment and construction material discharges, and illicit connections. All violations and necessary corrections must be documented in accordance with the ERP. All inspections at all inventoried construction sites must be tracked and recorded. These records must be retained electronically or in tabular form and be available to the RWQCB upon request. The inspections must include site name, date, and rainfall data since last inspection,

description of violations or findings, explanatory comments, description of enforcement actions, and resolution of problems with the date that each was resolved. Section 5.5 has been prepared to address this requirement.

- E.4.e—Enforce its legal authority established pursuant to Municipal Permit Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with requirements of the Municipal Permit in accordance with the ERP. Section 5.6 has been prepared to address this requirement.
- E.7.a.(3)—Promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable NSWDs from entering the MS4, and protect water quality standards in receiving waters. The public education program must be implemented in accordance with the strategies in the WQIP and must include, at a minimum, appropriate education and training measures for specific target audiences, such as construction site operators. Section 5.7 has been prepared to address this requirement.

5.1.1 SOURCE CHARACTERIZATION

The construction component of the SWMP addresses demolition, grading, excavation, clearing, and structure and road construction, which can disturb soil and/or produce materials that can transport trash, debris, sediment, and other pollutants to the storm water conveyance system. Construction grading and clearing can expose underlying soil, making it susceptible to erosion from rainfall, wind, or improper water use. Natural vegetation root structures normally stabilize underlying soil and increase infiltration, which typically decreases storm water runoff volume and velocity. Excess sediment that is eroded in the absence of vegetation at a construction site is considered a pollutant because it degrades aquatic life by interfering with photosynthesis, respiration, growth, and reproduction.

Sediment particles eroding from construction sites can provide a substrate to which other pollutants can attach (e.g., trace metals, hydrocarbons, conventional pollutants, pesticides, and coliform bacteria). In addition, construction materials and waste can have significant detrimental effects on downstream receiving waters if they are not properly handled and contained. The magnitude of the storm water impacts depends on the nature of construction activities, climatic conditions, site conditions, material- and waste-handling protocols, and appropriately implemented and maintained BMPs. After construction is completed, an increase in impervious surface coverage can have a lasting negative impact on drainage patterns, runoff velocities and downstream erosion, and downstream drainage systems and natural waterways. The impacts of development and associated BMPs to reduce them are outlined in Section 4.0.

Sources of construction pollutants identified by the Authority include any existing or future construction sites at SAN. Designated minimum construction BMPs, as outlined in Section 5.3, are required to be implemented at all construction sites. When necessitated by project- or site-specific characteristics, construction phasing, and/or the season, additional BMPs will also be required. The minimum BMPs, as well as any required additional project-specific BMPs, are intended to reduce the discharge of trash, debris, sediment, and other pollutants from the site to the MEP and to prevent the site from causing or contributing to a violation of water quality standards.

5.2 CONSTRUCTION SITE INVENTORY AND TRACKING

5.2.1 SITE INVENTORY

The Authority maintains an inventory of completed and active construction projects at the SAN. The inventory exists in a Web-based database management system maintained by the P&EAD. The database manages, and tracks completed, ongoing, and upcoming construction projects. Project information is initially entered into the database during the project intake (PIT) process, described in Section 5.4.

The database records the following specific details required by the Municipal Permit and other pertinent information for each project:

- Project name and location (by address and/or by latitude and longitude);
- Owner's name, address, telephone number, and email address;
- Contractor's name, address, telephone number, and email address;
- Project manager's name, address, telephone number, and email address;
- Construction manager or site superintendent's name, address, telephone number, and email address;
- Qualified SWPPP Developer's name, address, telephone number, and email address;
- Qualified SWPPP Practitioner's (QSP's) name, address, telephone number, and email address;
- Start and completion dates;
- Size of the site;
- Approximate disturbed soil area (DSA);
- TTWQ designation;
- Required inspection frequency;
- Copy of the SWPPP or Water Pollution Control Plan (WPCP);
- Date on which the SWPPP or WPCP was received by the P&EAD;
- Date on which the SWPPP or WPCP was approved by the P&EAD;
- WDID number, if any; and
- Minutes and notes from any pertinent pre-bid, pre-construction, or construction progress meetings.

The database is also used to track:

- Current construction phase;
- Inspections; and
- Ongoing enforcement actions.

The Municipal Permit requires that the Authority also record the hydrologic subarea in which each project lies, so that a watershed-based inventory can be maintained. However, this hydrologic information is not recorded in the Authority's database, because all construction projects at the SAN lie in the same watershed (namely, the Pueblo San Diego hydrologic unit, San Diego Mesa hydrologic area, Lindbergh hydrologic sub-area [908.21]).

The Municipal Permit requires the construction site inventory to be updated at least quarterly. The database of construction projects at the SAN can provide up-to-the-minute information about completed and ongoing construction projects and suffices as the updated inventory, or it can be used to produce an electronic or hard-copy report at any time.

5.2.2 THREAT TO WATER QUALITY

Municipal Permit Provision E.4.b.(2), requires that "each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality." Like other Copermittees, the Authority refers to "threat to downstream surface water quality" as "threat to water quality." Factors to consider when designating high TTWQ must include:

- Whether the site is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the WQIP;
- Whether the site is located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the 303(d) list;
- Whether the site is located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and
- Whether it is another site determined by the Copermittees or the RWQCB to be a high TTWQ.

ESAs are areas that include 303(d)-listed impaired water bodies, areas designated as an ASBS, State Water Quality Protection Areas, water bodies designated with the RARE beneficial use, areas designated as preserves or their equivalents under the Multiple Species Conservation Program, and any other equivalent area identified by the Copermittees.

In considering the factors used to identify the TTWQ, the Authority notes that:

1) There are currently no hydrologic subareas identified in the San Diego Bay WQIP where sediment is known to contribute to, or is suspected of contributing to, the highest priority water quality conditions.
2) The Authority's jurisdiction does not lie in a hydrologic subarea and is not tributary to a 303(d)-listed water body segment that is currently listed as impaired for sediment.
3) Only one of the six criteria for an ESA applies to the discharges from the Authority's jurisdiction: if a particular construction site is directly adjacent to or discharging directly into San Diego Bay because the bay is designated with RARE beneficial use in the Water Quality Control Plan for the San Diego Basin (2012, Table 2-3). Note that most of the runoff from the Authority's jurisdiction does not drain directly into San Diego Bay, but rather is commingled with runoff from other jurisdictions, including the City of San Diego, the Port of San Diego, and the United States Marine Corps.

The Authority has determined that construction projects subject to the CGP are considered high TTWQ. Given all of the above, the Authority has developed a two-tiered methodology for determining the TTWQ of any particular construction project. This methodology is presented in Table 5-1.

Table 5-1. Level of Threat to Water Quality Criteria

TTWQ	Authority Criteria
High	Site is directly adjacent to or discharging directly to San Diego Bay without commingling runoff from another jurisdiction (i.e., within drainage basins 12 or 15); or Site is subject to the CGP and does not qualify for an erosivity waiver from the CGP.
Low	Site is not directly adjacent to nor discharging directly to San Diego Bay (i.e., is not within drainage basins 12 or 15); and Site is not subject to the CGP because of the size of the DSA or because it qualifies for an erosivity waiver from the CGP.

As stated in the Municipal Permit, either the Copermittee or the RWQCB may unilaterally determine that a particular construction project should be identified as a high TTWQ for reasons not listed above. It is possible that a project that is initially identified by the Authority as a low TTWQ could become a high TTWQ site merely because an erosivity waiver expires before the project is completed. In addition, as the San Diego Bay WQIP and the 303(d) list are updated, the Authority will revise its TTWQ determination methodology as necessary. Table 5-2 presents the inventory of planned and active construction sites as of January 2019.

Table 5-2. Inventory of Planned and Active Construction Sites as of January 2019

#	Sponsor	Project Name	Project Description	Start Date	Priority
1	Authority	CIP#412001 Federal Inspection Service Facility	Demolition work and construction activity to build a new Federal Inspection Service facility.	May 2017	Low
2	Authority	CIP#104220R Rehabilitate Cross Taxiways B1, B4-B7, C3, C4 & C6	Asphalt milling and overlay of cross taxiways	October 2018	Low
3	Authority	CIP#104227 North Side vehicle service road and SD Improvements	Remove and replace vehicle service road between ARFF and the GreenBuild	October 2018	Low
4	Authority	CIP#104251 Northside RON Aircraft Parking Design-Build	Northside RON Aircraft Parking. On hold pending resolution on modified lease area.	Planning Phase as of Jan 2019	High
5	San Diego Fuel Coalition	TIP#17036 San Diego Fuel Coalition Additional Fuel Tanks	Installation of 3 additional aboveground fuel tanks	Review Phase as of Jan 2019	Low
6	Authority	CIP#104205 Widen Sassafras Intersection	Widen East side of Sassafras & Pacific Highway Intersection	Design Phase as of Jan 2019	Low
7	Authority	CIP#104231 North Cargo Apron Project	New airfield cargo ramp (associated with new cargo facility)	Design Phase as of Jan 2019	High
8	Authority	CIP#104252 Northside Utility Infrastructure - Cargo Development	Undergound utilities associated with new cargo facility	Design Phase as of Jan 2019	Low
9	Authority	CIP#104255 Rehabilitate Cross Taxiways C1, C2, C5 and D	Asphalt milling and overlay of cross taxiways Taxiway C1 reconstruct with concrete	Design Phase as of Jan 2019	Low
10	Authority	CIP#104228 Admiral Boland Way Entry/Exit Gates	Installation of speed gates at north and south ends of the Terminal Link Road.	January 2019	Low

Table 5-2. Inventory of Planned and Active Construction Sites as of January 2019 (continued)

#	Sponsor	Project Name	Project Description	Start Date	Priority
11	Authority	CIP#104244 Battery Energy Storage System	Construct battery energy storage system in NTC Parking Lot	Construction pending as of Jan 2019	Low
12	Authority	CIP#104245 Airport Support Facilities (ASF/FMD) Design-Build	Construction of Airport Support Facilities (Belly Cargo) on South Side of Airport and Facilities Maintenance Department Building on North Side of Airport	December 2018	Low
13	Authority	CIP#104249 Hydrant Fueling Infrastructure	Construction of hydrant fueling infrastructure parallel to vehicle service road	January 2019	High

5.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

Each construction site must be protected by an effective combination of site planning, erosion, and sediment controls; materials and waste management controls; and other BMPs to prevent or reduce the discharge of storm water pollution and to prohibit NSWDs from construction sites to the MEP. Effectiveness depends on properly implementing and maintaining these BMPs. This section designates the BMPs required for all construction sites at the SAN, depending on their applicability to the activity at hand.

5.3.1 GENERAL BMP REQUIREMENTS

All projects and construction activities are required to implement construction BMPs. The project proponent must identify the construction BMPs to be implemented in accordance with the performance standards in this section. For projects disturbing one acre or more, the construction BMPs must be identified in a SWPPP in accordance with the CGP. For projects disturbing less than one acre, a WPCP is required, because all projects require some form of BMP plan per Municipal Permit Provision E.4.a to identify the pollution prevention measures that will be taken during construction.

It is the responsibility of the project proponent to ensure the proper selection, installation, and maintenance of appropriate BMPs. Storm water BMPs for construction sites typically require frequent maintenance to maintain effectiveness. BMPs may require relocation, revision, and re-installation, particularly as project phases change. Therefore, the project proponent for any construction project within the Authority's jurisdiction must retain a dedicated qualified person, specifically a QSP as defined in the CGP (even if the project is not subject to the CGP). The QSP must be on the construction site daily to evaluate site conditions with respect to storm water pollution prevention planning and implementation of the SWPPP or WPCP and the BMPs.

All construction project proponents and contractors are required to ensure that the QSP conducts and documents self-inspections of the project site on a weekly basis. (Note that the CGP has additional inspection requirements that must be met.) Documentation of self-inspections must record, among other information as discussed in Section 5.5, the date, time, the condition of the BMPs, the effectiveness of the BMPs, and the need for changes to either the SWPPP or WPCP, or the BMPs, or both. Documentation must be kept on site and made available for inspection by the Authority upon request.

The primary purposes of self-inspections are to ensure that:

- The owner/contractor takes full responsibility for managing storm water pollution caused by the project site's construction activities;
- Storm water BMPs are properly documented, implemented, and functioning effectively; and

- BMP maintenance (e.g., sediment removal) and repair needs are identified and addressed.

BMPs must be installed in accordance with an industry-recommended standard or in accordance with the requirements of the CGP. More information about BMPs is provided in the CASQA Stormwater BMP Handbook Portal: Construction.

BMP requirements differ, depending upon the type of the project, the topography of the site, and the season (i.e., the rainy wet season from October 1 through April 30, or the dry season, from May 1 through September 30).

5.3.2 PERFORMANCE STANDARDS

The Authority will evaluate the adequacy of the project proponent's construction site management for storm water pollution prevention, including BMP implementation. These evaluations will be based on performance standards for storm water BMPs, which include:

- Pollution prevention measures designed so that there is no increase of project-related pollution (including sediment) in runoff from the site;
- Prevention of slope erosion; and
- Mitigation of runoff discharge velocity to less than or equal to pre-construction levels.

A site is considered inactive if construction activities have ceased for a period of 14 or more consecutive calendar days. At any time of year, an inactive site must be fully protected from erosion and discharges of sediment. It is also the project proponent's responsibility (for both active and inactive sites) to implement a plan to address all potential NSWDs.

Regardless of inspections conducted by the Authority, project proponents are required to prevent any construction-related materials, wastes, spills, or residues from entering a storm water conveyance system. More detailed performance standards that each project will be evaluated against are captured as part of the PIT process, described in Section 5.4.2.

5.3.3 MINIMUM REQUIREMENTS

The following requirements are the minimum standards for a construction site. Additional BMPs may be required to comply with the performance standards detailed in Section 5.4.2. The P&EAD may further amend these requirements on a case-by-case basis.

The minimum BMPs must be implemented unless the justification for their exception is submitted and approved during the SWPPP or WPCP review process (e.g., projects that will not be using concrete and therefore will not generate concrete waste). The justification must be documented in the SWPPP or WPCP, and annotated on the PIT process form. Such exceptions to the minimum BMPs can be approved only by the P&EAD.

The Authority's designated set of minimum BMPs for use at all construction projects, regardless of the project's TTWQ (unless approved by the Authority as not applicable, as described above) are presented in Table 5-3.

Table 5-3. Designated Minimum BMPs for All Construction Projects

BMP Category, CASQA Identification Number,(1) and Title	
Erosion Control BMPs:	
EC-1–Scheduling	EC-16–Non-Vegetative Stabilization
EC-15–Soil Preparation	
Temporary Sediment Control BMPs:	
SE-1–Silt Fence	SE-7–Street Sweeping and Vacuuming
SE-5–Fiber Rolls	SE-10–Storm Drain Inlet Protection
SE-6–Gravel Bag Berm	SE-13–Compost Socks and Berms
Wind Erosion Control BMPs:	
WE-1–Wind Erosion Control	
Temporary Tracking Control BMPs:	
TC-1–Stabilized Construction Entrance and Exit	
Non-Storm Water Management BMPs:	
NS-1–Water Conservation Practices	NS-9–Vehicle and Equipment Fueling
NS-3–Paving and Grinding Operations	NS-12–Concrete Curing
NS-6–Illicit Connection/Discharge	NS-13–Concrete Finishing
Waste Management and Materials Pollution Control BMPs:(2)	
WM-1–Material Delivery and Storage	WM-5–Solid Waste Management
WM-2–Material Use	WM-8 Concrete Waste Management
WM-3–Stockpile Management	WM-9–Sanitary/Septic Waste Management
WM-4–Spill Prevention and Control	

Note that some BMPs may be not applicable to certain construction projects, such as one with no use of concrete.

(1) Details of the Authority's minimum BMPs are in the CASQA Stormwater BMP Handbook Portal for Construction at https://www.casqa.org/resources/bmp-handbooks. BMPs must be employed to industry standards, as outlined in the CASQA *Construction Handbook*.

(2) For sites with pre-existing soil contamination issues, BMP WM-7, Contaminated Soil Management, must be added to the SWPPP or WPCP.

The 2007 Municipal Permit (Order No. R9-2007-0001) indicated that erosion prevention is to be "used as the most important measure for keeping sediment on site during construction, but never as the single method." Sediment controls should be used as a "supplement to erosion prevention for keeping sediment on site during construction." BMPs at each construction site must be site-specific, seasonally appropriate, construction-phase appropriate, and implemented year-round, as applicable. Year-round requirements include, but are not limited to:

- Erosion control BMPs must be installed and maintained to comply with detailed performance standards from Section 5.4.2.
- Perimeter protection BMPs must be installed and maintained to comply with detailed performance standards from Section 5.4.2.
- Sediment control BMPs must be installed and maintained to comply with detailed performance standards from Section 5.4.2.

- BMPs to control sediment tracking must be installed and maintained at entrances and exits to comply with detailed performance standards from Section 5.4.2.
- Materials needed to install standby BMPs necessary to completely protect the exposed portions of the site from erosion and to prevent sediment discharges must be stored on site. Areas already protected from erosion through implementation of physical stabilization or established vegetation stabilization BMPs (as described below) are not considered to be "exposed" for purposes of this requirement.
- Deployment of physical or vegetation erosion control BMPs must begin as soon as grading and/or excavation has been completed for any portion of the site. The project proponent may not continue to rely on the ability to deploy standby BMP materials to prevent erosion of areas where grading has been completed.
- All slopes must be protected and stabilized during rain events.
- All vegetation erosion control must be established prior to the rainy season to be considered as a BMP.
- A disturbed area that is not completed but is not being actively graded must be fully protected from erosion if left idle for 14 or more calendar days. The ability to deploy standby BMP materials is not sufficient for these areas; BMPs must actually be deployed.
- A washout area must be designated and maintained for materials such as concrete, stucco, paint, caulking, sealants, and drywall plaster.
- Materials and wastes must be stored in properly protected, designated storage areas.
- Trash and debris must be removed and properly stored or disposed of daily.
- Storage, service, cleaning, and maintenance areas for vehicles and equipment must be identified and protected accordingly.
- Materials for spill control and containment must be stockpiled on site.
- NSWDs must be eliminated or controlled to the MEP.

In addition to the minimum BMPs listed above, construction projects must select and implement additional BMPs, when necessary, to sufficiently address all anticipated activities at the site throughout the project's duration and phases. For sites with pre-existing soil contamination issues, BMP WM-7, Contaminated Soil Management, must be added to the SWPPP or WPCP.

5.3.4 ADDITIONAL REQUIREMENTS FOR HIGH TTWQ CONSTRUCTION SITES

The P&EAD may, as part of the project approval process, require incorporation of multiple BMPs in each of the required minimum BMP categories to provide "multiple lines of defense" for high-TTWQ construction sites. Construction projects determined to be high-TTWQ sites also must incorporate the following requirements into the SWPPP or WPCP for the project.

Project proponents for high TTWQ construction projects must:

- Implement a weather-triggered action plan (WTAP) as necessary. The QSP is responsible for monitoring the weather and for ensuring that the WTAP is implemented as needed. The five-day weather forecast will be monitored daily and a WTAP will be developed whenever there is a 40 percent or greater chance of precipitation forecast over the next five days by the National Weather Service. The WTAP must outline any necessary additional BMPs to be implemented prior to a rain event, the person responsible for implementing additional BMPs, any changes required in the construction schedule, any changes required in the activities underway for the particular construction phase, a listing of the types of tradesmen and subcontractors active on the construction site, and their

relevant contact information. The WTAP must be deployed/activated whenever the National Weather Service forecasts the chance of precipitation as 50 percent or greater at any time in the next 48-hour period.

High-TTWQ construction projects discharging directly to San Diego Bay will:

- Use high-performance erosion control methods, such as bonded fiber matrix or anchored erosion control blankets, on all exposed soils;
- Ensure at least two lines of defense for sediment control where site drainage is directed to an inlet that conveys flow to San Diego Bay, with each line of defense designed to independently control sediment to the MEP;
- Fully protect stockpiles and locate them as far from any inlets as possible; and
- Ensure that no flow concentration points are present that could scour soil or overwhelm erosion and sediment control measures.

5.4 PROJECT APPROVAL PROCESS

All construction projects at the SAN undergo the review described below, as part of the project approval process. This section describes the steps that will be taken to require and verify the implementation of the designated minimum BMPs at all construction sites. The detailed content and organization of this section reflect the specific processes used by the Authority.

Section 4.0 of this SWMP outlines the process for approving development or improvement projects carried out by the Authority or airport tenants. In short, the P&EAD receive project information for evaluation and review to assess environmental impacts. The conditions of approval for an airport tenant project become part of the lease or use permit. Conditions of approval for the Authority's own projects are incorporated into the planning, design, and contracting as the project goes before the Authority Board for approval. This process leads to the identification and imposition of the construction and post-construction BMPs required for the project. In general, conditions of approval require the project proponent and project management team to prepare a construction site SWPPP or WPCP, depending upon the size and type of the project, as described below. These plans are reviewed and approved by the P&EAD.

5.4.1 POLLUTION PREVENTION PLANNING

To facilitate both the preparation and review of construction project SWPPPs, the Authority has developed two templates that are required to be used by project proponents. One template is for a SWPPP in accordance with the CGP and the other template is for a WPCP for those projects not subject to the CGP.

The templates are designed to ensure that the specific information that the Authority requires to be in a SWPPP or WPCP for construction at the SAN are addressed. The templates include:

- The minimum BMPs required to be implemented at all construction sites (including BMP cut sheets from CASQA, illustrating proper installation); and
- A checklist for additional BMPs to be selected on a per-project basis, depending on specific site characteristics, the season or the likelihood of rainfall, and the construction phases.

5.4.2 PROJECT INTAKE

Once the project proponent or project management team has developed the requisite SWPPP or WPCP, it is submitted to the P&EAD for review and approval. The P&EAD has developed a PIT process to obtain the information needed in reviewing the plans for any construction project at SAN.

In addition to providing a signed copy of the WPCP or certified SWPPP, the project proponent or project management team must provide the following information on the PIT form (Appendix G):

- Project name and location (by address and/or by latitude and longitude);
- Owner's name, address, telephone number, and email address;
- Contractor's name, address, telephone number, and email address;
- Project manager's name, address, telephone number, and email address;
- Construction manager's or site superintendent's name, address, telephone number, and email address;
- QSP's name, address, telephone number, and email address;
- WDID number (for projects subject to the CGP);
- Qualified SWPPP Developer's name, address, telephone number, and email address (for projects subject to the CGP);
- Start and completion dates;
- Size of the site;
- Approximate DSA in acres;
- Project proponent's self-assessed level of TTWQ, based on whether:
  - The site is directly adjacent to or discharging directly to San Diego Bay;
  - The site is subject to the CGP and does not qualify for an erosivity waiver from the CGP;
- A list of any minimum BMPs required by the Authority that do not apply to the project, because the BMP is related to activities that are not expected to occur;
- A list of any minimum BMPs required by the Authority that will not or cannot be implemented on the project and the justification for their exception, with the justification included in the SWPPP/WPCP;
- A description of how the project has been scheduled so that grading in the wet season is avoided or minimized;
- A description of how the project has been scheduled so that the areas to be cleared and graded are minimized to only the portion of the site that is necessary for construction;
- A description of how the project has been scheduled so that the exposure time of DSAs is minimized;
- A description of the measures put in place to ensure that the maximum DSA stated in the SWPPP/WPCP is not exceeded;
- A description of how active slopes will be stabilized prior to a rain event;
- Confirmation that any pre-existing soil contamination issues will be addressed by appropriate safety measures and BMPs; and
- Confirmation that the provisions have been addressed in the SWPPP or WPCP to begin deployment of physical or vegetation erosion control BMPs as soon as grading and/or excavation has been completed for any portion of the site.

For construction projects that are self-assessed to be high-TTWQ construction projects, the project proponent or project management team must also provide:

- Confirmation that the provisions have been addressed in the SWPPP or WPCP to implement a WTAP as necessary.

For construction projects that are self-assessed to be high-TTWQ construction projects discharging directly to San Diego Bay, the project proponent or project management team must also provide:

- Confirmation that provisions for the use of high-performance erosion control methods (such as bonded fiber matrix or anchored erosion control blankets) on all exposed soils have been addressed in the SWPPP or WPCP;
- Confirmation that provisions have been addressed in the SWPPP or WPCP to ensure that there are at least two lines of defense for sediment control where site drainage is directed to an inlet that conveys flow to San Diego Bay and that each line of defense is designed to independently control sediment to the MEP;
- Confirmation that stockpiles are fully protected and located as far from any inlets as possible; and
- Confirmation that provisions are in the SWPPP or WPCP to ensure that no flow concentration points are present that could scour soil or overwhelm erosion and sediment control measures.

The P&EAD uses the PIT process to verify (as required by the Municipal Permit) that those projects subject to the CGP have obtained coverage.

Once the PIT form and the SWPPP or WPCP are submitted, the P&EAD has 14 days to review the documents. The P&EAD will either approve or reject the SWPPP or WPCP, and the information on the PIT process form. If a plan is rejected, the project proponent or project management team will be advised as to the reasons for rejection. The project cannot begin construction until approved by the P&EAD.

5.5 CONSTRUCTION SITE INSPECTIONS

The P&EAD inspects all construction sites to monitor and enforce compliance with the Authority's ordinances, permits, approvals, the Municipal Permit, and this SWMP. This section discusses the processes and procedures for these inspections.

5.5.1 INSPECTION FREQUENCY

The Municipal Permit requires the Authority to establish the inspection frequency for construction projects on the basis of the TTWQ designation, the phase of construction, and WQIP highest water quality priorities. However, there are several issues related to the operation of an airport in an urban center in close proximity to San Diego Bay that led the Authority to establish a year-round weekly inspection frequency for all construction projects at the SAN, regardless of their TTWQ designation.

5.5.2 INSPECTION CONTENT

The inspection by the P&EAD includes (1) a review of the SWPPP or WPCP and associated documentation, and (2) a site walk to observe the correlation of project documentation with actual field conditions and the adequacy and effectiveness of the BMPs being implemented. Required documentation of SWPPP or WPCP implementation includes updated site layout plans and figures, and weekly self-inspection reports. If the project is subject to the CGP, then the inspection will also include a review of SWPPP supporting documentation, such as reports for other required inspections (e.g., rain event, etc.), plan amendments, personnel training records, and runoff monitoring results, as applicable. The objectives of the construction site inspection are to:

- Assess compliance with the Authority's permits, approvals, applicable ordinances, rules, and regulations related to pollution prevention, including the implementation and maintenance of applicable BMPs;
- Assess BMP adequacy and effectiveness;

- Observe actual NSWDs;
- Observe actual or potential discharge of sediment and/or construction-related materials from the site;
- Observe actual or potential illicit connections; and
- Verify coverage under the CGP (when applicable).

The inspector carries the following forms and equipment during the inspection: (1) a tablet or cellular telephone, with a backup paper inspection form in case of technical difficulties, to be completed during the inspection (see Appendix G); (2) a copy of the PIT process form with which to review and verify the contents of the SWPPP or WPCP; and (3) a camera, to document site conditions.

After reviewing the documentation associated with the project, including the inspection history and compliance status, the inspector evaluates conditions across the entire site, including:

- The perimeter;
- Run-on and discharge points;
- Materials, equipment, and waste storage areas;
- Storm drain inlets;
- Access roads;
- Outside perimeter of the site (including nearby storm drain inlets);
- All active and inactive areas; and
- Supplies of BMPs stored on site in readiness for a rain event.

5.5.3 INSPECTION TRACKING AND RECORDS

The P&EAD inspector documents the results of the inspection, including any issues identified (such as inadequate implementation or maintenance of required BMPs, inadequate SWPPP or WPCP documentation, and missing inspection records) via the Web-based database management system, described in Section 5.2. When issues are identified, the inspector can also capture images and location information (such as Global Positioning System [GPS] coordinates) that can be stored in the inspection database system. The Web-based database allows the P&EAD to effectively and efficiently share the inspection results with the project proponent and the project management team. The database records the information from all inspections and re-inspections.

At a minimum, the inspection records include:

- The project site name, location (address and hydrologic subarea), and WDID number (if applicable);
- The inspection date;
- The approximate amount of rainfall since last inspection;
- A description of problems observed with BMPs and an indication of need for BMP additions, repairs, or replacements, along with any scheduled re-inspection, and date of such re-inspection;
- Any other specific inspection comments, which must, at a minimum, include rationales for the allowance of longer compliance timeframes, if any;
- A description of enforcement actions issued in accordance with the Authority's SWMP ERP; and
- Confirmation that issues noted during the inspection have been resolved and the date of resolution.

While on site, the P&EAD inspector will discuss the results of the inspection with the project proponent or project management team and the project-dedicated QSP. The project proponent and project management team receive the inspection report in an email or as a hard copy. The project proponent and/or project management team accesses the Web-based database to view additional inspection detail and to provide information (text, maps, and pictures) about how and when issues have been resolved. The P&EAD inspector uses the information in the database provided by the project proponent or project management team to confirm compliance, request further action, or escalate enforcement.

5.6 CONSTRUCTION SITE ENFORCEMENT

5.6.1 ENFORCEMENT RESPONSE PLAN FOR CONSTRUCTION SITES

All construction activities undertaken in the Authority's jurisdiction are required to maintain compliance with the Authority Rules and Regulations, Storm Water Code (Article 8), SWMP, the Municipal Permit, the CGP (if applicable), project permits and approvals, and contracts and leases. Provision E.6 of the Municipal Permit requires each Copermittee to develop an ERP to enforce its legal authority to achieve compliance. Each component of the ERP must describe the enforcement response approaches that will be used to compel compliance. The description must include the protocols for implementing progressively stricter enforcement responses ("escalating enforcement").

This section describes the ERP as it applies to construction activities at SAN. In accordance with the Municipal Permit, the ERP has been updated concurrently, with submittal of the final San Diego Bay WQIP in June 2015, so that the ERP aligns with WQIP strategies.

Any findings or violations noted during a site inspection by the P&EAD inspector will be discussed on site with the project proponent or project management team and the project-dedicated QSP. The P&EAD inspector will discuss the issues, and the inspection report will detail the corrective actions required and the timeframe in which corrective actions must be completed. Findings and violations will be described and recorded in the inspection database (and include photographs, GPS, or other location information, as applicable).

The Authority requires that corrective actions must be started immediately and be completed prior to the next predicted rain event or within a maximum of 72 hours, whichever is sooner. Depending on the nature of the finding, some corrective actions may take longer to complete. In those cases, the project proponent will provide an explanation to the P&EAD inspector and a suggested timeframe for completion, which the P&EAD inspector will either agree upon or reject and provide a preferred timeframe. (Note: corrective actions must be completed within 24 hours for Enforcement Level 2 violations, as described below.) The project proponent or project management team must document the corrective action taken by responding to P&EAD through the Web-based database. Project proponents and project management teams who cannot complete corrective actions in the time required must explain in detail, through the Web-based database, the specific causes of delay, and must propose a new schedule for compliance. The P&EAD has the sole discretion to grant an extension or pursue escalated enforcement. All corrective actions, as well as the time periods allowed and dates of actual completion, are recorded in the inspection database.

The enforcement mechanisms used by the Authority are listed below. The Authority generally obtains compliance using the first four mechanisms listed here. The remaining enforcement mechanisms can be used, as necessary, to increase the severity of penalties and to compel compliance as soon as possible.

1) Verbal and written warnings;
2) Written notices of violation;
3) Written notices to clean, test, or abate;
4) Order to cease and desist (stop work orders);

5) Fines;

6) Denial or revocation of permits and approvals;

7) Administrative and criminal penalties;

8) Bonding requirements; and

9) Liens.

The Authority's ERP for construction has two levels of enforcement. Enforcement is initiated and escalated by standard mechanisms for each level. The Authority has the discretion to initiate or escalate enforcement using any enforcement mechanism available, depending on the nature of the concerns, existing site and weather conditions, and actions by the project proponent or project management team to control or correct the finding or violation. The general enforcement process is as follows:

- Enforcement Level 1 is initiated by the finding of a BMP deficiency in the BMP categories of general housekeeping, waste management, non-storm water management issues, erosion controls, sediment controls, tracking controls, run-on and runoff controls, and plan implementation (e.g., lack of self-inspections or documentation thereof, lack of ongoing training or documentation thereof, or failure to adequately update the SWPPP or WPCP to reflect site conditions). A verbal warning and written notification of the finding are used to initiate enforcement and corrective actions are expected to be observed during a re-inspection after 7 days. Photos of the corrective action should be date-stamped to show completion within 72 hours, or the agreed upon timeframe, if longer. If the finding is not corrected upon re-inspection, a written notice of violation is issued to escalate enforcement and compliance is expected within 5 days. Upon the second re-inspection, if the finding is still not corrected a second written notice of violation is issued, which may include an order to clean, test, or abate, and compliance is expected within 2 days. Continued failure to correct the violation in the time allowed will result in a mandatory meeting between the project proponent or project management team and the Director of the P&EAD and/or Vice President of Development to discuss the reasons for failing to comply and the means of resolving the issue.
- Enforcement Level 2 is initiated when a prohibited off-site discharge occurs. A written notice to clean, test, or abate, and/or an order to cease and desist (stop work order), is used to initiate enforcement and compliance is expected within 24 hours. If the violation is not corrected upon re-inspection, the project proponent or project management team must attend a mandatory meeting with the Director of the P&EAD and/or Vice President of Development to discuss the reasons for failing to comply and the means of resolving the issue.

In accordance with Municipal Permit Provision E.6.e, the Authority will notify the RWQCB in writing or email within five days of issuing an escalated enforcement action between levels to a site that it has designated as a significant TTWQ. A construction site that poses a significant TTWQ as a result of violations or other noncompliance with its permits and applicable ordinances, regulations, rules, and the requirements of the Municipal Permit is considered by the Authority to be any site at which there has been any spill, release, or discharge of sewage, petroleum, or a hazardous material listed in accordance with 40 CFR Parts 117 or 302 that enters the storm water conveyance system and that is not fully contained and cleaned up and/or that reaches San Diego Bay. (40 CFR Part 117 addresses the determination of such quantities of hazardous substances that may be harmful pursuant to Section 311(b)(3) of the Clean Water Act. 40 CFR Part 302 addresses the designation, reportable quantities, and notification requirements for the release of substances designated under Section 311(b)(2)(A) of the Clean Water Act.)

Penalties for violations, including failure to correct a finding or violation, generally include (1) submittal of a written report that outlines the cause of the violation and the actions taken to prevent or minimize a reoccurrence of the violation; (2) attendance at a relevant training session and documentation of such; (3) attendance at an Authority-sponsored or presented relevant training session; (4) attendance at a mandatory meeting between the project proponent or project management team and the Director of the

P&EAD and/or Vice President of Development; and (5) monetary penalties. The Authority may exercise its discretion to use any and all penalties available, depending on the nature of the concerns and actions by the project proponent or project management team to control or correct the violation.

5.6.2 RE-INSPECTIONS

The enforcement process requires project proponents or project management teams to take corrective actions within a specified time period. To confirm that corrective actions have been completed effectively and on time, findings or violations typically require re-inspection by P&EAD within one to seven days, depending on the nature of the issues, whether or not escalated enforcement is being pursued, and the type and level of enforcement. The following are the general time periods for re-inspection by P&EAD associated with each level of enforcement:

- Enforcement Level 1 requires a re-inspection within 7, 5, or 2 days; and
- Enforcement Level 2 requires a re-inspection within 1 day (24 hours).

Re-inspections are also documented in the inspection database in the same manner as are regularly scheduled inspections.

5.7 EDUCATION AND TRAINING

5.7.1 EDUCATION

Municipal Permit Provision E.7 requires that the Authority implement a public education and participation program in accordance with the WQIP to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants to the MEP, effectively prohibit NSWDs from construction sites into the MS4, and protect water quality standards in receiving waters. The Authority's public education program includes appropriate education and training measures for specific target audiences, such as those involved in construction activity at SAN, including Authority management and staff, project proponents, planners and reviewers, contractors, construction site managers, and on site personnel. The Authority's storm water construction education focuses on construction activities and their relationship to urban runoff impacts on water quality. The Authority has developed internal and external outreach programs to present the following objectives to this audience, as appropriate:

- Federal, state, and local water quality laws and regulations that apply to construction projects;
- Methods to minimize impacts on receiving water quality resulting from construction;
- The connection between project implementation decisions and short- and long-term water quality impacts; and
- Methods to integrate the consistent application of reasonable and effective BMPs, pollution prevention strategies, and BMP requirements into the Authority's construction management process.

The construction education program uses available guidance mechanisms, BMP information, and training programs to create the awareness of (1) pollution-causing activities related to construction sites, and (2) methods used to minimize these pollutants. This program is designed to address the following primary objectives:

- Provide useful guidance in developing outreach and training programs that will support the successful implementation of the Authority SWMP and the project-specific SWPPP/WPCP;
- Encourage participation by all construction personnel; and

- Maximize consistency in information and help adapt education and outreach to the appropriate construction personnel, raising their knowledge and awareness of the issues related to storm water and urban runoff.

5.7.2 TRAINING

The Authority uses formal and informal training mechanisms to educate construction personnel about storm water pollution prevention and BMPs. The most comprehensive training is provided annually to Authority management and staff. This training involves classroom training at a divisional level for the ADC (including Project Managers and Construction Managers) and the P&EAD staffs.

The annual training provides construction project proponents, project managers, inspection staff, and other relevant persons with an understanding of the following topics:

- Federal, state, and local water quality laws and regulations applicable to construction and grading activities;
- Municipal Permit and CGP requirements, as applicable;
- Water quality impacts of land development and control measures to address them;
- The connection between construction activities and water quality impacts (e.g., impacts from land development and urbanization and impacts from construction-related material such as sediment);
- Proper implementation of erosion and sediment controls and other BMPs to minimize the impacts on receiving water quality resulting from construction activities;
- The Authority's construction SWPPP review, inspection, and enforcement policies and procedures;
- Compliance construction site inspections and self-inspections;
- Preventive maintenance;
- Spill response, containment, and recovery;
- Current advancements in BMP technologies; and
- Prohibited discharges to the MS4 and the Authority's IDDE program.

The annual training may be a joint effort between the P&EAD and ADC staffs to emphasize the relationships among the requirements of the Municipal Permit, the CGP, the SWMP, the SWPPP or WPCP, and the specific project plans and contract documents. Continuous training may also include in-house presentations, emails, joint field-walk inspections, new-hire reviews, and training programs put on by outside agencies.

The P&EAD and ADC will also provide or support training directed at the contractors and subcontractors working on construction projects underway within the Authority's jurisdiction. Such project- and site-specific training will address the Authority's storm water pollution prevention policies, procedures, and expectations. Training for contractors and subcontractors may be conducted during:

- Pre-bid, pre-construction, and ongoing project progress meetings;
- On-site inspections, tailgate safety and training meetings, and site visits;
- Seasonal training sessions to emphasize the expectations for an upcoming dry or wet season; and
- Refresher training sessions conducted by the P&EAD every six months for projects scheduled to last more than one year.

The Authority may also use the following educational mechanisms to provide training to the construction activity audience:

- Development and distribution of BMP guidance for specific construction activities;
- Workshops;
- Community meetings;
- Posters, pamphlets, and flyers;
- Educational videos;
- Authority newsletter articles;
- Airport tenant notices and advisories;
- Website updates;
- Outreach to business associations; and
- Participation in joint outreach efforts (e.g., the Think Blue campaign).

When feasible, the Authority will help sponsor outreach to and/or training of representatives from other municipal and quasi-governmental agencies, private construction, and the development industry. It is also anticipated that those business communities and trade associations related to construction activities will train their colleagues in response to their own experiences related to preventing construction storm water pollution within the Authority's jurisdiction.

Finally, the Authority employs enforcement actions that require supplemental education in response to violations and noncompliance issues at construction sites. The enforcement process and the Director of P&EAD will dictate when and how often additional education is required. The following resources are examples of the types of education and training that might be required through the enforcement process:

- Free online training courses without certifications, but with self-documentation of completion:
  - www.dot.ca.gov/hq/construc/stormwater/interactive.html, and
  - www.dot.ca.gov/hq/construc/stormwater/swppp_training.html.
- Online training courses with certifications:
  - www.waterboards.ca.gov/water_issues/programs/stormwater/training.shtml,
  - www.owp.csus.edu/courses/stormwater-bmp.php, and
  - www.ieca.org/education.
- Registration and attendance at a conference relating to storm water and erosion control:
  - www.stormcon.com/preconference.html,
  - www.casqa.org/events, and
  - www.ieca.org/conference/annual/ec.asp.
- Subscriptions to a journal on erosion control, construction, or similar topics:
  - http://www.erosioncontrol.com/EC/EChome.aspx.

6.0 MUNICIPAL AND COMMERCIAL COMPONENT

6.1 INTRODUCTION

This section addresses requirements in provisions of the Municipal Permit (Provisions E.5.a-e and E.6) that the Authority has determined are relevant to the municipal and commercial existing development at SAN. Existing development in industrial areas of SAN is addressed in Section 7.0. The provisions of the Municipal Permit require the Authority to:

- E.5.a—Annually update a watershed-based inventory of municipal, commercial, and industrial areas and activities that may discharge a pollutant load to and from the MS4. Tables 6-1 and 6-2 and Sections 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8 and 7.0 have been prepared to address this requirement.
- E.5.b.(1).(a), (b), and (c).(i)—Designate, implement, and properly operate and maintain pollution prevention methods and BMPs for all municipal, commercial, and industrial areas and activities to address the priorities and strategies in the San Diego Bay WQIP. Sections 6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.6.3, 6.7.3, 6.8.3, and 7.0, and Appendix B have been prepared to address this requirement.
- E.5.b.(1).(c).(ii)—Properly operate, inspect, and maintain its MS4s and structural treatment controls. Section 6.2.3 and Appendix B have been prepared to address this requirement.
- E.5.b.(1).(c).(iii)—Implement a schedule of operation and maintenance for roads and parking facilities that is designed to reduce pollutant discharges to its MS4s. Section 6.3.3 and Appendix B have been prepared to address this requirement.
- E.5.b.(1).(c).(iv)—Implement controls and measures to prevent and eliminate infiltration of sewage from municipal sanitary sewers into MS4s. Section 6.4.3 and Appendix B have been prepared to address this requirement.
- E.5.b.(1).(d)—Implement BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit NSWDs to MS4s associated with the application, storage, and disposal of pesticides, herbicides, and fertilizers from municipal, commercial, and industrial areas and activities. Sections 6.5.3 and 7.0 and Appendix B have been prepared to address this requirement.
- E.5.c—Inspect at least 20 percent of its inventoried municipal, commercial, and industrial areas and activities annually and the entire facility once every five years. The Authority must also inspect its facilities as a response to valid public complaints, or as frequently as needed to confirm that the BMPs are being implemented and to reflect the priorities in the WQIP. In addition, the Authority must implement all follow-up actions necessary to comply with the provisions of the Municipal Permit. Sections 6.9 and 7.8.4 have been prepared to address this requirement.
- E.5.d and E.6—Enforce its legal authority to ensure compliance with the requirements of this SWMP and the Municipal Permit for all inventoried existing development in accordance with its ERP. Sections 2.3 and 6.10 have been prepared to address this requirement.
- E.5.e.(1)—Describe a program to retrofit areas of existing development to address identified sources of pollutants and/or stressors that contribute to the highest and focused priority water quality conditions in the San Diego Bay WQIP. Sections 4.0 and 6.12 and Appendix C have been prepared to address this requirement.
- E.5.e.(2).(e)—Collaborate and cooperate with other Copermittees to develop WMA and regional rehabilitation projects that benefit water quality. Sections 4.0 and 6.12 have been prepared to address this requirement.

6.1.1 OVERVIEW OF MUNICIPAL AND COMMERCIAL AREAS AND ACTIVITIES

This section outlines the information in the remainder of Section 6.0 that applies to the municipal and commercial source areas under the control of and activities conducted by the Authority at SAN, the associated significant materials that could generate storm water pollutants, and the program implemented to achieve the water quality goals established in the WQIP. The Municipal Permit requires an inventory and discussion of specific municipal and commercial facilities and activities, as well as industrial facilities and activities (discussed in detail in Section 7.0). SAN is in itself a municipal airfield, as discussed below, and includes these facilities: (1) MS4 and associated structural controls; (2) streets and roads; (3) parking facilities; (4) flood control devices and structures; (5) sanitary sewer collection systems; (6) corporate yards; (7) hazardous waste collection facilities; (8) other treatment, storage, or disposal facilities; (9) special event venues; and (10) commercial facilities and areas determined by the Authority to potentially contribute a significant pollutant load to the MS4. SAN no longer has a closed landfill. Sections 6.2 through 6.8 discuss each of these facilities.

Airport operation is also subject to the requirements of the Industrial Permit. Many of the activities classified as municipal activities by the Municipal Permit are also considered to be industrial activities by the Industrial Permit. For this reason, many of the municipal activities discussed in this section are also detailed in Section 7.0, which addresses the Industrial Component. For instance, inspection and maintenance of the storm drain system is discussed in both sections, as are pesticide, herbicide, and fertilizer management and sweeping activities.

The Municipal Permit requires an inventory of all the municipal and commercial areas and activities. Each entry must include a name, location (e.g., address and hydrologic subarea), and description. The description can include the status of the facility (e.g., active or inactive); a statement of whether the business is a mobile business; SIC or North American Industry Classification System (NAICS) code; Industrial Permit NOI or WDID number; identification of pollutants generated or potentially generated by the facility or area; determination of whether the facility or area is adjacent to an ESA; and a statement of whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the 303(d) list and generates pollutants for which the water body segment is impaired. The inventory of municipal and commercial areas and activities at SAN is stored in a Web-based database and is updated annually, as required by the Municipal Permit. This SWMP includes a map showing the locations of the inventoried municipal and commercial areas and activities, watershed boundaries, and water bodies (Figure 3) and is updated annually.

Of the municipal and commercial areas/activities defined by the Municipal Permit, the following are considered to be a high priority in terms of being potential sources of pollutants that contribute to the focused priority water quality conditions for the Authority identified in the WQIP (i.e., copper and zinc in wet weather discharges):

- MS4 and related structures;
- Roads;
- Parking facilities;
- Corporate yards (used for maintenance or storage of materials, waste, equipment, and vehicles);
- Sanitary sewer collection systems;
- Hazardous waste collection areas;
- Other treatment, storage, or disposal facilities for municipal waste; and
- Power washing.

Table 6-1 presents the inventory of entities conducting municipal and commercial areas and activities at SAN. Table 6-2 presents the inventory of municipal areas and activities at SAN.

Municipal airfields were not included in the list of SAN's Municipal Permit-defined areas because the entire jurisdiction of the Authority is an airfield, and so is subject to the requirements of the Industrial Permit as well as the Municipal Permit. Therefore, this SWMP describes storm water management over the entire airport area. The remainder of Section 6.0 provides detailed information on:

- The storm drain system and associated structural controls (Section 6.2);
- Sweeping of municipal areas, within the discussion of roads, streets, and parking lots (Section 6.3);
- Infiltration from the sanitary sewer system into the storm drain system (Section 6.4);
- Management of pesticides, herbicides, and fertilizers (Section 6.5);
- Special event venues (Section 6.6);
- Power washing (Section 6.7); and
- Municipal waste management (Section 6.8).

Section 6.2 provides the most complete description of the municipal and commercial program elements required by the Municipal Permit. Given the overlap between the Municipal Permit and the Industrial Permit, Section 7.0 of the SWMP addresses the Authority's corporate yards; hazardous waste collection areas; other waste storage and disposal facilities; and power washing, ramp scrubbing, and sweeping of industrial airport areas; and further discusses some of the municipal areas listed above. Section 3.0 addresses landscaping activities.

Municipal airfields were not included in the list of SAN's Municipal Permit-defined areas because the entire jurisdiction of the Authority is an airfield, and so is subject to the requirements of the Industrial Permit as well as the Municipal Permit. Therefore, this SWMP describes storm water management over the entire airport area. The remainder of Section 6.0 provides detailed information on:

- The storm drain system and associated structural controls (Section 6.2);
- Sweeping of municipal areas, within the discussion of roads, streets, and parking lots (Section 6.3);
- Infiltration from the sanitary sewer system into the storm drain system (Section 6.4);
- Management of pesticides, herbicides, and fertilizers (Section 6.5);
- Special event venues (Section 6.6);
- Power washing (Section 6.7); and
- Municipal waste management (Section 6.8).

Sections 6.2 through 6.8 provide the most complete description of the municipal and commercial program elements required by the Municipal Permit. Given the overlap between the Municipal Permit and the Industrial Permit, Section 7.0 of the SWMP addresses the Authority's corporate yards; hazardous waste collection areas; other waste storage and disposal facilities; and ramp scrubbing, and sweeping of industrial airport areas; and further discusses some of the municipal areas and activities listed above. Section 3.0 addresses landscaping activities.

6.2 OPERATION AND MAINTENANCE OF MS4 AND STRUCTURAL CONTROLS

6.2.1 BACKGROUND

The Authority's storm drain system consists of roads, curbs, catch basins, gutters, inlets, culverts, trench drains, and pipes of varying materials and sizes. The structural treatment controls incorporated into the storm drain system by the Authority or tenants include:

- Ten (10) OWSs;
- Four (4) Contech StormFilters, and one (1) ContechJellyfish Filter;
- Three (3) Curb Inlet Boxes and two (2) drop inlet filters;
- Two (2) Bio Clean Round Curb Inlet Skimmer Box;
- Six (6) Bio Clean Grate Inlet Skimmer Boxes;
- Thirty (30) ClearWater High-Rate Media Filters;
- Three (3) Trench Drain Filters;
- Eight (8) Subsurface Infiltration Basins;
- One (1) Infiltration Trench;
- Seventeen (17) Permeable Surface Locations (permeable pavement, asphalt strips);
- Three (3) hydrodynamic separators (one (1) Contech CDS and two (2) Aquashield Aqua-Swirl HDS);
- Fourteen (14) Modular Wetland System;
- Twelve (12) biofiltration areas (bioswale, biofilter, bioretention);
- Four (4) Rock infiltration curb cuts;
- One (1) Underground Detention Basin;
- One (1) Artificial Turf Infiltration;
- One (1) Oldcastle/Kristar PerkFilter Unit;
- Six (6) CleanWay MetalZorbs;
- Three (3) Activated Alumina Filter Bags (including one as a trench drain filter); and
- Two (2) Biochar Booms.

The Authority uses underground detention basins at the Economy Parking Lot and at the RCC Bus Parking Facility. The locations of these structural treatment controls, along with an overview of the storm drain system network, are shown in Figure 4.

Table 6-1. San Diego International Airport Entities Conducting Municipal and Commercial Activities

Facility Name	Address	Hydro. Area	SICs	NAICSs	Principal Activity	Bacteria	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediments	Trash	Tributary to 303d Hydrologic Subarea?1	Priority Level
ACE	3665 North Harbor Dr. Suite #200 San Diego, CA 92101	908.0-908.21	7521	812930	Parking Lot Management	No	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Low
Authority	3835 North Harbor Dr. San Diego, CA 92101	908.0-908.21	4581	488111	Facility Maintenance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Cartwright	3225 North Harbor Dr. San Diego, CA 92101	908.0-908.21	7342	561710	Facility Pest Control	No	Yes	Yes	No	Yes	No	Yes	No	Yes	No	High
FlagShip	3835 North Harbor Dr. Suite #130 San Diego, CA 92101	908.0-908.21	4581	561720	Janitorial	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
High Flying Foods	3225 North Harbor Dr. San Diego, CA 92101	908.0-908.21	5812	722310	Food & Beverage	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	No	Low
HMS Host	3665 North Harbor Dr. San Diego, CA 92101	908.0-908.21	5812	722310	Food & Beverage	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Low

Facility Name	Address	Hydro. Area	SICs	NAICSs	Principal Activity	Bacteria	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediments	Trash	Tributary to 303d Hydrologic Subarea?1	Priority Level
Mission Yogurt	3225 North Harbor Dr. San Diego, CA 92101	908.0-908.21	5812	722310	Food & Beverage	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	Low
SP Plus	3225 North Harbor Dr. San Diego, CA 92101	908.0-908.21	4173	488490	Bus Terminal Operation	No	Yes	No	No	Yes	No	No	No	Yes	Yes	Low
SSP	3225 North Harbor Dr. San Diego, CA 92101	908.0-908.21	5812	722310	Food & Beverage	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	High

1. San Diego Bay is designated as an ESA.

Table 6-2. San Diego International Airport Municipal Land Use and Activity Areas

Type of Municipal Activity	Facility/Element/Company Name or Description	Priority Level
MS4	1 element (550 inlets and 192,000 linear feet of pipe)	High
Roads	1 element (6 miles total)	High
Parking Lots(2)	14 elements (14 individual parking lots)	High
Airside Operations Area(1)	1 element (ramp/runway)	High
Construction Activities	15 acres (approximately)	High
Grounds/Landscape	1 element (approximately 18 acres)	Low
Maintenance Storage Areas(1)	Corporate Yard – "Bone Yard"	High
	Runway Generator Shop	High
Solid Waste Operation(1)	Trash and Recycling Compactor Area	High
	Terminal 2 East Trash Compactors	High
	North Ramp Airside Sweeping And Scrubbing Waste Accumulation Area	High
	Landscape Waste Dumpsters	High
Structural Treatment Controls	Below Grade Box Structures	High
	Drain Inserts	High
	Inlet Screen Covers	High
	Trench Drain Filters	High
	Oil-Water Separators	High
	High Rate Media Filters	High
	Hydrodynamic Separators	High
	Pervious Surfaces	High
	Bioswales	High
	Detention Basin	High
	Infiltration Trenches/Infiltration Beds/Infiltration Basins	High
	Artificial Turf Infiltration	High
	Modular Wetland Treatment Units	High
Buildings	Administration Building (Former Commuter Terminal)	Low
	Terminal 1	Low
	Terminal 2	Low
	Truxton Road Offices	Low
	Central Plant (Heating, ventilation, and air conditioning building and Power Plant)	Low
	FMD (offices)	Low
	FMD Shops (maintenance shops)	Low
	Procurement Office and Storage Building	Low
	ADC Trailers	Low
	Air Traffic Control Tower	Low
	USO/Parking Management Office	Low

(1) Also considered industrial activities in terms of both the Municipal Permit and the Industrial Permit.

(2) Because of construction activities, the number of parking lots changed during Fiscal Year 2013-2014.

6.2.2 SOURCE CHARACTERIZATION

As indicated in Table 6-1, the Authority has 192,000 linear feet of storm drain pipe and 550 inlets under its jurisdiction. As a consequence of its function, the storm water conveyance system collects and transports storm water runoff at SAN. To prevent transport of certain pollutants in the runoff, BMPs must be implemented properly and adequate inspections and maintenance of the storm drain system performed. At SAN, pollutants with the potential to enter the storm drain system include sediment, trash and debris, oil and grease, hydrocarbons/fuels, hydraulic fluids, solvents, soap/cleaning fluids, lavatory chemicals and waste, paints, used batteries and battery acid, antifreeze, hazardous wastes (mostly oils), metals, deicing chemicals, herbicides and pesticides, adhesives, rust preventers, aircraft firefighting foam (AFFF), and sealants. Structural treatment controls that are not properly maintained can also be sources of sediment, oil and grease, trash and debris, and other associated pollutants such as metals.

6.2.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

The San Diego Bay WQIP includes strategies for reaching water quality goals for copper and zinc in wet weather discharges (the focused priority water quality condition for the Authority). Those strategies that are related to the MS4 and structural treatment controls that the Authority will implement in accordance with the WQIP schedule are (1) determining optimal catch basin inlet inspections and cleanings; (2) developing and maintaining green infrastructure and treatment systems to collect and treat parking lot runoff; 3) providing BMP inspections and enforcement at tenant and high pollutant generating areas; and (4) providing continued training and public education.

6.2.3.1 Minimum BMPs

Table 6-3 shows the minimum BMPs for MS4 and structural treatment controls. Descriptions of these BMPs can be found in Appendix B.

Table 6-3. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC10 Employee Training
SC17 Storm Drain Maintenance	TC01 Treatment Controls

6.2.3.2 Schedule of Maintenance

MS4

The FMD has contracted for inspection and cleaning the storm drains. Drop inlet, curb inlet, trench drains, and slit drains are inspected quarterly and are cleaned on an as-needed basis. The contractor inspects the whole storm water conveyance system, and cleans the OWSs, underground storm drain pipes, and catch basins on an annual basis. Silts, trash, green waste, and heavy metals removed from the storm drain system are properly disposed and measures are implemented to prevent any waste discharges to receiving waters during these maintenance activities. The contractor is responsible for all waste disposal. The P&EAD has contracted for maintenance of the following drains on the tarmack: SW trash compactor on the south side of the fence (SUMP), Menzies facility OWS (storm drain goes into OWS), and the Least Tern area oval storm drains. All of these are inspected quarterly. During the rainy season they are cleaned on a quarterly basis and before the start of the rainy season. During the dry season they are cleaned on an as-needed basis. Additionally, seven tenants also perform some storm drain inspections, either sporadically or as part of their own routine facility inspections. All tenants monitor operations to prevent illicit discharges to the MS4. Screens are installed in front of curb inlets in the southern portion of the Authority's jurisdiction to protect storm drains, and they are easily cleaned by street sweepers.

STRUCTURAL TREATMENT CONTROL BMPS

Annual inspections and maintenance of the structural treatment control BMPs identified in Section 6.2.1 are performed by the P&EAD, FMD, and a contractor hired by the Authority. Maintenance consists of as needed cleaning. Filter fabric inserts are maintained quarterly, and before and after rain events, with high-priority areas inspected monthly. The criteria used for cleaning inlet skimmers, trench drain filters, hydrodynamic separators, and high rate media filters are (1) presence of blockages/obstructions in the inflow pathway, (2) condition of BMP structure and filter media, (3) trash/debris/sediment amount accumulated in BMP, and/or (4) presence of standing water and unpleasant odors in the BMP.

Inspections and maintenance of permeable surfaces, swales, and modular wetlands are done by the landscape contractor and parking lot management contractor hired by the Authority. P&EAD also performs annual inspections. Maintenance consists of as-needed cleaning. The criteria used for cleaning permeable surfaces, swales, modular wetlands, and infiltration devices are (1) condition of BMP structure and outlet, (2) trash/debris/sediment amount accumulated on BMP or drainage area, (3) presence of standing water after 72 hours of rain event, (4) vegetative cover height and type, (5) presence of erosion, and/or (6) presence of burrowing animals.

Annual inspections of the four Authority owned OWSs are conducted by P&EAD and FMD. OWSs have an alarm system. If the oil reaches a certain level, or oil leaks to the ground, an alarm goes off. Alarms are checked monthly. Service companies hired by the Authority are contracted to pump out the OWSs on an as-needed basis. The criteria used for cleaning the OWSs are (1) the amount of sediment at the bottom of the tanks, (2) the amount of oil, grease, and floatables at the top of the tank, and (3) capacity and functionality of the units. The FSF/RFF operator and the RCC each contract with outside vendors to service the remaining five OWSs and the 12,000-gallon wastewater UST annually.

All the maintenance activities above include proper disposal of sediment, debris, and wastewater removed from the treatment control BMPs, and implementation of measures to prevent waste discharges to receiving waters during these maintenance activities.

6.3 OPERATION AND MAINTENANCE OF ROADS AND PARKING FACILITIES

6.3.1 BACKGROUND

As required by Provision E.5.b.(1).(c).(iii) of the Municipal Permit, the Authority has implemented a schedule of operation and maintenance for the streets, unpaved roads, paved roads, and parking facilities, including landscaped areas within the Authority's jurisdiction to minimize pollutants that can be discharged in storm water. This section addresses only road and parking facility sweeping and repair, and landscaping maintenance. The Authority's program for ramp sweeping is described in Section 7.7.4.1.

FMD maintains approximately 18 acres of environmentally friendly landscaping within or adjacent to parking lots. The landscaped areas include a variety of indigenous and drought-tolerant plants, shrubs, and ground cover. The various plants, shrubs, and ground cover were chosen because they are drought tolerant, generate smaller amounts of plant litter and debris, and require less fertilizer, pesticide, and herbicide to maintain than do other exotic species. All of the green waste collected from landscape maintenance activities is recycled into mulch and compost. The Authority uses a satellite water-tracking system called Weather Track to automatically adjust watering based on weather conditions. This system is expected to save approximately 9 million gallons of water each year.

6.3.2 SOURCE CHARACTERIZATION

Littering by the general public contributes to trash and debris pollutants in public parking facilities at SAN. Any erosion from landscaped areas within parking lots can be a sediment pollutant source. Fluid leaks from

vehicles on roads or in parking facilities are a potential source of pollutants such as oils, fuel, antifreeze, etc. Atmospheric deposition (fallout from automobile emissions and other sources), vehicle use and emissions, asphalt and concrete surfaces, and peeling or crumbling paint from parking lot painting can introduce particulate copper and zinc into the storm drain system at SAN. In addition, over-irrigation in parking lot landscaped areas can mobilize nutrients, bacteria, metals, and pesticides. The physical removal of particulates because of attachment to fine particulates (in particular, the binding of heavy metals from outdoor road and parking lot facility surfaces to fine grain sediment) may lessen the pollutant load transferred to receiving waters.

6.3.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

The San Diego Bay WQIP includes strategies for reaching water quality goals for copper and zinc in wet weather discharges (the focused priority water quality condition for the Authority). Strategies that are related to road and parking facility sweeping and maintenance of landscaped areas that the Authority will implement in accordance with the WQIP schedule include (1) determining and implementing optimal street sweeping locations and frequencies to maximize pollutant removal, (2) enhancing street sweeping through equipment replacement, (3) enhancing tenant and high pollutant-generating area BMP inspections and enforcement; and (4) continuing training and public education.

6.3.3.1 Minimum BMPs

Table 6-4 shows minimum BMPs for road and parking facility sweeping and repair, and maintenance of landscaped areas. Descriptions of these BMPs can be found in Appendix B.

Table 6-4. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC09 Building and Grounds Maintenance
SC10 Employee Training	SC12 Outdoor Washdown/Sweeping
SC16 Parking Lots	SC19 Safer/Alternative Products
SR01 Spill Prevention, Control, and Cleanup	TC01 Treatment Controls

6.3.3.2 Schedule of Maintenance

SWEEPING OF ROAD AND PARKING FACILITIES

The entities responsible for implementing BMPs for parking facilities are the Authority, the parking lot management service provider, the FSF operator, the refueling operator, the Central Receiving and Distribution Center operator, the FBO, and one or two other tenants with parking lots. A contractor is hired by the Authority to sweep all roads in front of the terminals, including the Administration Building (old Commuter Terminal), overpasses leading into and exiting SAN, and the area from McCain Road to Gate P-18 overnight on Mondays through Fridays using a motorized sweeper unit. The debris/sweepings are disposed of at a landfill. The parking lot management contractor sweeps all parking lots once a week and maintains all parking lots owned or leased by the Authority. Sweeping is done manually or by motorized sweeper unit. Additionally, tenants perform sweeping of their parking areas.

ROADS AND PARKING FACILITIES REPAIRS AND IMPROVEMENTS

Inspection of parking lots, roads, and curbs is continuous. Minor repairs in parking lots are performed by the parking lot management service provider. However, major maintenance work would likely be contracted out by the Authority. Construction projects of one acre or larger would be subject to the CGP. The Authority is responsible for any repairs to the roads, other than minor repairs to parking lots, and conducts those repairs or replacement as follows:

- Outdoor repairs and construction are avoided during rain events or during any period for which the National Weather Service is forecasting a 50 percent chance of precipitation. Sealants should not be applied if rainfall is predicted during the application or curing period.
- Storm drain inlets and manholes must be protected during outdoor repairs and construction. Storm drain inlets, including slit trenches, within 10 yards of the work area must be covered with spill pads and/or mats or otherwise protected to prevent discharges of solid and liquid materials and waste to the storm drain system. Storm drain inlet protection devices will be regularly inspected for proper installation and condition by those persons performing the work and will be removed when it is no longer needed.
- Run-on and runoff controls will be put in place to direct flow away from work areas and erodible materials by using silt fence, fiber rolls, and gravel bags. Run-on and runoff controls will be regularly inspected for proper installation and condition by those persons performing the work and will be removed when it is no longer needed.
- Before onset of a rain event or when not actively being used, stockpiles of "cold mix" asphalt (premixed aggregate and asphalt binders), dry-powder concrete mixing products (such as Readymix and Portland cement), and/or basic materials (e.g. fly ash, stucco, or lime) will be laid on top of and covered with plastic or other relevant material and protected with a temporary perimeter sediment barrier.
- Stockpiles of soil, and/or debris, and/or rubble will be covered and protected with a temporary perimeter sediment barrier when not actively being used and before the onset of a rain event.
- Materials are to be stored inside buildings or sheds or on containment pallets. Chemicals and fluids are to be stored indoors or in watertight containers on secondary containment.
- Slurry, waste, and debris generated by pavement and concrete cutting activities will be collected/vacuumed immediately, properly disposed of, and prevented from entering the storm drain system.
- Work sites will be kept clean at all times to prevent loose materials and contaminants from leaving work area or discharging into storm drain system. Dry cleanup methods (e.g., vacuuming, sweeping, dry rags) will be used. Use of hoses is restricted to the alleviation of safety or sanitation hazards only, per City of San Diego permanent mandatory water restrictions. All water hoses will be equipped with positive shutoff type nozzles, and any wash water will be prevented from entering the storm drain system and disposed of properly. The Authority P&EAD should be contacted prior to any washing activities.
- All waste will be disposed of properly. The site will be policed for litter daily and all litter will be disposed of properly in covered waste containers.
- All products used to clean surfaces must be approved for use by the P&EAD (619-400-2782) prior to application.
- Temporary sanitation facilities must have secondary containment and be located away from drainage courses, inlets, and traffic circulation. Temporary sanitation facilities will be regularly inspected for leaks and spills and facilities will be cleaned and replaced when necessary. Facilities that are no longer needed will be removed.
- Equipment will be maintained in good working condition to minimize leaks and drips. Equipment will have drip protection (e.g., drip pans or plastic sheeting) available at designated areas for storage, fueling, and maintenance. Designated areas are away from drainage courses and inlets.
- Spill cleanup materials will be readily available at the work area.
- All spills will be cleaned up immediately, provided that it is safe to do so. Workers are trained in spill response procedures.

- Equipment and vehicles will be cleaned off site.
- If tools, equipment, and/or vehicles coated with concrete material are to be cleaned on site, then concrete washout facilities will be provided and maintained. Alternatively, liquid waste can be contained in buckets or drums with tight-fitting lids for transport and proper disposal off site.
- Concrete washout facilities may be above or below grade, but designated areas must be at least 50 feet away from storm drains, water bodies, and open ditches. Facilities will be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations. Facilities can be a temporary pit or bermed area lined to prevent discharge to ground or surrounding area. Concrete washout from concrete pumper bins can be washed into trucks and discharged into concrete washout facilities or be properly disposed of off site.
- Facilities will be cleaned or replaced when the washout is 75 percent full or when there is damage (e.g., torn liner or evidence of leaks). Facilities will be maintained to provide a holding capacity with a minimum freeboard of 4 inches for above-grade facilities and 12 inches for below-grade facilities. Maintaining facilities should include removing and disposing of hardened concrete and returning facilities to a functional condition. No overflow from concrete washouts is permitted. On-site washout facilities will be covered during rain events. All concrete washout debris will be disposed of properly. Holes, depressions, or other ground disturbances caused by the removal of the facilities will be backfilled and repaired.

LANDSCAPED AREAS: XERISCAPING, WATER CONSERVATION AND SUSTAINABILITY PROGRAM

Maintenance on landscaped areas is performed by the Authority FMD and for specific needs, a contractor. Several landscaped areas are maintained by tenants at the FBO and the RCC. The Authority prohibits over-irrigation. To assist with preventing over-irrigation, the Authority has deployed a weather tracking system, which collects and analyzes data from multiple weather stations to determine watering needs, and shuts off irrigation when rainfall is forecasted or detected. Additionally, the Authority and FMD have designated personnel to ensure systems are functioning as designed. FMD staff are available 24/7 to respond to over-irrigation incidents. An over-irrigation hotline is set up using the Communication Center 619-400-2710 hotline number, and through routine maintenance and inspection. For incidents where over-irrigation issues cannot be resolved immediately, FMD will shut down the entire irrigation system within an hour. Corrective actions are performed within 12-24 hours of the time of notification. Water conservation measures are practiced as much as possible. The Authority embraces xeriscaping, or drought-tolerant landscaping, and drip-irrigation watering systems that both cut down on water usage and prevent the occurrence of over-irrigation. FMD and their contractor(s) are trained in proper pesticide, herbicide, and fertilizer use, avoiding contact with rainfall and irrigation. Specific BMPs for landscaped areas include the following:

- The use of pesticides, herbicides, and fertilizers will be minimized and used according to directions. Less harmful/toxic products should be considered to replace ones currently used.
- An Environmentally Preferable Purchasing Program will be developed to minimize the purchase of products containing hazardous ingredients, to maximize the purchase of alternative products that pose less risk to employees and environment, and to maximize the purchase of products containing recycled materials.
- Residual landscape waste including grass trimmings, leaves, sticks, etc. will be recycled or composted as much as possible or disposed of appropriately.
- Plant native vegetation for proper xeriscaping management and landscaping to reduce irrigation needs. Hand-weeding will be performed where practical.
- Temporary stockpiled materials such as soil, rocks, or other landscaping materials or waste will be removed at the end of the day or placed away from watercourses and drainage inlets. Stockpiled materials will be bermed and covered to prevent material releases to the storm drain.

- Irrigation will not occur during forecasted rain events and 48 hours following a rain event.
- Irrigation systems and landscaped areas will be periodically inspected and maintained to prevent prohibited over-irrigation and leaks.
- Irrigation will be based on the satellite water-tracking system to reach proper levels of soil moisture applicable for landscaping, and City water restriction guidelines will be followed.
- Landscaped areas will be irrigated using timed sprinkler system, handheld water container, or a hand-held hose equipped with positive shut-off nozzle. Over-irrigation is strictly prohibited. New technologies and practices to conserve water will be experimented.
- If rain is expected or occurring, pesticides will not be used, mixed, or prepared for application near storm drains. Pesticides will only be applied when wind speed is low.
- Over-irrigation of landscaped areas is prohibited.
- For areas of exposed soil, the areas of exposed soil will be landscaped, re-vegetated or will have erosion and sediment controls installed.
- Sidewalks and pavements will be cleaned using dry methods or reclaimed water before applying irrigation water to prevent any residual materials or spills to the storm drain. Wash water will be properly captured and disposed of.

STRUCTURAL TREATMENT CONTROL BMPS

Many green infrastructure, LID, or treatment control BMPs listed in Section 6.2.1 have been incorporated into parking lots, including inlet filters, high rate media filters, hydrodynamic separators, porous pavement, bioswales, and modular wetland treatment units. They are inspected and maintained as described in Section 6.2.3.2.

6.4 PREVENTION OF INFILTRATION FROM SANITARY SEWER TO MS4

6.4.1 BACKGROUND

The Authority does not own or manage a municipal sanitary sewer system. The City of San Diego MWWD provides municipal sanitary sewer service to SAN. However, the Authority is responsible for those portions of the on-site sanitary sewer system that connect to the MWWD system. As a result, the Authority has implemented controls to prevent and eliminate infiltration of sewage from sanitary sewers into the storm drain systems, as required by Provision E.5.b.(1).(c).(iv) of the Municipal Permit. These controls are implemented through thorough routine inspection and preventive maintenance of the sanitary sewer system and inspection of the storm drain system. In general, these measures will also identify issues related to the municipal sanitary sewer system operated by MWWD. Issues related to the municipal sanitary sewer system will be reported to and resolved in coordination with MWWD. FMD and ADC oversee a thorough programmed maintenance process for inspection, maintenance, repair, and upgrade of physical plant structures at SAN, including the sanitary sewer system.

Fats, oils, and grease can clog sanitary sewer pipes, which can create overflows. Regular pickup of waste grease from food and beverage vendors and using grease traps can prevent fats, oils, and grease from entering into the sanitary sewer and thereby removing a contributing factor of sewage seepage into the MS4. FMD oversees the management of 19 grease traps with sizes ranging from 25 to 50 gallons to 3,000 gallons. Most of these grease traps are located on the airside or inside Terminals 1 and 2 and can be above or below ground. Each grease trap has three baffles in sequence to process wastewater before it exits into the sanitary sewer.

6.4.2 SOURCE CHARACTERIZATION

Infiltration from sanitary sewers to the storm drain system may be caused by several factors, including a lack of structural integrity. Most infiltration scenarios are the result of spills, leaks, and overflows. Spills, leaks, and inadequate overflow control response and containment can result in the following potential pollutants: metals, sediments, nutrients, bacteria, organics, and oxygen-demanding substances.

6.4.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

The constant surveillance at SAN includes the routine daily inspection of the airport terminals, runways, and airside operations by the Airside Operations Supervisors. These inspections are one element of the IDDE program, because any environmental issues are both reported to the P&EAD and captured in the Airside Operations' daily log, and are then entered into the Authority's Web-based database.

The Authority must implement controls identified in the SAN SWMP that have been designed to limit infiltration into the storm water conveyance system from the sanitary sewer system and to prevent and respond to sewage spills.

6.4.3.1 Minimum Best Management Practices

Table 6-5 shows the minimum BMPs to prevent or minimize infiltration from the sanitary sewer to the MS4. Descriptions of these BMPs can be found in Appendix B.

Table 6-5. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC10 Employee Training
SC11 Lavatory Service Operation	SC17 Storm Drain Maintenance
SR01 Spill Prevention, Control, and Cleanup	

6.4.3.2 Schedule of Maintenance

A contractor is hired by the Authority to perform maintenance on small grease traps every month and large grease traps every two to three months. Grease is vacuumed out and rinsed into a storage tank for proper disposal. Additionally, a contractor hired by the Authority picks up grease from commercial tenants one to three times per week for proper disposal. Grease is either picked up in lined buckets or extracted from grease containers to be stored in a storage tank and later collected for processing at an off-site facility once a month. When sanitary sewer system malfunctions occur, such as stoppages, the cause of the problem is investigated and analyzed. Maintenance schedules are then adjusted accordingly. If necessary, repairs are initiated by the FMD or the commercial tenants, as appropriate.

For aircraft sewage, the waste is emptied from the aircraft into mobile lavatory trucks and then into the sewer system at the triturator via a connection hose. If there are spill incidents, the Airside Operations Department or the P&EAD documents the incident, requests corrective actions if necessary, and monitors implementation of any required corrective actions.

In the event that any infiltration from the sanitary sewer into the storm drain system is observed or suspected, the Authority will investigate the source of the sewage. The Authority will conduct any required maintenance or repair on the on-site lateral lines, and issues related to the municipal sanitary sewer system main lines will be reported to the MWWD. The Authority will coordinate with the MWWD, as necessary.

6.5 MANAGEMENT OF PESTICIDES, HERBICIDES, AND FERTILIZERS

6.5.1 BACKGROUND

As required by Provision E.5.b.(1).(d) of the Municipal Permit, the Authority is required to reduce pollutants in storm water discharges to the MEP and prohibit NSWDs associated with over-irrigation and the application, storage, and disposal of pesticides, herbicides, and fertilizers from municipal and commercial facilities and areas to the storm drain system, and implement BMPs. Important municipal and commercial areas and activities associated with these potential pollutants at SAN include municipal facility structures and buildings, landscaped areas, and commercial areas and activities. This section and Section 7.7.3 discuss these potential pollutant sources and the BMPs implemented by the Authority to reduce or eliminate impacts of pollutants on the storm drain system.

The landscaped areas and maintenance activities conducted by FMD are described in Section 6.3.

The Authority operates 2 acres of bioswales and 1.25 acres of bioretention swales in the northern side of SAN that have been installed recently as part of the Master Plan LID projects. The Authority also operates 6 small pet-service animal relief areas on the southern side of Terminal 2.

6.5.2 SOURCE CHARACTERIZATION

The Authority and commercial tenants generally use pesticides and/or herbicides to control pests and weeds. Although the use of pesticides and herbicides at SAN does not result in significant discharges to the ground, during rainfall events, pesticide and herbicide residuals that accumulate at the application sites can be washed into the storm drain system. However, based on the small quantities used at SAN and recent sampling results, this activity appears to have little potential for impacting storm water discharge. Over-irrigation is prohibited to prevent the mobilization of pesticides and herbicides to the storm drain system.

6.5.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

The FMD has implemented an integrated pest management (IPM) program designed for landscaping services that encourages methods of pest control that use natural processes and chemicals and that limits the need for manmade biocides. The IPM program promotes the use of native plant species in the landscaped areas and around structures/buildings to (1) control pests without the need for pesticides and herbicides; (2) help minimize the application of fertilizers; and (3) limit the need for irrigation. In addition to encouraging minimal use of manmade biocides, the IPM program also ensures that the FMD uses and disposes of these chemicals properly, including avoiding their use during irrigation and 48 hours before and after rain is forecast. The FMD also maintains a minimal inventory of these chemicals as part of the IPM program. To reduce waste, the department strives to purchase only the amounts of these chemicals that are needed. Any unused fertilizers, pesticides, and herbicides are disposed of properly. The department files a "Monthly Summary Pesticide Use Report" with the State of California Department of Pesticide Regulation that states the amount of pesticides or herbicides used during the period. A copy of the report is also provided to the P&EAD.

The Authority has implemented an IPM program designed for food and beverage services that encourages methods of pest control that use mechanical and cultural controls to limit or remove the need for chemical controls such as manmade biocides. The IPM program uses cultural controls to target pest attractants such as food, water, and shelter using sanitation practices, education, and communication. Examples of cultural controls include housekeeping within work areas, proper food storage, handling of food wastes, prevention of standing water, cleaning and drying of drains and mops, storage areas with clearance away from floor and walls, stock rotation, sealing of any penetrations (including replacing ceiling tiles), closing of outside doors, and maintenance of ventilation screens in good condition. Mechanical controls target building entry and repair to create physical barriers such as door sweeps or rubber trims, seal holes and cracks around piping

and exterior walls, replace screens for windows and doors used for ventilation, install caps for open pipes, and apply traps (e.g., bait stations, snap traps, and glue boards). These controls are enforced with education and regular inspections. The Authority has partnerships with other organizations to continuously make improvements in their own and other IPM programs, and in 2016, won the IPM Achievement Award from the California Department of Pesticide Regulation.

6.5.3.1 Minimum BMPs

Table 6-6 describes the minimum BMPs for the management of pesticides, herbicides, and fertilizers. Descriptions of these BMPs can be found in Appendix B.

Table 6-6. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC06 Outdoor Loading/Unloading of Materials
SC07 Outdoor Material Storage	SC09 Building and Grounds Maintenance
SC10 Employee Training	SC18 Housekeeping
SC19 Safer/Alternative Products	SR01 Spill Prevention, Control, and Cleanup

6.5.3.2 Schedule of Maintenance

The FMD stores small amounts of these materials in storage lockers at the runway generator area east of the Administration Building (former Commuter Terminal). FMD and P&EAD routinely inspect the pesticide, herbicide, and fertilizer storage areas, report required maintenance to FMD, and follow the IPM program. Commercial tenants do not store these materials at SAN. Landscaping contractors do bring in and apply small amounts of pesticides and herbicides in their activities. Commercial food and beverage tenants do not use pesticides. A janitorial contractor hired by the Authority is used to implement IPM mechanical controls, power wash, and handle municipal waste. Pesticides, herbicides, and fertilizers are not used or prepared for application when rain or irrigation is expected or occurring. Pesticides will only be applied when wind speed is low.

6.6 MANAGEMENT OF SPECIAL EVENT VENUES

6.6.1 BACKGROUND

As required by Provisions E.5.b of the Municipal Permit, the Authority requires the designation, implementation, and proper operation and maintenance of minimum BMPs for special events that are expected to generate significant trash and litter. Provision E.5.(c) of the Municipal Permit requires the Authority to inspect municipal and commercial areas and activities. This section discusses the potential pollutant sources and BMPs implemented to mitigate pollutant transport to the storm drain system from special event venues.

6.6.2 SOURCE CHARACTERIZATION

The size of several parking lots, along with the general public's familiarity with the location, makes SAN a potential venue for large special events. Although rare, some large events (such as the Rock-n-Roll Marathon) have made use of the Authority's parking areas. Potential pollutants of concern generated by large special events are trash, litter, and debris.

6.6.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

6.6.3.1 Minimum BMPs

Table 6-7 describes the minimum BMPs for the management of special event venues. Descriptions of these BMPs can be found in Appendix B.

Table 6-7. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC06 Outdoor Loading/Unloading of Materials
SC08 Waste Handling and Disposal	SC09 Building and Grounds Maintenance
SC10 Employee Training	SC11 Lavatory Service Operation
SC12 Outdoor Washdown/Sweeping	SC16 Parking Lots
SC18 Housekeeping	SR01 Spill Prevention, Control, and Cleanup

6.6.3.2 Additional Controls

Special events sponsored/coordinated by Authority staff and/or tenants are required to implement the BMPs listed above. If the special event sponsors/coordinators are not Authority staff or tenants, they must generally obtain Authority approval in the form of a "use permit." The conditions of the "use permit" typically include fencing and barricades as necessary to delineate the event area; appropriate signage regarding recycling, trash disposal, and storm water pollution prevention; an adequate number of recycling containers and trash cans; portable restrooms, as necessary; an adequate number of on-site event management staff to monitor and control trash and litter; an adequate number of on-site event staff to promptly clean up after the event; and street sweepers, as necessary.

6.7 POWER WASHING

6.7.1 BACKGROUND

As required by Provisions E.5.b.(1) of the Municipal Permit, the Authority requires the designation, implementation, and proper operation and maintenance of minimum BMPs for power washing to prevent pollutants from entering the storm drain system. Provision E.5.(c) of the Municipal Permit requires the Authority to inspect municipal and commercial areas and activities. This section discusses the potential pollutant sources and BMPs implemented to mitigate pollutant transport to the storm drain system from power washing activities.

6.7.2 SOURCE CHARACTERIZATION

Power washing is performed by janitorial services for the health and safety of passengers, visitors, and tenants. Power washing is done in high-volume areas of foot traffic or in waste collection and storage areas to remove debris, grime, stains, and odors from concrete sidewalks and metal storage bins areas. Wastewater generated from power washing can collect and direct pollutants to storm drains if BMPs are not applied correctly. Potential pollutants of concern are metals, trash and debris, sediments, oil and grease, bacteria, and floatables.

6.7.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

6.7.3.1 Minimum BMPs

Table 6-8 describes the minimum BMPs to control pollutants from power washing activities. Descriptions of these BMPs can be found in Appendix B.

Table 6-8. Minimum BMPs Requirements

SC01 Non-Storm Water Management	SC08 Waste Handling and Disposal
SC09 Building and Grounds Maintenance	SC10 Employee Training
SC12 Outdoor Washdown/Sweeping	SC18 Housekeeping
SR01 Spill Prevention, Control, and Cleanup	

6.7.3.2 Schedule of Maintenance

A contractor hired by the Authority power washes the terminal smoking areas and baggage claim sidewalks five times and the trash compactor area, dumpster areas at Terminal 1 and between Terminal 2 East and West, and grease container areas once a week. Another contractor hired by the Authority power washes the dumpsters and trash compactors biweekly and as needed. Collected air conditioning condensate is used for pressure washing operations at the rate of 80 to 100 gallons per day. Before starting the pressure washing operation, all runoff areas are identified, and storm drains are protected with berms or mats. All trash, debris, and cigarette butts are swept up and removed. The path that the water will run is determined and the water is funneled using berms and bags into the vacuum/reclaim system. Pressure washers are equipped with water recollection and filtration systems for direct reuse. All wastewater is disposed of in the sanitary sewer.

6.8 MUNICIPAL WASTE MANAGEMENT

6.8.1 BACKGROUND

As required by Provisions E.5.b.(1) of the Municipal Permit, the Authority requires the designation, implementation, and proper operation and maintenance of minimum BMPs for municipal waste management that are expected to generate pollutants. Provision E.5.(c) of the Municipal Permit requires the Authority to inspect municipal and commercial areas and activities. This section discusses the potential pollutant sources and BMPs implemented to mitigate pollutant transport to the storm drain system from the collection, storage and transport of municipal waste.

The Authority implemented a single-stream recycling program in 2002, which has resulted in a continuous increase in recyclables collected, therefore diverting these materials from the landfill. In 2015, composting was implemented in all Authority breakrooms and all food and beverage concessions to divert food waste from landfill. Tenants and employees were trained in compost separation and had their compost initially tested for contamination. Compost is collected and delivered to an off-site facility run by the City of San Diego commercial food waste composting program. Tons of food waste diverted from the landfill through composting efforts continues to increase each year.

6.8.2 SOURCE CHARACTERIZATION

Municipal waste is generated from all kinds of users at SAN, from the public to employees and commercial tenants involved with food and janitorial services, as well as other tenants. Waste collection is in the form of bins, dumpsters, compactors, storage tanks, and grease traps. Potential pollutants of concern are trash and

debris, landscape wastes, medical wastes, food wastes, oil and grease, degreasers, recyclables, metals, bacteria, and nutrients.

6.8.3 BEST MANAGEMENT PRACTICE REQUIREMENTS

6.8.3.1 Minimum BMPs

Table 6-9 describes the minimum BMPs for the management of municipal waste. Descriptions of these BMPs can be found in Appendix B.

Table 6-9. Minimum BMPs Requirements

SC06 Outdoor Loading/Unloading of Materials	SC08 Waste Handling and Disposal
SC10 Employee Training	SC18 Housekeeping
SR01 Spill Prevention, Control, and Cleanup	

6.8.3.2 Schedule of Maintenance

Bins and dumpsters are placed throughout SAN to separate municipal waste into trash, recyclables, and food waste. Further separation of materials include cardboard, wood, and metal to keep them out of the landfill and recycling bins. A contractor is hired by the Authority to pick up, sort, and deliver municipal waste from various points throughout the Airport to the dumpsters and/or compactors multiple times a day. The Authority contracts for pick-up and haul of municipal waste from compactors and dumpsters to an off-site facility at least once a day, seven days a week. Drivers inspect the conditions of dumpsters and compactors daily and report any needed repair/replacement. The waste hauler also conducts weekly cleaning of the compactor areas, ensuring a clean facility and space. The food waste compactor is cleaned when serviced, which is approximately twice a week. The Authority has an electronic recycling program by which e-waste generated by tenants can be dropped off twice a year at the Sustainability Fairs. Pickup and disposal of grease is described in Section 6.4.3.

6.9 FACILITY INSPECTIONS

The P&EAD inspects all municipal and commercial areas and activities to ensure compliance with Authority Rules and Regulations, Storm Water Code (Article 8), this SWMP, the Municipal and Industrial Permits, other permits and approvals, and contracts and leases. This section discusses the processes and procedures for these inspections. In addition to these inspections, FMD and tenants conduct their own inspections as part of their routine facility activities.

6.9.1 INSPECTION FREQUENCY

The Municipal Permit requires the Authority to establish the inspection frequency for municipal and commercial areas and activities on the basis of the potential for NSWDs and pollutant discharge in storm water and should reflect the priorities set forth in the WQIP. The frequency of inspections must also be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water, effectively prohibit NSWDs, and respond to public complaints. Based on these factors, and the required inspection frequency under the Industrial Permit, the Authority conducts monthly inspections of all municipal and commercial areas and activities, an annual comprehensive inspection, and unscheduled as-needed inspections of all Authority areas. Inspections are performed during daylight hours. Based on inspection findings, the Authority implements all follow-up actions necessary to require and confirm compliance with Authority Rules and Regulations, Storm Water Code (Article 8), this SWMP, the Municipal and Industrial Permits, other permits and approvals, and contracts and leases. Follow up action can include,

but is not limited to, (1) education and outreach, (2) requirement to perform corrective actions, (3) re-inspection, (4) enforcement action, and (5) capital improvement projects. Follow-up actions are in accordance with the ERP as described in Section 6.10. Investigations from inspections of municipal and commercial areas and activities that determine whether any subsequent structural improvements need to be made will be brought forth through the capital improvement program, as described in Sections 4.0 and 6.12 and Appendix C of this SWMP. The Authority Board budget approval process is described in Section 10.0.

6.9.2 INSPECTION CONTENT

The inspection by the P&EAD includes (1) a review of the SWMP, any associated documentation, and the Authority's web-based database; and (2) an on-site visit to determine the actual field conditions. Review of the SWMP and the database can include past monthly and maintenance inspection reports, past annual comprehensive reports and site audits, SWMP appendices, and other supporting documents. The objectives of the inspection include:

- Visual inspection for the presence of actual NSWDs;
- Visual inspection for the presence of actual or potential discharge of pollutants;
- Visual inspection for the presence of actual or potential illicit connections and illicit discharges;
- Verification that the description of the municipal and commercial areas and activities has not changed;
- Assessment of compliance with this SWMP and the Authority's rules and regulations and code related to NSWDs and storm water discharges and runoff;
- Assessment of the implementation of designated BMPs;
- Verification of coverage under the Industrial Permit (if applicable); and
- Documentation of follow-up and/or enforcement actions taken in accordance with the ERP if problems or violations are found.

The P&EAD inspector carries the following forms and equipment during the inspection: (1) a tablet or cellular telephone, with a backup paper inspection form in case of technical difficulties, to be completed during the inspection (see Appendix G), and (2) a camera, to document site conditions.

After reviewing the documentation associated with the tenant or municipal area, including the inspection history and compliance status, the inspector evaluates conditions for that site, including:

- MS4 (storm drain inlets and basin areas);
- Materials, equipment, and waste storage areas;
- All municipal and commercial areas and activities; and
- BMPs.

Any NSWDs and potential illicit discharges observed are followed up on and/or sampled through the dry weather monitoring programs described in Section 3.3 and Appendices D-1 and D-2 of this SWMP. The program includes designated monitoring locations and frequencies, field screening/sampling procedures, data interpretation techniques, and follow-up investigation and reporting procedures.

Inspection content for industrial users is described in Section 7.8.4 of this SWMP.

6.9.3 INSPECTION TRACKING AND RECORDS

The P&EAD inspector documents the results of the inspection, including any issues identified, via the Web-based database maintained by P&EAD. When issues are identified, the inspector can also capture images and location information (such as GPS coordinates) that can be stored in the Web-based database. The Web-based database allows the P&EAD to effectively and efficiency share the inspection results with the Authority and tenants, so that prompt corrective actions can be taken, and inspection results, corrective actions, and any follow-up inspections can be documented.

At a minimum, the inspection records include:

- Name and location of the facility or area;
- Inspection and re-inspection date(s);
- Inspection method (e.g. on-site, drive-by, etc.);
- Observations and findings from the inspection;
- Description of any problems or violations found during the inspection;
- Description of any enforcement actions issued in accordance with the ERP; and
- The date that problems and violations were resolved.

The P&EAD inspector can discuss the results of the inspection with the Authority employee or tenant while on site, on the phone, or in email or hard copy form. The Authority and tenants have access to the Web-based database to view additional inspection details and can provide information (text, maps, and pictures) regarding how and when issues have been resolved. The P&EAD inspector uses the information in the database provided by the Authority employees and tenants to confirm compliance, request further action, or escalate enforcement activities.

6.9.4 MAINTENANCE INSPECTIONS

Both the Authority P&EAD and the FMD inspect the storm drain system as part of their routine facility inspections. Several airport tenants also perform some MS4 and associated structure and/or parking lot inspections, either sporadically or as part of their own routine facility inspections. Airport tenants also share in maintaining the storm drains by working to prevent dirt, trash and other pollutants from entering the storm drain system. FMD performs the inspections and maintenance of certain sections of the sanitary sewer system (such as the grease traps and receptacles described in Section 6.4.1). The following standard procedures will be incorporated into maintenance and cleaning activities of all MS4 and structural treatment controls, road and parking facilities, and sanitary sewers, as applicable:

- Appropriate records will be kept for all maintenance activities. The inspection and waste removal records contain the following information as appropriate:
  - Date and time of the inspection;
  - Name of the inspector;
  - Items inspected;
  - Location of facility inspected or cleaned;
  - Condition of facility;
  - Overall amount (estimated in volume or dry weight) of material removed;
  - Type(s) of materials removed;

- Disposal site(s);
- Problems noted;
- Illegal/illicit connection detected;
- Corrective action required;
- Date corrective action was taken;
- Photographs;
- Additional field notes; and
- Drawings and maps.

Records of maintenance inspections and activities can be found at the P&EAD or FMD.

Additional items to be investigated for maintenance of structural treatment control BMPs are in Section 6.2.3. Those items can be, but are not limited to, (1) condition of the BMP, filter media, or outlet; (2) trash/debris/sediment/floatables/oil and grease amount accumulated in the BMP; (3) presence of standing water and unpleasant odors in the BMP; (4) presence of blockages/obstructions in the inflow pathway; (5) vegetation cover height and type; or (6) presence of erosion or burrowing animals.

For MS4 maintenance and cleaning activities, appropriate disposal of the waste removed pursuant to applicable laws will be incorporated into the maintenance and cleaning activities. If wastes are suspected of containing hazardous materials, they will be sampled to determine any special handling and/or disposal needs. Non-emergency storm drain system facility repairs and construction will generally be scheduled to take place between May 1 and September 30 (dry season). Emergency repairs will be completed on an as-needed basis, regardless of time of year.

For MS4 and sanitary sewer maintenance and cleaning activities, appropriate practices will be implemented to ensure that maintenance and cleaning activities will not discharge wastes into the downstream storm drain system. The practices include gravel-bagging/berming, capture of any runoff from cleaning activities, use of material beneath waste piles to prevent seepage of liquids, covering of waste piles to prevent water or wind transport of wastes, and blockage of downhill drainages and inlets to prevent entry of maintenance or cleaning wastes. If appropriate, the infrastructure component is referred for repair or replacement by maintenance crews or commercial tenants. Larger, more complex issues generally become recommendations for capital improvement projects as part of the Authority budget planning and approval process (described in Section 10.0). Sewer line improvements are the responsibility of MWWD.

For roads and parking facilities maintenance and cleaning activities, the Authority's Storm Water Code (see Appendix F of this SWMP) in Section 8.74 requires the Authority, or any persons owning or operating parking lots or impervious surfaces used for similar purposes, to clean the areas frequently and thoroughly and to prevent discharge of pollutants to the storm drain system by removing sweepings and debris.

6.10 ENFORCEMENT RESPONSE PLAN

All municipal and commercial areas and activities undertaken in the Authority's jurisdiction are required to maintain compliance with the Authority Rules and Regulations, Storm Water Code (Article 8), this SWMP, the Municipal and Industrial Permits, other permits and approvals, and contracts and leases. Provision E.6 of the Municipal Permit requires each Copermittee to develop an ERP to enforce its legal authority to achieve compliance. Each component of the ERP must describe the enforcement response approaches that will be used to compel compliance. The description must include the protocols for implementing progressively stricter enforcement responses ("escalating enforcement").

This section describes the ERP as it applies to municipal and commercial areas and activities at SAN. In accordance with the Municipal Permit, the ERP has been updated concurrently, with submittal of the final San Diego Bay WQIP, so that the ERP aligns with WQIP strategies.

Any findings or violations noted during a site inspection by the P&EAD inspector will be discussed on site or via the Web-based database with the Authority employee or tenants. The P&EAD inspector will discuss the issues and the inspection report will detail the corrective actions required and the timeframe in which corrective actions must be completed. Findings and violations will be described and recorded in the Web-based database (and will include photographs and other information, as applicable).

The Authority requires that corrective actions be started immediately and be completed prior to the next predicted rain event or within a maximum of 30 days, whichever is sooner. Depending on the nature of the finding, some corrective actions may take longer to complete. In those cases, the Authority employee or tenants will provide an explanation to the P&EAD inspector and a suggested timeframe for completion, which the P&EAD inspector will either agree upon, or will reject and provide a preferred timeframe. (Note: corrective actions must be completed within 24 hours for Enforcement Level 2 violations, as described below.) The Authority or tenants must document the corrective action taken by responding to P&EAD through the Web-based database. The Authority or tenants who cannot complete corrective actions in the time required must explain in detail through the Web-based database the specific causes of delay and propose a schedule for compliance. P&EAD has the sole discretion to grant an extension or pursue escalated enforcement. All corrective actions, as well as the time periods allowed and dates of actual completion, are recorded in the Web-based database.

The enforcement mechanisms used by the Authority are listed below. The Authority generally obtains compliance using the first four mechanisms listed here. The remaining enforcement mechanisms can be used, as necessary, to increase the severity of penalties and to compel compliance as soon as possible.

1) Verbal and written warnings;
2) Written notices of violation;
3) Written notices to clean, test, or abate;
4) Orders to cease and desist (stop work orders);
5) Fines;
6) Denial or revocation of permits, approval, and occupancy;
7) Administrative and criminal penalties;
8) Bonding requirements; and
9) Liens.

The Authority's ERP for municipal and commercial areas and activities has two main levels of enforcement, with escalating enforcement measures utilized as necessary on a case by case basis, using the professional judgment of the Authority inspector. Enforcement is initiated and escalated by standard mechanisms for each level. The Authority has the discretion to initiate or escalate enforcement using any enforcement mechanism available, depending on the nature of the concerns, existing site and weather conditions, and actions by the Authority or tenants to control or correct the violation. The general enforcement process is outlined below:

- Enforcement Level 1 is initiated by the findings of a BMP deficiency in the BMP categories outlined in Appendix B, as appropriate for the particular activity or area being inspected. Also, a lack of SWMP implementation also initiates Level 1 enforcement. A verbal and/or written notification of the finding is used to initiate enforcement and corrective actions are expected to be observed during a reinspection after 30 days. Photos of the corrective action should be date-stamped to show completion

within 30 days, or the agreed upon timeframe, if longer. If the finding is not corrected, a written notice of violation is issued to escalate enforcement. Upon the second re-inspection, if the finding is still not corrected, a second written notice of violation is issued, which may include an order to clean, test, or abate. Continued failure to correct the violation in the time allowed will result in a mandatory meeting between the Authority or tenants and the Director of the P&EAD to discuss the reasons for failing to comply and the means of resolving the issue.

- Enforcement Level 2 is initiated when a prohibited off-site discharge occurs. A written notice to clean, test, or abate, or an order to cease and desist (stop work order), is used to initiate enforcement and compliance is expected within 24 hours. If the violation is not corrected, the Authority or tenants must attend a mandatory meeting with the Director of the P&EAD to discuss the reasons for failing to comply and the means of resolving the issue.

Penalties for violations including failure to correct a finding or violation generally range as follows: (1) submittal of a written report that outlines the cause of the violation and the actions taken to prevent or minimize a reoccurrence of the violation; (2) attendance at a relevant training session and documentation of such; (3) attendance at an Authority-sponsored or presented relevant training session; (4) attendance at a mandatory meeting between the project proponent or project management team and the Director of the P&EAD; and (5) monetary penalties. The Authority may exercise the discretion to use any and all penalties available, depending on the nature of the concerns and actions by the project proponent or project management team to control or correct the violation.

6.10.1 RE-INSPECTIONS

The enforcement process requires the Authority or tenants to take corrective actions within a specified time period. To confirm that corrective actions have been completed effectively and on time, Authority employee or tenant corrective actions taken for findings or violations will be reviewed by P&EAD in the database and if needed, re-inspections will be performed. Re-inspections are also documented in the Web-based database in the same manner as are regularly scheduled inspections.

6.11 EDUCATION AND STAFF TRAINING

All Authority staff members attend an annual mandatory SWMP training session plus other trainings at meetings and other events, or as a result of enforcement proceedings, to cover items such as prohibited discharges, inspections, spill response, good housekeeping, implementation of minimum and other BMPs, and recordkeeping procedures. This annual training program is run by P&EAD. In addition, FMD staff members attend an annual mandatory training session on proper pesticide and herbicide storage, application, and disposal. For additional details on staff training, see Section 9.1.2 of this SWMP.

6.12 RETROFITTING AND REHABILITATION AREAS OF EXISTING DEVELOPMENT

The Authority has developed a program to retrofit areas of existing development within its jurisdiction when redevelopment and new development occurs, to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in its WMA. The Authority will identify those areas of existing development that are candidates for retrofitting where feasible. These candidates may be used to reduce pollutants and/or stressors that contribute to the highest and focused priority water quality conditions. If retrofitting projects are deemed infeasible to address the highest and focused priority water quality conditions in the WQIP, the Authority will collaborate and cooperate with other Responsible Parties in the WMA to identify, develop, and implement regional retrofitting projects adjacent to and/or downstream from the Authority's areas of existing development. For additional details on the program to retrofit areas, see Section 4.0 and the BMP Design Manual in Appendix C of this SWMP.

There are no streams, channels, and/or habitats in areas of existing development within the Authority's jurisdiction. Therefore, Municipal Permit Provision E.5.e.(2) is not addressed in this SWMP.

6.13 MUNICIPAL COMPONENT EFFECTIVENESS ASSESSMENT

The Authority has developed internal and external effectiveness assessment programs to evaluate the Authority staff, Authority Board, and tenant compliance with water quality issues. The Authority's Effectiveness Assessment component is described in Section 11.2 of this SWMP.

6.14 MUNICIPAL COMPONENT PROGRAM REVIEW AND MODIFICATION

The Authority has reserved this section to identify and document future changes to the Municipal Component of the SWMP. Section 13.0 of this SWMP addresses the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal and Industrial Permits.

- Updates were made to the Municipal and Commerical Component, Section 6 in January 2019, following the designation of additional minimum BMPs, as well as addition of specific BMPs for preventing over-irrigation. Table 6.1 was updated to reflect current commercial tenants and commercial related activities and potential generated pollutants. Table 6.2 was updated for municipal land uses and activity areas. The list of structural control BMPs was updated in Section 6.2.1. Management of landscaped areas (Section 6.3.3.2), the composting program (Section 6.8.1) and municipal waste management program (6.8.3.2) descriptions were also updated.

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7.0 INDUSTRIAL COMPONENT

7.1 INTRODUCTION

This section addresses the requirements of the Industrial Permit, Provision E.5 (Existing Development Management) of the Municipal Permit as it pertains to industrial facilities, and relevant strategies for industrial discharges outlined in the San Diego Bay WQIP.

Many sources were consulted in preparing this section, including Authority plans and regulations as well as state and federal plans and permits. Authority regulations utilized include the SAN Rules and Regulations and the Authority's Storm Water Code. The state and federal permits, plans, and regulations consulted include the 2012 Water Quality Control Plan for the San Diego Basin, the California 2010 Integrated Report 303(d) List/305(b) Report, hazardous waste regulations and permits, and air quality regulations and permits.

In general, Section 7.0 addresses most of the requirements outlined in the Industrial Permit for industrial dischargers. Additional information is included in Appendix A, Appendix B, Appendix D.1, Appendix E, Figures 3 through 7, and other sections of the SWMP as noted in this section. As listed below, the sections of the Industrial Permit requires the Authority to:

- II—Obtain coverage under the Industrial Permit through submission of all Permit Required Documents through SMARTS. As a facility discharging storm water associated with industrial activity to San Diego Bay, a water body of the United States, SAN had to certify and submit a NOI by July 1, 2015. All changes or terminations of Industrial Permit coverage and required reports will be submitted through SMARTS. Facilities previously operating at SAN under a separate WDID number have been integrated into the SAN SWPPP through SWPPP Amendment No.2. The appropriate Change of Information (COI) has been submitted through SMARTS, and the affected tenants submitted their NOT documents. Section 7.2 has been prepared to address this requirement.
- III—Prohibit all discharges of storm water to waters of the United States, except as authorized by the Industrial Permit or the Municipal Permit. All NSWDs are prohibited, except those designated as authorized by the NPDES permits. Both storm water discharges and NSWDs are prohibited if they contain pollutants that cause or threaten to cause pollution, contamination, or nuisance. Other discharge prohibitions, including those stated in regional or statewide water quality control plans and federal regulations, are also enforced. Section 7.5.1 has been prepared to address this requirement.
- IV—Prohibit NSWDs, except for certain authorized classes, provided that these authorized NSWDs (1) do not otherwise violate regional or statewide water quality control plans, or the Authority's Storm Water Code or Rules and Regulations; (2) have appropriate BMPs in place, as outlined in this document; (3) are visually inspected monthly; and (4) are reported by the Authority in the Industrial Annual Report. Section 7.5.2 has been prepared to address this requirement.
- V—Implement BMPs using BAT and BCT to reduce or prevent discharge of pollutants in industrial storm water runoff. The Authority will comply with any applicable Federal Storm Water Effluent Limitation Guidelines (ELGs) outlined in USEPA regulations in 40 CFR Chapter I Subchapter N (Subchapter N). The Authority will comply with any applicable total maximum daily loads (TMDLs). Section 7.5.3 has been prepared to address this requirement.
- VI—Ensure that industrial storm water discharges and NSWDs do not cause or contribute to the exceedance of a water quality standard in the receiving water (San Diego Bay), do not adversely affect human health or the environment, and do not contain pollutants in quantities that threaten to cause pollution or public nuisance. Section 7.5.4 has been prepared to address this requirement.
- VII—Comply with any incorporated TMDL-specific requirements, once the Industrial Permit is amended to incorporate any TMDLs applicable to the Authority. New dischargers applying for coverage under the Industrial Permit are also required to comply with special regulations associated

with 303(d)-listed impairments in the receiving water. However, the Authority is not classified as a new discharger. Section 7.5.3 has been prepared to address this requirement.

- VIII—If discharging to the ocean, comply with the California Ocean Plan. Per the definitions outlined in the California Ocean Plan, the Authority discharges to an enclosed bay, and therefore California Ocean Plan requirements are not applicable. Section VIII is not addressed in this plan.
- IX—Ensure appropriate training. Section 7.6 has been prepared to address this requirement.
- X—Prepare a SWPPP. This section of the Authority's SWMP (Section 7.0), and other applicable sections or appendices, as indicated in this section, comprise the Authority's SWPPP as required by the Industrial Permit. Required components of the SWPPP include (1) facility name and contact information; (2) a site map; (3) a list of industrial materials; (4) a description of potential pollutant sources; (5) an assessment of potential pollutant sources; (6) minimum BMPs; (7) advanced BMPs, if applicable; (8) a monitoring implementation plan; (9) an Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation); and (10) the date that the SWPPP was initially prepared and date of each subsequent revision. A copy of this SWPPP will be maintained with the P&EAD and is available on the Authority's webpage. The locations of required SWPPP elements are provided in Appendix A. Most of the SWPPP requirements are addressed in Section 7.7.
- XI—Conduct monitoring, including monthly dry weather visual observations of each drainage area, wet weather visual observations during each wet weather sampling event, and wet weather sampling four times per year during qualifying storm events (QSEs). Sampling results will be compared with numeric action levels (NALs) as outlined in the Industrial Permit. Sections 7.8.3 and 7.8.4 and Appendix D-1 have been prepared to address this requirement.
- XII—Respond to NAL exceedances in a given year by escalating to a Level 1 status and conducting a Level 1 Exceedance Response Action (ERA) evaluation and report. The evaluation and report will be completed by or with the assistance of a Qualified Industrial Storm Water Practitioner (QISP). Respond to continuing NAL exceedances by escalating to a Level 2 status and completing a Level 2 ERA Action Plan. This Action Plan will be followed by a Level 2 ERA Technical Report the following year. Section 7.9 has been prepared to address this requirement.
- XIII—Comply with regulations for inactive mining operations. This section is not applicable to the Authority and is not addressed in this plan.
- XIV—Choose to form a Compliance Group with other dischargers of the same industry type. The Authority has elected not to join a Compliance Group, and Section XIV is not addressed in this plan.
- XV—Complete an Annual Evaluation. Section 7.10.1 has been prepared to address this requirement.
- XVI—Complete an Annual Report and submit via SMARTS. Section 7.10.2 has been prepared to address this requirement.
- XVII—File for a conditional exclusion to the Industrial Permit if there is no exposure of storm water to industrial activities. The Authority does not intend to file for a conditional exclusion because of no exposure and so Section XVII is not addressed in this plan. The new RCC operated by Conrac Solutions (Conrac) had applied for and received approval for a NEC (because their industrial operations are conducted indoors/under cover). However, the RCC has now been incorporated into the Authority's SWPPP and no longer requires an NEC.
- XVIII—Comply with additional regulations applicable to facilities handling plastic materials. The Authority does not handle plastic materials as described in Section XVIII and therefore this section is not addressed in this plan.
- XIX—Recognize the RWQCB's authority to review and enforce the Authority's compliance with the Industrial Permit.

- XX and XXI—Be subject to various special and standard conditions. Violations of the Industrial Permit are subject to a civil penalty not to exceed $37,500 per calendar day of such violation.

The Municipal Permit requires that the Authority, as a Copermittee, establish, maintain, and enforce its legal authority to manage existing developments within its jurisdiction, including industrial developments. For the purposes of enforcement, the Authority considers existing industrial lease holders to be existing development. Per Provision E.5 of the Municipal Permit, the Authority will inventory and track all industrial developments, designate a minimum set of BMPs for all inventoried industrial developments, and inspect all industrial developments at a minimum of once every five years. The monthly inspections required by the Industrial Permit will supersede this municipal inspection requirement. The Authority will also retrofit and rehabilitate areas of existing development that are identified sources of pollutants or stressors that contribute to the focused priority water quality condition for the Authority jurisdiction. This is discussed in Section 6. Requirements of the Municipal Permit as they pertain to industrial discharges are generally addressed in Section 7.7.

7.2 OBTAINING PERMIT COVERAGE

The Authority maintains coverage for industrial activities and industrial tenants under both the Industrial Permit and the Municipal Permit. The Authority has elected to assume a lead role with regard to the Industrial Permit. Airport tenants that conduct industrial activities are also subject to the requirements of the Industrial Permit and must comply with the Authority direction regarding storm water management at SAN. This approach (1) conforms to federal regulations, (2) was the preferred option of the SWRCB, and (3) allows for implementation of consistent storm water pollution prevention measures throughout the entire airport site. This approach provides for consistency in the programs that the Authority has developed and implemented to comply with the requirements of both the Industrial Permit and the Municipal Permit.

7.2.1 OBTAINING INDUSTRIAL PERMIT COVERAGE

The Authority obtained regulatory coverage under the 2014 Industrial Permit through filing of an NOI through SMARTS by July 1, 2015. All Permit Required Documents for the NOI were certified and submitted by the Vice President of Development, Jeffrey Woodson, as the Legally Responsible Person (LRP) at the time. The LRP is now Brendan Reed, Director of the P&EAD. The NOI submittal included:

1) The NOI, signed Electronic Authorization Form, and signed certification statement;
2) A site map (provided in Figure 3);
3) This document as the SWPPP; and
4) Annual fees for coverage (established through regulation adopted by the SWRCB and subject to change).

The complete requirements of the NOI are described in Attachment D of the Industrial Permit. All future documents related to the Industrial Permit required to be submitted via SMARTS will be certified and submitted by the Director of P&EAD or his DAR.

7.3 SWPPP AVAILABILITY AND IMPLEMENTATION

The SWPPP, as part of the SWMP, will be available to all Authority employees, tenants, contractors, and vendors during all hours of facility operation through the Authority's internal electronic network (Intranet) and/or on the Authority's webpage. A paper copy of the SWPPP will be maintained in the Authority's P&EAD.

This SWPPP was implemented on July 1, 2015. Additional amendments have been developed and implemented as follows: Amendment No.1 - January 24, 2016, Amendment No. 2 – November 15, 2016,

Amendment No. 3 – March 17, 2017, Amendment No.4 – December 27, 2017, and Amendment No. 5 – January 26, 2019.

7.4 POLLUTION PREVENTION TEAM

The Authority's Pollution Prevention Team is primarily composed of members of the Authority's P&EAD and FMD, as well as their designated outside consultants. A full list of staff responsible for implementation of the SWPPP is provided in Table 7-1. Figure 8 presents the Authority's organizational chart. The following key roles within the Authority perform essential roles in SWPPP implementation and monitoring:

- Director, P&EAD: The Director of the Authority's P&EAD is the LRP for the implementation of the SWPPP. The LRP will certify and submit all reports on the SMARTS website. The LRP is responsible for signing and certifying all permit-related documents, and for managing the day-to-day implementation of the SWPPP. In the event of the LRP's extended absence, the DAR within the P&EAD will manage the industrial storm water program.
- Manager, P&EAD: The P&EAD Manager will serve as the DAR and is responsible for managing the day-to-day implementation of the SWPPP. Duties include conducting meetings with and training of appropriate stakeholders, ensuring proper implementation of required BMPs, directing staff and consultants in performance of wet and dry season monitoring and wet weather storm water sampling, overseeing annual facility inspections of all industrial areas and activities, preparing annual reports for submittal to the RWQCB, submitting monitoring results onto SMARTS, and revising and updating the SWMP as necessary.
- Staff, P&EAD: All members of the P&EAD, from Senior Environmental Specialist to Environmental Assistant level, are responsible for implementation of the SWPPP. Staff-level individuals are responsible for performing inspections, implementing training programs, observing and recording daily implementation of required BMPs, requiring corrective actions for BMP deficiencies, developing or directing the development of reports, and enforcing BMP implementation. All members of the P&EAD are tasked to recognize and report tenant and staff failures to implement required BMPs.
- FMD: The Authority's FMD is responsible for implementing minimum BMPs in common areas and Authority property not otherwise covered under another leasehold. Department supervisors are responsible for remediating any BMP deficiencies identified in common use and Authority areas during inspections and recording corrective actions taken.
- Airside Operations, and Security and Public Safety Departments: The Authority Airside Operations (Air Ops) Department is generally the first point of contact for tenant and staff reporting of spills. Air Ops generates a daily log of any reported spills, leaks, and other actual and potential discharges; this log is included in the Authority's Web-based database so that the records are immediately available upon request.
- Tenant Environmental Program Managers: All tenants are required to implement minimum BMPs to prevent storm water pollution as a condition of their leasehold. Tenant environmental managers will be responsible for remediating any BMP deficiencies identified in their tenant areas during inspections and for recording corrective actions taken. The managers in charge of environmental program implementation are identified in the Tenant Summary Sheets in Appendix E.
- ADC Department and Airport P&EAD: These two departments are generally responsible for project planning, design, and approval. ADC and P&EAD will be responsible for the design of Industrial and Municipal Permit-compliant treatment control BMPs.
- Terminal Operations and Revenue Management Departments: These two departments, in collaboration with P&EAD and Air Ops, are generally responsible for helping tenants properly

implement the BMPs required in this SWMP. Both departments may be consulted if escalated enforcement of BMPs is required.

Table 7-1. Authority Key Personnel Responsible for SWMP Implementation

Department	Title	Responsible Individual
Development Division	Vice President	Dennis Probst
Planning and Environmental Affairs	Director	Brendan Reed
	Manager	Richard Gilb
	Manager	Chad Reese
	Manager	Ralph Redman
	Manager	Ted Anasis
Facilities Management	Director	David LaGuardia
	Facilities Management Manager	Andrew Hoge
	Fleet Manager	Jonathan Mason
Airside Operations	Director	Jeff Rasor
	Manager	Dean Robbins
	Duty Managers	Mark Hander
		Steve Duboce
		David Billings
		Mario Carldera
		Mark Chewiwie
		Rodrigo Rendon
		Eric Smith
		Scarlett Swanson
		Wayne Thomas
Terminal Operations	Manager	Amiel Porta
	Customer Relations Manager	Maggie Hartnett
	Program Manager	Nyle Marmion
	Customer Service Coordinator	Colm Marmion
	Terminal Coordinators	Scott La Rocco
		Elsie Gonzalez
		Nadya Vedepo
		Mitesh Patel
	Management Analyst	Vatana Kang
	Airport Properties Operations Coordinator	Suzanne Roybal
Aviation Security & Public Safety	Director	Clint Welch
	Manager, Emergency Preparedness & Public Safety	Susie Prieser
	Manager, Aviation Security & Law Enforcement	Cameron Burkel
Airport Design & Construction	Director	Bob Bolton
	Program Manager	Ajay Babla
	Program Manager	Mike Tilley
Revenue Management	Director	Natasha Collura
	Program Manager	Eric Podnieks

7.5 STORM WATER AND AUTHORIZED NON-STORM WATER DISCHARGE REQUIREMENTS

In general terms, any discharge of materials other than storm water is prohibited under both the Industrial Permit and the Municipal Permit. Section 7.5.1 discusses these discharge prohibitions in more detail, and Section 7.5.2 lists those classes of NSWDs that are authorized. Storm water and authorized NSWDs are subject to effluent limitations. These limitations can be either technology-based, requiring the discharger to implement a certain minimum technology to control pollutants, or water-quality-based, requiring discharges to meet either numeric or narrative receiving water quality standards. Technology-based effluent limitations are discussed in Section 7.5.3. Receiving water limitations and water quality standards are discussed in Section 7.5.4.

7.5.1 DISCHARGE PROHIBITIONS

The following storm water discharges or NSWDs are always prohibited:

- Discharges that cause or threaten to cause pollution, contamination, or nuisance as defined in Section 13050 of the Water Code are prohibited;
- Discharges that violate discharge prohibitions contained in the San Diego Basin Plan are prohibited; and
- Discharges that contain hazardous substances equal to or in excess of a reportable quantity listed in 40 CFR Sections 110.6, 117.21, or 302.6 are prohibited.

7.5.2 INDUSTRIAL NON-STORM WATER DISCHARGES

The Municipal Permit effectively prohibits all NSWDs through implementation of the IDDE Program discussed in that portion of Section 3.2 of the SWMP (included in Attachment 1 of the SWPPP), unless they are authorized through another NPDES permit. The following NSWDs are prohibited unless authorized by a separate NPDES permit, or they must be addressed pursuant to the requirements from the Municipal Permit Provision E.2 as identified in Section 3.1.1 and 3.1.2:

- Fire prevention system flushing/testing;
- Potable water sources and system flushing/testing;
- Drinking water fountains;
- Air conditioning, refrigeration and compressor condensate;
- Uncontaminated natural springs, groundwater, and foundation and footing drainage;
- Tidal intrusion; and
- Incidental windblown mist from cooling towers.

Further discussion of NSWDs and their associated BMPs is provided in that portion of Section 3.0 of the SWMP (presented in Attachment 1 of the SWPPP).

7.5.3 INDUSTRIAL EFFLUENT LIMITATIONS

The Authority meets the Industrial Permit Section V effluent limitations by employing BMPs that meet the BAT and BCT standard, as appropriate. The BAT standard generally applies to industrial discharges of toxic and nonconventional pollutants, while the BCT standard applies to conventional pollutants including biological oxygen demand (BOD), total suspended solids, fecal coliform, pH, and oil and grease. The Authority's required BMPs are further outlined in Section 7.7 and in Appendix B.

The Authority is not subject to storm water ELGs in Subchapter N because no pavement deicing occurs at SAN and because the Authority is not a new discharger.

Additionally, there are no TMDLs applicable to the Authority so the Authority is not subject to any TMDL specific requirements. If the Authority does become named in a TMDL, this SWPPP will be amended at that time to incorporate requirements of the TMDL.

7.5.4 RECEIVING WATER LIMITATIONS FOR INDUSTRIAL DISCHARGES

The Authority's storm water discharges and NSWDs will not cause or contribute to an exceedance of any applicable water quality standard in San Diego Bay, including standards set forth in the Basin Plan. Industrial storm water discharges and NSWDs will not adversely affect human health or the environment, or contain pollutants in quantities that threaten to cause pollution or public nuisance.

7.6 TRAINING QUALIFICATIONS

Per 2014 Industrial Permit requirements, the Authority designated a QISP, to complete an approved SWRCB training course and register as a QISP in SMARTS, following QISP training development by the SWRCB when the Authority entered Level 1 discharger status, as described in Section 7.9. The QISP trained appropriate team members and performed the duties related to ERAs, as described in Section 7.9. The SWPPP was modified to reflect this designation. Whenever the Authority is in baseline status (i.e., no NAL exceedances), additional training by a QISP will not be required.

All engineering work subject to the Professional Engineer's Act (California Business and Professions Code Sections 6700-6799) and required by the Industrial Permit will be performed by a California licensed professional engineer. A professional engineer will certify hydrologic calculations for any new volume-based treatment control BMPs installed at SAN after July 1, 2015, per Section X.H.6.a of the Industrial Permit. Additionally, according to Provision E.3.d of the 2013 Municipal Permit, compliance with the BMP Design Manual is also required. The BMP Design Manual addresses on-site post-construction storm water requirements for Standard Projects and PDPs, and provides updated procedures for planning, preliminary design, selection, and design of permanent storm water BMPs based on the performance standards presented in the Municipal Permit (see Appendix C).

7.7 STORM WATER POLLUTION PREVENTION PLAN COMPONENTS

7.7.1 BACKGROUND

As an industrial discharger, the Authority has developed Section 7.0, along with other associated sections or appendices of the SWMP, as its SWPPP. Per Section X.A of the Industrial Permit, the Authority's SWPPP contains the following elements:

- Facility name and contact information;
- Site map;
- List of industrial materials;
- Description of potential pollutant sources;
- Assessment of potential pollutant sources;
- Minimum BMPs;
- Advanced BMPs, if applicable;
- Monitoring Implementation Plan;

- Annual Evaluation; and
- Date that the SWPPP was initially prepared and the date of each SWPPP amendment.

A checklist of required SWPPP elements and their locations is provided in Appendix A. Section 7 of the SWMP contains most of the required SWPPP elements.

The Municipal Permit also requires identification and description of existing industrial facilities or areas as part of the Authority's JRMP. Most of the elements required under the Municipal Permit are already provided as a requirement of the SWPPP under the Industrial Permit. Specifically, Provision E.5.a of the Municipal Permit states that the JRMP must include the following elements for industrial facilities:

- Name and location, including hydrologic subarea and address, if applicable;
- Status of facility or area as active or inactive;
- Identification if a business is a mobile business;
- SIC code or NAICS code, if applicable;
- Industrial Permit NOI and/or WDID number, if applicable;
- Identification of pollutants generated and potentially generated by the facility or area;
- Whether the facility or area is adjacent to an ESA;
- Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the 303(d) list and generates pollutants for which the water body segment is impaired; and
- An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

Table 7-4 presents an inventory of industrial sites and sources at SAN. Based on this inventory of existing facilities, the Municipal Permit calls for the prioritization of known or suspected sources of pollutants contributing to the highest or focused priority water quality conditions identified in the San Diego Bay WQIP. The WQIP identifies metals as the focused priority water quality condition in the Authority jurisdiction, and both Industrial Tenant Operational Areas and Industrial Airport Operational Areas (i.e., runways and taxiways) are identified as high-priority sources of metals (Responsible Parties, 2015). Strategies identified in the WQIP to address industrial sources of metals include enhanced tenant inspections, optimization of runway rubber removal, and increased frequency of sweeping runways, taxiways, and ramp areas.

Per Provision E.1.a of the Municipal Permit, the Authority must establish legal authority to control the contribution of pollutants in discharges from industrial facilities within its jurisdiction, including those with existing coverage under the Industrial Permit. The Authority has legal authority over all land uses within its jurisdiction through property leases or use agreements. A complete discussion of the Authority's legal authority is provided in Section 2.2 of the SWMP (included in Attachment 1 of the SWPPP).

7.7.2 FACILITY INFORMATION

SAN is owned and operated by the Authority. The primary economic activity of SAN is as an airport; therefore, the primary SIC Code is 4581. Other secondary SIC codes associated with the activities of SAN and its industrial tenants include the following:

- 4512 Air Transportation, Scheduled;
- 4513 Air Courier Services;

- 4522 Air Transportation, Nonscheduled;
- 5171 Petroleum Bulk Stations and Terminals; and
- 4173 Terminal and Service Facilities for Motor Vehicle Passenger Transportation.

SAN covers approximately 663 acres and is located in the Pueblo Hydrologic Unit (HU 908.00), San Diego Mesa Hydrologic Area (HA 908.20), and Lindbergh Hydrologic Sub-Area (HSA 908.21). Storm water from SAN drains to San Diego Bay, which is designated as an ESA, with portions contained in the 303(d) list. Certain areas of San Diego Bay are subject to TMDLs; however, SAN does not directly drain to these areas. A complete discussion of the facility drainage is provided in Section 7.7.2.2 of this plan, and also can be viewed on the site map (Figure 3).

Table 7-2 provides the basic facility information for SAN, including name, address, contact information, SIC code, hydrologic subarea, and WDID number.

Table 7-2. SAN Industrial Facility and Facility Discharge Information

Industrial Facility Information	
Facility Name	San Diego International Airport (SAN)
Facility Operator	San Diego County Regional Airport Authority
Facility Address	3225 N. Harbor Dr., San Diego, CA 92101
Facility Mailing Address	PO Box 82776, San Diego, CA 92138
Latitude	32.7337
Longitude	-117.1933
Legally Responsible Person (LRP)	Brendan Reed, Director of Planning and Environmental Affairs
Facility Contact	Richard Gilb
Contact Email	Rgilb@san.org
Contact Telephone	(619) 400-2790
Qualified Industrial Storm Water Practitioner (QISP)	Amanda Archenhold, Nancy Phu
Scheduled Facility Operating Hours	6:30 a.m.-11:30 p.m., 365 days per year
Industrial Facility Discharge Information	
Primary Standard Industrial Classification (SIC) Code	4581 (Airports, Flying Fields, and Airport Terminal Services)
Waste Discharge Identification (WDID)	9 37I018035
Hydrologic Unit (HU)	908 (Pueblo)
Hydrologic Sub Area (HSA)	908.21 (Lindbergh)
Receiving Water Body	San Diego Bay
Facility Status	Active
Mobile Discharger?	No
Discharges to Environmentally Sensitive Area (ESA)?	Yes (San Diego Bay)

7.7.2.1 Facility Operations

The primary operation of SAN is as a domestic and international commercial airport. Airport operations at SAN currently include two main airline terminals, an FBO facility, one main runway area, taxiways, ancillary support facilities (including an aircraft fuel storage facility, a remote fueling facility, air cargo facilities, ground support facilities and operations areas), two wash racks (one operated by the Authority, one operated by the tenant Menzies), overnight airplane parking areas, and the ARFF.

7.7.2.2 Descriptions of Drainage Areas and Existing Drainage

The storm water conveyance system at SAN consists of 15 drainage basins. To be consistent with historical naming conventions at the airport, these drainage basins are named as Basins 1 through 15, with drainage basin 2 removed in 2018, and drainage basin 5A added. Of the 15 basins at SAN, 9 contain industrial activities, namely Basins 1, 3, 5, 6, 7, 8, 12, 13, and 15. A full description of the drainage areas is provided in Section 1.4 of the SWMP presented in Attachment 1.

Storm water from SAN drains to San Diego Bay, portions of which are currently 303(d) listed for impacts due to PCBs, PAHs, chlordane, lindane, indicator bacteria, and metals, as well as benthic community effects and sediment toxicity. The 2010 303(d) list includes copper as a pollutant impacting water quality in the marinas along Harbor Island and bacteria impacting water quality at Spanish Landing. Runoff from the airport commingles with runoff from other sources and discharges into the waters along Harbor Island, including near Spanish Landing. San Diego Bay in its entirety is also 303(d) listed as impacted by PCBs.

There are two TMDLs established in San Diego Bay, namely dissolved copper impacting Shelter Island Yacht Basin and indicator bacteria impacting Shelter Island Shoreline Park. Runoff from the airport does not discharge in close proximity to these areas of San Diego Bay.

There are four Toxic Hot Spots in San Diego Bay, one of which (namely, the Laurel Hawthorn Central Embayment) is located near outfalls associated with runoff commingled from SAN and other sources. A technical investigation prompted by an Investigative Order issued by the RWQCB (Order No. R9-2014-2007) is currently being conducted to determine the source of pollution in this area. The SWRCB has designated San Diego Bay in its entirety as having RARE beneficial use in the Basin Plan (2011 update). Both the Sweetwater Marsh National Wildlife Refuge and the South Bay Unit of the San Diego National Wildlife Refuge are considered ASBS, but neither is within close proximity to SAN.

7.7.2.3 Storm Water Run-On from Off-Site Areas and Non-Industrial Areas

Basins 1, 3, 4, 5, 6, 8 and 13 have been identified as potentially receiving run-on from off-site areas. Basins 1, 3, and 4 receive storm water run-on from adjacent properties to the south and east of SAN. Basins 5, 6, 8, and 13 receive storm water run-on from adjacent properties to the north and west of SAN.

There are no identified areas of run-on from non-industrial drainage basins within SAN to industrial drainage basins. There are, however, identified areas of run-on from non-industrial source areas within the industrial drainage basins. Basins 3, 4, 5, 6, 8, 12, and 13 contain areas of natural soil and fill that are exposed to rainwater. Runoff from these areas may reach the storm drains in the corresponding drainage areas. These areas are outlined in Figure 3. Basins 3, 6, 7, 8, and 15 contain non-industrial roof runoff that comingles with industrial runoff before reaching the storm drains. Basins 1, 3, 4, 5, 6, 8, 12, 13, and 15 contain portions of the vehicle perimeter road or vehicle parking areas; runoff from these areas may comingle with industrial runoff. As of January 2019, there is active construction in Basins 1, 3, 5, 6, 8, 12, 13 and 15. Construction runoff is addressed in Section 5.0 of the SWMP.

7.7.2.4 Geology and Groundwater

Approximately 90 percent of SAN property is covered by impervious surfaces consisting mainly of buildings and paved areas. The soils underlying SAN are generally undifferentiated bay deposits and hydraulic fill material originating from San Diego Bay. The soil is described as undetermined in the Soil Hydrologic Groups map in the San Diego County Hydrology Manual. The elevation of SAN ranges from approximately 10 to 25 feet above mean sea level.

7.7.3 POTENTIAL POLLUTANT SOURCES

Entities conducting industrial activities as listed in Attachment A of the Industrial Permit are subject to the Industrial Permit and Provision E.5 of the Municipal Permit. There are 27 tenants conducting industrial activities, plus the Authority itself as operator of the airport and the ARFF (the Authority includes the ARFF facility, which is the airport's firefighting facility and is indicated separately to assign its particular activity), for a total of 29 entities conducting industrial activities that could contribute a significant pollutant load to the storm drain system. These 29 entities and the type of industrial activity into which they have been categorized are listed in Table 7-3. The location of these 29 entities on the airport is shown in Figure 3 and Figures 5 through 7.

The Authority site maps shown in Figure 3, and Figures 5 through 7 depict the facility boundaries; the outline of all storm water drainage basins within the facility boundaries; portions of the drainage basins impacted by run-on from surrounding areas; direction of flow within each drainage basin; nearby surface water bodies; and areas of soil erosion. The site maps identify San Diego Bay as the receiving water into which storm water from SAN discharges. The site maps also show the storm water drainage system at the airport; associated inlets and points of discharge; any structural control measures (e.g., OWSs); compliance sampling locations; an outline of all impervious areas of the facility, including paved areas, buildings, covered storage areas, and other roofed structures; locations where materials are directly exposed to precipitation; the locations where significant spills or leaks have occurred; areas of industrial activity, including the locations of all storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, and cleaning and rinsing areas; and other areas of industrial activity that are potential pollutant sources.

The Municipal Permit requires that Copermittees identify and prioritize their industrial sources of pollutants contributing to the focused priority water quality conditions in the Authority's jurisdiction. The process implemented by the Authority for determining the potential threat of those operations conducting industrial activities is described Section 7.7.3.1. Per the WQIP source prioritization, all Industrial Tenant Operational Areas and Industrial Airport Operational Areas are designated as high-priority sources (Responsible Parties, 2015).

7.7.3.1 Description of Potential Pollutant Sources

Under the Industrial Permit, commercial passenger air carriers, cargo air carriers, FBOs (of which there is only one at SAN), fuel vendors, aircraft refuelers, aircraft and airport service and maintenance providers, and all airfield/airport related activities are defined as industrial operations. The Authority used information gained from site visits, annual inspections, and storm water sampling results, including information regarding industrial materials handled and stored at the airport, descriptions of those industrial activities that may be sources of pollutants, and pollutants detected in prior sampling events, to determine their potential pollutant sources and areas. This information is presented in Tables 7-3 and 7-4.

Using the information on hand, the Authority has determined that all the activities listed in Tables 7-3 and 7-4, and therefore all 29 entities conducting industrial activities at SAN, are considered high-priority threats to water quality.

The Municipal Permit requires the Authority to maintain an inventory of industrial and commercial sites and sources and to update this inventory annually. These industrial and commercial sites and sources were prioritized as part of the WQIP process. The results of the commercial prioritization are presented in Section 6.0. The results of the current prioritization for industrial activities are included in Tables 7-3 and 7-4, as discussed above. Some of the entities conduct multiple industrial activities and, therefore, may be listed more than once in Table 7-3. Table 7-4 provides the more detailed minimum information required by the Municipal Permit for each industrial site or source, specifically name; address; pollutants potentially generated by the site/source (and identification of whether the site/source is tributary to a 303(d)-listed water body segment and generates pollutants for which the water body segment is impaired); and a narrative description, including SIC codes that best reflect the principal products or services provided by each site/source/facility. The Municipal Permit also requires identification of mobile businesses, and whether businesses are active or inactive; all 29 industrial entities are active and stationary.

Table 7-3. Overview of Inventory of Industrial Sites/Sources

Land Use and Activity	Water Quality Threat Priority	Entity
Passenger Carrier	High	Air Canada Alaska Airlines Allegiant Air American Airlines British Airways Airlines Delta Airlines Edelweiss Frontier Airlines Hawaiian Airlines Japan Airlines JetBlue Airways Lufthansa Southwest Airlines Spirit Airlines Sun Country Airlines United Airlines WestJet Airlines
Cargo Carrier	High	DHL Airways Federal Express (FedEx) Corporation United Parcel Service Co. (UPS)
Cargo Handling	High	Bradford Federal Express (FedEx) Corporation United Parcel Service Co. (UPS)
Corporate General Aviation/ Fixed-Base Operations	High	Signature
Fuel Vendor	High	Allied Aviation Menzies
Aircraft Fueler	High	Menzies Signature
Aircraft and General Services Equipment and Maintenance	High	American Airlines United Airlines
Jetway and Baggage Maintenance	High	Siemens
Airport Terminal Services	High	FlagShip
Fire Fighting	High	Aircraft Rescue and Firefighting Facility (ARFF)
Airport/Facilities Maintenance	High	San Diego County Regional Airport Authority
Terminal and Service Facilities for Motor Vehicle Passenger Transportation	High	Conrac Solutions

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Table 7-4. Inventory of Industrial Sites/Sources

Facility Name	Address Number	Suite Number	Street Name	City	State	Zip Code	SIC Code	NAICS Code	Principal Products/ Services	Bacteria	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediment	Tributary	Threat
Air Canada	3665	#223	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Alaska	3665	#228	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Allegiant	3707	T2E	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Allied Aviation	3698	#C	Pacific Hwy.	San Diego	CA	92101	5171	424710	Fuel Storage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
American	3707	#103	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
ARFF	3698	-	Pacific Hwy.	San Diego	CA	92102	9224	922160	Airport Rescue & Fire Fighting	No	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Authority	3835	-	North Harbor Dr.	San Diego	CA	92101	4581	488111	Facility Maintenance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bradford	2247	-	West Washington St.	San Diego	CA	92101	4581	488190	Cargo Handling	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes
British Airways	3707	#117	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Conrac	3355	#Q228	Admiral Boland Way	San Diego	CA	92101	4173	532111	Rental Car Center	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Delta	3835	#107	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
DHL	225	-	Washington St.	San Diego	CA	92101	4513	492110	Air & Ground Freight	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Edelweiss	3707	-	North Harbor Drive	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
FedEx	2221	-	West Washington St.	San Diego	CA	92110	4513	492110	Cargo Handling	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
FlagShip	3835	#130	North Harbor Dr.	San Diego	CA	92101	4581	561720	Janitorial	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Frontier	3707	#105	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Hawaiian	3707	T2	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Japan Airlines	3707	#123	North Harbor Dr.	San Diego	CA	92101	4512	481111	Passenger Carrier	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
JetBlue	3835	#108	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Lufthansa	3835	#134	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Menzies	2340	-	Stillwater Rd.	San Diego	CA	92101	4581	488190	Fueling Services	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Siemens	3225	-	North Harbor Dr.	San Diego	CA	92101	4581	488111	Facility Maintenance and Maintenance (Boarding Bridges & Conveyors)	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes

Table 7-4. Inventory of Industrial Sites/Sources (continued)

Facility Name	Address Number	Suite Number	Street Name	City	State	Zip Code	SIC Code	NAICS Code	Principal Products/ Services	Bacteria	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediment	Tributary	Threat
Signature	2904	-	Pacific Hwy.	San Diego	CA	92101	4512, 4522	481111, 487990	Corporate General Aviation	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Southwest	3665	T1	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Spirit	3707	#227	North Harbor Dr.	San Diego	CA	92101	4512, 4581	481111, 488111	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Sun Country	3835	#107	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
United	3855	#115	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
UPS	3140	#G105	E Jurupa St.	Ontario	CA	91761	4513	492110	Cargo Handling	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
West Jet	3707	T2E	North Harbor Dr.	San Diego	CA	92101	4512, 4522	481111, 487990	Passenger Carrier	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes

INDUSTRIAL MATERIALS AS POTENTIAL POLLUTANT SOURCES

Industrial materials associated with industrial activities at SAN that could be potential pollutants consist primarily of metals, petroleum products (such as fuels, oil, and greases), solvents, soap/cleaning fluids, and trash. Lesser amounts of other potential pollutants also present at the airport include lavatory chemicals and waste, paints, used batteries and battery acid, anti-freeze, hazardous wastes (mostly oils), metals, deicing chemicals, herbicides and pesticides, adhesives, rust preventers, AFFF and other fire suppression chemicals, and sealants (see list below for more details). These pollutants can be transported to the storm water system either as direct spills, from contact with rainfall runoff, or from apron or ramp scrubbing, if not completely contained. Appendix E contains a list of potential pollutants for each industrial tenant. Also described in Appendix E are material storage areas, lists of materials stored in quantities over 55 gallons, and shipping and receiving information if available.

In general, the industrial materials that could be potential sources of pollutants at SAN include the following:

- Acetic acid
- Acetone
- Adhesives
- Antifreeze
- Asphalt debris
- Battery acid
- Brake cleaners
- Brake fluid
- Bulk auto gas and diesel
- Carburetor cleaner
- Caulking
- Cleaning solutions
- Coolant
- Deicing/anti-icing fluids
- Degreasers (citrus based)
- Diesel
- Dumpster wastes
- Fertilizers
- Firefighting foam
- Fuel
- Fuel hydraulic fluids
- Galvanizing compound
- Herbicides
- Hydraulic fluids
- Hydraulic fluid (Skydrol)
- Jet fuel
- Lavatory chemicals
- Landscape waste
- Lavatory wastes
- Lubricants
- Metals
- Oil and grease
- Paints
- Pesticides
- Purple K (fire suppression chemical)
- Radioactive goods
- Recyclable paper/cardboard
- Rubber particulates
- Rust preventer
- Sealant
- Sediment
- Solvents
- Sump fuel
- Transmission fluid
- Trash
- Turpentine

INDUSTRIAL ACTIVITIES AS POTENTIAL POLLUTANT SOURCES

The industrial activities, in and of themselves, conducted by both the Authority and tenants have the potential to impact water quality. Information gathered as described above indicates that the potential pollutant generating activities/operations consist primarily of specific airport-industry processes, material handling and storage, and spills and leaks. To a lesser extent, pollutants may also potentially result from dust

and particulate generating activities, soil erosion, and NSWDs. There may be pollutant sources related to commercial activities conducted within industrial drainage basins, such as commercial parking lots management and vehicle storage, food service, and janitorial service. These commercial activities are addressed in Section 6.0 of the SWMP presented in Attachment 1.

Aircraft Deicing/Anti-icing

Deicing and anti-icing chemicals are generally used on aircraft to eliminate or minimize the ice buildup on the wings and fuselage of aircraft. These activities are fairly uncommon at SAN. Only one tenant conducts deicing. Deicing can be performed using deicing fluids (typically, ethylene glycol and/or propylene glycol), water, or air. The deicing fluids are typically stored in drums or large plastic containers. Deicing fluid is generally applied by spraying the aircraft with a mixture of (hot) water and a glycol-based fluid. The spray drains from the aircraft onto the ramp area and could have the potential to result in an illicit discharge or transport other surface contaminants, thereby impacting storm water quality. Airlines typically use scrubbers, vacuums, or absorbents to cleanup and properly dispose of residual chemicals. Mixing of deicing chemicals takes place in the SAN triturator, which drains to the sanitary sewer.

Facilities performing deicing activities with aircraft deicing fluids may be subject to the requirements and storm water ELGs outlined in Subchapter N. ELGs for existing airports apply only to airports conducting pavement deicing. However, neither the Authority nor any industrial tenants at SAN perform airfield pavement deicing. Therefore, SAN is not currently subject to the Subchapter N ELGs.

Because deicing is fairly uncommon at SAN, the activity is not considered a significant non-storm water TTWQ. On average, deicing is performed on one to two aircraft per day during the seven-month "deicing season" from October to April. The Authority does require the use of BMPs to address deicing activities. Deicing activities are authorized on the paved ramp in areas that are (1) sufficiently far enough from the nearest storm drains to allow for capture and cleanup of the residual deicing fluids whenever chemical deicers are used; (2) sufficiently far enough from the nearest storm drains to allow for the liquid to be captured and cleaned up to prevent the transport of surface contaminants, whenever air or water are used as deicing agents; or (3) sufficiently far enough from the nearest storm drains to allow for the water to evaporate prior to reaching the storm drain system, whenever air or water are used as deicing agents. These areas are depicted in the figure attached to the Aircraft Deicing/Anti-icing BMP (SC05) description in Appendix B. In general, BMP SC05 can be implemented effectively at the gates, although pushing an aircraft back away from the terminal on the ramp area around Terminal 1 allows for additional distance between the deicing activity and the storm drain system. Tenants are responsible for properly implementing BMP SC05 at all times, including during inclement weather.

Aircraft, Vehicle, and Equipment Fueling

Fueling activities occur on a daily basis. Aircraft fueling activities are conducted on paved surfaces such as concrete ramps or at the gates. Approximately 450,000 gallons of jet fuel are brought to Terminals 1 and 2 ramp areas daily by tanker and loaded by positive lock hose into aircraft. Vehicle and GSE fueling is conducted at the gates or in maintenance areas. For the Authority, fueling activities also occur at all generators, light towers, and truck bays in the ARFF facility. Menzies maintains a fleet of trucks for fueling aircraft and three trucks for fueling GSE. Aircraft refueling trucks with a capacity of 10,000 and 15,000 gallons are loaded at the RFF. Fuel is delivered to the RFF from the FSF via a single 10 inch underground pipe. Both the RFF and the FSF are maintained and operated by Allied Aviation. At the FSF there is a 12,000-gallon OWS plus an 8,000-gallon holding tank. The four FBO aircraft refueling trucks take on fuel at the RFF and less frequently at the FSF. Fueling operations are performed on site at the FBO. The concrete pad at the RFF loading islands is steam cleaned periodically and the discharge enters the 12,000 gallon underground wastewater sump. This wastewater is then pumped to the RFF's 500 gallon aboveground OWS for treatment; the treated water is then discharged to the storm drain. Most tenant vehicles or equipment are fueled on site, although some perform vehicle or equipment fueling off site. Conrac performs fueling of rental cars indoors in their QTA area. Fuel is stored on site in their service yard, located to the northwest of the parking garage structure. This fuel farm houses three 25,000 gallon USTs of regular unleaded gasoline.

Fuel is delivered to the indoor QTA area, where fueling occurs, from the fuel farm where the fuel is stored on site via an underground pipe. Fuel is provided by Western Pump. Four OWSs are connected to the sanitary sewer line as a part of Conrac's drainage system to contain any discharged gasoline.

The industrial materials or potential pollutants from fueling activities are jet fuel, diesel fuel, and gasoline. Fuel spills are contained by absorbent materials, inflatable pools, or facility-specific spill containment areas/OWSs/tanks (for the RFF, FSF, and Conrac facility). The Authority procedures for spill reporting and response are outlined in Sections 3.5.3.2 and 3.5.3.3 of the SWMP (presented in Attachment 1 of the SWPPP). Tenants may also have additional spill procedures highlighted in their own SPCC plan, and environmental response contractors for spill response.

Aircraft, Vehicle, and Equipment Maintenance

The majority of industrial tenants at SAN maintain aircraft, equipment, and/or vehicles, although no major maintenance of aircraft is performed on site. Maintenance activities are performed both indoors and outdoors. Based on the nature of maintenance activities at airports, materials such as lubricating oils, hydraulic oils, degreasers, and other cleaning products are commonly used during maintenance activities. At tenant and Authority waste accumulation areas, waste oils, lubricants, oil filters, antifreeze, transmission fluids, and used absorbent materials are stored prior to transport to recycling or waste disposal facilities. Small leaks or spills of some of these fluids can occur during maintenance activities. Tenants respond to these leaks and spills by using absorbent socks, dry absorbent materials, rags, and mops, and request for service by the Authority's portable truck-mounted vacuum when needed. Many tenants use drip pans during maintenance activities in areas where the use of a drip pan is unlikely to become a foreign object debris (FOD). Maintenance activities occur on a daily basis, but tend to involve minor maintenance and industrial materials in small quantities. Where possible, maintenance activities are conducted indoors or under cover, and generally represent a low potential for significant pollutant discharge.

Some tenants have floor drains located in maintenance areas. At some of these facilities, the runoff entering the floor drain is conveyed to an OWS before entering the sanitary sewer system. At a few facilities, the runoff that discharges through the floor drains discharges directly to the sanitary sewer. Tenants are required to confirm that there are no illicit connections from these drains to the storm drain system at their leasehold.

Electric Vehicle Charging and Maintenance

Electric vehicle charging and maintenance represents a relatively new activity at SAN. The Authority has committed to clean air and emission reductions, including adopting the strategies in the California Air Resources Board State Implementation Plan, with its goal to transition existing GSE to zero-emission GSEs by 2032. The State Implementation Plan has a potential implementation date of 2023, in which P&EAD inventoried the age range, fuel types, and GSE types in the GSE database. In addition to the State Implementation Plan, the Authority has agreed to the specific measures identified in the *Memorandum of Understanding Between the Attorney General of the State of California and the Authority Regarding the San Diego International Airport Master Plan* that replaces all GSEs with electric or alternative fuel GSEs beginning in January 2010. In 2018, 26% of GSE was electric.

Multiple tenants utilize electric vehicles as part of their daily operations. These tenants charge the vehicles on site. During charging and maintenance, the batteries of electric vehicles have the potential to leak or spill materials such as acid or water containing heavy metals, particularly if the batteries are over-charged or over-filled with electrolyte solution. Tenants are responsible for maintaining good housekeeping at charging stations, monitoring for and preventing spills and leaks, and responding to spills and leaks by applying neutralizing materials (e.g., sodium bicarbonate/baking soda), or using dry absorbent materials, absorbent socks, rags, and mops, and request for service by the Authority's portable truck-mounted vacuum when needed. The Authority also recommends that tenants utilize sealed or maintenance free batteries whenever economically feasible. Charging occurs daily in many tenant areas, but generally represents a low potential for significant pollutant discharge because of the small volume of most leaks and spills.

Aircraft, Vehicle, and Equipment Washing

Several tenants at SAN conduct aircraft, vehicle, and equipment washing, with many using dry methods for cleaning the aircraft and others using water. In all but one instance, as described below, all aircraft, vehicles, and equipment washing activity conducted at SAN must be authorized in writing by the Authority P&EAD. To obtain approval, the P&EAD requires the submittal of a wash plan that identifies the tenant contact details; location where washing is performed; location of storm drains; equipment to be used and where it will be stored; quantity of wastewater to be generated; frequency of washing activities; water collection/ retrieval/ reclamation processes; water disposal/ elimination processes; chemicals to be used, if any, and the relevant material safety data sheets; washing methods employed; and BMPs used to control potential pollutants related to the activity. Where possible, tenants are encouraged to use reclaimed water from potable water flushing or air conditioning condensate as wash water. Upon satisfactory review of the wash plan, the Authority will provide written approval to conduct washing activities in the manner described in the plan. In general, the approved wash plans indicate that the washing is performed as far away from storm drains as possible and temporary berms are used to block off nearby storm drains to prevent runoff to the storm drain system. Wash water is then vacuumed up and properly disposed of either through the Authority's dewatering bin (where solids are removed) in Basin 6, or at the Authority wash rack, in Basin 8 (see Figure F-1). Any equipment degreasing is conducted indoors and washing activities are prohibited in areas that do not provide a wash rack, OWS, or area to deploy proper containment. The lone exception to obtaining this approval involves the use of properly designed wash rack connected to a dead-end sump and/or the sanitary sewer. One wash rack at SAN is leased to the tenant Menzies. It is an open-air facility designed for washing vehicles. The second wash rack is operated by the Authority itself. It is a covered, 2-sided facility that can be used for tenant and Authority vehicles and equipment washing. The Menzies wash rack collects the wash water runoff and then discharges it to the sanitary sewer system. The Authority wash rack uses a closed loop water recycle system. These wash racks are also used to wash equipment other than vehicles.

In addition to the two wash racks, the RCC has 13 wash bays, five on floors 2 and 3 of their parking garage and three on the first floor of the garage where the rental cars are washed inside. All of the car wash drains lead to OWSs. Water is recycled and kept in a reclaimed water tank that can hold up to 4,500 gallons; this water is used again to wash cars. For the final spray of the car wash, water from an on-site reverse osmosis system is used.

Due to 2015 and 2016 drought conditions, tenants are required to use a hand-held hose with positive shut off nozzle to wash vehicles. Washing of vehicles, aircraft, and equipment outside of the Authority wash rack is restricted to the hours of 4pm to 10am from November 1 to May 31 and 6pm to 10am from June 1 to October 31.

Outdoor Washdown/Sweeping

General Outdoor Washdown/Sweeping: Atmospheric deposition, vehicle and aircraft use and emissions, breakdown of asphalt and concrete surfaces, and peeling or crumbling paint from structures and runway surfaces can all introduce particulates into the storm drain system at SAN. The physical removal of particulates and attached fine pollutant particles (in particular heavy metals) from outdoor surfaces at SAN will prevent or eliminate the pollutant load that may be transferred to San Diego Bay. The Authority requires the use of the Outdoor Washdown and Sweeping BMP (SC12) in Appendix B to address pollutants associated with washing and sweeping activities. Aircraft and vehicle washing are discussed separately above and power washing is considered separately below.

Ramp Sweeping: The Authority conducts a sweeping program designed to reduce pollutant discharges to its MS4s from ramp and airfield industrial areas. The ramp sweeping program conducted by the Authority is further described in Section 7.7.3.1. This program differs from the Authority's road sweeping program described in Section 6.3 of the SWMP (presented in Attachment 1 of the SWPPP). All terminal ramp areas are swept at least once every other month, and upon request by tenants using two regenerative air sweepers. Potential pollutant sources that can be mitigated by sweeping practices in ramp areas are trash and debris (FOD), sediment, particulates, and other associated pollutants such as metals. Loading and unloading of

trash, cargo, and catering supplies from aircraft can lead to FOD on the ramp areas. Any uncovered dumpsters or trash cans can be potential sources of FOD, as well as littering by staff, tenants, or the public. All Authority staff and tenants are very much aware of the potential hazards of FOD at the airport, and conduct daily FOD walks to check for any trash, so the source from tenants and staff should be very minimal. Every individual working on the ramp is trained to immediately remove FOD when it is observed and to place it in covered FOD bins located in each tenant gate area and throughout the airport. Some tenants also perform manual sweeping of their operational areas. The Outdoor Washdown and Sweeping (SC12) and Housekeeping (SC18) BMPs are required to be implemented during ramp sweeping activities.

Power washing: Both the Authority and the airport janitorial services provider conduct power washing, the Authority on an as-needed basis and the janitorial services provider on a routine basis. Portions of the sidewalk areas in front of the terminals and the pedestrian bridges leading from the parking lots to the terminals are power washed by the janitorial services provider almost daily using high-pressure water only. Wastewater from power washing may contain and transport contaminants on the ground surface to the storm drain system, if not properly contained and collected. The primary pollutants associated with power washing at the airport are particulates and associated pollutants, trash, and debris. Both the Authority and the janitorial services provider use power-washing equipment designed to minimize the amount of water used and to capture all the wastewater. Non-potable air conditioning condensate is used for power washing, and washing is generally conducted between the hours of 11pm and 4am. To address the potential release or transport of pollutants during power-washing activities, the Authority requires the use of several BMPs in Appendix B, including the Non-Storm Water Management BMP (SC01), the Employee Training BMP (SC10), the Outdoor Washdown/Sweeping BMP (SC12), and the Housekeeping BMP (SC18).

Ramp Scrubbing: In addition to ramp-sweeping activities discussed above, the Authority also performs ramp scrubbing and power washing activities. CASQA guidance states that, "no currently available conventional sweeper is effective at removing oil and grease." As such, the Authority conducts an outdoor ramp-scrubbing program in the gate areas (and in the north ramp area when requested by Authority staff or tenants) designed to remove oil and grease, debris, and particulate matter (to which heavy metals may be adsorbed, or which may contain metals). The airport janitorial contractor uses either one of two 3,500 psi industrial pavement washers, or a pressure washing truck for ramp scrubbing. Both pieces of equipment are equipped with vacuum collection systems. The pressure washing truck also contains a reclamation system, for direct reuse of washwater. Oil and grease, fuels, hydraulic fluids, and other substances may leak onto the ramp from parked aircraft, vehicles, and equipment. An effective outdoor ramp-scrubbing program, in conjunction with the ramp sweeping program discussed above, can help to reduce the levels of these pollutants in storm water runoff from the airport. Following washing activities, the wash water is either directly reused or vacuumed and collected by the Authority's environmental contractor, who filters and reuses the water.

Runway Rubber Removal

On the runway, materials such as tire rubber, oil and grease, paint chips, jet fuel, and vehicle exhaust products can build up on a runway surface over time, causing a reduction in the pavement's surface friction. When the friction value falls below a specific level, safety may be compromised, and maintenance must be performed. The buildup is generally removed using high-pressure water or specialized biodegradable detergents within a containment/recovery system. The detergent solution is not stored on site. Only the amount needed is brought on site during each rubber removal. Runway rubber removal is conducted every 6-8 weeks during any runway rehabilitation projects, but returns to every 4 weeks after project completion depending on skidometer testing results. The waste rubber is disposed of in a lined rubber removal lowboy (dumpster), east of the ATCT. A contractor is responsible for disposal of the waste and waste water generated. To address the potential release or transport of pollutants during runway rubber removal activities, the Authority requires the use of the Runway Rubber Removal BMP (SC15) in Appendix B.

Pesticide/Herbicide Use

Currently, six industrial tenants/facilities and the Authority use pesticides and/or herbicides. Allied Aviation, Signature, Conrac, ARFF, Cartwright and Bradford all use pesticides and/or herbicides. Allied Aviation uses herbicides to control weeds. They store small quantities in small containers within secondary containment outdoors at the FSF. The RCC contracts a landscaping service that applies herbicides biannually and pesticides on an as needed basis. No herbicides or pesticides are stored on site at the RCC. The Authority stores a small amount of herbicides in flammable material storage lockers at the runway generator area. The Authority's landscape contractor also utilizes pesticides for weed control. These pesticides are not stored on site. The use of pesticides and herbicides at the airport does not result in significant discharges to the ground. During rainfall events, pesticide and herbicide residuals that accumulate at the application sites can be washed into the storm drain system. However, based on the small quantities used at the airport, and the application of an IPM system at SAN, this activity appears to present a low potential for impacting storm water discharge.

Shipping/Receiving Areas

The main shipping/receiving area is in Drainage Basin 6. Additional secondary shipping and receiving areas are in Drainage Basins 7, 8, and 12, as described in Section 1.4 and depicted in Figure 3 and Appendix B, Figure SC-06. The front of the main shipping and receiving area, the CRDC, is located in the northern portion of Drainage Basin 6 off of Pacific Coast Highway, where cargo and supplies are loaded and unloaded for the Authority and the various airlines and cargo carriers. The airport food service providers use loading/unloading areas at Terminal 1, Terminal 2 West and at the connection between the eastern and western halves of Terminal 2, where food, drink, and other catering supplies for the airport restaurants are delivered by truck. Equipment used for loading and unloading at the docks typically includes forklifts. Loading and unloading of aircraft occurs in Basins 1, 3, 6, 8, 12, and 15 using hydraulic lifting equipment. To address the potential release or transport of pollutants during loading and unloading activities, the Authority requires the use of the Outdoor Loading/Unloading of Materials BMP (SC06) in Appendix B. The main loading and unloading areas are shown in the figure attached to the Material Loading/Unloading BMP description in Appendix B. Shipping and Receiving areas for each industrial tenant are listed in Appendix E.

MATERIAL HANDLING AND STORAGE AREAS AS POTENTIAL POLLUTANT SOURCES

Fuel, GSE, and Chemical Storage Areas

Tenants at SAN store varying quantities of chemicals and petroleum products (i.e., hydraulic fluids, gasoline, diesel, and jet fuels). Many tenants have indoor and outdoor storage areas to house these items. Chemicals, oils, and waste oils are typically stored in 55-gallon drums or smaller containers. Fuels are typically stored in ASTs or USTs, but some tenants who store only small quantities have 5-gallon fuel containers. Deicing fluids are stored in 55-gallon metal or plastic drums. Other materials such as cleaners, paints, and paint-related products are stored in smaller containers. Secondary containment may be required by law for certain hazardous materials, and the Authority requires the use of secondary containment in all chemical storage areas. Outdoor storage areas, if not adequately protected from contact with storm water, have the greatest potential to impact storm water. In these areas, the Authority requires implementation of the Outdoor Material Storage BMP (SC07), including the proper use of secondary containment and cover, whenever possible.

Fueling Facilities: The FSF, RFF, and Conrac's RCC contain several ASTS and USTs, as outlined in the description of Basin 6 in Section 1.4 of the SWMP (presented in Attachment 1 of the SWPPP). Jet fuel is delivered to the two 1,000,000-gallon ASTs within a valved secondary containment area at the FSF via underground pipelines from the 10th Avenue Marine Terminal storage tanks. The facility can also receive jet fuel from commercial transport trucks at approximately 8,200 gallons per load. The fuel is off-loaded at the three dual-position unloading islands. The jet fuel tanks at the FSF and RFF are connected via an underground hydrant fueling system. Fueling is generally performed at SAN from fuel transfer trucks that load at the RFF. Loading of gasoline and diesel into cars and trucks takes place at various locations around the airport. The aircraft refueling trucks at the FBO are stored outdoors on the concrete ramp area at the FBO and are used to fuel general aviation aircraft and GSE at the FBO. Aircraft refueling trucks range in storage

capacity from 1,200 to 15,000 gallons, and vehicle refueling trucks range in storage capacity from 300 to 2,200 gallons. UST fuel storage capacities range from 3,000 to 15,000 gallons. An exception to this are the RCC's three 25,000 gallon USTs that hold regular unleaded gasoline for the refueling of rental vehicles. The emergency power generators at the airport are operated by the Authority and feature ASTs with fuel storage capacities ranging from 25 to 1,000 gallons. ASTs and USTs are fitted with a combination of overfill protection, leak detection, and alarm systems to prevent spills, leaks, and discharges. All fuel delivery trucks or fueling areas must be equipped with spill kits. The loading/unloading areas are inspected on a regular basis to identify any leaks from fuel transfers. At the FSF, leaks from fuel transfers are directed to bermed, sloped, spill containment areas that are linked to the 12,000-gallon OWS. At the RFF, the four loading islands are sloped and bermed to direct any discharges to a 12,000-gallon underground wastewater holding tank. Fuel spills that occur in any other area of the airport must be cleaned immediately using dry methods to reduce the potential to impact storm water. The Authority procedures for spill reporting and response are outlined in Sections 3.5.3.2 and 3.5.3.3 of the SWMP (See Attachment 1). Tenants may also have additional spill procedures highlighted in their own SPCC plan, and environmental response contractors for spill response. BMP SC03 covers Aircraft, Ground Vehicle, And Equipment Fueling and the attached figure in Appendix B outlines fueling areas.

GSE: Areas designated for the storage and maintenance of GSE are primarily located in Basin 7; however, parking of GSE occurs throughout the other ramp areas. During rain events, any residues (fuel, oil, or grease) on the GSE under repair or leaks from the GSE are potential pollutant sources in storm water discharges and must be controlled by proper BMP implementation. The Authority requires frequent inspections and preventive maintenance of GSE to prevent leaks, the implementation of containment measures if leaks do occur, and the proper, timely disposal of obsolete equipment, among other BMPs, as described in the Aircraft, Ground Vehicle, and Equipment Maintenance BMP (SC02B) as well as the Electric Vehicle Maintenance BMP (SC02C).

Chemical/Materials Storage: Chemicals and other materials are stored in the GSE maintenance areas, around the gate areas, in the North Side "boneyard" area, at the FBO, at the FSF, in the cargo areas north of the north ramp, and near the runway generator area. The materials stored include hydraulic fluids, lubricants, oils and greases, antifreeze, paints, rust preventers, solvents, batteries, metals, lavatory chemicals, cleaning solutions, deicing chemicals, pesticides, and herbicides. During rain events, any residues on chemical storage containers, or residuals from chemical spills or leaks in uncovered outdoor storage areas, are potential pollutant sources in storm water discharges. Facilities that include outdoor chemical and materials storage must have secondary containment and overhead coverage. Generally, only small quantities of these industrial materials are stored at SAN. They are generally contained within flammable materials storage lockers or outdoor sheds, or on spill pallets with tarps or other coverage. The lockers are completely enclosed, provide containment for small spills, and do not appear to be a source of significant quantities of pollutants to the storm drain system. Large volumes of materials in 55-gallon drums tend to be stored indoors and associated with various tenant maintenance areas. Material storage areas for each industrial tenant are listed in Appendix E.

Appendix B, Figure SC-07 outlines the main chemical and materials storage locations and the types of chemicals and materials stored. The figure attached to the Outdoor Loading/Unloading of Materials BMP (SC06) in Appendix B outlines areas where materials are shipped and received or loaded and unloaded. SC06 and SC07 detail the BMPs required by the Authority for these activities.

Waste Treatment, Storage, and Disposal

Lavatory Waste: Lavatory waste is pumped daily from aircraft on the ramp or apron areas and transported to a specially designed waste disposal facility, an enclosed facility referred to as the triturator. The triturator is located near the Administration Building (former Commuter Terminal). To prevent sewage spills during the transfer of lavatory waste through the triturator into the sanitary sewer, the transfer is performed in a drive-up facility that has overhead cover. During aircraft lavatory servicing operations, chemical odorizers and/or sanitizers may be used. Airline tenants generally store this chemical indoors at the gate areas, or occasionally

outdoors on spill pallets under overhangs or tarps. BMP SC11 in Appendix B covers Lavatory Service Operation and the associated BMPs required.

Hazardous Waste Storage: Hazardous waste, mostly waste oils, oil filters, and used absorbent materials in 55-gallon drums, is stored at:

- The Authority's boneyard area in Basin 6;
- The Authority 90-day holding facility in Basin 6;
- The FSF in Basin 6;
- The gate areas in Basins 8, 12, and 15;
- The GSE maintenance areas in Basin 7;
- The FBO in Basins 1 and 3;
- The north ramp in Basins 5 and 6; and
- RCC in Basins 3 and 5.

The locations at the airport at which more than 6000 kilograms (13,200 pounds) of hazardous waste might be stored at any time are the USTs for waste fuels at both the FSF and the RFF. The RCC stores waste fuel on site also in an oil room with three 2,500 containers of used oil. Currently, no facility at the airport generates more than 1000 kilograms (2200 pounds) of hazardous waste in any one month. To address the potential release or transport of pollutants during hazardous waste storage and handling activities, the Authority requires the use of both the Outdoor Material Storage BMP (SC07) and the Waste Handling and Disposal BMP (SC08) in Appendix B. The areas at which hazardous waste storage occurs at the airport are also shown in the figure attached to these two BMP descriptions in Appendix B.

Waste Disposal: The main waste disposal area at SAN is the trash compactor/recycling compactor/compost compactor area, as outlined in the description for Basin 8 in Section 1.4 of the SWMP (presented in Attachment 1 of the SWPPP). The trash compactors, recycling compactors, and compost compactor are located within a bermed area. Drainage in the bermed area is directed towards a sump that also pumps the water and liquids into the sanitary sewer. The dewatering bin was moved from the main waste disposal area to an area next to the ATCT in Basin 6. Additional disposal areas are the Terminal 2 trash compactors in Basin 12 and Basin 15, and the sweeping disposal lowboy in Basin 6, as depicted in Appendix B, Figure SC-08. There are also dumpsters and recycling bins at various locations throughout the airport. To address the potential release or transport of pollutants during waste disposal activities, the Authority requires the use of the Waste Handling and Disposal BMP (SC08). The areas at which waste disposal occurs at the airport are also shown in the figure attached to the Waste Disposal and Handling BMP description in Appendix B.

DUST AND PARTICULATE GENERATING ACTIVITIES AS POTENTIAL POLLUTANT SOURCES

Construction/demolition, aircraft and vehicle use and emissions, and airport operations can generate dust and particulates at SAN. In addition, airline off-loading of trash and debris from aircraft generates a significant source of gross pollutants, requiring proper handling and disposal. The main industrial areas generating dust and particulates are the runway/taxiway area, the terminal gate areas, the FBO, and the gate areas for cargo operators on the north ramp. The pollutants and particulates generated can include trash and debris, metals, and hydrocarbons. To address the generation of dust and particulates, the Authority requires the use of the Outdoor Washdown/Sweeping BMP (SC12), Erodible Areas BMP (SC20) and the Building Repair and Construction BMP (SC21), as described in Appendix B.

SIGNIFICANT SPILLS AND LEAKS AS POTENTIAL POLLUTANT SOURCES

Fueling and equipment maintenance activities generally involve the use or handling of jet fuel, aviation gas, hydraulic oils, oil, deicing fluids, degreasers, and other solvents. Considering that approximately 450,000

gallons of jet fuel are handled and transferred from truck to aircraft every day at the airport, it is highly likely that the history of significant spills (as defined by the Industrial Permit) would involve the handling of jet fuel. The refueler trucks operate nearly all around the airport, from the ramp areas of the terminals and at the FBO, to the air cargo/air freight operations area, and overnight aircraft parking areas. Areas where the largest spills have occurred are the Terminal gate areas, the FSF, the RON aircraft parking area, and the north cargo ramp area. In the last five years, all of these spills have involved less than 350 gallons; all were contained within SAN; all were immediately cleaned up; and none of these spills reached San Diego Bay. Spill procedures are described in Section 3.2 of the SWMP (presented in Attachment 1 of the SWPPP) and the BMP required by the Authority to address spills is the Spill Prevention, Control, and Clean-up BMP (SR01) in Appendix B.

ILLICIT DISCHARGES AS POTENTIAL POLLUTANT SOURCES

Potential illicit discharges include aircraft, vehicle, and equipment washing; power washing, ramp scrubbing, and runway rubber removal; non-emergency firefighting activities; improper materials and waste handling, storage, and disposal; and spills and leaks without proper BMP implementation. As discussed in Section 7.7.4, BMPs are in place to avoid potential discharges from these sources. Potential illicit discharges are described in Section 3.0 of the SWMP (presented in Attachment 1 of the SWPPP), including the BMPs to control these discharges. The Authority's IDDE program is also discussed in Section 3.2 of the SWMP (in Attachment 1 of the SWPPP). With nearly every drainage basin susceptible to tidal intrusion, the drainage areas where most of the potential NSWDs occur are Basins 1, 3, 8, 12, and 15 for potable water flushing; Basins 1, 5, 6, 7, 8, 9, 10, 11, 12, 14, and 15 for air conditioning condensation; and Basin 6 for non-emergency firefighting activities (see Appendix B, Figure SC-13).

ERODIBLE SURFACES AS POTENTIAL POLLUTANT SOURCES

SAN is approximately 90 percent impervious and is either covered by structures or is made up of concrete/asphalt surfaces. Unpaved areas are the least tern nesting ovals in the southeastern corner of SAN (south of the runway), northwest corner of SAN (north of the runway), erodible landscaped areas, and any active construction projects that may involve the removal of the impervious surface. The least tern nesting oval surfaces are generally very coarse gravel with little exposed soil. Landscaped areas are well maintained, and have environmentally friendly landscaping/xeriscaping, including a variety of indigenous and drought-tolerant plants, shrubs, and ground cover, which are used where possible to prevent soil erosion. High-performance erosion control methods, such as bonded fiber matrix or anchored erosion control blankets, are used on exposed soils. Where erosion does occur, sand bags or other storm drain inlet protection methods are employed and maintenance is performed to repair or revegetate the eroded areas. Over-irrigation is prohibited to prevent soil erosion to storm drains. Active construction projects contain specific contract requirements for erosion and sediment control, as well as being required to have a SWPPP or WPCP, per Section 5.0 of the SWMP presented in Attachment 1. Erodible surfaces are managed using the BMPs outlined in the Erodible Areas BMP (SC20) in Appendix B.

7.7.3.2 Summary of Industrial Sites and Sources

The industrial activities and pollutant sources occurring at SAN described above are summarized in Table 7-5. For each drainage basin at the airport (initially described in Section 1.4 of the SWMP (presented in Attachment 1 of the SWPPP) and depicted in Figure 3), Table 7-5 presents the drainage basin number; the storm water runoff sampling location identification number for any sampling locations within the basin; the name of the industrial entity located or operating in that particular basin; the types of industrial activities occurring in the basin; and the potential pollutants associated with those activities. Similar and additional information is provided by the individual industrial/commercial entity and the Authority on the Tenant Summary Sheets in Appendix E.

The potential pollutants listed in Table 7-5 are either stored or handled in the particular drainage basin identified. The main shipping and receiving area for most materials at the airport, including restaurant and

catering food service supplies, occurs at the CRDC located in the northern part of Drainage Basin 6. A secondary cargo area is located in Drainage Basins 7 and 8 at the airline maintenance buildings; the fronts of the maintenance buildings are located in the southeastern portion of Drainage Basin 8, and the backs in the western portion of Drainage Basin 7. All shipping and receiving areas, including aircraft loading/unloading areas, are shown on the figure attached to the Outdoor Loading/Unloading of Materials BMP (SC06) in Appendix B. Pollutant sources stored, handled, shipped, or received by each individual industrial entity are itemized in the Tenant Summary Sheets in Appendix E. The Tenant Summary Sheets also include maps that depict the locations or operating areas for each entity. The locations for storage of particular types of materials and waste are indicated on Figure 3 and the figures attached to the Outdoor Material Storage BMP (SC07) and the Waste Handling and Disposal BMP (SC08) in Appendix B. The BMP descriptions in Appendix B also include maps of where particular activities occur at SAN, as well as a list of the pollutants associated with those activities, and therefore the areas where the BMPs should be implemented.

Table 7-5. Industrial Inventory by Drainage Basin

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
1 Sampling location C-B01-11 was moved to location C-B03-21 to capture the effluent from a Stormfilter BMP, so treated runoff from Basins 1 and 3 is sampled	Authority Signature	Pesticide/herbicide usage Power washing Ramp/taxiway scrubbing Runway rubber removal	Antifreeze Asphalt debris Battery acid Brake fluid Cleaning solutions Fuel Hydraulic fluid Lubricants Metals Oil and grease Paints Rubber particulates Sediment Solvents Trash
2	Drainage Basin 2 has been discontinued	Drainage Basin 2 was determined to be integrated with Drainage Basin 1	Drainage Basin 2 used to include a lavatory waste disposal facility connected to the sanitary sewer, but this facility has been moved to Drainage Basin 8.
3 (C-B03-1c, C-B03-2, C-B03-21)	Conrac DHL Authority Signature	Aircraft fueling Aircraft maintenance Aircraft sanitary services Building/grounds maintenance Cargo handling Chemical storage Equipment degreasing Equipment fueling Equipment maintenance Equipment storage Fluid leaks from aircraft Fuel spills Fuel storage Outdoor loading/unloading Outdoor waste storage Pesticide/herbicide usage Potable water flushing Ramp/taxiway scrubbing Runway rubber removal Vehicle fueling Vehicle maintenance	Antifreeze Asphalt debris Battery acid Brake fluid Cleaning solutions Dumpster wastes Fuel Hydraulic fluid Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Rubber particulates Solvents Trash

Table 7-5. Industrial Inventory by Drainage Basin (Continued)

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
4 (No safe sampling location identified. See Appendix D-1 MIP for details.)	Authority	Ramp/taxiway scrubbing Runway rubber removal Power washing	Antifreeze Asphalt debris Brake fluid Cleaning solutions Fuel Metals Oil and grease Paints Rubber particulates Sediment Trash
5 (C-B05-4, C-B05-13)	Conrac DHL FedEx Authority UPS	Aircraft fueling Aircraft maintenance Cargo handling Chemical storage Equipment degreasing Equipment fueling Equipment maintenance Equipment storage Fluid leaks from aircraft Fuel spills Fuel storage Metals storage Outdoor apron wash Outdoor waste storage Vehicle fueling Vehicle maintenance	Antifreeze Asphalt debris Battery acid Brake fluid Cleaning solutions Dumpster wastes Fuel Hydraulic fluids Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Pesticides/herbicides/ fertilizers Rubber particulates Sediment Solvents Trash
5a	No industrial tenants	None	None

Table 7-5. Industrial Inventory by Drainage Basin (Continued)

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
6 (C-B06-5a, C-B06-14, C-B06-15a, C-B06-16a, C-B06-17, C-B06-19, C-B06-20)	Allied Aviation American ARFF Bradford DHL FedEx Authority Siemens UPS	Aircraft fueling Aircraft maintenance Aircraft sanitary services Building/grounds maintenance Cargo handling Chemical storage Equipment fueling Equipment maintenance Equipment painting Equipment storage Firefighting equipment testing Fluid leaks from aircraft/automobiles Fuel spills Fuel storage Loading/unloading of gasoline, diesel,and jet fuel Metals storage Offloading of water/ fuel mixture from a 3,000-gallon UST Outdoor apron wash Outdoor steam cleaning Outdoor waste storage Pesticide/herbicide usage Potable water flushing Ramp/taxiway scrubbing Runway rubber removal Vehicle fueling Vehicle maintenance	Acetone Adhesives Antifreeze Battery acid Brake fluid Carburetor cleaner Cleaning solutions Diesel Deicing/anti-icing fluids Dumpster wastes AFFF Fire Fighting Foam Gasoline Jet Fuel Hydraulic fluids Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Pesticides/herbicides Propylene glycol Purple K Radioactive goods Recyclable paper/cardboard Rubber particulates Sealants Sediment Solvents Sump fuel Trash Transmission fluid

Table 7-5. Industrial Inventory by Drainage Basin (Continued)

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
7 (C-B07-6, C-B07-7)	Alaska Allied Aviation American Delta FlagShip Menzies Authority Southwest United	Aircraft maintenance Aircraft washing Building/grounds maintenance Cargo handling Chemical storage Equipment degreasing Equipment fueling Equipment maintenance Equipment storage Equipment washing Fuel spills Fuel storage Loading/unloading of gasoline, diesel, and jet fuel Metals storage Oils storage Outdoor steam cleaning Outdoor waste storage Power washing Vehicle fueling Vehicle maintenance Vehicle washing	Acetic acid Acetone Adhesives Antifreeze Battery acid Brake fluid Coolant Cleaning solutions Diesel Dumpster wastes Gasoline Hydraulic fluids Jet fuel Landscape wastes Lubricants Metals Oil and grease Paints Propylene glycol Rust preventer Sealants Solvents Sump fuel Trash
8 (C-B08-8, C-B08-22*) *Alternate sampling location. Will be used to represent runway runoff if C-B03-1c is inaccessible due to safety reasons.	Alaska Allegiant American Delta FlagShip Frontier Authority Siemens Southwest Spirit Sun Country	Aircraft deicing Aircraft fueling Aircraft maintenance Aircraft sanitary services Aircraft washing Building/grounds maintenance Cargo handling Chemical storage Equipment fueling Equipment maintenance Equipment storage Equipment washing Fluid leaks from aircraft Fuel spills Fuel storage Metals storage Oils storage Outdoor apron wash Outdoor loading/unloading Outdoor waste storage Power washing Pesticide/herbicide usage Potable water flushing Ramp/taxiway scrubbing Runway rubber removal Vehicle fueling Vehicle maintenance	Acetone Antifreeze Battery acid Brake fluid Caulking Cleaning solutions Coolant Degreasers Dumpster wastes Fuel Galvanizing compound Hydraulic fluids Landscape wastes Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Pesticides/herbicides/ fertilizers Propylene glycol Rubber particulates Sealant Solvents Trash Transmission fluid Turpentine
9	No Industrial Tenants	None	None

Table 7-5. Industrial Inventory by Drainage Basin (Continued)

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
10	No Industrial Tenants	None	None
11	No Industrial Tenants	None	None
12 (C-B12-9a)	Air Canada Allegiant American Delta JetBlue Authority Siemens Spirit Sun Country United	Aircraft fueling Aircraft maintenance Aircraft sanitary services Aircraft washing Building/grounds maintenance Cargo handling Chemical storage Equipment fueling Equipment maintenance Equipment storage Fluid leaks from aircraft Fuel spills Fuel storage Metals storage Oils storage Outdoor apron wash Outdoor loading/unloading Outdoor waste storage Pesticide/herbicide usage Potable water flushing Power washing Ramp/taxiway scrubbing Vehicle fueling Vehicle maintenance	Acetone Antifreeze Battery acid Brake fluid Caulking Cleaning solutions Coolant Degreasers Dumpster wastes Fuel Galvanizing compound Hydraulic fluids Landscape wastes Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Pesticides/herbicides Rubber particulates Sealant Solvents Trash Transmission fluid Turpentine
13	No Industrial Tenants	None	None
14	No Industrial Tenants	None	None

Table 7-5. Industrial Inventory by Drainage Basin (Continued)

Drainage Basin/ Sampling Location ID	Facilities Located or Operating in Drainage Basin	Industrial Activities Conducted, Source Areas, or Potential Sources Within the Drainage Basin	Potential Industrial Pollutants
15 (C-B15-18a)	British Airways Delta Edelweiss Hawaiian Japan Airlines Lufthansa Authority Siemens United West Jet	Aircraft fueling Aircraft maintenance Aircraft overnight parking Aircraft sanitary services Aircraft washing Building/grounds maintenance Cargo handling Chemical storage Equipment fueling Equipment maintenance Equipment storage Fluid leaks from aircraft Fuel spills Fuel storage Metals storage Oils storage Outdoor apron wash Outdoor loading/unloading Outdoor waste storage Pesticide/herbicide usage Potable water flushing Power washing Ramp/taxiway scrubbing Vehicle fueling Vehicle maintenance	Acetone Antifreeze Battery acid Brake fluid Caulking Cleaning solutions Coolant Degreasers Dumpster wastes Fuel Galvanizing compound Hydraulic fluids Landscape wastes Lavatory chemicals Lavatory wastes Lubricants Metals Oil and grease Paints Pesticides/herbicides Rubber particulates Sealant Solvents Trash Transmission fluid Turpentine

7.7.4 BEST MANAGEMENT PRACTICE REQUIREMENTS

A BMP is broadly defined as any program, technology, process, siting criteria, operating method, measure, or device that controls, removes, or reduces pollution in storm water and authorized NSWDs. The Authority has identified BMPs that are required to control industrial/commercial pollutant sources at SAN, in accordance with Provision E.5.b of the Municipal Permit and Section X.H of the Industrial Permit. The required BMPs were first presented in the SWMP prepared under the 2001 Municipal Permit (RWQCB Order No. 2001-01).

Both the Industrial Permit and the Municipal Permit require the Authority to implement BMPs to address potential pollutant discharges; however, the performance standard established by each permit is different. The Industrial Permit requires that the implementation of BMPs achieve BAT for toxic and nonconventional pollutants and BCT for conventional pollutants. The Municipal Permit requires that the implementation of BMPs achieve MEP. These standards were taken into account when developing the BMP requirements at SAN.

BMPs are commonly defined two ways: nonstructural or structural, and source control or treatment control. Nonstructural BMPs generally consist of processes, prohibitions, procedures, schedules of activities, etc., that prevent pollutants associated with industrial activities from entering storm water or authorized NSWDs. They are generally low cost and low technology in nature. Structural BMPs either prevent the pollutants from coming into contact with storm water or treat/remove the pollutants in storm water. On the other hand, source control BMPs prevent contact between storm water and the pollution source and can be structural or nonstructural. Treatment control BMPs treat the storm water to remove pollutant(s) and are structural by their basic nature. Treatment control BMPs are not 100 percent effective, even if maintained and operated properly. From a cost and aesthetic perspective, treatment control BMPs that use natural processes are usually preferred over other fabricated or manufactured designs when conditions allow. Source control BMPs are preferred over treatment control BMPs because they are generally 100 percent effective if implemented properly and are usually less costly than treatment control BMPs.

LID BMPs can include source control or treatment control BMPs and are defined in the Municipal Permit as, "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of water of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction." These types of BMPs are also referred to as Green Infrastructure. The types and designs of LID BMPs that can be implemented at SAN are discussed in detail in Appendix C.

The BMPs required by the Authority may consist of a single measure or activity, a set of BMPs, or a pollution prevention program. This section discusses BMPs that pertain to specific industrial activities and areas, as well as the minimum BMPs required airport-wide under the Industrial Permit. Also discussed are four specific pollution prevention programs implemented at SAN. One of these is the regularly scheduled power washing conducted by the airport janitorial services provider. The other three pollution prevention programs are conducted by the Authority and entail ramp sweeping, ramp scrubbing, and runway rubber removal. LID and structural treatment control BMPs implemented at SAN are discussed in Section 6.2 of the SWMP (presented in Attachment 1 of the SWPPP) and in the Treatment Controls BMP (TC-01) in Appendix B and in Appendix C. They are also discussed below as advanced BMPs under the Industrial Permit.

Additional operational BMPs are discussed in other sections of the SWMP, such as the NSWDs section (Section 3) and the Public Participation and Education Component section (Section 9).

7.7.4.1 Updated BMP Requirements

The BMPs required by the Authority to address industrial pollutant sources at SAN were first summarized into 19 BMP titles in Appendix B of the August 2003 version of the SWMP and last presented in the same appendix of the March 2008 version of the SWMP. These 19 BMP titles are updated and revised as described below, to arrive at the current total of 25 required BMP titles. The updates and revisions are based on information gathered during recent site visits and annual inspections, the 2005, 2007, 2011, 2012, 2014, 2016 and 2018 Site Audits (Amec Foster Wheeler, 2005, 2007, 2009, 2011, 2013, 2015, 2017), the 2006 BMP Recommendations Report (Amec Foster Wheeler, 2006), the 2016, 2017 and 2018 ERA Evaluations, as well as other information regarding current industry and technical standards. The updates and revisions include enhancements to existing BMPs currently being implemented at SAN and the addition of new BMPs where necessary.

One significant change has been the categorization of the BMPs according to the minimum BMPs required by Section X.H of the Industrial Permit. The required minimum BMPs include:

- Good housekeeping;
- Preventive maintenance;
- Spill and leak prevention and response;
- Material handling and waste management;
- Erosion and sediment controls;
- Employee training programs; and
- Quality assurance and recordkeeping.

A summary of updates to each BMP is as follows:

- SC01 – Non-Storm Water Management; BMP description enhanced to include 6 new elements and 1 modified element;
- SC02A – Outdoor Equipment Operations and Maintenance Areas; no changes;
- SC02B – Aircraft, Ground Vehicle, and Equipment Preventive Maintenance; 1 BMP description modified;
- SC02C – Electric Vehicle Maintenance; added;
- SC03 – Aircraft, Ground Vehicle, and Equipment Fueling; no changes;
- SC04 – Aircraft, Ground Vehicle, and Equipment Cleaning; BMP description enhanced to include 3 new elements;
- SC05 – Aircraft Deicing/Anti-Icing; name changed;
- SC06 – Outdoor Loading/Unloading of Materials; no changes;
- SC07 – Outdoor Material Storage; BMP description enhanced to include 1 new element and 1 modified element;
- SC08 – Waste Handling and Disposal; name changed, 2 BMP descriptions modified, and BMP description enhanced to include 1 new element;

- SC09 – Building and Grounds Maintenance; BMP description enhanced to include 9 new elements;
- SC10 – Employee Training; no changes;
- SC11 – Lavatory Service Operations; BMP description enhanced to include 1 modified element and 3 new elements;
- SC12 – Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing); BMP description enhanced to include 3 new elements;
- SC13 – Firefighting Foam Discharge; no changes;
- SC14 – Potable Water System Flushing; no changes;
- SC15 – Runway Rubber Removal; BMP description enhanced to include 1 new element;
- SC16 – Parking Lots; BMP description enhanced to include 6 new elements;
- SC17 – Storm Drain Maintenance; no changes;
- SC18 – Good Housekeeping; no changes;
- SC19 – Safer/Alternative Products; no changes;
- SC20 – Erodible Areas; added;
- SC21 – Construction and Remodeling/Repair; added;
- SR01 – Spill Prevention, Control, and Clean-up; name changed and BMP description enhanced to include four new elements; and
- TC01 – Treatment Controls; name changed and BMP description enhanced to include one new element.

All Authority staff and tenant personnel are required to implement the minimum BMPs as applicable and appropriate. Table 7-6 presents an assessment of the sources of pollutants that are likely to be found in storm water discharges at SAN and identifies the BMPs, in terms of individual BMP element, required to address those sources. Table 7-6 associates the pollutant sources with issues/areas identified by the BMP titles listed above. A list and description of all 25 BMP categories required by the Authority are in Appendix B. Appendix B also lists the pollutants reduced, the targeted pollutant-generating activities, and the applicable tenants responsible for each BMP, and materials or equipment needed for implementation of the BMP, and frequency of BMP implementation if applicable. The majority of BMPs are implemented during the course of daily operations (e.g., housekeeping and spill response). Each BMP has an associated map illustrating the areas of SAN where the BMP applies.

The particular BMPs, listed by individual element applicable to each tenant and to the Authority, are presented in Table 7-7, which also indicates whether the activity is being performed indoors or outdoors. The particular BMPs listed by individual element are presented in the Tenant Summary Sheets in Appendix E.

Table 7-8 summarizes the BMPs required at SAN in terms of the minimum BMP categories that they satisfy. Some SAN BMPs satisfy multiple requirements under the Industrial Permit.

Table 7-6. Potential Pollutant Sources at SAN

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Non-Storm Water Management throughout SAN	Prevention of NSWDs	Misinformation (improper/lack of signs)	Metals, particulates, sediment, solid waste	SC01-01 Notify SAN Communication Center (619-400-2710) and the Authority P&EAD (619-400-2784) if there is any evidence of illicit connections or illegal discharges. SC01-02 Provide the appropriate level of employee, tenant and public training or education in NSWD management, i.e., spill response and prevention, non-storm water pollution prevention, and hazardous materials management. SC01-03 Limit the availability of outdoor water supplies (e.g. hose bibs, faucets) and post with appropriate use signs to discourage uses that may pollute the storm drain system/receiving water. SC01-04 Ensure the site is free of evidence of illicit connections and illegal discharges. SC01-05 Do not irrigate during forecasted rain events and 48 hours following a rain event. SC01-06 Periodically inspect and maintain irrigation systems and landscaped areas to prevent prohibited over-irrigation and to repair any leaks. SC01-07 Direct air conditioning or refrigerator condensation to landscaping, porous surface, into the sanitary sewer, or for reuse. SC01-08 Irrigate using the satellite water-tracking system to reach proper levels of soil moisture applicable for landscaping, and follow City water restriction guidelines. SC01-09 Use a hand-held hose equipped with positive shut-off nozzle, handheld water container, or timed sprinkler system to irrigate landscaped areas. SC01-10 Prohibit over-irrigation of landscaped areas
		Litter improperly disposed of, including bottles and cans, paper and plastic bags, fast-food wrappers, cigarette butts, etc.	Solid waste	
		Improper hosing, power washing or washing down of vehicles or equipment	Fuel oil, particulates/sediment	
		Spills or leaks	Fuel, oils, sewage, trash	
		Over irrigation	Pesticides, sediment, bacteria, metals, nutrients	
		Air conditioning condensate	Particulate, metals, oil and grease, bacteria	
Outdoor Equipment Operations and Maintenance Areas	Equipment operations and maintenance	Vehicle and aircraft use and emissions	Metals, fuels, lubricants, antifreeze	SC02A-01 Equipment operations and maintenance areas should not be located directly in the path of storm drains. SC02A-02 Perform equipment operations and maintenance in designated areas with overhead cover for pollutant sources and/or activity areas.
		Industrial and commercial spills and releases	Metals, oils and greases, fuels, battery acids, antifreeze	
		Dirt or fluids from equipment and vehicles	Particulates/sediment, oils, lubricants, antifreeze, fuel, battery acid	
		Maintenance activities	Oil and grease, lubricants, hydraulic fluids, antifreeze	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Aircraft, Ground Vehicle, and Equipment Maintenance	Aircraft, ground vehicle, and equipment operations and maintenance	Industrial and commercial spills and releases	Metals, oils and greases, fuels, battery acids, antifreeze	SC02B-01 Employees are trained in safe vehicle and equipment operations and maintenance. SC02B-02 Aircraft, vehicle and equipment maintenance areas should not be located directly in the path of storm drains. SC02B-03 Perform maintenance of aircraft, ground vehicles and equipment in designated areas that are either indoors or are covered, bermed, enclosed, or sloped/positioned away from the MS4. SC02B-04 Perform regular equipment inspection and testing. SC02B-05 Inspect aircraft, vehicles and equipment on a regular basis for fluid leaks. Place drip pans under leaks as needed. SC02B-06 Maintain aircraft, vehicles and equipment in good condition to prevent or correct any leakage of oil or other fluids. SC02B-07 Use drip pans during maintenance. SC02B-08 Do not leave drip pans containing fluids or other open containers lying around. Regularly transfer fluids for recycling or proper disposal. SC02B-09 Minimize the use of solvents or use less toxic solvents whenever possible. If solvents cannot be avoided, clean or drain parts in self-contained sinks or drum units, and check those units regularly for leaks. SC02B-10 Store mechanical parts, equipment and vehicles awaiting repair/removal under cover and away from storm drains. SC02B-11 Store spill response materials in maintenance areas and on maintenance vehicles. Adequately collect/remove absorbent materials from area after use and dispose of them in an appropriate manner. SC02B-12 Remove fluids and batteries from salvage vehicles and equipment and dispose of properly. SC02B-13 Properly dispose of obsolete and inoperable vehicles and equipment.
		Dirt or fluids from aircraft, equipment, and vehicles	Particulates/sediment, oils, lubricants, antifreeze, fuel, battery acid	
		Maintenance activities	Oil and grease, lubricants, hydraulic fluids, antifreeze	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Electric Vehicle Maintenance and Charging Areas	Electric vehicle charging, vehicle parking, and battery maintenance	Electrolyte spills and improper storage of batteries	Acid, heavy metals	SC02C-01 Do not overcharge batteries in electric vehicles. SC02C-02 Park electric vehicles in cool and dry areas (e.g. shade under building) when not in use. SC02C-03 Use acid resistant drip pans sprinkled with battery acid neutralizing agent (e.g. lime or baking soda) when filling or cleaning electric vehicle batteries and dispose of waste properly. SC02C-04 Maintain battery acid neutralizing kits adjacent to charging stations. Adequately recover spill response material from area after use and dispose of them in an appropriate manner. SC02C-05 Avoid overfilling electric vehicle batteries. SC02C-06 Do not fill batteries or perform electric vehicle maintenance during rain events. SC02C-07 Store batteries inside in a cool and dry place if possible. If batteries are stored outside, store in a non-reactive container with a cover. SC02C-08 Clean battery case and terminals regularly or when there is a buildup of corrosion with a rag dampened with a solution of water and battery acid neutralizing agent. Capture any wastewater to be treated as hazardous waste. SC02C-09 Apply petroleum jelly or grease on battery terminals to slow down corrosion process.
		Overcharged vehicles	Acid, heavy metals	
Aircraft, Ground Vehicle, and Equipment Fueling	Fueling	Fuel spills and improper storage of fuel	Jet fuel, gasoline, diesel	SC03-01 Perform aircraft, ground vehicle and equipment fueling in the designated areas that are covered, bermed, enclosed, or sloped/positioned away from the MS4. SC03-02 Fueling areas should not be located directly in the path of storm drains. SC03-03 Label, regularly inspect and keep in good condition all tanks, piping and valves. SC03-04 Store absorbent booms, spill kits, or vacuum equipment in fueling areas or on fueling vehicles. SC03-05 Regularly inspect fueling areas. SC03-06 Monitor major fueling operations.
		Leaking storage tanks	Jet fuel, gasoline, diesel	
		Aircraft, equipment, and vehicle leaks and spills	Jet fuel, gasoline, diesel	
		Hosing or washing down fuel areas without proper containment	Jet fuel, gasoline, diesel	
		Storm water run-on and runoff from fueling areas	Jet fuel, gasoline, diesel	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
		Spills and leaks during delivery, including topping off	Jet fuel, gasoline, diesel	SC03-07 Use secondary containment or cover when transferring fuel from a tanker truck to a fuel tank. SC03-08 Use leak detection, overfill protection and spill prevention devices for tanks and piping. SC03-09 Use automatic shut-off mechanisms for fuel tankers and hose connections. SC03-10 Do not top off fuel tanks. SC03-11 Restrict access to fuel tanks and fueling vehicles.
Aircraft, Ground Vehicle, and Equipment Cleaning	Cleaning	Aircraft, vehicle, or equipment washing	Particulates/sediment, oil and grease, metals, soaps/cleaning solutions	SC04-01 Keep vehicles, equipment, and washing areas clean and free of waste. SC04-02 Use dry washing and surface preparation techniques where feasible. SC04-03 Wash areas should not be located directly in the path of storm drains. SC04-04 Use pigs and cover mats to cover all catch basins in the surrounding area to contain the wash water during washing activities. SC04-05 Perform all washing activities in designated areas that capture, filter and recycle water (e.g. at new Wash Bay Facility), or use reclaimed water and divert wash water to a structural treatment control BMP, sanitary sewer or dead end sump with pump. SC04-06 Perform routine visual observations of washing activities and inspect nearby storm drains to detect and prevent discharges from cleaning activities. SC04-07 Remove all excess materials such as drippings and residue by using vacuum methods. Properly dispose of all waste materials. SC04-08 Use a hand-held hose equipped with positive shut-off nozzle to wash vehicles. SC04-09 Wash vehicles, aircraft, and equipment between 4pm to 10am from November 1 to May 31 and between 6pm to 10am from June 1 to October 31.
		Fall out from pressure washing	Particulates/sediment, oil and grease, metals	
Aircraft Deicing/Anti-Icing	Deicing/anti-icing	Spraying deicing fluid onto aircraft	Ethylene or propylene glycol	SC05-01 Perform all anti-icing and deicing operations only in designated areas that are covered, bermed, enclosed or sloped/positioned away from the MS4. SC05-02 Monitor deicing and anti-icing operations regularly to ensure quantities of fluids used are at a minimum while not jeopardizing aircraft safety and operation.
		Deicing fluids dripping from aircraft without proper clean up	Ethylene or propylene glycol	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
				SC05-03 All fluids are captured or diverted to a structural treatment control BMP, recycling system, sanitary sewer or dead end sump with pump. SC05-04 Clean the designated anti-icing and deicing ramp areas following deicing/anti-icing operations with wet-type sweepers to remove deicing fluids from the paved areas.
Outdoor Loading and Unloading of Materials	Loading/ unloading	Spills or leaks during loading/unloading	Fuel, oils, trash/debris	SC06-01 Contractors and haulers should be made aware of and adhere to BMPs specifications that are relevant to the loading and unloading of materials. SC06-02 Loading and unloading areas should not be located directly in the path of storm drains. SC06-03 Loading and unloading areas should be graded, bermed, covered or otherwise protected to prevent contact with rainfall and storm water run-on and runoff. SC06-04 Equipment used for loading and unloading should be checked on a regular basis for leaks. SC06-05 Use drip pans or other containment measures under hoses. SC06-06 Keep loading and unloading areas free of spills and debris by containing and absorbing leaks during transfers and spillage from hose disconnections or cargo pallets; dispose of residue or debris properly. SC06-07 Spill kits or other measures are available in accessible locations near areas where spills may be likely to occur to contain spills and/or prevent tracking off site.
		Leaking of loading/unloading equipment	Fuel, hydraulic fluids	
Outdoor Material Storage	Material storage	Industrial and commercial spills and releases from storage units	Fuels, oil and grease, solvents, soap/cleaning fluids, lavatory chemicals, paints, battery acid, antifreeze, ethylene or propylene glycol, pesticides/herbicides, adhesives, rust preventers, AFFF, sealants	SC07-01 Outdoor material storage areas and equipment should not be located directly in the path of storm drains. SC07-02 Outdoor material storage areas have areas with overhead cover and secondary containment. SC07-03 Outdoor material storage areas are prevented from contacting storm water run-on and run-off (e.g., by the use of berms, wood pallets etc). SC07-04 Cover and contain material stockpiles or implement erosion control practices at the perimeter of the site and at any inlets or catch basins to prevent the off-site transport of eroded material.

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Outdoor Material Storage (continued)	Material storage	Lack of proper secondary containment	Fuels, oil and grease, solvents, soap/cleaning fluids, lavatory chemicals, paints, battery acid, antifreeze, ethylene or propylene glycol, pesticides/herbicides, adhesives, rust preventers, AFFF, sealants	SC07-05 Cover wood products treated with preservative chemicals with tarps or store them indoors. SC07-06 Install protection guards (bollards, posts, or guardrails) around ASTs and piping to prevent damage from vehicles or forklifts and any subsequent release. SC07-07 Regular inspections are performed on tanks, storage containers, and berms to check for corrosion, structural failure, loose fittings, poor welds, leaks etc. Repairs or replacements are performed as needed. SC07-08 Liquid materials in ASTs should be stored in double-walled, valved storage tanks or within concrete bermed secondary containment areas to provide the capacity to contain the entire volume of the single largest container, with sufficient freeboard to contain precipitation. The area inside the curb should slope to a drain. SC07-09 Precipitation from bermed areas should be drained to the sanitary sewer if available, or inspected and tested according to applicable regulations prior to its release to a storm drain. The drain must have a positive control, such as a lock, valve, or plug, below the product level in the tank to prevent release of contaminated liquids. SC07-10 Properly dispose of ponded storm water removed from bermed or containment areas. SC07-11 The facility/operation has and displays a San Diego County hazardous materials permit for hazardous materials storage. SC07-12 Maintain an accurate, up-to-date inventory of the materials delivered and stored on site. SC07-13 Do not permanently store equipment and materials in the bed of a pickup truck. If storing temporarily, provide cover and containment.
		Raw material, and finished product stock piles	Metals, sediments, particulates, debris	
		Contact between stored materials and storm water run-on/off due to lack of cover/berms, etc.	Fuels, oil and grease, solvents, soap/cleaning fluids, lavatory chemicals, paints, battery acid, antifreeze, ethylene or propylene glycol, pesticides/herbicides, adhesives, rust preventers, AFFF, sealants	
		Improper storage of fuel	Fuels	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Waste Handling/ Disposal	Waste handling/ disposal	Lack or failure of proper secondary containment	Oils, fuels, antifreeze, deicing fluids	SC08-01 Reduce the amount of waste generated (e.g., use only amount needed, use solvents more than once, practice good inventory control, do not over-buying, purchase long-lasting products, etc.). SC08-02 Recycle materials whenever possible. SC08-03 Designate waste/recycling areas with restricted access. SC08-04 Do not locate waste/recycling areas directly in the path of storm drains. SC08-05 Provide secondary containment and cover for wastes. SC08-06 Wastes that are not contained or covered are prevented from contacting storm water and run-on and run-off by the use of berms. SC08-07 All dumpsters are covered and kept closed and any drain holes plugged. SC08-08 Inspect on a frequent basis all waste collection and storage containers for evidence of leaks, spills, compromised structural integrity, and proper closure seal. SC08-09 Train all employees in the proper handling and disposal of waste materials. SC08-10 Store wastes and recyclable materials in appropriate containers and segregate and properly labeled them. SC08-11 Wastes are properly characterized and disposed. SC08-12 Prevent overflow of waste containers by timely pickup/service and removal. SC08-13 Perform dumpster cleaning in designated areas that are bermed to contain wash water. Properly dispose of all fluids collected or discharge to the sanitary sewer. SC08-14 Track waste generated, stored, and disposed.
		Waste container leaks	Oils, fuels, antifreeze, deicing fluids	
		Improper training procedures	Oils, fuels, antifreeze, deicing fluids, lavatory wastes and chemicals	
		Contact between stored waste and storm water run-on/off due to lack of cover/berms etc	Oils, fuels, antifreeze, deicing fluids, trash/debris	
		Improper disposal practices	Wastewater, oil and grease, fuels, rubber debris, trash	
		Irregular waste removal schedule	Oils, fuels, antifreeze, deicing fluids, trash/debris	
Building and Grounds Maintenance	Maintenance	Painting	Metals	
		Pesticide application	Organic compounds	
		Wood preserving	Metals	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
		Underground utilities (copper grounding wires in electrical vaults connected to storm drains) and lighting systems	Metals	SC09-01 Landscape, re-vegetate, or install erosion and sediment controls in areas of exposed soil. SC09-02 Use hand weeding when practical. SC09-03 Implement integrated pest management methods, minimize the use of pesticides, herbicides, and fertilizers and use according to directions. SC09-04 Use temporary BMPs such as portable booms and vacuum trucks to contain water from outdoor building or structure washdown activities. Use reclaimed water, where possible, and collect and properly dispose of all waste water through a permitted connection to the sanitary sewer. SC09-05 Compost or recycle grass trimmings, leaves, sticks, or other collected vegetation, where possible, or dispose of appropriately. SC09-06 Remove temporary stockpiled materials at the end of the day or place away from watercourses and drainage inlets, and berm and cover stockpiles to prevent material releases to the storm drain. SC09-07 Clean pavement or sidewalk (using dry methods or reclaimed water) of any residual materials or spills before applying irrigation water, and capture and properly dispose of any wash water. SC09-08 Repair damaged asphalt when degradation is observed. SC09-09 Reduce the exposure of galvanized or rusty metal structures to rainfall, where possible.
		Roofing	Metals, tar	
		Cement in concrete pouring	pH	
Employee Training	Training	Mismanagement	Oil and grease, hydrocarbons, pH, solid waste, particulates, sediment, ethylene glycol, metals, fuels, chemicals	
		Lack of education outreach programs	Oil and grease, hydrocarbons, pH, solid waste, particulates, sediment, ethylene glycol, metals, fuels, chemicals	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
		Inefficient or irregular training	Oil and grease, hydrocarbons, pH, solid waste, particulates, sediment, ethylene glycol, metals, fuels, chemicals	SC10-01 Update the Authority SWMP and tenant SWPPPs covering the facility or operation on a periodic basis and complete and insert the amendment pages for the SWMP or SWPPP, as needed. SC10-02 Train Authority and tenant employees and contractors in storm water pollution prevention education covering all storm water issues, implementation and effectiveness of BMPs, spill prevention and cleanup, hazardous materials management, right-to-know awareness, and SWMP or SWPPP implementation. SC10-03 Implement additional training programs for relevant Authority and tenant employees and contractors covering any Spill Plan implementation, the prohibition on cross-connections between sanitary sewers and storm drains, and contractor responsibility to comply with adopted BMPs. SC10-04 Maintain training records for 5 years of current employees that have participated in the storm water pollution prevention education program and other related training programs.
Lavatory Service Operation	Operating/ maintenance	Leaking or blocked hoses	Lavatory waste, BOD, lavatory chemicals	SC11-01 Triturator facilities are covered and have low roll-over type berming. SC11-02 Triturator facilities should not be located directly in the path of storm drains. SC11-03 Perform regular inspections of all hoses and fittings used for transferring lavatory waste and keep the equipment in good condition. SC11-04 Absorbent booms, spill kits and other containment equipment are present on lavatory service equipment and at the triturator facility. SC11-05 Perform all mixing and transfers of surfactants and disinfectants within the covered and bermed triturator area or under a cover. SC11-06 Use drip pans when draining aircraft lavatory systems. Immediately dump the collected drippage into the bulk storage tank on the lavatory service cart or lavatory service truck. SC11-07 Immediately clean and properly dispose of all spills of lavatory wastes and lavatory chemicals at the triturator facility. SC11-08 Secure all hoses, valves, and equipment when transporting lavatory waste. SC11-09 Perform lavatory truck cleanouts/backflushing and lavatory waste discharging to sanitary sewer connections ONLY at triturator facilities.
		Spills during operations	Lavatory waste, BOD, lavatory chemicals	
		Improper waste disposal	Lavatory waste, BOD, lavatory chemicals	
		Storm water contact with dirty lavatory trucks or hoses	Lavatory waste, BOD, lavatory chemicals	
		Lack of lavatory truck/hose maintenance	Lavatory waste, BOD, lavatory chemicals	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
				SC11-10 Completely drain all hoses. SC11-11 Use lavatory service cart or truck with spill prevention equipment installed, where possible. SC11-12 Temporary sanitary facilities must have secondary containment and be located away from watercourses, drainage facilities, traffic circulation and high wind areas. SC11-13 Regularly inspect temporary sanitary facilities for leaks and spills and clean or replace when necessary.

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Outdoor Wash Down/Sweeping (Apron Washing Ramp Scrubbing)	Washing/ sweeping	Fallout from pressure washing operations	Particulates/sediment, rubber, debris, oil and grease, fuel	SC12-01 Inspect and maintain sweeping and scrubbing equipment regularly to ensure effectiveness at removing pollutants and to avoid leaks. SC12-02 Roads, ramp areas, apron areas, and, if feasible, runway/taxiway areas are swept on a regular basis. SC12-03 Perform sweeping during dry weather using dry sweeping techniques where feasible. SC12-04 Operate sweepers at manufacturer-recommended optimal speeds. SC12-05 Properly dispose of debris and sediment from sweeping. SC12-06 Berm outdoor washdown areas to contain the wash water and to prevent run-on to adjacent areas. SC12-07 Minimize the amount of water used during outdoor washdown activities. SC12-08 Wash water is collected and filtered and reused, or discharged to the sanitary sewer system through a permitted connection at designated and approved discharge facilities (i.e., dewatering bin). SC12-09 Maintain records of the sweeping or scrubbing activities including the miles swept or scrubbed and the amount of waste collected. SC12-10 Do not use a running hose to wash down sidewalks, or other hard surface areas. A water-efficient, filtering and recycling device must be used and all wash water must be prevented from entering the storm drain system (curb gutters, streets, alleys, and inlets) SC12-11 Use reclaimed or recycled/filtered water. SC12-12 Roads, ramp areas, and apron areas are scrubbed on an as-needed basis.
		Improper waste disposal	Particulates/sediment, rubber, trash/debris, oil and grease, fuel, waste water, soaps	
		Irregular sweeping or scrubbing	Particulates/sediments, oils and grease, fuel, trash/debris	
		Industrial air emissions	Particulates/sediments, metals	
Fire Fighting Foam Discharge	Fire fighting	Ineffective containment of discharge	AFFF, wastewater	SC13-01 Do not perform fire fighting foam testing directly in the path of storm drains. SC13-02 Inspect and test fire fighting equipment on a regular basis. SC13-03 Perform fire fighting foam testing ONLY in a designated area that captures or divers all foam waste to a structural treatment control, sanitary sewer, or dead end sump with pump. SC13-04 Service sump(s) and/or oil-water separators on a regular basis. SC13-05 Prevent all designated testing areas from contacting storm water run on and run-off or from reaching storm drains (e.g. by the use of berms and sandbags).
		Improper vacuum procedure	AFFF, wastewater	
		Improper waste disposal	AFFF, wastewater	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Potable Water System Flushing	Flushing	Fallout from flushing operations	Particulates/sediment, metals, oil and grease, fuels	SC14-01 The aircraft potable water system and water truck flushing/cleaning areas should not be located directly in the path of storm drains. SC14-02 Perform potable water system flushing only in designated flushing/cleaning areas that capture or divert all wastewater away from storm drains, or to a structural treatment control, sanitary sewer, or dead end sump with pump. SC14-03 Prevent flushing/cleaning areas from contacting storm water run-on and run-off.
Runway Rubber Removal	Cleaning	Failure of equipment to adequately capture all waste water and debris	Rubber particulates/sediment/debris, metals, oil and grease, fuels	SC15-01 Minimize the amount of water used during runway rubber removal activities. SC15-02 Prevent waste water produced from runway rubber removal activities from entering the storm drainage system by immediately collecting and properly disposing of it. SC15-03 Use manual or mechanical cleaning methods such as mechanical street sweepers to remove rubber particulates from the runway and adjacent paved areas following runway rubber removal activities. SC15-04 Inspect storm drain inlets, catch basins, and runway drainage areas following runway rubber removal activities for any resulting debris, and remove and properly dispose of debris. SC15-05 Use reclaimed water, where possible.
Parking Lots	Maintenance of parking lots	Dirt and leaking fluids from equipment and vehicles	Particulates/sediment, oil and grease, brake fluid, fuel, antifreeze, metals	SC16-01 Post "No Littering" signs around parking lots and regularly empty trash receptacles. Trash receptacles must be covered. SC16-02 Sweep all parking lot areas on a regular basis to remove accumulated debris and sediment. SC16-03 Operate sweepers at manufacturer-recommended optimal speeds. SC16-04 Perform sweeping in parking lot areas when the number of parked vehicles is lowest to maximize areas swept. SC16-05 Maintain records of the sweeping activities including the miles swept and the amount of waste collected. SC16-06 Clean oily spots from parking lot surfaces with absorbent materials. SC16-07 Perform all repairs to parking lot surfaces during periods of dry weather. SC16-08 Cover and seal nearby storm drain inlets, catch basins, and manholes during parking lot repairs.
		Dirt and grit from parking lots, driveways, sidewalks and landscaped areas	Particulates/sediment, metals	
		Litter improperly disposed of, including bottles and cans, paper and plastic bags, fast-food wrappers, cigarette butts, and more	Solid waste/trash	
		Galvanized metal roofs, gutters and downspouts	Metals, sediment	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
		Paving and recycling operations	pH, debris, tar/hydrocarbons	SC16-09 Use drip pans and absorbent materials to catch and collect drips and leaks from paving equipment that are not in use. SC16-10 Hot bituminous materials used for parking lot repairs are to be preheated and transferred or loaded away from storm drain inlets. SC16-11 Properly dispose of used absorbent materials, debris, and collected drips. SC16-12 Avoid draining rooftop downspout drains onto paved parking lot surfaces. SC16-13 Sweep, vacuum, or use other dry methods to remove waste materials generated from repairs. SC16-14 Temporarily store waste materials and debris generated from parking lot repairs in containers or in stockpiles with cover and berm around them and away from storm drain inlets.
Storm Drain Maintenance	Maintenance	Fallout from MS4 cleaning operations	Particulates/sediments, metals, trash and debris, fuel, oil and grease, bacteria, waste water	SC17-01 Stencil storm drains with "No Dumping" messages. SC17-02 Conduct routine self-inspections of the storm drainage system. The Authority should inspect the entire MS4 at least annually, between the dates of May 1 and September 30. SC17-03 Use appropriate measures to prevent discharges during MS4 cleaning and maintenance. SC17-04 Clean and maintain storm drain inlets, catch basins, pipes, and other conveyance structures before the wet season and as needed. SC17-05 Clear open channels of accumulated litter in a timely manner. SC17-06 Properly dispose of all accumulated sediments, contaminants, debris and waste water from cleaning and maintenance activities. SC17-07 Maintain records for all inspections, cleaning, and maintenance, including the quantity of waste removed.
		Irregular or inadequate inspection and maintenance schedule	Particulates/sediments, metals, trash and debris, fuel, oil and grease, bacteria	
Housekeeping	Cleaning/ tidying	Insufficient facility and BMP inspections	Trash/debris, oil and grease, paints, fuels, pesticides/herbicides, hydraulic fluids, antifreeze, rust preventers, sealants	SC18-01 Perform and document on a regular basis self-inspections and evaluations of the implemented BMPs. SC18-02 Keep all facility and operation areas clean and orderly. SC18-03 Place trash receptacles that have covers in appropriate locations. SC18-04 Sweep all facility and operation areas at least once per week to prevent the accumulation of sediments, debris, and contaminants. SC18-05 Properly dispose of all debris and sediment from sweeping.
		Improper trash handling/trash or FOD cans not covered	Trash and debris, bacteria	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
		Lack or failure of proper secondary containment	Oils, fuels, antifreeze, brake fluids, hydraulic fluids, lubricants, paints, deicing fluids	SC18-06 Store significant materials in the appropriate containers that are properly sealed and labeled. SC18-07 Store significant materials within secondary containment. SC18-08 Store significant materials in a restricted access area. SC18-09 Material Safety Data Sheets (MSDSs) are readily available for all significant materials.
		Dirt and grit from ramp and facility areas	Particulates/sediment, metals, trash, and debris	
Safer/Alternative Products	Replacement of toxic with less or non-toxic materials	Use of toxic materials	Metals, hydrocarbons, synthetic organic compounds	SC19-01 Whenever possible, use alternative products that are "Regionally Accepted" and are identified as being non-toxic, less toxic, or biodegradable. SC19-02 Whenever possible, maximize the purchase and use of products containing recycled materials.
Erodible areas	Erosion	Erosion of disturbed areas	Sediment	SC20-01 Implement erosion control BMPs to stabilize soils. SC20-02 Implement wind erosion control BMPs to control dust. SC20-03 Maintain effective perimeter controls. SC20-04 Stabilize loose soils and slopes prior to a forecasted storm event. SC20-05 Prevent material tracking off site. SC20-06 Divert all storm water away from erodible materials.
		Wind erosion	Sediment	
Construction and remodeling/repair	Construction	Erosion from erodible surfaces	Sediment	SC21-01 Avoid outdoor repairs and construction during rain events or during any period for which the National Weather Service is forecasting a 50% chance of precipitation. SC21-02 Stabilize inactive areas (where there will be no construction for 14 days) or finished slopes or erodible areas with erosion control. SC21-03 Implement wind erosion control BMPs to control dust, and limit traffic to stabilized roadways within the site, where possible. SC21-04 Maintain effective perimeter and run-on controls. SC21-05 Maintain effective inlet protection. SC21-06 Install a stabilized construction entrance to prevent off site tracking. SC21-07 Sweep streets of any loose dirt or materials. SC21-08 Cover and contain all chemicals, liquids, erodible landscape materials, and fertilizers when not in use. SC21-09 Discontinue use of erodible landscape material within 2 days prior to forecast rain even or when it's raining.

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
Construction and remodeling/repair (continued)	Construction	Off-site material tracking	Sediment, metals, oil, fuel, paint, trash/debris, hydraulic fluids, antifreeze, rust preventers, sealants	SC21-10 Waste containers are covered at the end of each work day and when it is raining. Use plastic under-sheets when appropriate. SC21-11 Cover waste containers at the end of each work day and prior to a rain event, and have waste recycled or collected and properly disposed of frequently. SC21-12 Perform concrete washout in designated areas away from inlets and drainage courses, and in appropriately sized and designed pits or containers. Empty regularly. SC21-13 Temporary sanitary facilities must have secondary containment and be located away from storm drains and traffic circulation. SC21-14 Minimize water usage and use reclaimed water where possible. SC21-15 Contain any particulate generating activities. SC21-16 Designate areas for fueling equipment and vehicles away from inlets and drainage courses, or perform off site.
		Material spills	Metals, oil, fuel, paint, trash/debris, hydraulic fluids, antifreeze, rust preventers, sealants	
Spill Prevention, Control & Clean-up	Spill control	Fuel spills and improper storage of fuel	Fuels	SR01-01 Develop, implement and keep current Spill Plan, and develop facility spill prevention and response procedures. SR01-02 Post a summary of the Spill Plan and spill response procedures, at key locations, identifying the spill cleanup coordinators, location of cleanup equipment, and phone numbers of regulatory agencies to be contacted in the event of a spill. SR01-03 Train relevant employees and contractors in the implementation of the Spill Plan, if applicable, or spill control procedures. SR01-04 Use leak and spill prevention devices. SR01-05 Place adequate spill kits in appropriate locations. SR01-06 Notify Airport Operations (619-400-2710), the Authority P&EAD (619-400-2784), and any agencies or companies identified in the Spill Plan or facility spill prevention and response procedures in the event of a spill. SR01-07 In the event of a spill or release, immediately follow procedures identified in the Spill Plan or facility spill prevention and response procedures. SR01-08 Use only dry cleaning methods. SR01-09 Properly dispose of all used spill control and clean-up materials.
		Improper waste storage and disposal	Oil and grease, fuel, hydraulic fluids, antifreeze, lubricants	
		Aircraft, equipment and vehicle fluid leaks and spills	Oil and grease, fuel, hydraulic fluids, antifreeze, lubricants, battery acid	
		Inadequate spill response or spill response materials	Oil and grease, fuel, hydraulic fluids, antifreeze, lubricants, battery acid	
		Lack or failure of proper secondary containment	Oil and grease, fuel, hydraulic fluids, antifreeze, lubricants, battery acid	

Table 7-6. Potential Pollutant Sources at SAN (continued)

Area	Activity	Pollutant Source	Pollutant	Best Management Practices
				SR01-10 Waste water from washing activities is captured by vacuum and properly disposed of, or is diverted to a structural treatment control, sanitary sewer, or dead end sump with pump.
Treatment Controls	Inspections/ cleaning/ maintenance	Irregular or inadequate inspections and maintenance	Particulates/sediment, oil and grease, metals, trash and debris, fuels	TC01-01 Regularly inspect, clean, and maintain all structural treatment control BMPs to prevent the accumulation or resuspension of oil, grease, floating debris and sediments. TC01-02 During cleaning operations, close any effluent valves at the treatment control device and properly dispose of any standing water and accumulated waste that are removed. Replace oil absorbent pads in the treatment control device prior to the start of the wet season and as needed. TC01-03 Document and maintain records for all inspections, cleaning, and maintenance of structural treatment control BMPs. TC01-04 Perform an annual inventory of all structural treatment control BMPs.

Table 7-7. BMPs Applicable to Individual Industrial Sites/Sources

TENANTS	SUMMARY OF INDUSTRIAL ACTIVITY CATEGORIES (See Appendix B For Associated BMPs)	AIRCRAFT				VEHICLES AND EQUIPMENT					OTHER																
		Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Aircraft Deicing/Anti-Icing	Lavatory Service Operation	Outdoor Equipment Ops and Maintenance Areas	Aircraft, Ground Vehicle and Equipment Maintenance	Electrical Vehicle Maintenance	Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Non-Storm Water Management	Outdoor Loading/Unloading of Materials	Outdoor/Indoor Material Storage	Waste Handling and Disposal	Building and Grounds Maintenance	Employee Training	Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)	Fire Fighting Foam Discharge	Potable Water System Flushing	Runway Rubber Removal	Parking Lots	Storm Drain Maintenance	Housekeeping	Safer/Alternative Products	Erodible Surfaces	Construction and Remodeling Repair	Spill Prevention, Control, and Clean-up	Treatment Controls
		SC03	SC04	SC05	SC11	SC02A	SC02B	SC02C	SC03	SC04	SC01	SC06	SC07	SC08	SC09	SC10	SC12	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SR01	TCO1
Air Canada	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11,14, 18, 19, SR01	O	O		O	O	O	I/O	O	O	I/O	O	I/O	I		X			O				O	X		O	
Alaska	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O	O		O	O	O	O	O	O	I/O	O	I	I		X			O				X	X		I/O	
Allegiant	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O	O		O	O	O	I/O	O	O	I/O	O	O	I		X			O				O	X		O	
Allied Aviation	SC01, 02A, 02B, 03, 04 06, 07, 08, 09, 10, 12, 13, 16, 17, 18, 19, SR01, TC01	O				O	O		O	O	I/O	O	I/O	O	I/O	X	O	O			O	O	O	X			O	O
American Airlines	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 09, 10, 11, 12, 14, 18, 19, SR01	O	O		O	O	I	I	O	O	I/O	O	I/O	I/O	O	X	O		O				I/O	X			I/O	
ARFF	SC01, 02A, 02B, 03, 04, 07, 08, 09, 10, 13, 16, 17, 18, 19, SR01					O	I		I	O	I/O		I	I/O	O	X		O			O	O	I /O	X			I/O	
Bradford	SC01, 02A, 02B, 04, 06, 08, 09, 10, 16, 18, 19, SR01, TC01		I			I	I/O			I	I/O	O		I/O	I/O	X					O		I/O	X			I/O	O
British Airways	SC01, 02A, 02B, 03, 04, 06, 08, 10, 11, 14, 18, 19, SR01	O			O	O	I/O			O	I/O	O		I		X			O				O	X			I/O	

Table Notes:

Industrial Activity Category
SC01 - Non-Storm Water Management
SC02A - Outdoor Equipment Ops and Maintenance Areas
SC02B - Aircraft, Ground Vehicle and Equipment Maintenance
SC03 - Aircraft, Ground Vehicle and Equipment Fueling
SC04 - Aircraft, Ground Vehicle and Equipment Cleaning
SC05 - Aircraft Deicing/Anti-Icing
SC06 - Outdoor Loading/Unloading of Materials
SC07 - Outdoor/Indoor Material Storage
SC08 - Waste Handling and Disposal
SC09 - Building and Grounds Maintenance
SC10 - Employee Training
SC11 - Lavatory Service Operation

Industrial Activity Category (continued)
SC12 - Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)
SC13 - Fire Fighting Foam Discharge
SC14 - Potable Water System Flushing
SC15 - Runway Rubber Removal
SC16 - Parking Lots
SC17 - Storm Drain Maintenance
SC18 - Housekeeping
SC19 - Safer/Alternative Products
SC20 – Erodible Areas
SC21 – Building Repair & Construction
SR01 - Spill Prevention, Control, and Clean-up
TC01 - Treatment Controls

Codes:
BMP = Best Management Practice
I = The industrial activity is performed by the tenant indoors
I/O = The industrial activity is performed by the tenant both indoors and outdoors
X = The activity applies to the tenant identified, without distinction regarding indoors or outdoors.

Table 7-7. BMPs Applicable to Individual Industrial Sites/Sources (continued)

TENANTS	SUMMARY OF INDUSTRIAL ACTIVITY CATEGORIES (See Appendix B For Associated BMPs)	AIRCRAFT				VEHICLES AND EQUIPMENT					OTHER																
		Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Aircraft Deicing/Anti-Icing	Lavatory Service Operation	Outdoor Equipment Ops and Maintenance Areas	Aircraft, Ground Vehicle and Equipment Maintenance	Electrical Vehicle Maintenance	Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Non-Storm Water Management	Outdoor Loading/Unloading of Materials	Outdoor/Indoor Material Storage	Waste Handling and Disposal	Building and Grounds Maintenance	Employee Training	Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)	Fire Fighting Foam Discharge	Potable Water System Flushing	Runway Rubber Removal	Parking Lots	Storm Drain Maintenance	Housekeeping	Safer/Alternative Products	Erodible Surfaces	Construction and Remodeling Repair	Spill Prevention, Control, and Clean-up	Treatment Controls
		SC03	SC04	SC05	SC11	SC02A	SC02B	SC02C	SC03	SC04	SC01	SC06	SC07	SC08	SC09	SC10	SC12	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SR01	TCO1
Conrac	SC01, 02A, 02B, 03, 04, 06, 08, 09, 10, 12, 16, 18, 19, 20, SR01, TC01					I	I	I	I	I	I	I/O	I	I	I	X	O				I		I	X	O		I	I/O
Delta	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 12, 16, 17, 18, 19, SR01	O			O	O	I/O	I/O	O	O	I/O	O	I/O	I/O		X	O				O	O	I/O	X			O	
DHL	SC01, 02A, 02B, 03, 04, 06, 07, 08, 09, 10, 11, 12, 18, 19, SR01	O	X		O	O	O		O	X	I/O	O	I/O	I/O	I/O	X	O						I/O	X			I/O	
Edelweiss	SC01, 02A, 02B, 03, 04, 07, 11, 14, 18, 19, SR01	O			O	O	I/O		O	X	I/O		I/O						O				O	X			O	
FedEx	SC01, 02A, 02B, 03, 04, 06, 07, 08, 09, 10, 12, 14, 16, 18, 19, SR01, TC01	O	O			O	O		O	O	I/O	O	O	I/O	I/O	X	O		O		O		O	X			O	O
FlagShip	SC01, 02A, 02B, 03, 04, 06, 07, 08, 09, 10, 12, 18, 19, SR01					I/O	I/O		O	O	I/O	O	I/O	O	O	X	O						O	X			O	
Frontier	SC01, 02A, 02B, 03, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O			O	O	I/O		X		I/O	O	I/O	I/O		X			O				O	X			O	
Hawaiian	SC01, 02A, 02B, 03, 04, 06, 07, 08, 10, 11, 12, 14, 18, 19, SR01	O	O		O	O	X		O	O	I/O	O	O	I/O		X	O		O				O	X			O	

Table Notes:

Industrial Activity Category
SC01 - Non-Storm Water Management
SC02A - Outdoor Equipment Ops and Maintenance Areas
SC02B - Aircraft, Ground Vehicle and Equipment Maintenance
SC03 - Aircraft, Ground Vehicle and Equipment Fueling
SC04 - Aircraft, Ground Vehicle and Equipment Cleaning
SC05 - Aircraft Deicing/Anti-Icing
SC06 - Outdoor Loading/Unloading of Materials
SC07 - Outdoor/Indoor Material Storage
SC08 - Waste Handling and Disposal
SC09 - Building and Grounds Maintenance
SC10 - Employee Training
SC11 - Lavatory Service Operation

Industrial Activity Category (continued)
SC12 - Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)
SC13 - Fire Fighting Foam Discharge
SC14 - Potable Water System Flushing
SC15 - Runway Rubber Removal
SC16 - Parking Lots
SC17 - Storm Drain Maintenance
SC18 - Housekeeping
SC19 - Safer/Alternative Products
SC20 – Erodible Areas
SC21 – Building Repair & Construction
SR01 - Spill Prevention, Control, and Clean-up
TC01 - Treatment Controls

Codes:
BMP = Best Management Practice
I = The industrial activity is performed by the tenant indoors
I/O = The industrial activity is performed by the tenant both indoors and outdoors
X = The activity applies to the tenant identified, without distinction regarding indoors or outdoors.

Table 7-7. BMPs Applicable to Individual Industrial Sites/Sources (continued)

TENANTS	SUMMARY OF INDUSTRIAL ACTIVITY CATEGORIES (See Appendix B For Associated BMPs)	AIRCRAFT				VEHICLES AND EQUIPMENT					OTHER																
		Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Aircraft Deicing/Anti-Icing	Lavatory Service Operation	Outdoor Equipment Ops and Maintenance Areas	Aircraft, Ground Vehicle and Equipment Maintenance	Electrical Vehicle Maintenance	Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Non-Storm Water Management	Outdoor Loading/Unloading of Materials	Outdoor/Indoor Material Storage	Waste Handling and Disposal	Building and Grounds Maintenance	Employee Training	Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)	Fire Fighting Foam Discharge	Potable Water System Flushing	Runway Rubber Removal	Parking Lots	Storm Drain Maintenance	Housekeeping	Safer/Alternative Products	Erodible Surfaces	Construction and Remodeling Repair	Spill Prevention, Control, and Clean-up	Treatment Controls
		SC03	SC04	SC05	SC11	SC02A	SC02B	SC02C	SC03	SC04	SC01	SC06	SC07	SC08	SC09	SC10	SC12	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SR01	TCO1
Japan Airlines	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 18, 19, SR01	O	O		O	O	O	O	O	O	I/O	O	O	I		X							O	X			O	
JetBlue	SC01, 02A, 02B, 03, 04, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O	O		O	O	O			O	I/O	O	O	I/O		X			O				O	X			O	
Lufthansa	SC01, 02A, 02B, 03, 04, 06, 07, 08, 10, 11, 12, 18, SR01	O	O		O	O	O		O	O	I/O	O	O	I/O		X	O						O				O	
Menzies	SC01, 02A, 02B, 03, 04, 06, 07, 08, 09, 10, 12, 16, 18, 19, SR01	O				O	I		O	O	I/O	O	I/O	I	I/O	X	O				O		I/O	X			I/O	
SDCRAA	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 09, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, SR01, TC01				O	O	O	I/O	O	O	I/O	O	I/O	I/O	I/O	X	O			O	O	O	I/O	X	O	I/O	I/O	O
Siemens	SC01, 02B, 02C, 08, 10, 18, 19, SR01						I/O	I/O			I/O			O		X							O	X			I/O	
Signature	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 09, 10, 11, 16, 17, 18, 19, 20, SR01, TC01	O	O		O	O	O	O	O	O	I/O	O	I/O	O	O	X					O	O	O	X	O		O	O
Southwest	SC01, 02A, 02B, 02C, 03, 04, 05, 06, 07, 08, 10, 11, 12, 14, 16, 18, 19, SR01	O		O	O	O	I/O	I/O	O	O	I/O	O	I/O	I/O		X	O		O		O		I/O	X			I/O	

Table Notes:

Industrial Activity Category
SC01 - Non-Storm Water Management
SC02A - Outdoor Equipment Ops and Maintenance Areas
SC02B - Aircraft, Ground Vehicle and Equipment Maintenance
SC03 - Aircraft, Ground Vehicle and Equipment Fueling
SC04 - Aircraft, Ground Vehicle and Equipment Cleaning
SC05 - Aircraft Deicing/Anti-Icing
SC06 - Outdoor Loading/Unloading of Materials
SC07 - Outdoor/Indoor Material Storage
SC08 - Waste Handling and Disposal
SC09 - Building and Grounds Maintenance
SC10 - Employee Training
SC11 - Lavatory Service Operation

Industrial Activity Category (continued)
SC12 - Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)
SC13 - Fire Fighting Foam Discharge
SC14 - Potable Water System Flushing
SC15 - Runway Rubber Removal
SC16 - Parking Lots
SC17 - Storm Drain Maintenance
SC18 - Housekeeping
SC19 - Safer/Alternative Products
SC20 – Erodible Areas
SC21 – Building Repair & Construction
SR01 - Spill Prevention, Control, and Clean-up
TC01 - Treatment Controls

Codes:
BMP = Best Management Practice
I = The industrial activity is performed by the tenant indoors
I/O = The industrial activity is performed by the tenant both indoors and outdoors
X = The activity applies to the tenant identified, without distinction regarding indoors or outdoors.

Table 7-7. BMPs Applicable to Individual Industrial Sites/Sources (continued)

TENANTS	SUMMARY OF INDUSTRIAL ACTIVITY CATEGORIES (See Appendix B For Associated BMPs)	AIRCRAFT				VEHICLES AND EQUIPMENT					OTHER																
		Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Aircraft Deicing/Anti-Icing	Lavatory Service Operation	Outdoor Equipment Ops and Maintenance Areas	Aircraft, Ground Vehicle and Equipment Maintenance	Electrical Vehicle Maintenance	Aircraft, Ground Vehicle and Equipment Fueling	Aircraft, Ground Vehicle and Equipment Cleaning	Non-Storm Water Management	Outdoor Loading/Unloading of Materials	Outdoor/Indoor Material Storage	Waste Handling and Disposal	Building and Grounds Maintenance	Employee Training	Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)	Fire Fighting Foam Discharge	Potable Water System Flushing	Runway Rubber Removal	Parking Lots	Storm Drain Maintenance	Housekeeping	Safer/Alternative Products	Erodible Surfaces	Construction and Remodeling Repair	Spill Prevention, Control, and Clean-up	Treatment Controls
		SC03	SC04	SC05	SC11	SC02A	SC02B	SC02C	SC03	SC04	SC01	SC06	SC07	SC08	SC09	SC10	SC12	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SR01	TCO1
Spirit	SC01, 02A, 02C, 03, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O			O	O		O	O		I/O	O	I/O	O		X			O				O	X			O	
Sun Country	SC01, 02A, 02B, 03, 06, 08, 10, 11, 18, 19, SR01	O			O	I	I				I/O	O		O		X							O	X			O	
United	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 18, 19, SR01	O			O	I/O	I/O	I/O	O	O	I/O	O	I/O	I/O		X							I/O	X				
UPS	SC01, 02A, 02B, 03, 04, 06, 07, 08, 09, 10, 11, 12, 16, 18, 19, SR01	O	X		O	O	O		O	X	I/O	O	O	O	I/O	X	O						O	X			O	
West Jet	SC01, 02A, 02B, 02C, 03, 04, 06, 07, 08, 10, 11, 14, 18, 19, SR01	O	O		O	O	O	I/O		O	I/O	O	O	I		X			O				O	O			O	

Table Notes:

Industrial Activity Category

SC01 - Non-Storm Water Management
SC02A - Outdoor Equipment Ops and Maintenance Areas
SC02B - Aircraft, Ground Vehicle and Equipment Maintenance
SC03 - Aircraft, Ground Vehicle and Equipment Fueling
SC04 - Aircraft, Ground Vehicle and Equipment Cleaning
SC05 - Aircraft Deicing/Anti-Icing
SC06 - Outdoor Loading/Unloading of Materials
SC07 - Outdoor/Indoor Material Storage
SC08 - Waste Handling and Disposal
SC09 - Building and Grounds Maintenance
SC10 - Employee Training
SC11 - Lavatory Service Operation

Industrial Activity Category (continued)

SC12 - Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)
SC13 - Fire Fighting Foam Discharge
SC14 - Potable Water System Flushing
SC15 - Runway Rubber Removal
SC16 - Parking Lots
SC17 - Storm Drain Maintenance
SC18 - Housekeeping
SC19 - Safer/Alternative Products
SC20 – Erodible Areas
SC21 – Building Repair & Construction
SR01 - Spill Prevention, Control, and Clean-up
TC01 - Treatment Controls

Codes:

BMP = Best Management Practice
I = The industrial activity is performed by the tenant indoors
I/O = The industrial activity is performed by the tenant both indoors and outdoors
X = The activity applies to the tenant identified, without distinction regarding indoors or outdoors.

Table 7-8. Minimum BMPs Implemented at SAN

Industrial Permit Minimum BMPs		BMPs Applicable to Authority and Tenants
Good Housekeeping	Observe all outdoor areas associated with industrial activity; including storm water discharge locations, drainage areas, conveyance systems, waste handling/disposal areas, and perimeter areas impacted by off-facility materials or storm water run-on to determine housekeeping needs. Any identified debris, waste, spills, tracked materials, or leaked materials shall be cleaned and disposed of properly.	SC-01: Non-Storm Water Management SC-02A: Outdoor Equipment Ops and Maintenance Areas SC-07: Outdoor/Indoor Material Storage SC-09: Building and Grounds Maintenance SC-15: Runway Rubber Removal SC-16: Parking Lots SC-17: Storm Drain Maintenance SC-18: Housekeeping SC-19: Safer/Alternative Products
	Minimize or prevent material tracking.	SC-18: Housekeeping SC-20: Erodible Areas SC-21: Building Repair and Construction
	Minimize dust generated from industrial materials or activities.	SC-20: Erodible Areas SC-21: Building Repair and Construction
	Ensure that all facility areas impacted by rinse/wash waters are cleaned as soon as possible.	SC-12: Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing) SC-18: Housekeeping
	Cover all stored industrial materials that can be readily mobilized by contact with storm water.	SC-07: Outdoor/Indoor Material Storage SC-18: Housekeeping
	Contain all stored non-solid industrial materials or waste (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water.	SC-12: Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing) SC-18: Housekeeping
	Prevent disposal of any rinse/wash waters or industrial materials into the storm water conveyance system.	SC-07: Outdoor/Indoor Material Storage SC-09: Building and Grounds Maintenance SC-12: Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing) SC-17: Storm Drain Maintenance SC-18: Housekeeping
	Minimize authorized NSWDs from non-industrial areas (e.g., potable water, fire hydrant testing, etc.) that contact industrial areas of the facility.	SC-01: Non-Storm Water Management SC-02A: Outdoor Equipment Ops and Maintenance Areas SC-17: Storm Drain Maintenance

Table 7-8. Minimum BMPs Implemented at SAN (continued)

Industrial Permit Minimum BMPs		BMPs Applicable to Authority and Tenants
Preventative Maintenance	Identify all equipment and systems used outdoors that may spill or leak pollutants.	SC-02A: Outdoor Equipment Ops and Maintenance Areas SC-02B: Aircraft, Ground, and Equipment Maintenance SC-02C: Electrical Vehicle Maintenance SC-09: Building and Grounds Maintenance SC-17: Storm Drain Maintenance
	Observe the identified equipment and systems to detect leaks, or identify conditions that may result in the development of leaks.	SC-02B: Aircraft, Ground, and Equipment Maintenance SC-02C: Electrical Vehicle Maintenance SC-09: Building and Grounds Maintenance SC-17: Storm Drain Maintenance
	Establish an appropriate schedule for maintenance of identified equipment and systems.	SC-02B: Aircraft, Ground, and Equipment Maintenance SC-02C: Electrical Vehicle Maintenance SC-09: Building and Grounds Maintenance SC-17: Storm Drain Maintenance
	Establish procedures for prompt maintenance and repair of equipment, and maintenance of systems when conditions exist that may result in the development of spills or leaks.	SC-02B: Aircraft, Ground, and Equipment Maintenance SC-02C: Electrical Vehicle Maintenance SC-09: Building and Grounds Maintenance SC-17: Storm Drain Maintenance
Spill and Leak Prevention and Response	Establish procedures and/or controls to minimize spills and leaks.	SC-03: Aircraft, Ground, and Equipment Fueling SC-04: Aircraft, Ground, and Equipment Cleaning SC-10: Employee Training SC-11: Lavatory Service Operation SR-01: Spill Prevention, Control, and Clean-up
	Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the storm water conveyance system. Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly.	SC-03: Aircraft, Ground, and Equipment Fueling SC-04: Aircraft, Ground, and Equipment Cleaning SC-11: Lavatory Service Operation SR-01: Spill Prevention, Control, and Clean-up
	Identify and describe all necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures.	SR-01: Spill Prevention, Control, and Clean-up
	Identify and train appropriate spill and leak response personnel.	SR-01: Spill Prevention, Control, and Clean-up SC-10: Employee Training

Table 7-8. Minimum BMPs Implemented at SAN (continued)

Industrial Permit Minimum BMPs		BMPs Applicable to Authority and Tenants
Material Handling and Waste Management	Prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event.	SC-05: Aircraft Deicing/Anti-Icing SC-08: Waste Handling and Disposal SC-11: Lavatory Service Operation
	Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water.	SC-05: Aircraft Deicing/Anti-Icing SC-06: Outdoor Loading/Unloading of Materials SC-07: Outdoor/Indoor Material Storage SC-08: Waste Handling and Disposal SC-11: Lavatory Service Operation SC-13: Fire Fighting Foam Discharge
	Cover industrial waste disposal containers and industrial material storage containers that contain industrial materials when not in use.	SC-07: Outdoor/Indoor Material Storage SC-08: Waste Handling and Disposal SC-11: Lavatory Service Operation
	Divert run-on and storm water generated from within the facility away from all stockpiled materials.	SC-05: Aircraft Deicing/Anti-Icing SC-06: Outdoor Loading/Unloading of Materials SC-07: Outdoor/Indoor Material Storage SC-08: Waste Handling and Disposal SC-13: Fire Fighting Foam Discharge SC-14: Potable Water System Flushing
	Clean all spills of industrial materials or wastes that occur during handling in accordance with the spill response procedures (Section X.H.1.c).	SC-07: Outdoor/Indoor Material Storage SC-08: Waste Handling and Disposal SC-11: Lavatory Service Operation
	Observe and clean as appropriate, any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes.	SC-08: Waste Handling and Disposal
Erosion and Sediment Controls	Implement effective wind erosion controls.	SC-20: Erodible Surfaces SC-21: Building Repair and Construction
	Provide effective stabilization for inactive areas, finished slopes, and other erodible areas prior to a forecasted storm event.	SC-20: Erodible Surfaces SC-21: Building Repair and Construction
	Maintain effective perimeter controls and stabilize all site entrances and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site.	SC-01: Non-Storm Water Management SC-20: Erodible Surfaces SC-21: Building Repair and Construction
	Divert run-on and storm water generated from within the facility away from all erodible materials.	SC-01: Non-Storm Water Management SC-20: Erodible Surfaces SC-21: Building Repair and Construction
	If sediment basins are implemented, ensure compliance with the design storm standards.	SC-21: Building Repair and Construction

Table 7-8. Minimum BMPs Implemented at SAN (continued)

Industrial Permit Minimum BMPs		BMPs Applicable to Authority and Tenants
Employee Training Program	Ensure that all team members implementing the various compliance activities of this General Permit are properly trained to implement the requirements of this General Permit, including but not limited to: BMP implementation, BMP effectiveness evaluations, visual observations, and monitoring activities. If a Discharger enters Level 1 status, appropriate team members shall be trained by a QISP.	SC-10: Employee Training
	Prepare or acquire appropriate training manuals or training materials.	SC-10: Employee Training
	Identify which personnel need to be trained, their responsibilities, and the type of training they shall receive.	SC-10: Employee Training
	Provide a training schedule.	SC-10: Employee Training
	Maintain documentation of all completed training classes and the personnel that received training in the SWPPP.	SC-10: Employee Training
Quality Assurance and Record Keeping	Develop and implement management procedures to ensure that appropriate staff implement all elements of the SWPPP, including the Monitoring Implementation Plan.	SC-10: Employee Training
	Develop a method of tracking and recording the implementation of BMPs identified in the SWPPP.	SC-10: Employee Training SC-12: Outdoor Washdown/Sweeping (Apron SC-16: Parking Lots SC-17: Storm Drain Maintenance
	Maintain the BMP implementation records, training records, and records related to any spills and clean-up related response activities for a minimum of five (5) years.	SC-10: Employee Training

ADVANCED BMPS

In addition to the minimum BMPs described above, the Authority implements a number of advanced BMPs to further prevent the discharge of pollutants in its storm water discharge. The advanced BMPs include exposure minimization and treatment control BMPs.

Exposure Minimization BMPs

Exposure minimization BMPs include storm-resistant shelters that prevent the contact of storm water with industrial materials or activities. Basins 3, 6 and 7 contain permanent storm resistant shelters for vehicle and equipment maintenance and operations. Basins 3, 5, 6, 7, 8, 12, and 15 contain fire-resistant cabinets, roll-top containers, storage sheds, and other storm resistant shelters for outdoor materials storage. Figures 3 and 5-7 show the locations of these shelters.

Storm Water Containment and Discharge Reduction BMPs

These BMPs include any that divert, infiltrate, reuse, contain, retain, or reduce the volume of storm water runoff. During the recent Green Build expansion of Terminal 2, artificial turf was added in Drainage Basin 15, near the RON parking lot, as well as porous pavement in that area to infiltrate runoff. Porous pavement and eight infiltration basins below permeable surfaces and asphalt strips were also installed as part of the Signature FBO construction. Twelve modular wetland systems are installed in the SANPark 2 parking lot on the north side of the runway. Additionally, air conditioning condensate is captured in basins 8, 12 and 15 and reused in power washing activities.

Treatment Control BMPs

Treatment control BMPs include mechanical, chemical, and biological systems that are utilized to reduce pollutants in storm water. Existing treatment control BMPs include: 10 OWS, 4 Contech StormFilters, 1 Contech Jellyfish Filter, 3 curb inlet boxes and 2 drop inlet filters, 2 Bio Clean Round Curb Inlet Skimmer Boxes, 6 Bio Clean Grate Inlet Skimmer Boxes, 30 ClearWater High-Rate Media Filters, 3 trench drain filters, 8 subsurface infiltration basins, 1 infiltration trench, 17 permeable surface locations, 3 hydrodynamic separators, 14 Modular Wetland Systems, 12 biofiltration areas, 1 underground detention basin, 1 artificial turf infiltration, 1 Oldcastle/Kristar Perkfilter Unit, 4 Rock infiltration curb cuts, 6 CleanWay Metalzorbs, 3 activated alumina filter bags including one as a trench drain filter, and 2 biochar booms. These treatment control BMPs were selected, designed, and implemented per Appendix C of this SWMP or as part of the ERA implementation for NAL exceedances. Any new treatment control BMPs will comply with the Industrial General Permit design storm standards as follows:

- Volume-based BMPs: The Authority, at a minimum, shall calculate the volume to be treated using one of the following methods:
  - The volume of runoff produced from an 85th percentile 24-hour storm event, as determined from local, historical rainfall records;
  - The volume of runoff produced by the 85th percentile 24-hour storm event, determined as the maximized capture runoff volume for the facility, from the formula recommended in the Water Environment Federation's Manual of Practice; or
  - The volume of annual runoff required to achieve 80% or more treatment, determined in accordance with the methodology set forth in the latest edition of the CASQA Storm Water BMPs Handbook, using local, historical rainfall records.
- Flow-based BMPs: The Authority shall calculate the flow needed to be treated using one of the following methods:
  - The maximum flow rate of runoff produced from a rainfall intensity of at least 0.2 inches per hour for each hour of a storm event;

- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from local historical rainfall records, multiplied by a factor of two; or
- The maximum flow rate of runoff, as determined using local historical rainfall records, that achieves approximately the same reduction in total pollutant loads as would be achieved by treatment of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

More information on treatment control BMPs is provided in Section 6.2 of the SWMP and Appendix C. Figures 3 and 5-7, and Appendix B, Figure TC-01, show the locations of these systems. Appendix C was updated in February 2016, in accordance with the Municipal Permit.

POLLUTION PREVENTION PROGRAMS

Regular Power Washing

Outdoor tenant operational areas that are regularly cleaned by power washing include the concrete pad at the RFF and several cargo ramp areas. The airport janitorial services provider also regularly power washes the sidewalks in front of the terminals, the trash compactor areas near the terminals, the loading/unloading dock at the western end of Terminal 2 West, and the grease trap areas operated by the food service provider. Power washing is performed between 11pm and 4am. The janitorial services provider uses recovered air conditioning condensate instead of potable water for power washing. This water is collected into 55 gallon drums and, once full, the drums are transferred to the power washing reservoirs. In 2014, more than 5,225 gallons of condensate were recovered and used. The pressure washers used are equipped with a water recollection and filtration system. They are designed to collect all residual water, and filter, recycle, and reuse the water throughout the operation of the equipment. Before starting the pressure washing operation, janitorial staff locate all storm drain inlets and cover the areas with berms or mats. They then remove and sweep all trash, debris and cigarette butts. Next, staff will determine the path that the water will run and will funnel the water using berms and bags into the vacuum/reclaim system. Once the job is complete, the wash water is vacuumed up, hoses are drained into the sanitary sewage system or airport wash rack, and equipment is cleaned. The concrete pad at the RFF is steam cleaned, and the discharge enters the 12,000-gallon underground wastewater tank, which is serviced as needed and at least annually. Those tenants power washing the cargo ramp areas either perform the work themselves or contract for the service. All power washing is conducted in accordance with the BMPs described in Section 7.7.3.1.

Ramp Sweeping

The Authority FMD sweeps the aircraft gate and ramp (apron) areas seven days a week during evening hours. Using mechanical sweeping equipment utilizing regenerative air technology, the program is directed mainly at removing FOD, but it also removes sediment, particulate matter, and other pollutants. The schedule allows sweeping of each gate area approximately every other month; some areas are swept more frequently upon request. Perimeter roads and taxiways are swept at least once per week. The debris/sweepings are vacuumed up into the unit and are disposed of in a lowboy container located in the northern portion of drainage basin 6. All sweeping is conducted in accordance with the BMPs described in Section 7.7.3.1.

Ramp Scrubbing

The janitorial services provider performs ramp scrubbing as needed, at a minimum of once every six months, using 3,500 psi industrial pavement washers. A biodegradable waxy soap, specifically made for oil removal, is used during the procedure. The soap is stored in two 100-gallon plastic containers on wooden pallets, under cover, at Terminal 2 West. The wash water is vacuumed up and collected by the Authority's environmental contractor, who filters and reuses the water. The north ramp/cargo areas near the control tower are scrubbed when tenants request it or as needed. The janitorial services provider recently acquired a pressure washing truck for ramp scrubbing. This truck is equipped with a vacuum water reclamation system, a series of two drums for solids and grease removal, and four filters to filter water for direct reuse. The FMD

also contracts for a professional concrete cleaning company to conduct large-scale ramp scrubbing operations to thoroughly clean ramp and apron areas once per year or as needed.

Runway Rubber Removal

Runway rubber removal is conducted by a professional company under contract to the Authority. An all-in-one system is used that uses either high-pressure water or a chemical rubber removal solution and scrubbing action followed by a rinse(s). Both systems vacuum up the rubber and any residual liquids. Runway rubber removal is performed as warranted by runway friction (skidometer) testing, which tends to be every 6-8 weeks during any runway rehabilitation projects but returns to every 4 weeks after project completion depending on skidometer testing results. The waste rubber is disposed of in a lined rubber removal lowboy (dumpster), east of the ATCT. A contractor is responsible for disposal of the waste and waste water generated.

7.8 PROGRAM IMPLEMENTATION

The Authority has identified those updated BMPs applicable to industrial activities at SAN (Table 7-6 and Appendix B) and has also identified those BMPs applicable to individual tenants and to the Authority (Table 7-7 and Appendix E). Tenants and Authority departments are required to adopt applicable BMPs, when necessary, as new activities are added, or existing activities change. BMPs or elements of BMPs requiring major operational and/or structural modifications must be implemented in a timely manner. New BMP requirements will be incorporated into any SWMP updates, as required by both the Industrial Permit and Municipal Permit.

All tenants and Authority departments (with storm water management responsibilities) maintain current, up-to-date copies of the SWMP in either hard-copy or electronic copy, or have immediate access to the SWMP via the internet. The Tenant Summary Sheets in Appendix E list the contact information for each tenant. Tenants are required to notify the Authority P&EAD at least annually regarding any need to update or modify the SWMP. All industrial tenants should be knowledgeable of the BMPs required for use by the Authority to address their individual operations and activities (see Tables 7-6 and 7-7, and Appendix B and E, respectively).

The specific elements of the Authority's industrial storm water management activities are presented in Sections 7.8.1 through 7.8.5.

7.8.1 EDUCATION AND OUTREACH

Details on education and outreach programs for Authority staff, tenants, and the general public related to industrial activities are provided in Section 9.0 of the SWMP presented in Attachment 1.

7.8.2 STAFF TRAINING

All Authority staff members are provided annual SWMP implementation training regarding topics such as prohibited discharges, BMP requirements, good housekeeping, inspections, spill response, and recordkeeping procedures. Authority staff training is mandatory. Additional details on staff training are in Section 9.0 of the SWMP (presented in Attachment 1 of the SWPPP).

7.8.3 WET WEATHER SAMPLING AND ANALYSIS

The Authority is required to collect and analyze storm water samples from four QSEs each year. A QSE is defined as a storm producing discharge from at least one drainage area and preceded by at least 48 hours with no discharge from any drainage area. The samples will be collected according to the following timeline:

- Two QSEs during the first half of each reporting year (July 1 through December 31); and
- Two QSEs during the second half of each reporting year (January 1 through June 30).

Samples will be collected within the first 4 hours after the start of discharge.

The details of the industrial compliance monitoring are provided in Appendix D-1, the Monitoring Implementation Plan.

7.8.4 FACILITY INSPECTIONS

Generally, the Authority staff and industrial tenants inspect their operating and storage areas either daily or as part of their own routine facility inspections. Tenants are encouraged to request the assistance of the Authority FMD for any cleaning that cannot be addressed by their own efforts (in response to lease obligations) or that are not being addressed by the Authority's regularly scheduled ramp-sweeping or ramp-scrubbing programs. The Authority Airside Operations Department staff also inspect the terminals, ramps, runway, and the FBO continuously during operating hours (and are generally available 24 hours per day).

Any inspections specifically required by either the Municipal Permit or the Industrial Permit will be conducted by the Authority P&EAD, as discussed below. The Authority may choose to require tenants and/or other Authority staff to conduct inspections that might complement the permit-required inspection program and further ensure that BMPs are being properly implemented. The Authority recommends that tenants conduct at least semi-annual inspections of their activities and operational areas and that they maintain records of these inspections as further means to ensure that BMPs are being properly implemented. Inspection records should be retained for at least five years.

7.8.4.1 Municipal Permit Inspection Requirements

The Authority is required to conduct inspections of industrial activities/operations/facilities to monitor compliance with the Municipal Permit, as well as the Authority's ordinances, permits, and approvals. The Municipal Permit (Provisions D.3.b.(3)(b) and D.3.b.(3)(c)) outlines procedures for determining the number of high-priority industrial sites that must be inspected in any given year of program implementation under the renewed Municipal Permit. Nevertheless, the Authority has determined that all industrial entities at SAN are considered high priority (as noted in Section 7.7.3.1) and each one will be inspected at least monthly. These inspections will be coordinated with inspections for the Industrial Permit (described below).

7.8.4.2 Industrial Permit Inspection Requirements

The Industrial Permit requires the Authority to conduct an inspection program to ensure that the BMPs being implemented are evaluated and revised to meet changing conditions, aid in the implementation and revision of the SWMP, and measure the effectiveness of BMPs to prevent or reduce pollutants in storm water discharges and authorized NSWDs, and identify additional BMP needs. The inspections must be recorded, and the program revised whenever appropriate. Inspections are readily available for review by Authority staff and tenants via the Authority's Web-based database. The Industrial Permit inspection requirements include the following:

- Monthly dry weather visual observations.
- Sampling event visual observations to coincide with storm water sampling/;
  - Two observations between July 1 and December 31; and
  - Two observations between January 1 and June 30.
- Annual Evaluation (addressed in Section 7.10.1).

Monthly Dry Weather Discharge Visual Observations: The Authority's P&EAD conducts monthly inspections of SAN to observe authorized NSWDs and their sources and to verify that BMPs required to control those authorized discharges are being properly implemented and are effective. The Authority also conducts monthly visual observations of all drainage areas to identify any prior, current, or potential illicit discharges and their sources. Authority staff evaluate authorized NSWDs to ensure that (1) they comply with the Industrial Permit and the Municipal Permit; (2) required BMPs are effective in preventing or reducing the contact of NSWDs with industrial materials or equipment and to minimize, to the MEP, the flow or volume of discharges; (3) NSWDs do not contain or transport significant quantities of pollutants that cause or contribute to an exceedance of a water quality standard; (4) they comply with the Authority's Storm Water Code and Rules and Regulations; and (5) they meet BAT/BCT standards. The monthly inspections also verify the list of potential pollutants at the industrial sites/sources, and identify any necessary modifications to the SWMP.

The monthly observations are conducted during daylight hours on days with no storm water discharges. The observations are conducted at least once per calendar month. Each year, at least one of the monthly inspections becomes the Annual Evaluation discussed below. The observations document the presence of any uncharacteristic volumes, discolorations, stains, odors, floating material, etc., as well as the source of any discharge. Records of the observations, including date, location, description of observations, and response taken to eliminate unauthorized NSWDs, to reduce or prevent pollutants from contacting NSWDs, and BMP corrective actions needed, are maintained by the Authority P&EAD via its Web-based database, as described below.

Sampling Event Visual Observations: The Authority's P&EAD conducts visual observations of storm water discharges at all storm water monitoring locations at the same time that sampling occurs at those discharge locations. Two such observations take place between July 1 and December 31 and two observations take place between January 1 and June 30 of each year. Visual observations are not required during dangerous weather conditions, such as electrical storms or flooding. During observations, the Authority documents the presence of any floating and suspended material, oil and grease, discolorations, turbidity, odor, trash, or debris, and the source of any pollutant observed. If the presence of pollutants is observed, efforts will be made to identify the source of the pollutants. The investigation will begin at the sampling location and continue upstream through the drainage basin until the pollutant source is located, if possible. Once the source is located, the Authority will direct that corrective actions to reduce or prevent pollutants from contacting storm water discharge be taken by the responsible party. Visual observations of stored or contained storm water, such as at the FSF, are conducted at the time of release. Containment areas are checked monthly to detect leaks and to ensure the maintenance of adequate freeboard. The SWMP will be revised, if necessary, in response to any issues identified during the sampling event visual observations.

Annual Evaluations: One Annual Evaluation is conducted in each reporting year, as required by Industrial Permit Section XV. The procedures for Annual Evaluations are discussed in Section 7.10.1, below.

7.8.4.3 Formal Inspection Procedures for Industrial Sites and Sources

Formal inspections of industrial sites and sources by the Authority's P&EAD staff generally include a review of the following information, to the extent the information exists: (1) any SWPPPs or BMP implementation plans; (2) any relevant monitoring data; (3) any self-inspection records; and (4) any previous inspection reports. The inspection generally involves an assessment of: (1) compliance with the SWMP and the Authority's ordinances and permits related to urban runoff; (2) existing BMP requirements and the adequacy of BMP implementation, BMP maintenance and effectiveness, and the site supervisor/manager's efforts to make appropriate adjustments when ineffective BMPs have been identified; (3) confirmation of no exposure for all drainage areas previously identified as having no exposure to industrial activities; and (4) visual observations for illicit discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff. The inspection also presents an opportunity to provide education and training regarding

storm water pollution prevention. There are four basics steps in the Authority's facility/site inspection procedures: initiation, preparation, site visit, and post-inspection activities.

Step 1: Initiation: The inspection is typically initiated in response to a schedule, a public report or complaint, or an illicit discharge investigation, or as follow-up to a previous inspection, violation, or other enforcement action. The inspector typically conducts a complete inspection of the entire facility/site, regardless of the initiating circumstances. However, the inspectors may choose to focus on specific issues that were previously identified or that were the reason for the initiation of the inspection.

Step 2: Pre-Inspection Preparation: Prior to visiting a facility/site, the inspector reviews any of the available information noted above and reviews the Authority's Web-based database which tailors the inspection form (found in Appendix G) to each particular tenant or facility. Using maps and other sources, the inspector familiarizes themselves with general site location and vicinity, including proximity to storm drain inlets. The inspector also gathers needed equipment, i.e. an iPad, tablet, or smart phone to access the Web-based database and to record the inspection, a camera, and pertinent documents or information not available in the database or internet, maps, and any other required equipment.

Step 3: The Site Visit: The inspector begins assessing site conditions upon approach to the facility/site. Depending upon circumstances and availability, the inspector may begin by interviewing the facility/site operator or other responsible individual. The inspector then verifies/clarifies observations made upon approaching the facility/site, and identifies and evaluates the BMP requirements applicable to the site/activity, as well as the effectiveness of the BMPs being implemented. If responsible individuals are available, the inspector will ensure that the contact information and BMP requirements on record are accurate and will discuss how various BMP requirements are being met (especially if requisite BMPs have been incorporated into the operations and activities in a manner that may not be obvious). The inspector typically asks to see any existing pollution prevention plans, records, or environmental management system documentation not previously gathered or available. While conducting a walkthrough of the facility/site, the inspector notes those industrial/commercial areas and activities that are exposed to precipitation (potentially increasing the risk of pollutants entering the storm drain system). Areas of storm water run-on and runoff are also noted. The inspector uses the walkthrough to assess the accuracy of site maps, descriptions of the areas and activities, and lists of materials on site; the effectiveness of the BMPs being implemented; and any evidence of potential or existing illegal discharges. The inspection is documented on the Web-based database, as outlined below. The inspection is acknowledged by both the inspector and the responsible individual (or designee) for the facility/site, in a back and forth communication on any issues requiring corrective actions.

Step 4: Post-Inspection Activities: After the inspection, the inspector ensures that actions are taken to address any immediate concerns; updates the Authority's records, as necessary; completes the inspection via the Authority's Web-based tracking application and ensures that a copy is issued to the responsible party; issues corrective action or enforcement orders to the responsible party via the Web-based database, as necessary; schedules follow-up inspections, as needed; and makes reports or referrals, as needed, to the appropriate departments or agencies.

7.8.4.4 Inspection Tracking and Records

The Authority's P&EAD conducts various inspections at SAN to maintain and ensure compliance with both the Industrial Permit and the Municipal Permit. The various inspection programs were outlined above. The inspections are documented within the Authority's Web-based database. Inspection reports and/or summaries, as appropriate, are included in the Annual Reports required by the Industrial Permit and Municipal Permit. The inspection forms used for each of the various inspection programs are presented in Appendix G.

The Authority generally conducts all inspections using the Web-based database in real time. However, the Authority may utilize the following inspection forms generated by the CASQA if the database is not available:

- Form 1 – BMP Inspection Form;
- Form 2 – Visual Observation Log—Monthly; and
- Form 3 – Visual Observation Log—Sampling Event.

[Note – Appendix G also includes CASQA Form 4 – Sampling Log, which is used to present the results of wet weather sampling and analysis. The wet weather sampling and analysis performed by the Authority in compliance with the Industrial Permit is discussed in Appendix D-1 of this SWMP.]

Alternatively, the inspections may be recorded directly in the Web-based database, the application developed for the Authority P&EAD to track and manage the storm water management program data. The Web-based database can be used to document BMP deficiencies for each tenant during monthly, annual, or ad hoc inspections. It can also be used as a platform to correspond with tenants on inspection issues, view records on inspection history, and access storm water reference material.

Both the inspection forms and the Web-based database incorporate the minimum required inspection tracking information per Industrial Permit Section XI.A.3 and Municipal Permit Provision E.5.c(3). This includes the inspector's name, name and location of each inspected entity, inspection date and time, findings of the inspection, description of any deficiencies, violations or pollutants observed, a description of any applicable enforcement actions, and date of resolution for each deficiency or violation. Any SWPPP revisions required in response to the visual observations will be implemented by the P&EAD.

7.8.4.5 Owner Operator Notifications

One objective of the SAN SWMP is to notify all industrial sites/sources at SAN, whether operated by tenants or the Authority, of the BMP requirements deemed applicable to each site/source by the Authority. As noted above, all tenants and Authority departments (with storm water management responsibilities) are provided and maintain current, up-to-date copies of the SWMP in either hard-copy or electronic copy, or have immediate access to the SWMP via the internet. BMP descriptions are also provided to all tenants in the Web-based database.

Notification of BMP deficiencies will be conveyed via the Web-based database. When an inspection or audit of a tenant area is complete, an authority inspector will upload the results of the inspection, including text and photos, into the Web-based database. An email is then generated by the Web-based database and sent to the tenant. The tenant is then provided with the opportunity to enter a resolution for each deficiency identified. The inspector then reviews the resolution for completeness and either approves or denies the action. Enforcement measures for issues that cannot be resolved in a timely fashion are addressed in Section 7.8.4.6.

7.8.4.6 Enforcement Measures

This section describes the ERP as it applies to industrial areas and activities at SAN. In accordance with the Municipal Permit, the ERP has been updated concurrently with submittal of the final San Diego Bay WQIP, so that the ERP aligns with WQIP strategies.

All industrial tenants operating within the Authority's jurisdiction are required to maintain compliance with the Authority Rules and Regulations, Storm Water Code (Article 8), SWMP, the Industrial Permit, the Municipal Permit, and contracts and leases. Any findings or violations noted during a site inspection by the P&EAD inspector will be discussed on site or via the Web-based database with the Authority employee or

tenants. A corrective action form may also be used to document the problem and its resolution. The P&EAD inspector will discuss the issues and the inspection report will detail the corrective actions required and the timeframe in which corrective actions must be completed. Findings and violations will be described and recorded in the Web-based database (and will include photographs and other information, as applicable).

The Authority requires that corrective actions be started immediately and be completed prior to the next predicted rain event or within a maximum of 30 days, whichever is sooner. Depending on the nature of the finding, some corrective actions may take longer to complete. In those cases, the Authority employee or tenants will provide an explanation to the P&EAD inspector and a suggested timeframe for completion, which the P&EAD inspector will either agree upon, or will reject and provide a preferred timeframe. (Note: corrective actions must be completed within 24 hours for Enforcement Level 2 violations, as described below.) The Authority or tenants must document the corrective action taken by responding to P&EAD through the Web-based database. The Authority or tenants who cannot complete corrective actions in the time required must explain in detail through the Web-based database the specific causes of delay and propose a schedule for compliance. P&EAD has the sole discretion to grant an extension or pursue escalated enforcement. All corrective actions, as well as the time periods allowed and dates of actual completion, are recorded in the Web-based database.

The enforcement mechanisms used by the Authority are listed below. The Authority generally obtains compliance using the first four mechanisms listed here. The remaining enforcement mechanisms can be used, as necessary, to increase the severity of penalties and to compel compliance as soon as possible.

1) Verbal and written warnings;
2) Written notices of violation;
3) Written notices to clean, test, or abate;
4) Order to cease and desist (stop work orders);
5) Fines;
6) Denial or revocation of permits and approvals;
7) Administrative and criminal penalties;
8) Bonding requirements; and
9) Liens.

The Authority's ERP for industrial dischargers has two main levels of enforcement, with escalating enforcement measures utilized as necessary on a case by case basis, using the professional judgment of the Authority inspector. The Authority has the discretion to initiate or escalate enforcement using any enforcement mechanism available, depending on the nature of the violation or discharge, the effect on water quality, and the degree of cooperation or response time of responsible parties. Further information on enforcement activities used by the Authority is provided in Section 2.3 of the SWMP. The general escalated enforcement process is outlined below:

- Enforcement Level 1 is initiated by the finding of BMP deficiencies. The responsible party is contacted and the inspector provides a verbal warning to fix the observed violation. The notification will also be documented in the Web-based database so that the responsible party and interested parties are aware of the violation. The responsible party can then notify the inspector via the Web-based database when the corrective action has been completed. If the inspector determines that the violation is severe enough that a verbal warning is not sufficient, a written notice will be issued to the responsible party. The written notice documents the violation, the time frame for correction, and the date of follow-up inspection. The written notice will be provided to the responsible party and the

facility/operation supervisor. If the violation is resolved within the time frame, the inspector will document compliance and save the inspection information in the inspection file.

- Enforcement Level 2 is initiated when the noncompliant activity or violation may impact water quality, human health, or the environment (i.e. prohibited discharge). A written notice to clean, test, or abate, and/or a CDO is used to initiate enforcement and compliance is expected within 24 hours. If a CDO is issued, the recipient must cease and desist all activities that cause or contribute to illegal discharges or remove illicit connections. A notice and order to clean, test, and abate is a written or verbal order to perform the activities listed in the Authority's Storm Water Code. Penalties and fines may be issued if administrative authority is ineffective and the violation continues.

If the noncompliance resulted in a spill or discharge, the party responsible for the discharge is responsible for conducting cleanup measures appropriate to the degree of the spill or discharge, or if needed, for contacting the appropriate emergency response or cleanup contractor.

Contractors and developers are required to abide by the Authority documents, permits, rules, and regulations while working within airport operational areas. The Authority may use provisions within the contract to correct any noncompliant activities. The Authority may also employ this mechanism for tenants that are under lease or use permits.

7.8.4.7 Reporting of Industrial Non-Filers and Incidents of Noncompliance

REPORTING OF INDUSTRIAL NON-FILERS

Per Municipal Permit Provision E.6.e(2), the Authority is required to report any persons required to obtain coverage under the Industrial Permit and failing to do so, within five calendar days of becoming aware of the non-filer. As noted in Section 1.0 of the SWMP, the industrial operations at SAN have been subject to the Industrial Permit since 1992. At that time, the Port of San Diego filed a NOI with the permit that included all the industrial entities at SAN. Since then, ownership and operation of SAN was transferred from the Port of San Diego to the Authority, and the Port of San Diego filed a Notice of Termination from permit compliance and listed the Authority as the new facility operator for SAN. In March 2003, the Authority filed a NOI to comply with the Industrial Permit and listed the primary SIC code for the site as 4500 Air Transportation. In response, the SWRCB issued WDID #937I018035 to SAN. In August 2003, the Authority prepared the SAN SWMP to comply, in part, with the Industrial Permit. As was true at the time that the Port of San Diego operated the airport, all airport tenants operate under lease or license agreement with the airport owner/operator, which is currently the Authority. As a result, industrial operations and tenants at SAN are also subject to the requirements of the Industrial Permit and must comply with the Authority direction regarding storm water management at SAN, as described in Section 7.2.

Incidents of Noncompliance

The Authority may issue a written enforcement notice for incidents of repeat or serious noncompliance. If an incident or practice of noncompliance occurs, P&EAD staff will then determine whether the incident endangers human health or the environment by considering the following criteria:

- Characteristics, quantity, and toxicity of substances/materials involved;
- Proximity of site to a sensitive water body (San Diego Bay);
- Proximity of site to an impaired water body (San Diego Bay);
- Proximity of site to a sensitive habitat/endangered species;
- Estimated volume of actual and/or potential discharge;
- Whether the incident involves a discharge to the storm drain; and
- Condition of the storm drain system (clog, etc.).

If the Authority determines that the incident does endanger human health or the environment, then the Authority will provide verbal notification to the RWQCB within 24 hours from the time that the Authority becomes aware of the circumstances. Within five days from the time that the Authority becomes aware of the circumstances, the Authority will provide the RWQCB with a written submission containing a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following will be reported within 24 hours:

- Any unanticipated bypass that exceeds any effluent limitation in the Municipal Permit;
- Any upset which exceeds any effluent limitation in the Municipal Permit; and
- Violation of a maximum daily discharge limitation for any or the pollutants listed by the RWQCB in the Municipal Permit to be reported within 24 hours.

In addition, under the Industrial Permit, incidents of noncompliance are grounds for enforcement actions and /or removal from Industrial Permit coverage. If any storm water or NSWDs exceed the discharge prohibitions, effluent limitations, or receiving water limitations specified in the Industrial Permit, or exceed any applicable water quality standards in the SWRCB or RWQCB Basin Plans, the facility is not in compliance. Should such a situation arise, the Authority will submit a report to the RWQCB within 60 days describing BMPs currently being implemented and additional BMPs that will be implemented, with a schedule of implementation, to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. Following approval of the report by the RWQCB, the Authority will revise and implement this SWMP and monitoring program, as necessary, within 90 days to incorporate any additional BMPs that may have been and/or will be implemented (including a schedule for implementation) and any additional monitoring requirements. Any anticipated noncompliance, such as a planned change at the airport facility that will change the nature or increase the amount of pollutants discharged, will be reported to the RWQCB. Any noncompliances will be reported in the monitoring report discussed below, and will include a description of the noncompliance and its cause, the date and time of the noncompliance and whether it has been corrected, and the steps taken or planned to reduce and prevent a recurrence of the noncompliance.

7.9 EXCEEDANCE RESPONSE ACTIONS

The Industrial Permit establishes NALs for certain pollutants (described in Appendix D-1). Under the Industrial Permit, all industrial dischargers are in baseline compliance status for the first year of implementation. If the pollutant levels are found to exceed either an annual NAL or an instantaneous NAL in a given year, this baseline status will change to Level 1 beginning July 1 of the subsequent year. The actions required under Level 1 status are described in Section 7.9.1. If pollutant levels are found to exceed an annual or instantaneous NAL while in Level 1 status, it will enter Level 2 status beginning July 1 of the subsequent year. The actions required under Level 2 status are described in Section 7.9.2. The exceedance response level is pollutant-specific, meaning that the Authority may fall under Baseline, Level 1, and Level 2 status for different pollutants within the same reporting year.

The Authority is required to implement water quality-based corrective actions if industrial discharges and/or NSWDs are found to be in violation of receiving water limitations in San Diego Bay. These required actions are summarized in Section 7.9.3.

7.9.1 LEVEL 1 EXCEEDANCE RESPONSE ACTIONS

The Authority started in baseline status for all pollutants for the 2015-2016 reporting year. However, by the end of the 2015-2016 reporting period, sampling results indicated an NAL exceedance for copper and the Authority entered Level 1 status for that parameter beginning July 1, 2016. By the end of the 2016-2017

reporting period, sampling results indicated NAL exceedances for copper and zinc. Subsequently, the Authority entered Level 1 status for zinc and Level 2 status for copper, beginning July 1, 2017.

By the end of the 2017-2018 reporting period, sampling results indicated NAL exceedances for copper, zinc, BOD, and chemical oxygen demand (COD). Subsequently, the Authority entered Level 1 status for COD and BOD, and Level 2 status for copper and zinc beginning July 1, 2018.

The Industrial Permit requires that by October 1, following commencement of Level 1 status, the Authority must have completed an evaluation, with the assistance of a QISP, of the industrial pollutant sources at SAN that are or may be contributing to the exceedance. The evaluation must also identify the corresponding BMPs and any additional BMPs that may be necessary to prevent future NAL exceedances to comply with the Industrial Permit. All drainage areas must be included in this evaluation.

The site evaluation for the copper NAL exceedance was conducted on September 23 and 28, 2016. As a result of the evaluation, three new BMPs were created and two existing BMPs were modified. The new BMPs include SC09-08: repair damaged asphalt, SC09-09: prevent rain from contacting galvanized or rusty metals, and SC12-12: scrub roads, ramp areas, and apron areas as needed. The language for the BMP SC02B-10 was modified to include the word removal in the following description: mechanical parts, equipment, and vehicles that are awaiting repair/removal under cover and away from storm drains. The BMP SC07-01 was modified to include equipment in the following description: locate storage and equipment away from storm drains. In addition, some sampling locations were changed as a result of the site evaluation to more accurately reflect the activities for which the Authority is sampling. In a further attempt to decrease copper concentrations, ERA training was given in November 2016 to tenant employees working in areas where copper levels were found to be elevated, and treatment control BMPs were implemented, where possible, in areas with elevated copper levels.

The site evaluation for the copper and zinc NAL exceedances was conducted on July 28, August 4, and August 8, 2017. As a result of the evaluation, changes to the following sampling locations were made: C-B05-4a was moved back to its previous location C-B05-4 for both safety and sampling feasibility reasons, C-B06-16a was moved to C-B06-16b in order to avoid construction staging yard runoff near C-B06-16a, and C-B15-18 was moved to C-B15-18a in order to avoid active construction site runoff near C-B15-18. Additionally, two new BMPs were created and one existing BMP was modified. The new BMPs are SC01-10: Prohibit over-irrigation of landscaped areas, and SC07-13: Do not permanently store equipment and materials in the bed of a pickup truck. If storing temporarily, provide cover and containment. The language for the BMP SC01-06 was modified to replace "minimize excess watering" with "prevent prohibited over-irrigation." In a further attempt to decrease copper and zinc concentrations, ERA training was given in June 2017 to tenants and employees working in areas where copper and zinc levels were found to be elevated, and treatment control BMPs were implemented, where possible, in areas with elevated copper and zinc levels.

The site evaluation for the copper, zinc, BOD, and COD NAL exceedances was conducted on August 21 and 22, 2018. As a result of the evaluation, changes to the following sampling locations were made: C-B06-16b was moved back to C-B06-16a because construction had finished and the construction staging yard was removed, and C-B07-7a was moved back to C-B07-7 once the new BMPs were installed. These sampling locations have been updated in this SWMP/SWPPP and its associated attachment and appendices. No source control BMPs were modified or added. In a further attempt to decrease copper, zinc, BOD and COD concentrations, ERA training was given in December 2018 to tenants and employees working in areas where copper, zinc, BOD and COD levels were found to be elevated, and treatment control BMPs were implemented, where possible, in areas with elevated copper, zinc, BOD and COD levels.

No later than January 1 following commencement of Level 1 statuses, the Authority revised this document as necessary and implemented any additional BMPs identified by the QISP in the Level 1 evaluations. The QISP prepared Level 1 ERA Reports and the LRP or his representative certified these reports via SMARTS.

The Level 1 ERA Reports included the QISP's identification number, name, phone number, and email address, as well as:

- A summary of the Level 1 ERA evaluations; and
- A detailed description of any SWPPP revisions made and additional BMPs implemented for each parameter that exceeds an NAL.

ERAs implemented for Level 2 copper and zinc are outlined in Section 7.9.2 below.

7.9.1.1 Returning to Baseline from Level 1 Status

The Authority will return to baseline status for a given parameter if the following conditions are met:

- A Level 1 ERA Report has been completed;
- All identified additional BMPs have been implemented; and
- Results from four consecutive QSEs indicate no additional NAL exceedances for that parameter.

Prior to the implementation of an additional BMP identified in the Level 1 ERA Evaluation or October 1 (whichever comes first), sampling results for any parameter(s) being addressed by that additional BMP will not be included in the calculations of annual average or instantaneous NAL exceedances in SMARTS.

7.9.2 LEVEL 2 EXCEEDANCE RESPONSE ACTIONS

If the Authority is in Level 1 status for a given parameter, the Level 1 ERA Report has been completed, and the sampling results indicate that an NAL exceedance for the same parameter has occurred, the Authority will enter Level 2 status for that parameter beginning on July 1 of the subsequent reporting year. Level 2 status requires submittal of a Level 2 ERA Action Plan and Level 2 ERA Technical Report. As stated above, the Authority entered Level 2 status for copper beginning July 1, 2017; and entered Level 2 status for zinc beginning July 1, 2018.

7.9.2.1 Level 2 ERA Action Plan

The Level 2 ERA Action Plan was prepared by a QISP. The LRP or his representative certified and submitted this report via SMARTS and included the QISP's identification number, name, phone number, and email address. The plan was submitted by January 1 following the reporting year in which the exceedance triggering a new Level 2 status occurred. A new Level 2 exceedance is any Level 2 NAL exceedance for a new parameter in any drainage area or an exceedance of the same parameter that is being addressed in an existing Level 2 ERA Action Plan, but in a new drainage area. This plan, at a minimum, addresses the drainage area in which the Level 2 exceedance has occurred.

For each new Level 2 exceedance, the plan identifies which of the following demonstrations the Authority has elected to perform:

- Industrial Activity BMP Demonstration: describing additional BMPs that will be implemented to eliminate future NAL exceedances, or any which are not feasible to be implemented and the reasons why;
- Non-Industrial Pollutant Source Demonstration: finding that the exceedance of the NAL is due solely to the presence of non-industrial pollutant sources; and
- Natural Background Pollutant Source Demonstration: finding that the NAL exceedance is due solely to the presence of the pollutant in the natural background, undisturbed by industrial activities.

The Level 2 ERA Action Plan includes a detailed schedule and description of tasks required to complete the selected demonstration. The Authority has chosen the Industrial Activity BMP Demonstration. All elements of the Action Plan were to be implemented as soon as practicable and completed no more than one year following submittal of the plan. In addition, the Authority provided ERA training in June 2017 and December 2018 to tenants and employees working in areas where copper and zinc levels were found to be elevated, and updated the SWPPP.

7.9.2.2 Level 2 ERA Technical Report

By January 1 of the reporting year following submittal of the Level 2 ERA Action Plan, the Authority will certify and submit via SMARTS a Level 2 ERA Technical Report. This report must include one of the three demonstrations listed above and described in Section XII.D.2 of the Industrial Permit. Upon submittal of the Level 2 ERA Technical Report, both the SWRCB and RWQCB may review the report; if the report is found to be deficient, the Authority may be directed to take further action to comply with the Industrial Permit. However, as allowed by the Industrial Permit, the Authority was able to apply for and was granted an automatic one-time extension to the January 1 submittal deadline when the following items were submitted to SMARTS (per Industrial Permit requirements):

- Reasons for the extension;
- A revised Level 2 ERA Action Plan with a schedule and tasks necessary to complete the Level 2 ERA Technical Report; and
- A description of any additional temporary BMPs that will be implemented while permanent BMPs are being constructed.

Any additional extensions must be approved in writing by the RWQCB. The RWQCB may require that additional tasks or temporary BMPs be implemented. The Authority has sent such a written request to the RWQCB, because the schedule in the Action Plan extends beyond the six month automatic extension.

Once the Level 2 ERA Technical Report has been developed, it will be updated annually upon additional NAL exceedances of the same parameter within the same drainage area outlined in the report. The report will also be updated annually following any facility operational changes, pollutant source changes, or new and relevant inspection and monitoring results. This updated Level 2 ERA Technical Report will be submitted with each Industrial Annual Report. If there have been no changes necessitating an updated Level 2 ERA Technical Report, the Authority will certify in the Annual Report that no changes are needed.

The Authority submitted the revised Level 2 ERA Action Plan for copper and zinc by January 1, 2019.

7.9.2.3 Returning to Baseline Status From Level 2 Status

The Authority will be eligible to return to baseline status for a pollutant only if the Level 2 ERA Technical Report follows the Industrial Activity BMP Demonstration and all BMPs outlined in the Level 2 ERA Action Plan have been implemented. The results from four consecutive QSEs must also indicate no additional NAL exceedances for that parameter. If any future NAL exceedances occur for that parameter, the Authority will automatically enter Level 2 status on July 1 of the subsequent reporting year, bypassing Level 1.

The Authority will not be eligible to return to baseline status if any of the following are submitted in the Level 2 ERA Technical Report:

- An Industrial Activity BMP Demonstration stating that all of the implemented BMPs, including additional BMPs outlined in the Level 2 ERA Action Plan, achieve compliance with the Industrial Permit but are not expected to eliminate future exceedances. This demonstration must include an

evaluation of any additional BMPs that could reduce or prevent NAL exceedances that are not being implemented, estimated costs of these additional BMPs, and an analysis of the basis for selecting the BMPs implemented rather than the additional BMPs evaluated.

- A Non-Industrial Pollutant Source Demonstration.
- A Natural Background Pollutant Source Demonstration.

The Authority continues to implement its revised ERA Level 2 Action Plan, following its submittal into SMARTS.

7.9.3 VIOLATION OF RECEIVING WATER LIMITATIONS

Per Industrial Permit Section XX.B, the Authority will implement water quality-based corrective actions if it is determined that industrial storm water discharges or NSWDs are in violation of any applicable receiving water limitations within the receiving water, or are causing or contributing to an exceedance of a water quality standard within the receiving water. Water quality-based corrective actions are different from Level 1 and Level 2 ERAs that result from effluent-based monitoring, and it is possible to be engaged in Level 1 or Level 2 ERAs while simultaneously being required to perform water quality-based corrective actions. The Authority will conduct a facility evaluation to identify any BMPs described in the SWPPP that are not being properly implemented. Following this evaluation, the SWPPP itself will be assessed to determine whether additional BMPs are needed to reduce pollutants to a level meeting receiving water limitations. If necessary, the SWPPP will be revised. These evaluations and revisions will be certified and submitted via SMARTS for review by the RWQCB, which may reject these corrective actions or request more documentation.

7.10 ANNUAL EVALUATION AND REPORTING

7.10.1 ANNUAL EVALUATION

The Authority conducts one Annual Evaluation during the Industrial Permit reporting period of July 1 through June 30 (which corresponds to the fiscal year of the Authority). Annual Evaluations are conducted within 8 to 16 months of each other. The Annual Evaluation process generally follows the procedure outlined in Section 7.8.4.3, and includes a review of all visual observations records, inspection records, and sampling and analysis results; inspections, review, and evaluation of all BMPs to determine whether the BMPs are adequate, properly implemented, and maintained, or whether additional BMPs are needed; a visual inspection of all potential pollutant sources for evidence of, or the potential for, pollutants entering the drainage system; an inspection of all drainage areas previously identified as having no exposure to industrial activities and materials; and a visual inspection of equipment needed to implement the SWMP, such as spill response equipment. Any incidents of noncompliance are noted and the responsible party is directed by the Authority to take corrective action. The Annual Evaluation process includes timely follow-up inspections whenever BMP deficiencies are found at any particular site. The process also produces a report that identifies any necessary revisions to the SWMP or to the Authority's BMP requirements, or to the descriptions of the BMPs, and outlines a schedule for implementing any necessary revisions. Any revisions necessary must be implemented within 90 days of the Annual Evaluation.

7.10.2 ANNUAL REPORTING

Both the Municipal Permit and the Industrial Permit require the Authority to submit Annual Reports to the RWQCB. The Municipal Permit requires submission of an Annual Report by January 31 of each year, which includes the information listed in Provision F.3 of the Municipal Permit. The Industrial Permit requires submission of an Annual Report by July 15 of each year, which includes the information listed in Section XVI of the Industrial Permit for the preceding 12-month period of July 1 through June 30. Annual Reports are signed and certified by the LRP or his DAR.

The Industrial Annual Report will be submitted via SMARTS. The following components will be included in the report:

- A compliance checklist indicating compliance with the components of the Industrial Permit;
- An explanation for any incidents of noncompliance, as indicated in the compliance checklist;
- An identification, including page numbers, of all revisions made to the SWPPP within the reporting year; and
- The date(s) of the Annual Evaluation.

The Municipal Annual Report consists of two components, an assessment of the Jurisdictional Runoff Management Program for July 1 through June 30 of the preceding year, and a WQIP monitoring and assessment evaluation for October 1 through September 30 of the preceding year. The requirements of the Municipal Annual Report are discussed in more detail in Section 12.1 of the SWMP.

7.10.3 RECORDS MANAGEMENT

Records of all storm water monitoring information, copies of all reports (including Annual Reports) required by the Municipal Permit and the Industrial Permit, records of all data used to complete the NOI for the Industrial Permit, and all other data and information required by either permit will be retained by the Authority for a period of at least five years. These records will be provided to the RWQCB, SWRCB, or USEPA within 10 days of receipt of a written request for information, or during office hours for review by the RWQCB.

7.11 INDUSTRIAL COMPONENT EFFECTIVENESS ASSESSMENT REPORTING

The Authority has developed internal and external effectiveness assessment programs to evaluate the Authority staff, Authority Board, and tenant compliance with water quality issues. The Authority's Effectiveness Assessment component is described in Section 11.6 of the SWMP (and presented in Attachment 1 of the SWPPP).

7.12 INDUSTRIAL COMPONENT PROGRAM REVIEW AND MODIFICATION

The Authority has reserved this section to identify and document future changes to the Industrial Component of the SWMP. Section 13.0 of the SWMP details the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal Permit and Industrial Permit. Changes made are listed below.

- Updates were made to the Industrial Component, Section 7, following the Annual Evaluations and ERA Evaluations (2016, 2017 and 2018), including update of the LRP and addition of the QISP.
- The following BMPs were added as a result of the ERA Evaluation (2016):
  - SC09-8 Repair Damaged Asphalt;

  - SC09-9 Reduce the exposure of galvanized or rusty metal structures to rainfall, where possible; and
  - SC12-12 Roads, ramp areas, and apron areas are scrubbed on an as-needed basis.
- The following BMPs were added as a result of the ERA Evaluation and Annual Evaluation (2017):
  - SC01-10; Prohibit over-irrigation of landscaped areas; and
  - SC07-13: Do not permanently store equipment and materials in the bed of a pickup truck. If storing temporarily, provide cover and containment.
- No new source control BMPs were added as a result of the ERA Evaluation and Annual Evaluation (2018).
- TCBMPs were installed in various locations following the 2016, 2017 and 2018 ERA Evaluations, and are indicated on the SWMP figures:
  - Six (6) CleanWay MetalZorbs;
  - Three (3) Activated Alumina Filter Bags (including one as a trench drain filter); and
  - Two (2) Biochar Booms.
- The SWMP was modified in February 2017 to enhance the information included in Section 7 for tenants Allied Aviation and Menzies, and to add information for the new tenant Conrac Solutions, in anticipation of their incorporation into the Authority's program and WDID number under the Industrial General Permit. Incorporation of those tenants under the Authority's WDID is dependent upon approval by the State and RWQCB of the Authority's COI and tenant NOTs.
- The SWPPP was modified in December 2017 to incorporate over-irrigation prohibitions.
- The SWMP was modified in January 2019 to incorporate updates as a result of ERAs and annual evaluations.

Section 13.0 will also be used as an amendment log for any future revisions to the SWMP. The amendment log will note the date of each amendment. The Authority will continue to revise the SWMP as needed, including changes necessary because of the following:

- There is a change in the total industrial area exposed to storm water;
- Additional BMPs are added;
- There is a significant change in industrial operations that may affect the type or amount of a pollutant that may be discharged;
- There is a change in the parties responsible for implementation of the SWMP; and
- A revision is otherwise deemed necessary.

The revised SWPPP will be submitted via SMARTS within 30 days when it contains significant revisions. The on-site SWPPP will be kept up to date at all times, although SWPPP revisions are not required to be certified and submitted via SMARTS more than once every three months.

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8.0 RESIDENTIAL COMPONENT

As noted in Section 1.0 of this SWMP, there are no residential land uses or activity areas within the Authority's jurisdiction. For this reason, the SWMP contains no discussion of activities conducted by the Authority relative to the residential requirements of the Municipal Permit.

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9.0 PUBLIC EDUCATION AND PARTICIPATION COMPONENT

The Municipal Permit and Industrial Permit require the Authority to promote public education about and participation in the implementation of the SWMP. This section describes the mechanisms put in place by the Authority to comply with this requirement.

The Provisions of the Municipal Permit require the Authority to:

- B.5.a.(6) and B.5.b.(10)—Assess and adapt the water quality priority conditions and improvement strategies during the term of the Municipal Permit. The Copermittees must evaluate the components outlined in WQIP water quality improvement strategies and assess their progress toward meeting numeric goals. Because the Copermittees' strategies include education and public participation efforts and programs, the effectiveness of these programs must be assessed. Recommendations for modifications to the WQIP program are solicited through the public participation process. Section 9.2.2 has been prepared to address this requirement.
- E.7—Implement a public education and participation program in accordance with the strategies described in the WQIP. Copermittees are required to include education and outreach to the public and to encourage public participation in the strategies to improve water quality. Sections 9.1 and 9.2 have been prepared to address this requirement.

The Sections in the Industrial Permit require the Authority to:

- IX—Designate a properly trained and certified QISP to train employees responsible for, or whose duties apply to, implementing the programs and requirements of this SWMP (if the Authority enters Level 1 or 2 status). Section 7.6 has been prepared to address this requirement.
- X.H.1.f—Ensure that all team members responsible for implementing the Industrial Permit requirements, such as BMP implementation, BMP effectiveness evaluations, visual observations, and monitoring activities, are trained to implement these activities. The Authority must identify the personnel that require training, their responsibilities, and the training they receive, and must provide a training schedule. Sections 7.0 and 9.1.2.2 have been prepared to address this requirement.

9.1 EDUCATION

As required by Provision E.7 of the Municipal Permit, Sections IX.A.3.b and X.H.1.f of the Industrial Permit, and strategies outlined in the San Diego Bay WQIP, the Authority conducts a comprehensive education and training program that measurably increases awareness of target populations with respect to the storm drain system, the impacts of urban runoff on receiving waters, NSWDs associated with over-irrigation and other prohibited discharges, and the BMPs (both structural and non-structural) that are implemented to reduce storm water and non-storm water quality impacts to the MEP. The Municipal Permit specifically requires the Authority to:

1) Implement educational activities to address pollutants associated with the application of pesticides, herbicides, and fertilizers, and other WQIP-identified pollutants of concern (e.g., copper and zinc in wet weather discharges).
2) Facilitate proper management and disposal of oils and toxic materials.
3) Reach out to specific target audiences on the basis of high-risk behaviors and pollutants of concern, as applicable to SAN.

The Authority's education efforts outlined in the SWMP are intended to increase understanding of storm water and non-storm water management issues and to help promote behavioral changes that will reduce storm water and non-storm water pollution to the storm drain system and ultimately San Diego Bay. Public education is also one of the regional strategies in the WQIP. Education efforts will support the goals of the Authority and other jurisdictional programs by gaining support from the public, staff, and tenants and unifying the effort across all operations within the San Diego Bay WMA. The Authority's training program objectives include:

- Providing useful guidance to develop outreach and training programs that support the successful implementation of the Authority's SWMP;
- Encouraging participation by all personnel, tenants and contractors; and
- Maximizing consistency in information and helping adapt education and outreach to the appropriate personnel, raising their knowledge and awareness of the issues related to storm water and urban runoff.

This section provides a general description of the content, form, and frequency of training developed for Authority staff and airport tenants, as applicable. The Authority has also implemented community-based social marketing strategies to reach and educate the general public and school children about storm water pollution and storm water pollution prevention issues.

9.1.1 TARGET AUDIENCES

The Authority's storm water and non-storm water education program targets the following audiences: Authority departments and personnel, SAN industrial and commercial tenants, the traveling public using the airport, the general public and school children, and construction site project managers, developers, and contractors. While there is no residential land use within the jurisdiction of SAN, as one of the Responsible Parties the Authority supports and participates, where reasonable, in the Copermittees' regional and WMA outreach efforts to residential communities. Additional training may be given or required of those Authority tenants or departments exhibiting high-risk behaviors, or that are subject to escalated enforcement because of noncompliance actions or issues.

9.1.2 STAFF TRAINING ELEMENT

Authority staff members involved in the implementation of the SWMP receive continual training related to their job duties. The Authority uses formal and informal training mechanisms to educate tenants and department personnel about storm water and non-storm water pollution prevention and BMPs. The most comprehensive training is provided annually to Authority management and staff through classroom and online training systems. The classroom training is targeted at a divisional level for the ADC, FMD, and P&EAD staffs. Much of the training is provided in house and on the job, and through attendance at meetings, seminars, and conventions. P&EAD staff members regularly attend external professional training and development workshops and training events. Most ADC staff that are involved in development planning and approval as well as construction project management and oversight receive more frequent training, refreshers, and reminders at staff meetings. These Authority staff members are responsible for (1) implementing BMPs; (2) conducting inspections, sampling, and visual observations; and (3) managing storm water runoff. They receive more intensive and more frequent training that is geared to their specific responsibilities. Education mechanisms initially used to train Authority staff members who are involved in SWMP implementation include classroom seminars and workshops, online training, as well as specific printed and audio/visual guidance on BMPs and storm water management procedures.

9.1.2.1 Trainer Qualifications

As described in Section 7.6, when the Airport enters Level 1 status under the Industrial Permit, the Authority will designate a staff member or contractor with appropriate QISP certifications to lead training for the Authority employees who are responsible for SWMP implementation activities. However, if the Authority is in baseline status for all analytes under the Industrial Permit, P&EAD, together with other appropriate departments such as ADC and/or other contractors, will conduct training for Authority personnel.

9.1.2.2 General Storm Water Topics

The training program provides Authority personnel responsible for implementation of various components or elements of the SWMP with an understanding of the following topics:

- Basic urban runoff concepts for all personnel, such as the distinction between the storm drain system and the sanitary sewer system, and the impacts of urban runoff on receiving waters;
- California's Statewide NPDES Permit requirements, including the Industrial Permit, Municipal Permit, the CGP, and federal, other state, and local water quality regulations;
- Water quality impacts associated with land development and construction site management and control measures to address and minimize them;
- The Authority SWMP, including the IDDE Program;
- The San Diego Bay WMA WQIP, including the Authority focused priority water quality conditions and pollutants of concern, water quality goals, and water quality improvement strategies;
- Storm water and non-storm water inspections and self-audits;
- Prohibited discharges to the MS4, including the prohibition of over-irrigation and how the Authority prevents over-irrigation through the water conservation program, landscaping/xeriscaping, and IPM program;
- Hazardous materials disposal and containment;
- Spill response, containment, and recovery;
- Preventive maintenance;
- Water quality awareness for emergency/first responders;
- IPM;
- Minimum required and advanced BMPs and their proper implementation;
- The connections between daily airport operations and activities, construction activities, and water quality impacts; and
- Advancements in BMP technologies.

Annual training is a joint effort among P&EAD, and ADC staff to emphasize the relationships between the requirements of the Municipal Permit, WQIP, Industrial Permit, CGP, SWMP, construction SWPPPs or WPCPs, and any relevant project and contract documents or leases. Continuous training may also include in-house presentations, emails, the Authority intranet, monthly ramp-walk inspections, new-hire reviews, and training programs led by outside agencies. Those Authority staff members not directly involved in SWMP implementation receive annual basic training to increase their general awareness of storm water and non-storm water issues at work and at home. This training generally emphasizes pollution prevention methods. General storm water pollution prevention information is also a part of safety training, incoming new employee orientation, and other training opportunities, as appropriate. Training opportunities also include

workshops, audio/visual guidance on BMPs, announcements, posters, displays, and company events. A training schedule is used to track employees or departments that have received or require training, and reminders are provided for employees to receive refresher training.

9.1.3 EDUCATION OUTREACH ELEMENT

Specific training for airport tenants involved in industrial and commercial activities at SAN is generally accomplished through:

- On-site monthly and annual inspections, training meetings, ad-hoc site visits, site audits, and ramp walks;
- Seasonal training sessions emphasizing the expectations for an upcoming dry or rainy season;
- Refresher training sessions conducted by the P&EAD facilities for high-risk activities, as needed; and
- Pre-bid, pre-construction, and ongoing project progress meetings for construction sites.

Training for construction site contractors is described in Section 5.7. Both the Tenant Safety Committee and the Lindbergh Airline Managers Council meet monthly to discuss a variety of operational issues, and the Authority P&EAD makes use of these meetings to provide training and information about storm water management. The annual site inspection, site audits, and monthly ramp walks and inspections also provide opportunities for P&EAD staff to provide training and educational materials to tenants. Topics of education include storm water laws, regulations, permits, the SWMP, BMPs, NSWDs and illicit discharges including over-irrigation, general urban runoff concepts, Authority rules and regulations, materials and waste storage and proper disposal, and storm water pollution prevention. Tenant training also focuses on proper BMP implementation for high-risk activities, such as fueling and hazardous waste storage. Authorized NSWDs and methods to control them (as described in Section 3.0) are also covered in training.

The Authority engages employees, tenants, and contractors to prevent and report over-irrigation. The Communication Center, Airport Operations, FMD, and P&EAD are trained to respond to over-irrigation. Employees and the public can report over-irrigation incidents to the Communication Center or to P&EAD. Airport employees and Authority staff are informed of the over-irrigation prohibition at outreach events, all-hands meetings, and through email and tenant information notices. Over-irrigation information and reporting instructions are also highlighted in the annual mandatory training required for all Authority employees and tenants.

The Authority uses SAN itself as a venue to highlight and/or emphasize the education and outreach efforts developed by others that are directed at school children and the general public. The Authority Public Art Program reserves 2 percent of the total costs of project construction in the Capital Program and Master Plan budgets to fund public art at the airport. Billboards, banners, display cases, and the Terminal 2 Youth Art Wall are used to highlight the existing efforts such as the Caltrans "Don't Trash California" campaign. The Green Build provided the opportunity for art to be incorporated into the design and build process, which now displays art projects relating to the San Diego environment. The Authority also provides support to Copermittees' Regional Residential Education Plan.

The Authority uses several mechanisms on a daily basis year-round to educate both tenants and the general public. These mechanisms include (1) the Authority webpage, (2) storm drain stenciling, (3) posters, banners, and signage in the terminals and parking lots, (4) brochures, (5) public service announcements in the terminals, (6) collaborative efforts, (7) special presentations to the public, (8) airport tours, (9) presentations to tenants and staff, and (10) monthly ramp walks. Each of these mechanisms is briefly described as follows:

1) **The Authority Webpage**: The P&EAD has a webpage (http://www.san.org/Airport-Projects/Environmental-Affairs) that features several environmental issues at SAN, including storm

water and non-storm water management. The webpage, which is accessible by the general public, Authority staff, and tenants, presents important SAN documents related to storm water such as the SWMP, the WQIP, Sustainability Policy, Sustainability Reports, Municipal and Industrial Annual Reports, IDDE Annual Reports, and new development Environment Impact Reports. Details are also provided on the Green Build, North Side Improvements, Airport Development Plan, over-irrigation prohibition and LEED certifications. GIS data is also downloadable on the Authority webpage. Once approved by the RWQCB, the WQIP and new BMP Design Manual were made available on the Authority webpage. The webpage provides contact information for the P&EAD, affording the general public another opportunity to review and comment on the SWMP and the BMPs described in it. The P&EAD storm water web page highlights the education and outreach efforts in place at the airport for preventing, reporting, and addressing over-irrigation.

2) **Storm Drain Stenciling**: Warning stencils are placed in and around storm drain inlets throughout the Airport (e.g., "No Dumping" warning signs). These warnings notify staff, tenants, and the general public of the need to protect storm drain inlets.

3) **Posters/Banners/Signage/Displays in Terminals and Parking Lots: The Authority participates in billboard programs and displays that promote anti-litter campaigns** and encourage habitat restoration. These billboards are placed strategically to reach a broad audience.

4) **Brochures**: Outreach materials, such as the Airport Recycling Brochure, are also made available to the general public. The Sustainability and Storm Water Pollution Prevention brochure is available during the biannual Sustainability Fair, workshops, and training events. These materials provide information that individuals can use to help prevent storm water pollution at SAN.

5) **Public Service Announcements**: "Think Blue" public service announcements have aired in the Terminal 2 baggage claim area. The public service announcements raise public awareness about the impacts of storm water pollution and how it can be prevented.

6) **Collaborative Efforts**: The Authority collaborates with community groups, local organizations, and other agencies and jurisdictions to provide outreach to the general public regarding storm water pollution prevention. The Authority is applying the concepts of community-based social marketing to public education efforts, and is seeking to collaborate with other organizations to leverage public outreach methods. To date, the Authority has collaborated with local environmental groups (non-governmental organizations [NGOs]) that share the goals of effective storm water management at SAN and protection of San Diego Bay. The Authority has collaborated with NGOs on (1) environmental campaigns that target local school children, (2) bilingual natural resource conservation campaigns aimed at the general public and schoolchildren, and (3) efforts to educate the public and children about the harmful effects of litter, cigarette butts, plastics, and other storm water pollutants in the region's waters. Authority staff are also members of community organizations and serve as board directors and committee members for local nonprofit groups.

7) **Special Presentations/Events**: The Authority presents storm water management information to grade school and high school students about environmental issues at SAN. Presentations are given at forums open to the public. Information booths at community events, such as local Earth Day celebrations, allow Authority staff to conduct public outreach. Authority staff also present at various public seminars about their storm water programs.

8) **Airport Tours**: Tours are offered to educate and engage the public on airport operations and activities. Special tours are geared toward school children in grades two through eight, and are offered twice per month. Additional tours for the general public are offered twice weekly, and discuss topics such as the art program, endangered species areas, and general activities at SAN.

9) **Tenant Presentations**: The Authority uses internal presentations during tenant and staff meetings to inform tenants of updates to the SWMP. For example, P&EAD gave presentations at 12 Tenant Safety and Security Committee meetings during the 2013–2014 reporting period. Airline station managers

also receive information on SWMP updates during monthly Lindbergh Airport Managers Council meetings.

10) **Monthly Ramp Walks**: P&EAD participates in monthly ramp walks with tenants to observe activities and operational areas. These ramp walks provide an opportunity for P&EAD to educate tenants about storm water BMPs.

The Authority intends to use community-based social marketing as the backbone for designing and implementing effective public outreach and education programs. The Authority continues to look for opportunities to partner with other Copermittees, other governmental agencies (federal, state, and local), and non-profit organizations and NGOs. Each year, the Authority's Municipal Permit Annual Report describes the actual outreach and education mechanisms put to use, and provides a general indication of the target audience.

9.2 PUBLIC PARTICIPATION

The goals of the SWMP Public Participation Component are to facilitate public participation in SWMP implementation and to engage the public in sustaining and improving the Authority's storm water management efforts. An educated public generally is a more effective partner in preventing storm water pollution. As such, there is some overlap between the Authority's public education efforts described in Section 9.1 and the public outreach efforts described in this section. Public participation is enlisted in two primary ways: (1) participation in implementation of SWMP programs, and (2) public feedback on SWMP programs. Feedback is used to improve the SWMP itself and to improve implementation of the SWMP.

The Authority's public participation program is directed primarily at Authority staff and the airport tenants and tries to address the general public to the extent possible.

9.2.1 PUBLIC PARTICIPATION OPPORTUNITIES

In addition to daily interactions between the tenants, Authority staff, and the public, several mechanisms are used to allow airport tenants, staff, and the public to participate in the implementation and ongoing development of the Authority's SWMP. The Municipal Permit requires the Authority to provide a minimum of three opportunities for public participation:

1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the WQIP
2) Opportunities for members of the public to participate in providing the Authority recommendations for improving the effectiveness of the water quality improvement strategies implemented within the Authority's jurisdiction
3) Opportunities for members of the public to participate in programs and/or activities that can help prevent or eliminate NSWDs to the MS4, reduce pollutants in storm water discharges from the MS4, and/or protect the quality of receiving waters

These mechanisms can be separated into two categories: those available to all (including the general public), and those additional mechanisms that are available to Authority staff and airport tenants. Public participation mechanisms available to all include (1) regular meetings of the Authority Board and subcommittees; (2) regular meetings of the various Copermittee committees and workgroups; (3) WQIP public workshops; (4) stakeholder engagement; (5) WQIP updates; (6) the Authority webpage, (6) the San Diego County Project Clean Water webpage; (7) the Copermittees' Public Hotlines; (8) outreach events; and (9) collaborative efforts with the community. Additional public participation mechanisms available to Authority staff and airport tenants include (1) the Authority's 24-hour telephone line/public hotline; (2) the Airport Advisory Committee; (3) the Tenant Safety Committee; and (4) the Lindbergh Airline Managers Council. The two categories of participation mechanisms and their components are described in Sections 9.2.2 and 9.2.3.

9.2.2 PUBLIC PARTICIPATION OPPORTUNITIES AVAILABLE TO ALL

San Diego County Regional Airport Authority Board Meetings

The Authority Board is committed to ensuring that all SAN staff and tenants comply with all environmental laws. The tenants, Authority staff, and the public are encouraged to review and comment on the San Diego Airport SWMP, thereby helping to improve both the plan and its implementation. SAN tenants and staff are encouraged to speak directly to the Authority Board during public meetings. All Authority Board, Authority Board Committee, and Authority Advisory Committee meetings are open to the public and provide public comment periods.

Copermittee Meetings

The Copermittees meet regularly to discuss various aspects of the Storm Water Management Programs being implemented throughout San Diego County. In addition to the meetings of the Copermittee Management Committee, the Copermittees have established a number of subcommittees and workgroups for each WMA. All meetings of the Committees, the subcommittees, and workgroups are open to the general public. These meetings provide numerous opportunities for public participation in storm water management activities, both throughout the region and at SAN. Attendees include a wide variety of experts, including representatives of federal, state, and local agencies, industry representatives, environmental groups, consulting firms, product vendors, and academic and research institutions, as well as the general public.

WQIP Public Workshops

Collaboration in the WQIP public participation process to date has included various responsible party public workshops aimed at educating and engaging the public in the WQIP process and identifying water quality issues in the WMA. In an effort to better facilitate communication between WQIP stakeholders and the general public, the Copermittees created the WQIP Consultation Panel. The Authority works with the WQIP Consultation Panel, which includes representatives from the RWQCB, environmental interest groups, development groups, and "at-large" interest groups, in the continuous development of water quality goals and strategies.

Stakeholder Engagement

SAN's stakeholders include the general public, business leaders, local governments, environmental and community-based groups, and transportation agencies. Authority Board Members engage with stakeholders on a regular basis to support collaboration and transparency within their business and environmental practices. These stakeholders are encouraged to participate in public Authority Board meetings, become involved in SAN activities via social media and public tours, and connect with Authority Board members via the contact information provided on www.san.org. To further support stakeholder participation, the Authority has formed a citizen's advisory committee to assist with planning and development of SAN facilities. The Authority Advisory Committee serves as a communication mechanism for stakeholders to provide recommendations to the Authority Board on issues under the Authority's responsibility.

Water Quality Improvement Plan Updates

The WQIP will be assessed during annual reporting and preparation of the ROWD, a required element of the Municipal Permit. During these assessments, the WQIP Consultation Panel will be consulted on proposed updates to the WQIP. At this time, the public will have the opportunity to comment on all aspects of the airport SWMP, as well as highest and focused priority water quality conditions, sources, numeric goals, and water quality improvement strategies outlined in the WQIP. The ROWD was submitted in December 2017; therefore, the period of public participation was during the spring and summer of 2017, and then annually after that during WQIP reporting.

Authority Webpage

The Authority webpage features several sections regarding the environmental issues at SAN (http://san.org/Airport-Projects/Environmental-Affairs), including storm water management, as previously described. Schedules for upcoming Authority Board meetings are posted on the webpage and the public can view the results of the sustainability efforts at SAN established in the 2008 Sustainability Policy updated in January 2019 (http://sustain.san.org). Results of these efforts include ways that the Authority is integrating community involvement, public outreach, and stakeholder engagement into the airport's operations and business practices. Over-irrigation incidents can be reported using the over-irrigation hotline or reporting form.

Project Clean Water Webpage

Partly in response to its duties as the Principal Copermittee to the 2007 Municipal Permit, the County of San Diego established the Project Clean Water webpage (www.projectcleanwater.org) that features both general and specific information on regional water issues, WQIP, and the local Storm Water Management Programs. The webpage features contact information and direct web-links to the Authority. The webpage is intended to represent a major portal for public participation in storm water management regionally and at the watershed and individual jurisdictional levels, and is intended to continue to serve as the Regional Clearinghouse for uploading reports, monitoring results, and other WMA and regional information, as required by the 2013 Municipal Permit

Copermittees' Public Hotlines

The Copermittees have established regional hotlines: the Regional Storm Water Hotline and the Think Blue Hotline. Both are toll-free 800-numbers that allow the general public to obtain contact information for any of the individual Jurisdictional Runoff Management Programs, including the Authority's. The hotlines provide a mechanism for the general public to report unauthorized NSWDs and/or other storm water concerns, which are then referred to the appropriate jurisdiction. The hotlines provide services in English and Spanish and are available 24 hours a day.

The Regional Storm Water Hotline is: (888) 846-0800.

The Think Blue Hotline is: (619) 235-1000 or (888) 844-6525.

Outreach Events

Outreach events for the Authority staff, tenants, and the general public allow P&EAD and these entities the opportunity to exchange information, ideas, and opinions about storm water management issues and those issues specific to SAN. Outreach events have both an education and a public participation component. Such events promote public participation and further environmental stewardship by tenants, staff, and the general public. Events include meetings, employee open houses, cleanup, recycling, and community events, and presentations to various groups, clubs, and organizations.

Collaboration with the Community

To date, the Authority has collaborated with local environmental NGOs that share the goals of effective storm water management at SAN and protection of San Diego Bay. The Authority has collaborated with NGOs on environmental campaigns that target local school children and on bilingual natural resource conservation campaigns aimed at the general public and school children. Several of these collaborative efforts have resulted in displays at the Children's Art Wall in Terminal 2. The Authority has also collaborated with NGOs to educate the public and children about the harmful effects of litter, cigarette butts, plastics, and other storm water pollutants. The Authority continues to seek and support such collaborations to promote environmental stewardship among the public and school children. These collaborative efforts provide another opportunity for the public to share ideas and concerns regarding storm water pollution

prevention with the Authority. The Authority also supports three local watershed cleanup events: (1) Annual California Coastal Cleanup Day, (2) Annual Creek to Bay Cleanup, and (3) EarthFair in Balboa Park.

9.2.3 ADDITIONAL PUBLIC PARTICIPATION OPPORTUNITIES AVAILABLE TO AUTHORITY STAFF AND AIRPORT TENANTS

Authority's 24-Hour Telephone Line/Public Hotline

Authority staff, tenants, and the general public can always voice immediate storm water concerns directly to the Authority using the SAN Communication Center 24-hour telephone line/public hotline. In addition to providing Authority staff, tenants, and the general public with another link to P&EAD, the telephone line enables callers to report illicit discharges and other storm water concerns. Tenants and staff can also direct questions via the Hotline to P&EAD regarding appropriate implementation of BMPs and the SWMP as a whole. Over-irrigation incidents can be reported using the over-irrigation 24-hour hotline or reporting form.

The Authority's 24-Hour Hotline is: 619-400-2710.

Airport Advisory Committee

The Airport Advisory Committee serves as a communication liaison between airport tenants, City representatives, and the Authority. During these meetings, Committee members discuss issues related to SAN development and planning and receive recommendations from the public and tenants. All recommendations are submitted to the Authority Board for review.

Tenant Safety Committee

The Tenant Safety Committee is another opportunity to encourage tenants and Authority staff to take ownership of the SWMP and to help ensure effective implementation of the plan. During monthly committee meetings, storm water management concerns are presented by P&EAD and discussed with tenants and staff. At the same time, tenants and staff are encouraged to submit comments on the SWMP and its implementation during the meetings.

Lindbergh Airline Managers Council

Tenants and Authority staff meet monthly to discuss and improve the operational aspects at SAN. During these meetings, P&EAD presents storm water program updates to airline station managers and tenants and staff are encourages to become involved in the SWMP, take ownership of the SWMP, and help ensure SWMP implementation. The meetings allow for frank exchange of information and opinions regarding storm water management concerns at SAN.

FMD Status Meetings

P&EAD staff members attend FMD's monthly status meetings to encourage communication and cooperation among departments. FMD and P&EAD work together to achieve many of the strategies in the storm water programs, and this provides an opportunity to openly discuss plans and developments relating to Airport storm water management.

9.3 PUBLIC PARTICIPATION AND EDUCATION OUTREACH COMPONENT EFFECTIVENESS ASSESSMENT

To support the iterative and adaptive management process of the WQIP required under Provision B.5 of the Municipal Permit, the Authority will assess the effectiveness of its education, training, and public participation programs as part of the re-evaluation of WQIP water quality improvement strategies. The Authority's assessment of WQIP goals and strategies is described in Section 11.0.

9.4 PUBLIC PARTICIPATION AND EDUCATION OUTREACH COMPONENT PROGRAM REVIEW AND MODIFICATION

The Authority has reserved this section to identify and document future changes to the Public Participation and Education Outreach Component of the SWMP. Section 13.0 discusses the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal Permit.

- Language was added to emphasize the over-irrigation education and outreach conducted and to add information on the Sustainability Fair.

10.0 FISCAL ANALYSIS COMPONENT

10.1 INTRODUCTION

The San Diego County Regional Airport Authority Act, the Authority's enabling legislation, frames the financial parameters of the Authority. As a financially self-sufficient agency, the Authority does not rely on taxpayer dollars or any city or county funds for its operations. As of June 2014, the Authority held total assets of over $2.2 billion. The Municipal Permit requires that the Authority secure the resources necessary to meet the requirements of Order No. R9-2013-0001. The Authority will annually conduct and report the results of a fiscal analysis of its jurisdictional runoff management program in its entirety (including jurisdictional, watershed, and regional activities).

10.2 FISCAL ANALYSIS METHODS

The fiscal analysis identifies the various categories of expenditures attributable to the jurisdictional runoff management program and outlines the program budget for the current year, including a description of the sources of the funds that are proposed for use.

10.2.1 AUTHORITY BUDGET PROCESS

The Authority operates on a fiscal year from July 1 through June 30. The budget process begins in November, with senior management updating, reviewing, and formulating the Authority's long-term goals and strategies. At the same time, division managers and staff develop programs, plans, and objectives for the following fiscal year. In January, the Revenue Management staff review the first six months of the then-current fiscal year and departments submit budget requests that reflect operating needs and programs to achieve the Authority's goals and objectives. Personnel, contractual services, utilities, maintenance, supplies and materials, business development, employee support, fixed assets (property, plant, and equipment), and capital projects are proposed and reviewed. The Revenue Management department, Talent, Culture & Capability department, Purchasing department, and ADC analyze the requests and determine the cost impact, where appropriate. Meetings are held with each division to review the budget requests. To ensure that the budget is adequately funded and to maintain the Authority's strong financial condition, the Revenue Management department prepares a revenue budget that incorporates budget expenditure requests into the rate-setting formula to determine projected rates, fees, and charges to the airlines and other tenants. Budget workshops are held with the Authority Board to review the budget and receive further direction. The Authority Board adopts the budget as a whole. It may be amended as required, pending Authority Board approval, at any time during the year.

The Authority has four sources of revenue: (1) airline revenue; (2) non-airline revenue; (3) non-operating revenue; and (4) investment earnings. Airline revenue is primarily from landing fees, terminal rents, and security related fees. Non-airline revenue is composed of public parking fees, terminal and other concessions, rental car fees, and ground rents. Non-operating revenue is primarily passenger facility charges, FAA Airport Improvement Program grants, airport revenue bonds, and short-term borrowing using commercial paper.

The divisional and departmental budgets, addressing the Authority's overall goals, objectives, and mandated obligations, contribute to an expense budget. The expense budget is composed of costs for salaries, wages, benefits, operating equipment and systems, safety and security, maintenance, utilities, contractual services, business development (including advertising and promotional activities), various property lease payments, debt service, and capital improvements. The Capital Improvement Program is a rolling three- to five-year program that provides for critical improvements and asset preservation. The program includes projects that address federal security requirements, airfield safety and capacity, terminal building improvements, electrical upgrades, and environmental pollution prevention/remediation needs. Funding sources for the

projects include FAA Airport Improvement Program grants, passenger facility charges, airport operating revenues, airport revenue bonds, and short-term borrowing using commercial paper.

There are "revenue diversion" restrictions imposed by federal laws and regulations on the use of Authority funds. The expenditure of Authority funds off airport property may violate federal law. Penalties for violation of the federal "revenue diversion" restrictions are severe and include withholding of current and future grant funds, withholding of other FAA approvals, and other civil penalties.

10.2.2 BUDGET FOR STORM WATER MANAGEMENT PROGRAMS

Currently, the Authority's fiscal analysis of the storm water management program examines previously adopted budgets and expenditures against program needs to develop adequate budgets for future years. The methodology incorporates costs for program administration, planning, monitoring, necessary infrastructure, and other capital improvements. The fiscal analysis includes an assessment of personnel time and expenditures related to implementation of the SWMP and a description of funding sources and any legal restrictions on the use of the funds.

The P&EAD summarizes the expenditures required each year to execute the programs outlined in the SMWP. Most of the expenditures related to implementation of the SWMP pass through the P&EAD and the FMD. The P&EAD is responsible for administrative functions within the Storm Water Management Program, including fiscal analysis, budget management, and planning. The P&EAD carries out the administrative activities for the program, including (1) general program budget analysis and planning; (2) inspections and enforcement; (3) monitoring and reporting; (4) coordination and involvement with the Copermittees and agencies; (5) assistance to other groups outside the department; (6) internal and external training, workshops, and public events; and (7) assistance in securing the materials and equipment necessary to perform required tasks. The FMD is generally responsible for the operations and maintenance aspects of the program, including (1) inspection and maintenance of storm drain systems; (2) maintenance of facilities and grounds; (3) securing of materials, equipment, and vehicles necessary to perform required tasks; and (4) support for management of the Authority's wastes.

The various expenditures attributable to the jurisdictional runoff management programs include:

- Personnel Expenses:
  - P&EAD; and
  - FMD.
- Non-Personnel Expenses:
  - NPDES Permit Fees;
  - Professional Services:
    - Legal and
    - Consulting.
  - Routine Maintenance;
  - Ramp Cleaning/Runway Rubber Removal;
  - Landscape Maintenance;
  - MS4/BMP Cleaning/Maintenance;
  - Parking Lot and Street Sweeping;
  - Hazardous Waste Disposal;

  - Equipment Purchases; and
  - Education, Training, and Public Outreach.
- Capital Improvement Program Expenses (to the extent that they exist).

10.3 UPDATE TO FISCAL ANALYSIS METHODS

Each year, the Authority will conduct an annual fiscal analysis of the storm water management program, as outlined above, as an attachment to the Jurisdictional Runoff Management Program Annual Report. The fiscal analysis will report four general categories of expenditures: jurisdictional expenditures, watershed shared expenditures, regional shared expenditures, and total program expenditures, including a description of the specific capital, operation and maintenance, and other expenditure items in each category of expenses. The analysis will include any personnel expenses and staff resource expenditures needed and allocated to meet the requirements of the Municipal Permit in the current reporting year. The analysis will also identify sources of funds that are proposed to meet necessary jurisdictional runoff management program expenditures in the following fiscal year, including legal restrictions on the use of such funds.

10.4 FISCAL ANALYSIS COMPONENT PROGRAM REVIEW AND MODIFICATION

The Authority has reserved this section to identify and document future changes to the Fiscal Analysis Component of the SWMP. Section 13.0 of this SWMP details the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal Permit and Industrial Permit.

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11.0 EFFECTIVENESS ASSESSMENT COMPONENT

In accordance with Municipal Permit Provisions D.4 and F.3, the Authority annually assesses the effectiveness of SWMP implementation, and specifically the effectiveness of each major component of the Authority's urban runoff management program, as described in this SWMP; the effectiveness of each significant type of jurisdictional activity/BMP implemented; and the effectiveness of the Authority's urban runoff management program as a whole. The Authority will also assess progress toward achieving interim jurisdictional goals outlined in the WQIP and assess the effectiveness of selected strategies. Additionally, Industrial Permit Section XV mandates an annual comprehensive industrial facility compliance evaluation, involving inspection of all industrial areas and BMPs as well as review of sampling and inspection records from the previous year. Additional assessments are required if SAN enters Level 1 or Level 2 discharger status. The Authority's approach to the annual and long-term effectiveness assessment is described below.

11.1 INTRODUCTION

Since 2004, the Authority has been evaluating the effectiveness of the SAN SWMP to varying degrees under both the Industrial Permit and the Municipal Permit. Beginning with the 2013 Municipal Permit, the focus of assessment changed to encompass required evaluations of the WQIP. The Copermittees have developed and will continue to refine criteria that allow for an assessment of the effectiveness of storm water management efforts implemented in accordance with the Municipal Permit. The Authority will continue to collaborate with the Responsible Parties to outline standardized methods and procedures for assessing the effectiveness of local urban runoff management programs, which incorporate WQIP strategies. The WQIP assessment program is described in Sections 11.2, 11.5.1 and 12.0.

11.2 MUNICIPAL PERMIT ASSESSMENT COMPONENTS

Municipal Permit Provision D.4 mandates two types of general assessments: (1) receiving water assessment; and (2) MS4 outfall assessment. Additionally, the Authority will periodically assess progress toward achieving goals related to the focused priority condition outlined in the San Diego Bay WQIP, as well as contributing to watershed-wide special studies assessments. Finally, the Authority will perform assessments integrating the annual assessment components, JRMP and WQIP implementation evaluations, and monitor data to evaluate the overall effectiveness of the WQIP and this SWMP. This iterative process of program assessments and revisions is required to comply with the provisions of the Municipal Permit.

11.3 RECEIVING WATER ASSESSMENT

Receiving water data, collected per the methods discussed in Appendix K of the WQIP, will be assessed in the San Diego ROWD. Receiving water data will be collected and analyzed as a watershed and/or regional effort. However, prior to completing the receiving water assessment, the Authority will review their jurisdictional program to compile any available and relevant data that may be used to assess the MS4 contribution to receiving water quality conditions. Jurisdictional Runoff Management Program data that will be compiled may include, but are not limited to, hotline reports, IDDE investigations, industrial and commercial tenant inventories or land use data, inspection results, new BMPs, or new Authority regulations or policies.

Once relevant data have been compiled in regional formats, the Responsible Parties will conduct a watershed assessment as required by Municipal Permit Provision D.4.a.(2).

11.4 MS4 OUTFALL ASSESSMENT

The Authority will assess its MS4 outfall monitoring program annually as part of the San Diego Bay WQIP Annual Report process, described in Section 12.0. Assessments will include evaluations of dry and wet weather outfall monitoring, including field screening and observations, and data collected under the IDDE program (Section 3.0 and Appendix D-2).

Assessments will include the following:

- Non-storm water assessments per Municipal Permit Provision D.4.b.(1):
  - Progress toward effectively prohibiting NSWDs and illicit discharges into the MS4;
  - Ranking and prioritization of MS4 outfalls according to TTWQ;
  - Identification of known and suspected sources contributing to non-storm water action level exceedances at highest ranking MS4 outfalls;
  - Estimation of volumes and loads of NSWDs; and
  - Identification of data gaps.
- Wet weather MS4 outfall assessments per Municipal Permit Provision D.4.b.(2):
  - Estimation of volumes and loads of storm water discharges;
  - Identification of modifications to MS4 outfall monitoring locations and frequencies;
  - Identification of known and suspected sources contributing to storm water action level exceedances at highest-ranked MS4 outfalls; and
  - Identification of data gaps.

It is important to note that the assessments conducted under Municipal Permit Provision D.4.b focus primarily on data gathered from the single permit-required MS4 outfall monitoring location (see Appendix D-2 for outfall location and description) and the IDDE program. As described in Section 11.4, additional sampling data gathered under the Industrial Permit will be utilized to measure progress toward meeting the interim and final numeric goals stated in the WQIP.

11.5 SPECIAL STUDIES ASSESSMENT

The Authority is participating in a number of regional and watershed special studies, including the San Diego Regional Reference Streams and Beaches Studies and the San Diego Bay Debris Study. The Authority will collaborate with the other Responsible Parties to evaluate the results and finding from these special studies, as described in Appendix K of the San Diego Bay WQIP. These assessments will be incorporated into the WQIP Annual Reports as well as the ROWD.

11.5.1 FOCUSED PRIORITY CONDITION ASSESSMENT AND INTEGRATED ASSESSMENT

As part of the WQIP process mandated under the 2013 Municipal Permit, the Responsible Parties selected highest and focused priority conditions within their jurisdictions. The process for selecting these conditions is documented in Section 2.0 of the San Diego Bay WQIP. The Authority selected metals (copper and zinc) as the focused priority condition for the Authority jurisdiction, and, based on this selection, the Authority set a number of interim and final goals to evaluate progress. The first of these interim goals coincides with the end of the current Municipal Permit cycle and preparation of the ROWD. At that time, the Authority will evaluate progress toward achieving these interim goals on the basis of monitoring data and records of program implementation.

Table 11-1 lists the interim and final goals that have been set to evaluate the focused priority condition, as well as notes on the data that will be assessed and the assessment method. Data gathered from Industrial Permit-required monitoring (described in Appendix D-1) and records of BMP implementation will be used to assess these goals.

Table 11-1. Assessment of Goals for Focused Priority Condition (Copper and Zinc) Within Authority Jurisdiction, Current and Future Permit Terms

Water Quality					
Numeric Goals		**Assessment Period and Fiscal Year**			
		Current Permit Term	**FY 16-20**	**FY 21-25**	**FY 26-30**
		FY 17	FY 18	FY 21	FY 26
		Interim Goal[1]			Final Goal[2]
MS4 Discharges Jurisdiction-wide % of Wet Weather Samples With Concentrations Exceeding Target)	Dissolved Copper[3]	70%	30%	20%	0%
	Dissolved Zinc[3]	65%	35%	25%	0%
OR					
Performance Metrics		FY 16	FY 18	FY 21	FY26
MS4 Discharges Sub-basins 1, 3, and 5 (in total) Area Treated with Street Sweeping	Acres/ Week[4]	7 Acres/ Week (Current Frequency)	21 Acres/ Week (3-fold increase in area)		

Notes:

1. Interim Goals are based on State Industrial General Permit Numeric Action Levels (NALs), which are based on the 2008 USEPA NPDES Multi-Sector General Permit benchmark values. Benchmark values for copper and zinc are 33.2 µg/L and 260 µg/L, respectively, and were calculated based on the highest hardness as CaCO3 value in the 2008 Multi-Sector General Permit hardness table.
2. Final Goals are based on the 1-hour average concentration for dissolved solids from the USEPA California Toxics Rule Criteria for Enclosed Bays and Estuaries. Criteria values for copper and zinc are 4.8 µg/L and 90 µg/L, respectively.
3. The data assessed is the wet weather compliance sampling data gathered under the Industrial Permit monitoring program (Appendix D-1). The assessment method is a comparison of sample results to the Industrial Permit NALs and calculation of percent exceedance.
4. The data assessed is the SWMP implementation records. The assessment method is tracking and confirmation of the implementation of street sweeping frequency.

11.6 INDUSTRIAL PERMIT ASSESSMENT COMPONENTS

The Authority will conduct an annual facility evaluation, including an assessment of industrial source areas and BMPs. Additional BMP and facility assessments will be conducted when the Authority enters Level 1 or Level 2 discharger status for any analyte as a result of NAL exceedances.

11.6.1 ANNUAL EVALUATION

As described in Section 7.0, the Authority will conduct an Annual Evaluation. This evaluation will include an assessment of all BMPs in each industrial drainage area and associated potential pollutant sources to determine whether the BMPs are properly designed, implemented, and effective in reducing and preventing pollutants from industrial storm water and authorized NSWD. The evaluation also includes review of sampling results and inspection records. Based on the Annual Evaluation, the SWPPP may be revised to ensure (1) the site map is up to date; (2) control of all potential pollutant sources is included in the SWPPP; and (3) proper BMPs are being implemented based on sampling data and visual records.

11.6.2 LEVEL 1 STATUS ASSESSMENTS

As part of the Level 1 ERA evaluation (described in Section 7.0), the Authority will assess industrial pollutant sources that are or may be related to any Level 1 NAL exceedances. Based on this evaluation, the Authority will identify and assess the corresponding BMPs in the SWMP and any additional BMPs revisions necessary to prevent future exceedances.

11.6.3 LEVEL 2 STATUS ASSESSMENTS

When the Authority enters Level 2 status for any analyte, one of three demonstrations will be completed by a QISP as part of the Level 2 Action Plan and Technical Report, described in Section 7.0. Each evaluation includes additional assessments, listed below.

- Industrial Activity BMP Demonstration:
  - An assessment of current BMPs and additional BMPs recommended under the Level 2 ERA Action Plan will be conducted to determine whether these BMPs (1) achieve compliance with effluent limitations in the Industrial Permit; and (2) are expected to eliminate future NAL exceedances; and
  - If current and additional BMPs are not expected to eliminate future NAL exceedances, an assessment of the BMP selection methodology will be conducted to describe why any further BMPs are not implemented. This assessment will include an economic analysis of BMP alternatives.
- Non-Industrial Pollutant Source Demonstration:
  - An assessment of the relative contributions of the pollutant exceeding NALs from (1) storm water run-on from adjacent properties or non-industrial areas of SAN or aerial deposition, and (2) storm water associated with the Authority's industrial activities will be conducted; and
  - An assessment of the monitoring data used to evaluate the relative contributions of non-industrial and industrial sources will be conducted.
- Natural Background Pollutant Source Demonstration:
  - An assessment of monitoring data, research, and published literature used to demonstrate that a natural background source is responsible for the NAL exceedance will be conducted.

11.7 PROGRAM REVIEW AND MODIFICATION

The Municipal Permit and Industrial Permit both require an Annual Report that includes an assessment of SWMP effectiveness. The Annual Reports will provide documentation of the SWMP elements and data needed to make decisions regarding refinement of the SWMP. The assessment will document specific strategies implemented each year, comparison to the action levels and numeric goals, effectiveness of the strategies toward meeting goals, need for further action or modification, and recommendations. This process

will be used to track the effectiveness of the Authority's jurisdictional runoff management program on an annual basis.

Additionally, the Municipal Permit requires a ROWD at the end of each Municipal Permit cycle. This includes an assessment of the SWMP effectiveness in improving the Authority's focused priority condition. The assessment documents monitoring results and actions implemented in comparison with goals set in the WQIP. Lessons learned from this assessment will guide an adaptive management process that may lead to modifications to the SWMP as the Authority reevaluates its focused priority condition, water quality goals and schedules, water quality improvement strategies and BMPs, and monitoring and assessment programs. As progress toward achieving goals is made, the Authority's focused priority condition will be re-evaluated, and new priorities will be identified if appropriate.

The Authority has reserved this section to identify and document future changes to the Effectiveness Assessment Component of the SWMP. Section 13.0 of this SWMP details the program modifications made to the March 2008 version of the SWMP to bring this document into compliance with the renewed Municipal Permit and Industrial Permit. Changes made are listed below.

- The WQIP sweeping goal was amended slightly in Section 11 to reflect the most up-to-date information collected on the runway/taxiway sweeping program, and older goals incorporated into draft versions of the WQIP (which are no longer included in the final WQIP) have been removed; and
- The table showing WQIP goals (Table 11-1) has been updated to include all interim and final WQIP goals.

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12.0 REPORTING

12.1 MUNICIPAL PERMIT REPORTS

The Municipal Permit requires Copermittees to submit deliverables in the form of annual reports and updates to ensure compliance. The Authority's JRMP implementation and results will be documented and communicated to the RWQCB and the public through the reports described in Sections 12.1.1 through 12.1.4. When requested, the Authority, along with the other Responsible Parties, will appear before the RWQCB to present progress reports on implementation of the San Diego Bay WQIP program and individual JRMPs.

12.1.1 TRANSITIONAL REPORTS

Until the first WQIP Annual Report was submitted, the Authority continued to submit a JRMP Annual Report by October 31 of each year for the previous reporting period of July 1 to June 30. The JRMP Annual Report includes a completed JRMP Annual Report Form (Attachment D of the Municipal Permit) and any required additional information to explain or clarify the responses in the form.

The Copermittees jointly submitted a Transitional Monitoring and Assessment Annual Report by January 31 of each year following each transitional monitoring and assessment reporting period of October 1 through September 30 until the first WQIP Annual Report was submitted. The Transitional Monitoring and Assessment Program Annual Report included receiving water and MS4 outfall discharge monitoring data, as well as the assessments of those data, and any required reporting from the previous Municipal Permit (R9-2007-0001).

12.1.2 WATER QUALITY IMPROVEMENT PLAN ANNUAL REPORT

The San Diego Bay WQIP Annual Report provides updates to, and results from, the WQIP program. The Authority and other Responsible Parties submit the WQIP Annual Report for each reporting period of July 1 to June 30 before January 31 of the following year. In accordance with Provision II.F.3.b.(3) of the Municipal Permit, the WQIP Annual Report includes the following information:

- Receiving water and MS4 outfall discharge monitoring data;
- Updates on the Authority's (and other Responsible Parties') contribution and progress toward completing special studies, including the results, interpretations, and conclusions following completion of each phase;
- Assessments, conclusions, and recommendations for receiving water quality, MS4 outfall discharge reduction, special studies, and WQIP program monitoring;
- Progress toward achieving interim and final numeric goals for highest and focused priority water quality conditions for the WMA;
- Description of the implemented WQIP strategies and those planned for implementation during future reporting periods;
- Description of WQIP strategies that were removed or anticipated but not implemented during the current and previous reporting periods;
- Proposed modifications to the WQIP strategies and supporting rationale;
- Comments received during the WQIP update public comment period;
- Previous modifications or updates incorporated into the WQIP and/or JRMP document;

- Proposed modifications to the WQIP and/or JRMP document and supporting rationale;
- Completed JRMP Annual Report Form (Attachment D of the Municipal Permit) for each responsible party, certified by a Principal Executive Officer, Ranking Elected Official, or DAR;
- Data or documentation used in the WQIP Annual Report, if requested by the RWQCB; and
- Monitoring and assessment data used in the WQIP Annual Report, which will be uploaded to the California Environmental Data Exchange Network and made available on the Regional Clearinghouse described in Section 12.1.4.

12.1.2.1 Water Quality Improvement Plan Update

As part of the adaptive management process, the WQIP will be updated in response to the results of the assessment presented in the WQIP Annual Report. As required under Provision F.2.c.(1)(a) of the Municipal Permit, the Authority and the other Responsible Parties will implement a public participation process to incorporate information, recommendations, and comments from the general public into the WQIP update. The WQIP Consultation Panel held a meeting in early 2017 to provide an opportunity for representatives of the RWQCB, environmental community, development community, and the public to comment on all aspects of the WQIP update, including the highest and focused priority water quality conditions, sources, and water quality improvement strategies, and to recommend additional updates. The Authority will continue to work with the other Responsible Parties to incorporate any proposed updates to the WQIP, and the supporting rationale, either as part of the WQIP Annual Report or the ROWD.

Final updates will be implemented 90 days after submission of the WQIP updates, unless otherwise directed by the RWQCB. Updates to the WQIP will be made available on the Regional Clearinghouse within 30 days following acceptance by the RWQCB.

12.1.2.2 Jurisdictional Runoff Management Program Document Update

This SWMP represents the Authority's updated JRMP, in accordance with the requirements in Municipal Permit Provisions F.2.a.(1) and F.2.a.(2). The Authority will also update its SWMP as necessary during submittal of WQIP Annual Reports or as part of the ROWD. The updated JRMP will be made available on the Regional Clearinghouse within 30 days following the WQIP Annual Report submittal.

12.1.2.3 BMP Design Manual Update

The BMP Design Manual was developed regionally by the Copermittee Land Development Workgroup and replaces the previous SUSMP. The BMP Design Manual includes the elements described in Section 4.7 of this SWMP. The Authority continued to implement the SUSMP until the new BMP Design Manual was adopted in February 2016. Subsequent updates to the BMP Design Manual will be submitted with the WQIP Annual Reports or the ROWD. The updated BMP Design Manual is available on the Regional Clearinghouse via a link to the Authority's webpage.

12.1.3 REPORT OF WASTE DISCHARGE

The Authority and the other Municipal Permit Copermittees reapplied for coverage prior to expiration of the Municipal Permit on June 27, 2018, in accordance with the CFR Duty to Reapply [40 CFR 122.41]. The ROWD was submitted no later than December 24, 2017, as part of the application for reissuance of Order number R9-2013-0001 (NPDES Permit number CAS0109266).

The ROWD included the following information:

- Names and addresses of Copermittees;

- Names and titles of Authority and Copermittee primary contacts;
- Proposed updates and supporting rationale for changes to the WQIP;
- Proposed updates and supporting rationale for changes to the JRMP;
- Additional updates to the JRMP, WQIP, or BMP Design Manual that were not included in the WQIP Annual Reports; and
- Applicable information required under federal regulations for reissuance of the NPDES Permit.

12.1.3.1 Regional Monitoring and Assessment Report

The Regional Monitoring and Assessment Report was submitted no later than December 24, 2017, as part of the ROWD. In compliance with Provision II.F.3.c of the Municipal Permit, the Regional Monitoring and Assessment Report considered receiving water and MS4 outfall discharge monitoring and assessment data, results, and conclusions from previous reporting years. Based on these considerations, the report assesses, within the San Diego region, the following:

- Are beneficial uses of receiving waters being supported or adversely impacted by MS4 discharges?
- What is the progress toward protecting the beneficial uses of receiving waters?
- What are the pollutants or conditions of emerging concern that may impact the beneficial uses of receiving waters?

Recommendations for improving strategies, implementation, and assessment of the WQIP and JRMP were included in the Regional Monitoring and Assessment Report. Any Authority data used in preparation of the report will be made available on the Regional Clearinghouse described in Section 12.1.4.

12.1.4 REGIONAL CLEARINGHOUSE

The Authority and the Responsible Parties will continue to maintain and update the internet-based Regional Clearinghouse (www.projectcleanwater.org) in accordance with Provision II.F.4 of the Municipal Permit. This Regional Clearinghouse will be organized according to WMA and will continue to be used to make responsible party documents available to the public. These documents include, but are not limited to, the following (per WMA):

- WQIPs and all updates;
- Annual Reports;
- Jurisdictional Runoff Management Program documents and all updates;
- BMP Design Manual and all updates;
- Special Study reports;
- Monitoring data links to California Environmental Data Exchange Network (where data will be uploaded); and
- GIS) data, layers, and/or shapefiles used to develop applicable maps.

In addition, the Authority will provide contact information, the public storm water hotline telephone number and email address, a link to the Authority webpage, information on Authority-sponsored public participation activities available, reports from regional monitoring programs where the Authority is a participant, the Regional Monitoring and Assessment Program, and additional data or information that the Authority deems appropriate for public access.

12.1.5 STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Federal regulation 40 CFR 122.41(l) requires the Authority to notify the RWQCB as soon as possible of any changes to the airport property or activities that may result in any of the following:

- Planned physical alterations or additions to airport facilities that may result in a new source of pollutants, or a significant change in the nature or quantity of pollutants discharged; and
- Anticipated noncompliance with the requirements of the Municipal Permit.

Any occurrence of noncompliance that may threaten health or the environment, such as an unanticipated bypass or upset that exceeds effluent limitations, or any violation of maximum daily discharge limitations, will be verbally reported to the RWQCB within 24 hours from the time the Authority becomes aware of the incident, followed by a written notification within 5 days (unless the RWQCB waives this requirement). The written report must include:

- A description of the incident and its cause;
- The period of noncompliance (dates/times);
- If not corrected, anticipated time until correction; and
- Steps taken or planned to prevent reoccurrence of the noncompliance.

All other instances of noncompliance will be included annually in the monitoring reports.

General Provisions of the Municipal Permit require any reports submitted to comply with any Municipal Permit requirements to include an executive summary, introduction, conclusion, recommendations, and signed certified statement covering the Authority's responsibilities, in a hard copy and an electronic copy to the RWQCB, unless requested otherwise, and one electronic copy to the USEPA.

12.2 INDUSTRIAL PERMIT REPORTS

An Annual Report will be submitted each year in accordance with Section XVI of the Industrial Permit. Sampling results from the 2015-2016 reporting period indicated an NAL exceedance for copper and the Authority entered Level 1 status for that parameter beginning July 1, 2016. The Authority also submitted an ERA Report because of this NAL copper exceedance. By the end of the 2016-2017 reporting period, sampling results indicated NAL exceedances for copper and zinc. Subsequently, the Authority entered Level 1 status for zinc and Level 2 status for copper, beginning July 1, 2017. An ERA Evaluation and Report was submitted for the Level 1 status for zinc. An ERA Action Plan was submitted for the Level 2 status for copper, and an ERA Technical Report will be submitted once all tasks in the Action Plan are completed. By the end of the 2017-2018 reporting period, sampling results indicated NAL exceedances for copper, zinc, BOD, and COD. Subsequently, the Authority entered Level 1 status for BOD and COD, and Level 2 status for copper and zinc, beginning July 1, 2018. An ERA Evaluation and Report was submitted for the Level 1 status for BOD and COD. A revised ERA Action Plan was submitted for the Level 2 status for copper and was modified to incorporate zinc, and an extension request to the ERA Technical Report was submitted to allow time for all tasks in the Action Plan to be completed. These reports are described in Sections 12.2.2.

12.2.1 INDUSTRIAL PERMIT ANNUAL REPORT

The Industrial Permit Annual Report, in a standardized format generated under the Industrial Permit, will be submitted in SMARTS by July 15 following each reporting year (July 1 through June 30). The Annual Report will include the following:

- A Compliance Checklist indicating compliance with all applicable Industrial Permit requirements;

- An explanation of any non-compliant activities or events within the reporting year;
- A description of any revisions applied to the SWPPP during the reporting year and their location within the SWPPP; and
- The date of the Annual Evaluation, as described in Section 7.10.

The Authority will submit any sampling and analytical results via the SWRCB's SMARTS website within 30 days of obtaining all results for each sampling event.

12.2.2 EXCEEDANCE RESPONSE ACTION REPORTING

An ERA Report will be submitted by January 1, only if the Authority enters Level 1 or Level 2 status at any point during the previous reporting period. ERAs are conducted in response to an annual or instantaneous maximum NAL exceedance, as defined in Section XII of the Industrial Permit. ERA analyses, plans, and reports will be completed by a certified QISP and submitted in SMARTS. The ERA documents required for each level will include the following:

Level 1

- ERA Report:
  - A description of any revisions to the SWPPP necessary to address the potential pollutant source(s) related to the NAL exceedance;
  - BMP additions or modifications necessary to prevent future NAL exceedances;
  - A summary of the required SWPPP revisions; and
  - The name, identification number, and contact information for the QISP assigned to perform the ERA evaluation and prepare the report.

Level 2

- ERA Action Plan:
  - A separate ERA Action Plan will be submitted for each new parameter that exceeded the NAL or for equivalent parameters that exceeded NALs in different drainage areas. The Action Plan will identify the BMP demonstration(s) to be performed in each corresponding drainage area to prevent future NAL exceedances.
  - The ERA Action Plan will include a schedule and description of tasks required to complete the BMP demonstration(s).
- ERA Technical Report:
  - The Authority will select a BMP demonstration from the list provided in Sections XII.D.2.a through XII.D.2.c of the Industrial Permit to address the source(s) of each pollutant with a NAL exceedance. The ERA Technical Report will include a detailed description of the BMP demonstration chosen to address each NAL exceedance.
  - The ERA Technical Report will be updated annually to include additional NAL exceedances of the same parameter and drainage area, activity or operational changes, pollutant source(s) changes, and/or additional information acquired through visual observations, evaluations, and sampling as applicable. If no changes are necessary, the Authority will explain in the Annual Report why resubmittal of the ERA Technical Report is not necessary.

Further information about the ERA levels, evaluations, planning, and reporting is provided in Section 7.9.

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13.0 MODIFICATIONS TO THE SWMP

This SWMP was updated from the March 2008 version of the SWMP to comply with the new requirements of the Municipal Permit, the Industrial Permit, and to incorporate new developments and BMPs installed during the Green Build North Side Development and other redevelopments at SAN. As part of the iterative process for the WQIP and any required updates to the SWPPP, modifications may continue to be made to this SWMP to reflect programmatic changes and/or strategy improvements as a result of WQIP and NAL assessments required under the respective permits. Proposed changes to the SWMP or applicable program modifications will be included in the Annual Reports for the Municipal Permit and the Industrial Permit.

Modifications made to the overall structure of the SWMP and incorporated into the SWMP June 2015 Revision to bring this document into conformance with the renewed Municipal Permit and the Industrial Permit include the following:

- Combining previous Sections 3.0 and 9.0 into the new Section 3.0 "Non-Storm Water Discharges/Illicit Discharge Detection and Elimination."
- Combining previous Sections 10.0 and 11.0 into the new Section 9.0 "Public Participation and Education Component."
- Separating sections regarding compliance with the Industrial Permit from the rest of the SWMP. Section 7.0 was modified so that it could be extracted from the remainder of the SWMP for uploading to SMARTS per Industrial Permit requirements. An attachment to Section 7.0 will include material from other sections of the SWMP that are referenced in Section 7.0, and will be uploaded with Section 7.0 into SMARTS. This attachment is for SMARTS upload purposes only, and will not be included in this SWMP.
- Transferring Tables 1 through 9 from the end of the document into their corresponding sections.
- Rearranging Appendices D-1 and D-2 for wet and dry weather monitoring into Appendices D-1 and D-2 for Industrial Permit Monitoring Implementation Plan and Municipal and BMP Effectiveness Monitoring Plan, respectively.
- Updating the JRMP in accordance with the strategies identified in the WQIP.

Modifications made to the SWMP in February 2016 include the following:

- The BMP Design Manual replaced the SUSMP in Appendix C, and related updates to Sections 4 and 12 were made.

Modifications made to the SWMP following the Annual Evaluations (2015 and 2016), ERA Site Assessment (2016) and WQIP Annual Report (2017) include:

- Updates were made to the Industrial Component, Section 7, following the Annual Evaluation and ERA, including update of the LRP and addition of the QISP.
- Appendix B was updated following the Annual Evaluations (2015 and 2016) and ERA (2016).
- Updates were made to Appendix D-1 following the Annual Evaluations (2015 and 2016) and ERA (2016).
- Updates were made to the tenant summary sheets and maps in Appendix E following the Annual Evaluations.
- Sampling locations were modified in order to collect samples representative of activities conducted in specified drainage basins.

- Sampling procedures, sampling sites, data quality objective table, and sampled analytes were updated in Appendix D-1.
- The following BMPs were added to Appendix B as a result of the ERA Evaluation:
  - SC09-8 Repair Damaged Asphalt;
  - SC09-9 Reduce the exposure of galvanized or rusty metal structures to rainfall, where possible; and
  - SC12-12 Roads, ramp areas, and apron areas are scrubbed on an as-needed basis.
- The SWMP was modified to enhance the information included in Section 7 and Appendices B, D and E for tenants Allied Aviation and Aircraft Services International Group (now Menzies), and to add information for the new tenant Conrac Solutions, in anticipation of their incorporation into the Authority's program and WDID number under the Industrial Permit. Incorporation of those tenants under the Authority's WDID is dependent upon approval by the State and RWQCB of the Authority's COI and tenant NOTs.
- Tenant Summary Sheets and Appendix E figures were updated to reflect Tenant operations.
- Figures 3-7 were updated to reflect changes in the tenant gates, sampling locations, and new TCBMPs installed.
- The WQIP sweeping goal was amended slightly in Section 11 to reflect the most up-to-date information collected on the runway/taxiway sweeping program, and older goals incorporated into draft versions of the WQIP (which are no longer included in the final WQIP) have been removed.

Modifications made to the SWMP following the Annual Evaluation (September 2017) and ERA (July/August 2017)

- Updates were made to the Industrial Component, Section 7, following the Annual Evaluation and ERA Evaluation;
- All BMP Summary Sheets and maps were updated in Appendix B to reflect tenant and tenant gate changes, to reflect the change of Aircraft Services International Group to Menzies, and to include the airline Edelweiss that began operations at SDIA in May 2017;
- Updates were made to Appendix D-1 to reflect changes in sampling locations for the 2017-2018 monitoring year;
- Updates were made to the tenant summary sheets and maps in Appendix E following the Annual Evaluation (September 2017);
- Figures 3-7 were updated to reflect changes in the tenant gates, sampling locations and to include the airline Edelweiss;
- The tenant Aircraft Services International Group was renamed Menzies during summer 2017 and the Industrial Component, Section 7, Appendix B, Appendix E, and Figures 3-7 were updated to reflect this change; and
- The following BMPs were added to Appendix B as a result of the ERA Evaluation and Annual Evaluation:
  - SC01-10: Prohibit over-irrigation of landscaped areas; and SC07-13: Do not permanently store equipment and materials in the bed of a pickup truck. If storing temporarily, provide cover and containment.

Modifications made to the SWMP following the Annual Evaluation (September/October 2018) and ERA (August 2018)

- Updates were made to the Industrial Component, Section 7, following the Annual Evaluation and ERA Evaluation.
- All applicable BMP Summary Sheets and maps were updated in Appendix B to reflect any tenant and tenant gate changes.
- Updates were made to Appendix D-1 to reflect changes in sampling locations for the 2018-2019 monitoring year.
- Updates were made to the tenant summary sheets and maps in Appendix E following the Annual Evaluation (September/October 2018).
- Figures 3-7 were updated to reflect changes in the tenant gates and sampling locations.
- Minor updates were made to the drainage basins in Section 1.
- Updates were made to Authority departments in Section 2 following organizational changes at SAN, and subsequent assignment of roles and responsibilities.
- Further BMPs and details were added on the prohibition of over-irrigation in Section 3 (and throughout the SWMP), and details on the FOD Management Program at SAN. The outline of potential NSWDs at SAN was reorganized in Sections 3.1.1. – 3.1.2.
- Updates were made to Section 4 in January 2019, following finalization of the Strategic Master Drainage Plan and change in the storm water capture and reuse WQIP strategy from an optional to a jurisdictional strategy.
- Updates were made to Section 5 in January 2019, to add the current (as of January 2019) construction sites and the method of assigning TTWQ designations for construction sites.
- Updates were made to Section 6 in January 2019, following the designation of additional minimum BMPs, and addition of specific BMPs for preventing over-irrigation.
- Section 7 of the SWMP was modified in January 2019 to incorporate updates as a result of ERAs and the 2018 annual evaluation.
- Language was added to Section 9 to emphasize the over-irrigation education and outreach conducted and to add information on the Sustainability Fair.
- Section 11, Table 11-1 was updated to show all interim and final WQIP goals.
- Section 12 was updated to reflect the latest ERAs and reporting following the 2017-2018 monitoring season.

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14.0 CONCLUSIONS AND RECOMMENDATIONS

The SAN SWMP describes procedures and activities intended to manage and reduce urban runoff pollution to the storm drain system, and ultimately San Diego Bay, from the operations and activities at SAN. This document was prepared by the Authority to be consistent with the Municipal Permit and the Industrial Permit to provide a written account of the various programs and strategies developed to comply with the requirements of these two permits and ultimately to improve water quality of receiving waters in San Diego Bay. The SWMP is a combination of the Authority's JRMP document required by the Municipal Permit and the industrial SWPPP required by the Industrial Permit. This SWMP contains information required by the Municipal Permit for each component of the Authority's storm water management program, including land use planning for new development and redevelopment, construction activities, existing development, IDDE activities, and education and public participation activities. It also serves to document the Authority's plans to meet the goals and strategies developed for the San Diego Bay WQIP. The WQIP serves as the tool to assess the effectiveness of Copermittees' individual JRMPs and to track progress toward meeting water quality improvement goals. The iterative process of the WQIP allows jurisdictional programs and strategies to be adapted and modified as the understanding of their impacts on water quality improves.

The requirements of the Industrial Permit are included in this SWMP to provide one document to serve as a reference for all Authority staff and tenants. However, the Industrial section and corresponding appendices and attachments will be extracted and uploaded via SMARTS per Industrial Permit requirements.

Any recommendations for future actions and/or program additions or revisions will be presented in the Annual Reports required by both the Industrial Permit and the Municipal Permit.

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FIGURES

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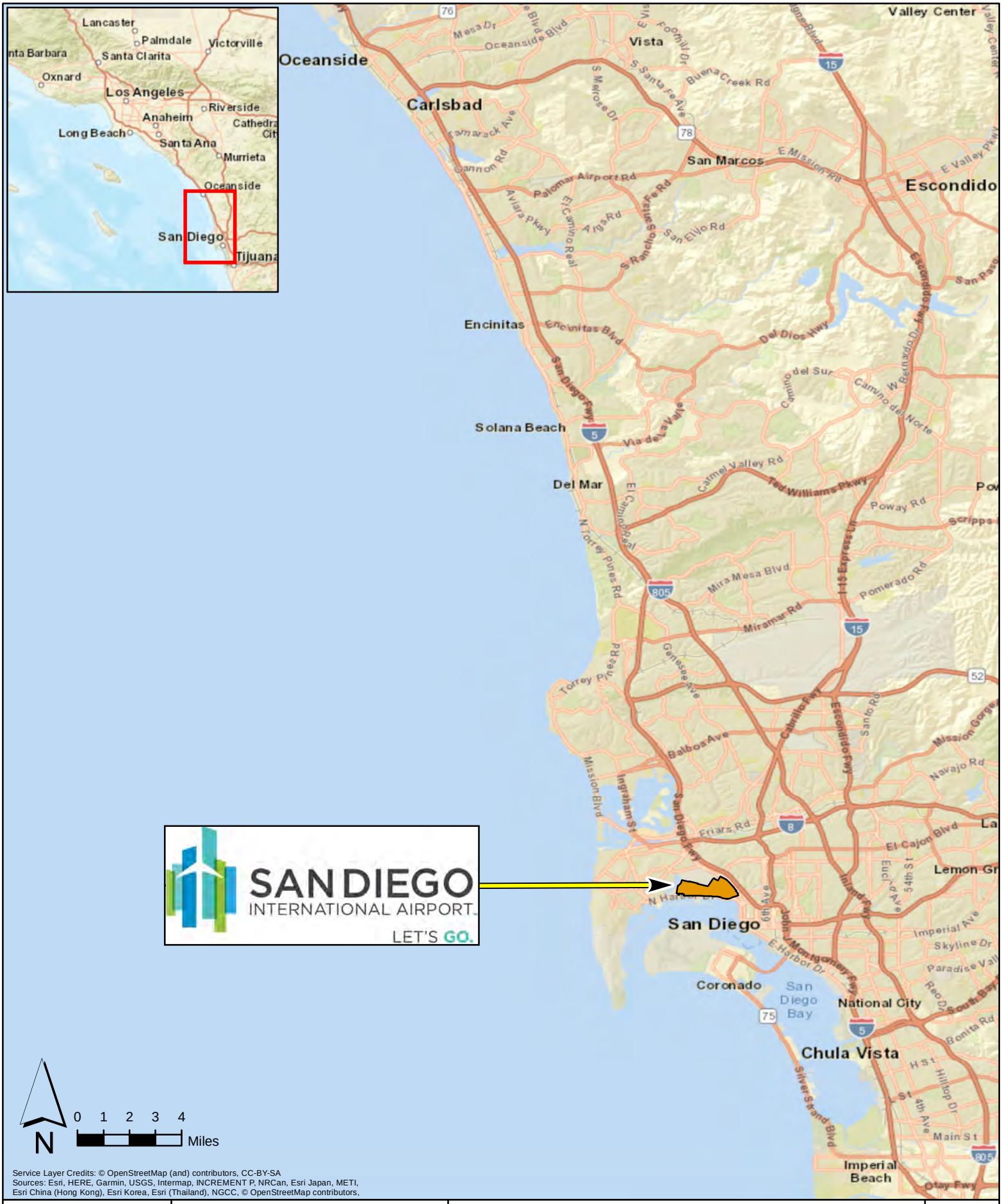

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Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors,

SAN Storm Water Management Plan January 2019	wood.	**Regional Location Map** **San Diego International Airport**	FIGURE 1

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Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

SAN Storm Water Management Plan January 2019	wood.	**General Vicinity Map** **San Diego International Airport**	FIGURE 2

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Notes:

1. Areas impacted by storm water run-on from surrounding areas include the eastern portion of Drainage Basin (DB) 1 and the northern portions of DB 5, 6, and 13.
2. Most storage areas are under cover, apart from the boneyard area and some equipment storage areas outside some maintenance shops in DB 7.
3. All areas are paved apart from the erodible areas, the Least Tern ovals, and the landscaped areas in the parking lots.
4. Shipping and receiving areas are located at Bradford's facility (DB 6) and west of the Cargo Buildings in DB 8.
5. Equipment maintenance/storage areas are mainly inside, and east of Cargo Buildings in DB 7. Minor maintenance is also performed in ramp areas.
6. No significant spills or leaks have occurred at SAN in the last five years.
7. Storm drain inlets are shown on map attached to SC01 in Appendix B.

C-B06-14
C-B06-19
T-B06-7
C-B06-5a
T-B06-09
C-B06-15a
C-B08-22
C-B06-17
S-B12-12a
C-B12-9a
C-B15-18a
C-B08-8
C-B05-13
T-B05-08
C-B03-21
T-B03-1
C-B03-1c
C-B06-20
C-B07-6
T-B05-2a
C-B05-4
C-B06-16a
T-B07-5
C-B07-7a
C-B03-2
T-B03-6

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Sampling Location
Inlet
Outfall
Stormwater Pipe
Trench Drain
Direction of Surface Flow
Permeable Strip

Composting
Dumpster
Fuel Storage
Fueling
Grease Trap
Industrial Waste
Loading

Material Storage
Metal Storage
Oil Storage
Recycling
Underground Storage Tank
Wash Area

Airport Boundary
Artificial Turf
Erodible Area
Least Tern Nesting Area
Signature BMP
Building
Drainage Basin and Number

A Inlet Filter
B Permeable Surface
C Trench Drain Filter
D Bio Clean Grate Inlet Skimmer Box
E Bio Clean Curb Inlet Skimmer Box
F Infiltration Trench

G Contech Storm Filter
H Contech CDS
I ClearWater Solutions BMP Unit
J Modular Wetland System
K Detention Basin
L Bioswale

M Artificial Turf Infiltration
N Aquashield HDS
O Oil Water Separator
P Pervious Gravel
Q Bioretention Basin
R Subsurface Infiltration Basin

S Curb Inlet Box
T Curb Cut with Rock Infiltration Bed
U Old Castle/Kristar Perkfilter Unit
V Contech Jellyfish Unit
W CleanWay Drop Inlet Filter Insert
X Activated Alumina Filter Bags
V Biochar Boom

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SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT

FIGURE
3

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Notes:

1. Areas impacted by storm water run-on from surrounding areas include the eastern portion of Drainage Basin (DB) 1 and the northern portions of DB 5, 6, and 13.
2. Most storage areas are under cover, apart from the boneyard area and some equipment storage areas outside some maintenance shops in DB 7.
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C-B06-15a
C-B08-22
C-B06-17
S-B12-12a
C-B12-9a
C-B15-18a
C-B08-8
T-B05-08
C-B05-13
C-B03-21
T-B03-1
C-B03-1c
C-B06-20
C-B07-6
T-B05-2a
C-B05-4
C-B06-16a
T-B07-5
C-B07-7a
C-B03-2
T-B03-6

Sampling Location
Inlet
Outfall
Stormwater Pipe
Trench Drain
Direction of Surface Flow
Permeable Strip

Composting
Dumpster
Fuel Storage
Fueling
Grease Trap
Industrial Waste
Loading

Material Storage
Metal Storage
Oil Storage
Recycling
Underground Storage Tank
Wash Area

Airport Boundary
Artificial Turf
Erodible Area
Least Tern Nesting Area
Signature BMP
Building
Drainage Basin and Number

A Inlet Filter
B Permeable Surface
C Trench Drain Filter
D Bio Clean Grate Inlet Skimmer Box
E Bio Clean Curb Inlet Skimmer Box
F Infiltration Trench
G Contech Storm Filter

H Contech CDS
I ClearWater Solutions BMP Unit
J Modular Wetland System
K Detention Basin
L Bioswale
M Artificial Turf Infiltration
N Aquashield HDS

O Oil Water Separator
P Pervious Gravel
Q Bioretention Basin
R Subsurface Infiltration Basin
S Curb Inlet Box
T Curb Cut with Rock Infiltration Bed

U Old Castle/Kristar Perkfilter Unit
V Contech Jellyfish Unit
W CleanWay Drop Inlet Filter Insert
X Activated Alumina Filter Bags
V Biochar Boom

Figure 5
Figure 6
Figure 7

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San Diego, California

STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT

FIGURE 4

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C-B08-8
C-B06-17
C-B06-20
C-B07-6
C-B06-16a
T-B07-5
C-B07-7a

- Sampling Location
- Inlet
- Outfall
- Stormwater Pipe
- Trench Drain
- Direction of Surface Flow
- Permeable Strip
- Composting
- Dumpster
- Fuel Storage
- Fueling
- Grease Trap
- Industrial Waste
- Loading
- Material Storage
- Metal Storage
- Oil Storage
- Recycling
- Underground Storage Tank
- Wash Area
- Airport Boundary
- Artificial Turf
- Erodible Area
- Least Tern Nesting Area
- Signature BMP
- Building
- Drainage Basin and Number
- A Inlet Filter
- B Permeable Surface
- C Trench Drain Filter
- D Bio Clean Grate Inlet Skimmer Box
- E Bio Clean Curb Inlet Skimmer Box
- F Infiltration Trench
- G Contech Storm Filter
- H Contech CDS
- I ClearWater Solutions BMP Unit
- J Modular Wetland System
- K Detention Basin
- L Bioswale
- M Artificial Turf Infiltration
- N Aquashield HDS
- O Oil Water Separator
- P Pervious Gravel
- Q Bioretention Basin
- R Subsurface Infiltration Basin
- S Curb Inlet Box
- T Curb Cut with Rock Infiltration Bed
- U Old Castle/Kristar Perkfilter Unit
- V Contech Jellyfish Unit
- W CleanWay Drop Inlet Filter Insert
- X Activated Alumina Filter Bags
- V Biochar Boom

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STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT

FIGURE
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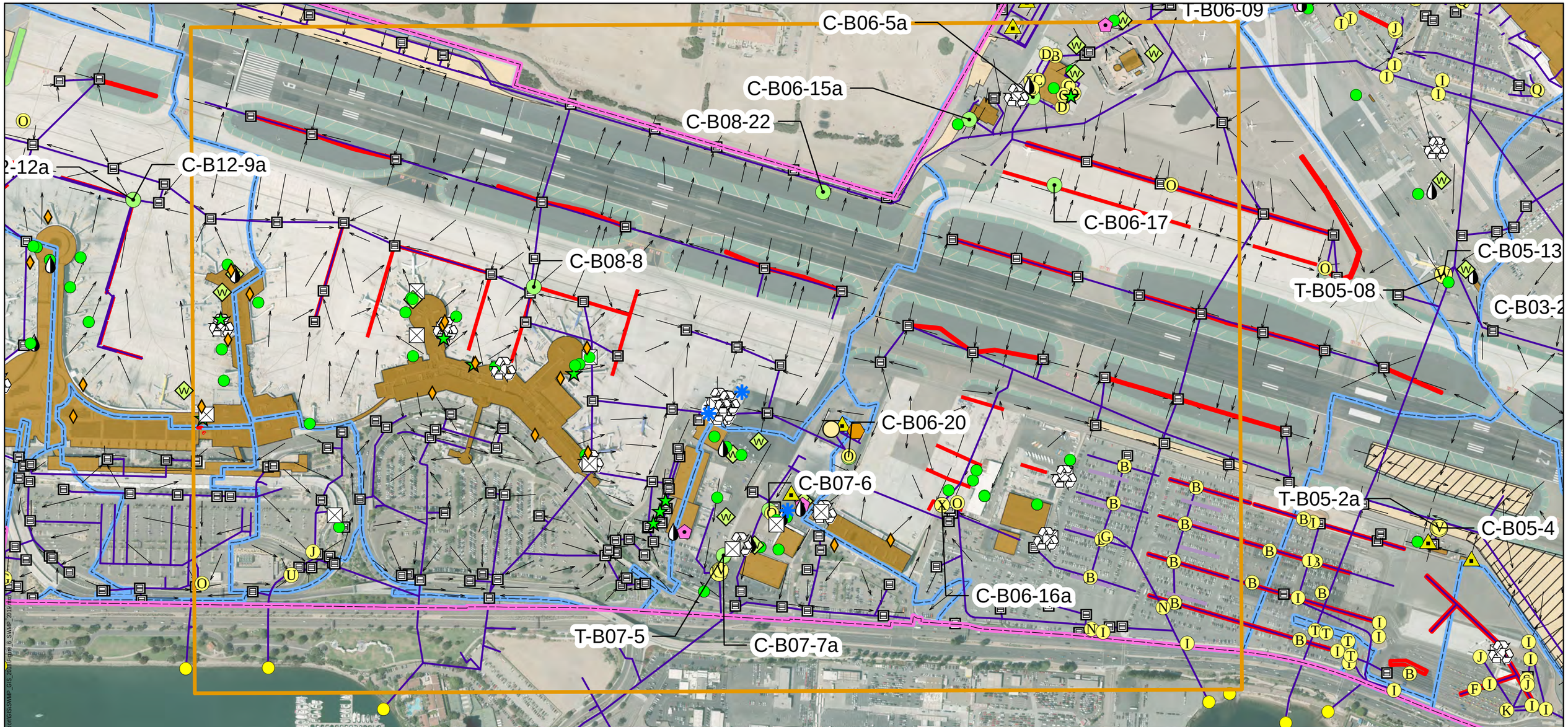

- Sampling Location
- Inlet
- Outfall
- Stormwater Pipe
- Trench Drain
- Direction of Surface Flow
- Permeable Strip
- Composting
- Dumpster
- Fuel Storage
- Fueling
- Grease Trap
- Industrial Waste
- Loading
- Material Storage
- Metal Storage
- Oil Storage
- Recycling
- Underground Storage Tank
- Wash Area
- Airport Boundary
- Artificial Turf
- Erodible Area
- Least Tern Nesting Area
- Signature BMP
- Building
- (1) Drainage Basin and Number
- (A) Inlet Filter
- (B) Permeable Surface
- (C) Trench Drain Filter
- (D) Bio Clean Grate Inlet Skimmer Box
- (E) Bio Clean Curb Inlet Skimmer Box
- (F) Infiltration Trench
- (G) Contech Storm Filter
- (H) Contech CDS
- (I) ClearWater Solutions BMP Unit
- (J) Modular Wetland System
- (K) Detention Basin
- (L) Bioswale
- (M) Artificial Turf Infiltration
- (N) Aquashield HDS
- (O) Oil Water Separator
- (P) Pervious Gravel
- (Q) Bioretention Basin
- (R) Subsurface Infiltration Basin
- (S) Curb Inlet Box
- (T) Curb Cut with Rock Infiltration Bed
- (U) Old Castle/Kristar Perkfilter Unit
- (V) Contech Jellyfish Unit
- (W) CleanWay Drop Inlet Filter Insert
- (X) Activated Alumina Filter Bags
- (V) Biochar Boom

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San Diego, California

STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT

FIGURE

6

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C-B12-9a
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C-B08-8
C-B05-13
T-B05-08
C-B03-21
T-B03-1
C-B06-20
C-B03-1c
C-B07-6
T-B05-2a
C-B05-4
C-B06-16a
T-B07-5
C-B07-7a
C-B03-2
T-B03-6

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Sampling Location
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Industrial Waste
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V Biochar Boom

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San Diego, California

STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT

FIGURE 7

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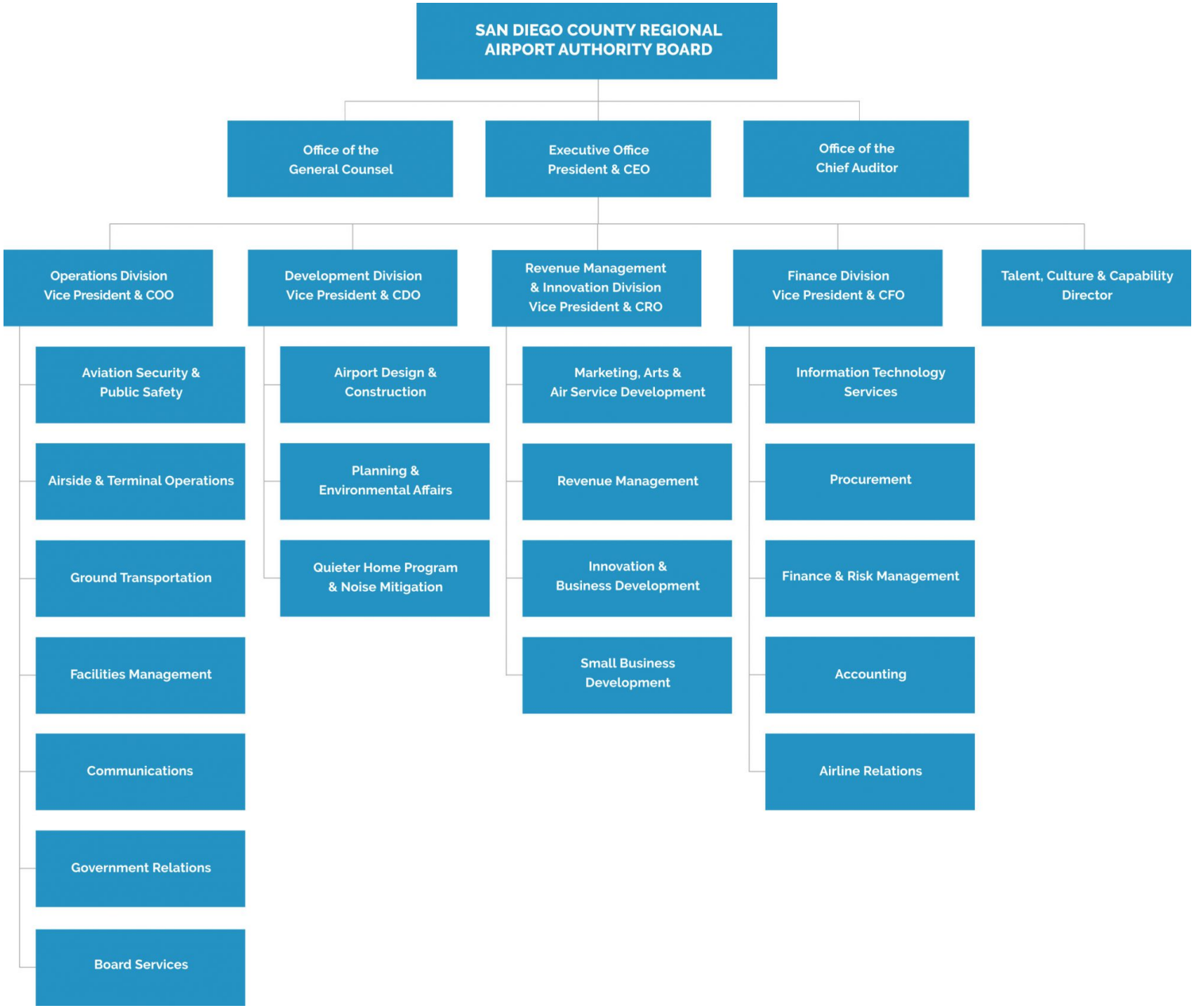
SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY BOARD
Office of the General Counsel
Executive Office President & CEO
Office of the Chief Auditor
Operations Division Vice President & COO
Development Division Vice President & CDO
Revenue Management & Innovation Division Vice President & CRO
Finance Division Vice President & CFO
Talent, Culture & Capability Director
Aviation Security & Public Safety
Airside & Terminal Operations
Ground Transportation
Facilities Management
Communications
Government Relations
Board Services
Airport Design & Construction
Planning & Environmental Affairs
Quieter Home Program & Noise Mitigation
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Revenue Management
Innovation & Business Development
Small Business Development
Information Technology Services
Procurement
Finance & Risk Management
Accounting
Airline Relations

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APPENDIX A
GENERAL INDUSTRIAL PERMIT CHECKLIST AND NOTICES


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

NATIONAL POLLUTION DISCHARGE ELIMINTATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

FACILITY NAME: San Diego International Airport
Waste Discharge Identification (WDID)#: 937I018035

	FACILITY CONTACT	Consultant/Qualified Industrial Storm Water Practitioner (QISP)
Name	Richard Gilb	Amanda Archenhold, Nancy Phu
Title	Manager, Environmental Affairs	Project Manager, Technical Professional
Company	San Diego Regional Airport Authority	Wood Environment & Infrastructure Solutions, Inc.
Street Address	P.O. Box 82776	9177 Sky Park Court
City, State	San Diego, CA	San Diego, CA
Zip	92138	92123

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Signed Certification (Section II.A)		Appendix A	12/1/2016
Pollution Prevention Team (Section X.D.1)		Table 2-1, Section 7.4, Table 7-1 Tab	6/26/2015,12/27/17, 1/26/2019
Existing Facility Plans (Section X.D.2)		Section 7.1	11/15/2016,12/27/17

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Site Map(s) (Section X.E)			
Facility boundaries (Section X.E.3.a)		Figure 3	11/15/2016, 3/02/2017
Drainage areas (Section X.E.3.a)		Figure 3	6/26/2015, 3/02/2017, 1/26/2019
Direction of flow (Section X.E.3.a)		Figure 3, Figure SC-01	11/15/2016, 3/02/2017
On-facility water bodies (Section X.E.3.a)	X		6/26/2015
Areas of soil erosion (Section X.E.3.a)		Figure 3, Figure SC-20	6/26/2015, 3/02/2017, 1/26/2019
Nearby water bodies (Section X.E.3.a)		Figure 3	6/26/2015, 3/02/2017, 1/26/2019
Municipal storm drain inlets (Section X.E.3.a)		Figure SC-01, Figure SC-17	6/26/2015, 3/02/2017, 1/26/2019
Points of discharge (Section X.E.3.b)		Figure 3	6/26/2015, 3/02/2017, 1/26/2019
Sampling Locations (Section X.E.3.b)		Figure 3	11/15/2016, 3/02/2017, 12/27/17, 1/26/2019
Structural control measures (Section X.E.3.c)		Figure 3, Figure TC-01	11/15/2016, 3/02/2017, 1/26/2019
Impervious areas (Section X.E.3.d)		Figure 3, Figure SC-09	11/15/2016, 3/02/2017, 1/26/2019
Location of Directly Exposed Materials (Section X.E.3.e)		Figure 3	11/15/2016,3/02/2017, 12/27/17, 1/26/2019
Locations of significant spills and leaks (Section X.E.3.e)	X; no significant spills or leaks in previous five years		6/26/2015
Areas of Industrial Activity (Section X.E.3.f)		Figure 3	11/15/2016, 3/02/2017, 1/26/2019
Storage areas/storage tanks (Section X.E.3.f)		Figure 3, Figure SC-07, Figure SC-08	11/15/2016, 3/02/2017,12/27/17, 1/26/2019
Shipping and receiving areas (Section X.E.3.f)		Figure 3, Figure SC-06	6/26/2015, 3/02/2017, 1/26/2019
Fueling areas (Section X.E.3.f)		Figure 3, Figure SC-03	11/15/2016, 3/02/2017, 1/26/2019
Vehicle and equipment storage/maintenance (Section X.E.3.f)		Figure 3, Figure SC-02A, Figure SC-02B, Figure SC-02C, Figure SC-16	11/15/2016, 3/02/2017, 1/26/2019

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Site Map(s) (Section X.E) Continued			
Material handling/processing (Section X.E.3.f)		Figure 3, Figure SC-07, Figure SC-08	11/15/2016, 3/02/2017, 1/26/2019
Waste treatment/disposal (Section X.E.3.f)		Figure 3, Figure SC-08, Figure SC-11	6/26/2015, 3/02/2017, 1/26/2019
Dust or particulate generation (Section X.E.3.f)		Figure 3, Figure SC-20	6/26/2015, 3/02/2017, 1/26/2019
Cleaning and material reuse (Section X.E.3.f)		Figure 3, Figure SC-04, Figure SC-12, Figure SC-18	6/26/2015, 3/02/2017, 1/26/2019
Other areas of industrial activities (Section X.E.3.f)		Figure SC-05, Figure SC-13, Figure SC-15	11/15/2016, 1/26/2019
List of Industrial Materials (Section X.F)			
Storage location			
Quantity		Section 7.7, Appendix E	11/15/2016
Frequency		Section 7.7, Appendix E	11/15/2016
Receiving and shipping location			
Quantity		Section 7.7, Appendix E	11/15/2016
Frequency		Section 7.7, Appendix E	11/15/2016
Handling location			
Quantity		Section 7.7, Appendix E	11/15/2016
Frequency		Section 7.7, Appendix E	11/15/2016

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Potential Pollution Sources (Section X.G)			
Description of Potential Pollution Sources (Section X.G.1)			
Industrial processes (Section X.G.1.a)		Section 7.7.3.1	11/15/2016, 1/26/2019
Material handling and storage areas (Section X.G.1.b)		Section 7.7.3.1	11/15/2016, 1/26/2019
Dust & particulate generating activities (Section X.G.1.c)		Section 7.7.3.1	6/26/2015
Significant spills and leaks (Section X.G.1.d)		Section 7.7.3.1	6/26/2015
Non-storm water discharges (Section X.G.1.e)		Section 7.7.3.1	6/26/2015, 12/27/17, 1/26/2019
Erodible surfaces (Section X.G.1.f)		Section 7.7.3.1	6/26/2015, 1/26/2019
Assessment of Potential Pollutant Sources (Section X.G.2)			
Narrative assessment of likely sources of pollutants (Section X.G.2.a)		Section 7.7.3.2, Table 7-5	11/15/2016, 3/02/2017, 1/26/2019
Narrative assessment of likely pollutants present in storm water discharges (Section X.G.2.a)		Section 7.7.3.2, Table 7-5	11/15/2016, 3/02/2017, 1/26/2019
Identification of additional BMPs Section X.G.2.b)		Section 7.7.4.1	11/15/2016, 12/27/17, 1/26/2019
Identification of drainage areas with no exposure (Section X.G.2.c)	X; all industrial drainage areas identified as having exposure		6/26/2015
Identification of additional parameters (Section X.G.2.d)		Appendix D.1	6/26/2015 3/02/2017

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Storm Water Best Management Practices (Section X.H)			
Minimum BMPs (Section X.H.1)			
Good housekeeping (Section X.H.1.a)		Section 7.7.4.1, Appendix B	1/11/2016, 12/27/17, 1/26/2019
Preventative maintenance (Section X.H.1.b)		Section 7.7.4.1, Appendix B	1/11/2016, 1/26/2019
Spill response (Section X.H.1.c)		Section 7.7.4.1, Appendix B	1/11/2016
Material handling and waste management (Section X.H.1.d)		Section 7.7.4.1, Appendix B	1/11/2016
Erosion and sediment controls (Section X.H.1.e)		Section 7.7.4.1, Appendix B	1/11/2016
Employee training program (Section X.H.1.f)		Section 7.7.4.1, Appendix B	1/11/2016
Quality assurance and record keeping (Section X.H.1.g)		Section 7.7.4.1, Appendix B	1/11/2016
Advanced BMPs (Section X.H.2)			
Implement advanced BMPs at the facility (Section X.H.2.a)		Section 7.7.4.1	1/11/2016
Exposure Minimization BMPs (Section X.H.2.b.i)		Section 7.7.4.1	1/11/2016, 1/26/2019
Storm Water containment and discharge reduction BMPS (Section X.H.2.b.ii)			1/11/2016
Treatment Control BMPs (Section X.H.2.b.iii)		Section 7.7.4.1 Section 6, Appendix B – TC-01	1/11/2016
Other advance BMPs (Section X.H.2.b.iv)		Section 7.7.4.1	1/11/2016
Temporary Suspension of Activities (Section X.H.3)			
BMPs necessary for stabilization of the facility (Section X.H.3)	X; facility activities not anticipated to be suspended		6/26/2015

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
BMP Descriptions (Section X.H.4)			
Pollutant that a BMP reduces or prevents (Section X.H.4.a.i)		Appendix B	11/15/2016, 12/27/17, 1/26/2019
Frequency of BMP implementation (Section X.H.4.a.ii)		Appendix B Section 7.7.4:1	6/26/2015
Location of BMP (Section X.H.4.a.iii)		Appendix B	11/15/2016, 1/26/2019
Person implementing BMP (Section X.H.4.a.iv)		Appendix B	11/15/2016, 1/26/2019
Procedures/maintenance/ instructions for BMP implementation (Section X.H.4.a.v)		Appendix B	11/15/2016, 12/27/17, 1/26/2019
Equipment and tools for BMP implementation (Section X.H.4.a.vi)		Appendix B Section 7.7.4:1	6/26/2015
BMPs needing more frequent inspections (Section X.H.4.a.vii)		Appendix B, TC-01	6/26/2015
Minimum BMP/applicable advanced BMPs not implemented at the facility (Section X.H.4.b)	X; all minimum BMPs implemented		6/26/2015, 12/27/17, 1/26/2019
BMPs implemented in lieu of minimum or applicable advanced BMPs (Section X.H.4.c)	X; all minimum BMPs implemented		6/26/2015
BMP Summary Table (Section X.H.5)			
Monitoring Implementation Plan (Section X.I)			
Team members assisting in developing the MIP (Section X.I.1)		Appendix D-1	6/26/2015 3/02/2017, 1/26/19
Summary of visual observation procedures, locations, and details (Section X.I.2)		Appendix D-1	6/26/2015 3/02/2017, 12/27/17, 1/26/19
Justifications if applicable for: Alternative discharge locations, Representative Sampling Reduction or, Qualified Combined Samples (Section X.I.3)		Appendix D-1	6/26/2015 3/02/2017

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Monitoring Implementation Plan (Section X.I) Continued			
Procedures for field instrument calibration (Section X.I.4)		Appendix D-1	6/26/2015 3/02/2017
Example of Chain of Custody (Section X.I.5)		Appendix G	6/26/2015
Annual Comprehensive Facility Compliance Evaluation (Section XV)			
Review of all visual inspection and monitoring records and sampling and analysis results conducted during the previous reporting year (Section XV.A)		Section 7	6/26/2015
Visual inspection of all areas of industrial activity and associated potential pollutant sources (Section XV.B)		Section 7	6/26/2015
Visual inspection of all drainage areas previously identified as having no-exposure to industrial activities and materials in accordance with the definitions in Section XVII (Section XV.C)	X; no areas previously identified as having no-exposure.		6/26/2015
Visual inspection of equipment needed to implement the BMPs (Section XV.D)		Section 7	6/26/2015
Visual inspection of any structural and/or treatment control BMPs (Section XV.E)		Section 7	6/26/2015
Review and assessment of all BMPs for each area of industrial activity and associated potential pollutant sources (Section XV.F)		Section 7	6/26/2015
Assessment of other factors needed to complete the information described in Section XVI.B (Section XV.G)		Section 7	6/26/2015

State Water Resources Control Board

NOTICE OF INTENT

GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH INDUSTRIAL ACTIVITIES (WQ ORDER No. 2014-0057-DWQ)

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

WDID: 9 37I018035 — Active

Operator Information

Type: Other

Name: San Diego County Regional Airport Authority
Address: PO Box 82776
Address 2:
City/State/Zip: San Diego CA 92138

Richard Gilb
Title:
Phone #: 619-400-2790
Email: rgilb@san.org

Facility Information

Site Name: San Diego Int Airpor
Address: 3225 N Harbor Dr
City/State/Zip: San Diego CA 92101
County: San Diego
Latitude: 32.72921 Longitude: -117.1896
663 Acres

Contact Name: Richard Gilb
Title:
Site Phone #: 619-400-2790
Email: rgilb@san.org
619-400-2790
%
521 Acres

SIC Code(s)

4581	Airports, Flying Fields, and Airport Terminal Services
4512	Air Transportation, Scheduled
4513	Air Courier Services

Receiving Water: San Diego Bay — Directly
Storm drain system: Port of San Diego

RWQCB Jurisdiction: Region 9 - San Diego
619-516-1990 r9_stormwater@waterboards.ca.gov

Certification

Name Jeffrey Woodson — Date: June 17, 2015
Title: VP Development

Attachments Meta Data Information:

Attachment ID	File Name	File Description	File Hash	File Size	Date Attached	Attachment Type
222312	218897.pdf	SWARM Reg. - Paul Manisjan	5e50a765f73bfffb7cf2a18c21516c92a47c241b98c180fc319121c3d2c6f8e0	118622	2007-07-24 08:29:05.0	Binary Large Object
1286611				239227	2014-07-10 14:42:42.0	Submitted Report PDF
1286612	COR zip		e6a8783127755db897faef88abd32c91c493d5c3c4e4f33d427a2f826954fc8	205656	2014-07-10 14:42:43.0	Report COR

State of California
State Water Resources Control Board

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH **INDUSTRIAL ACTIVITY** (WQ ORDER No. 97-03-DWQ)
(*Excluding Construction Activities*)

SECTION I. NOI STATUS (please check only one box)

A. [X] New Permittee B. [ ] Change of Information WDID # |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

SECTION II. FACILITY OPERATOR INFORMATION (See instructions)

A. NAME:
|S|A|N| |D|I|E|G|O| |C|O|U|N|T|Y| |R|E|G|I|O|N|A|L| |A|I|R| P|O R T AUTHORITY

Phone:
|6|1|9|-|4|0|0|-|2|7|9|2|

Mailing Address:
|P|O| |B|O|X| |8|2|7|7|6|

City:
|S|A|N| |D|I|E|G|O|

State:
|C|A|

Zip Code:
|9|2|1|1|3|8|-|2|7|7|6|

Contact Person:
|R|I|C|K| |A|D|C|O|C|K|

B. OPERATOR TYPE:
(*check one*) 1.[ ] Private 2.[ ]City 3.[ ]County 4.[ ]State 5.[ ]Federal 6.[ ]Special District 7.[ ]Gov. Combo 8.[X]Local

SECTION III. FACILITY SITE INFORMATION

A. FACILITY NAME
|S|A|N| |D|I|E|G|O| |I|N|T|E|R|A|I|T|I|O|N|A|L| |A|I|R|P|O|R|T|

Phone:
|6|1|9|-|4|0|0|-|2|7|9|2|

Facility Location:
|3|2|2|5| |N|O|R|T|H| |H|A|R|B|O|R| |D|R|I|V|E|

County:
|S|A|N| |D|I|E|G|O|

City:
|S|A|N| |D|I|E|G|O|

State:
|C|A|

Zip Code:
|9|2|1|1|0|1|-| | | | |

B. MAILING ADDRESS
|P|O| |B|O|X| |8|2|7|7|6|

City:
|S|A|N| |D|I|E|G|O|

State:
|C|A|

Zip Code:
|9|2|1|1|3|8|-|2|7|7|6|

Contact Person:
|R|I|C|K| |A|D|C|O|C|K|

C. FACILITY INFORMATION (check one)
Total Size of Site: |5|2|6| | | | Acres [X] Sq. Ft. [ ]

Percent of Site Impervious (*including rooftops*)
|1|8|0| %

D. SIC CODE(S) OF REGULATED ACTIVITY: E. REGULATED ACTIVITY (*describe each SIC code*):

1. |4|5|1|1|2| |A|I|R| |T|R|A|N|S|P|O|R|T|A|T|I|O|N|

2. |4|5|1|1|3| |A|I|R| |C|O|U|R|I|E|R|

3. |3|7|2|1|1| |A|I|R| |C|R|A|F|T|

FOR STATE USE ONLY:

SECTION IV. ADDRESS FOR CORRESPONDENCE

[ ] Facility Operator Mailing Address (Section II)	[ ] Facility Mailing Address (Section III, B.)	[X] Both

SECTION V. BILLING ADDRESS INFORMATION

SEND BILL TO: [ ]Facility Operator Mailing Address (Section II) [X]Facility Mailing Address (Section III, B.) [ ]Other (*enter information below*)

Name: SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY	Phone: 619-400-2712

Mailing Address: PO BOX 82176

City: SAN DIEGO	State: CA	Zip Code: 92138-2176

Contact Person: RICK ADCOCK

SECTION VI. RECEIVING WATER INFORMATION

Your facility's storm water discharges flow: (*check one*) [ ] Directly OR [X] Indirectly to waters of the United States.

Name of receiving water: SAN DIEGO BAY
(river, lake, stream, ocean, etc.)

SECTION VII. IMPLEMENTATION OF PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (*check one*)
[X] A SWPPP has been prepared for this facility and is available for review.
[ ] A SWPPP will be prepared and ready for review by (enter date): ____/____/____.

B. MONITORING PROGRAM (check one)
[X] A Monitoring Program has been prepared for this facility and is available for review.
[ ] A Monitoring Program will be prepared and ready for review by (enter date): ____/____/____.

C. PERMIT COMPLIANCE RESPONSIBILITY
Has a person been assigned responsibility for:

1. Inspecting the facility throughout the year to identify any potential pollution problems?	X YES	___NO
2. Collecting storm water samples and having them analyzed?	X YES	___NO
3. Preparing and submitting an annual report by July 1 of each year?	X YES	___NO
4. Eliminating discharges other than storm water (*such as equipment or vehicle wash-water*) into the storm drain?	X YES	___NO

SECTION VIII. REGULATORY STATUS (*Go to Section IX if not applicable*)

A. WASTE DISCHARGE REQUIREMENT ORDER NUMBER: 97-03-DWA B. NPDES PERMIT CA CAS010010011

SECTION IX. SITE MAP

I HAVE ENCLOSED A SITE MAP YES[X] A new NOI submitted without a site map will be rejected.

SECTION X. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan, will be complied with."

Printed Name: TED SEXTON

Signature: _____ Date 3-26-02

Title: VICE PRESIDENT, AIRPORT OPERATIONS, SAN DIEGO REGIONAL AIRPORT AUTHORITY

State of California
State Water Resources Control Board

NOTICE OF TERMINATION

Submission of this Notice of Termination constitutes notification that the facility operator identified below is no longer required to comply with the **Industrial Activities** Storm Water General Permit No. 97-03-DWQ.

I. WDID NO. 9 37S006107

II. FACILITY OPERATOR

NAME San Diego Unified Port District CONTACT PERSON David Merk

ADDRESS 3165 Pacific Highway TITLE Director, Recreation & Env'l Services

CITY San Diego STATE CA ZIP 92101 PHONE 619-686-6254

III. FACILITY SITE INFORMATION

FACILITY NAME San Diego International Airport CONTACT PERSON David Merk

LOCATION 3225 North Harbor Drive TITLE Director, Recreation & Env'l Services

CITY San Diego STATE CA ZIP 92101 PHONE 619-725-6024

SIC CODE(S) 4/5/1/2, 4/5/1/3, 3721 TYPE OF BUSINESS International Airport

IV. BASIS OF TERMINATION

_____ 1. **Closed Facility.** The facility is closed and all closure, moving, and clean-up activities are complete.

Date of closure ___/___/___ Are you moving to a new location in CA? _____ Yes _____ No

If Yes, start date at new location? ___/___/___ Will you file new NOI? _____Yes _____No

NEW FACILITY INFORMATION

NAME CONTACT PERSON

MAILING ADDRESS TITLE

CITY STATE ZIP PHONE

_____ 2. **Light Industry Exemption.** Exposure of industrial activities, materials, and equipment to storm water has been eliminated (Applies only to certain facilities - see instructions). Complete and submit Attachment A.

Date of evaluation: ___/___/___ Date exposure eliminated (if applicable): ___/___/___

Planned date of next evaluation: ___/___/___

_____ 3. **No Storm Water Discharge.** Storm water associated with industrial activity does not discharge to waters of the United States because:

____ a. the storm water is retained on site (such as in evaporation or percolation ponds).
____ b. the storm water is discharged to a municipal sanitary sewer systems or municipal combined sewer system.
____ c. the storm water is retained offsite (such as in evaporation or percolation ponds).

_____ 4. **Not Required to be Permitted.** The facility is not required by federal regulations to be regulated by an industrial activities storm water NPDES permit.

_____ 5. **Regulated by Another Permit.** Discharge of storm water associated with industrial activity is specifically regulated by another general or individual NPDES permit.

NPDES Permit No._____ Date coverage began ___/___/____

__X__ 6. **New Facility Operator.** There is a new facility operator of the identified facility.

Date facility was transferred to new facility operator 01/01/03.

Have you notified the new facility operator of the storm water NPDES Permit requirements? Yes_X_ No___

NEW FACILITY OPERATOR INFORMATION

NAME San Diego County Regional Airport Authority CONTACT PERSON Rick Adcock

MAILING ADDRESS P.O. Box 82776 TITLE Senior Environmental Specialist

CITY San Diego STATE CA ZIP 92138-2976 PHONE 619-725-6024

V. ADDITIONAL TERMINATION INFORMATION

Are you attaching any additional termination information? Yes____ No_X_

VI. FACILITY PHOTOGRAPHS

Have you attached facility photographs? Yes____ No_X_ (See Instructions)

VII. ANNUAL REPORT

Have you attached an Annual Report? Yes____ No_X_ (See Instructions)

VIII. CERTIFICATION

I certify under penalty of law that 1) I am not required to be permitted under the Industrial Activities Storm Water General Permit No. 97-03-DWQ, and 2) this document and all attachments were prepared under my direction and supervisions in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. I am aware that it is unlawful under the Clean Water Act to discharge storm water associated with industrial activity to waters of the United States if the discharge is not authorized by a NPDES permit, and there are significant penalties for submitting false information. I understand that the facility operator is still required to submit an annual report to the Regional Water Board by July 1. I also understand that the submittal of this Notice of Termination does not release a facility operator from liability for any violations of the General Permit or the Clean Water Act.

PRINTED NAME David Merk TITLE Director, Recreation & Env'l Services

SIGNATURE _____ DATE 09/17/02

REGIONAL WATER BOARD USE ONLY

☐ **Approved** and sent to State Board for termination ☐ **Denied** and returned to applicant

Printed Name	Signature	Date
		/ /

State Water Resources Control Board

NOTICE OF INTENT
FOR
GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ Order No. 91-13-DWQ)
(Excluding Construction Activities)

MARK ONLY ONE ITEM: 1. [X] Existing Facility 2. [ ] New Facility 3. [ ] Change of Information WDID # _____

I. OWNER/OPERATOR

Name: San Diego Unified Port District

Mailing Address: P.O. Box 488

City: San Diego

Contact Person: Ralph T. Hicks, Env'l. Mgmt.

A. Owner/Operator Type: (Check one)
1. [ ] City 2. [ ] County 3. [ ] State 4. [ ] Federal
5. [X] Special District 6. [ ] Government Combo 7. [ ] Private

State: CA Zip: 92112 – Phone: ext. 254 (619) 291-3900

B. 1. [ ] Owner 2. [ ] Operator 3. [X] Owner/Operator

II. FACILITY/SITE INFORMATION

Facility Name: San Diego International Airport

Street Address: 3707 & 3665 No. Harbor Drive

City: San Diego

County: San Diego

Contact Person: Bud McDonald, Airport Operations

State: CA Zip: 92101 – Phone: (619) 291-3900

Parcel Number(s) (If more than 4 apply to facility, enter additional numbers in SECTION IX. A):

A. _____ B. _____ C. _____ D. _____

III. BILLING ADDRESS

Send Billing Statements To: A. [X] Owner/Operator B. [ ] Facility C. [ ] Other (Specify in SECTION IX. B)

IV. RECEIVING WATER INFORMATION

A. Does your facility's storm water discharge directly to: (Check one)

1. [X] Storm drain system

Owner of storm drain system: (Name) City of San Diego

2. [ ] Directly to waters of U.S. (e.g., river, lake, creek, ocean)

3. [ ] Indirectly to waters of U.S.

B. Name of closest receiving water:

San Diego Bay

V. INDUSTRIAL INFORMATION

A. SIC Code(s):

1. 4512 2. 4513 3. 3721 4. 4581

B. Type of Business:

Aviation transportation & cargo handling

C. Industrial activities at facility: (Check all that apply)

1. [ ] Manufacturing
2. [X] Vehicle Maintenance
3. [ ] Hazardous Waste Treatment, Storage, or Disposal Facility (RCRA Subtitle
4. [X] Material Storage
5. [X] Vehicle Storage
6. [X] Material Handling
7. [ ] Wastewater Treatment
8. [ ] Power Generation
9. [ ] Recycling
10. [ ] Landfill
99. [X] Other: Aviation transpor

NOI-1 (12/4

FORGOERS

VI. MATERIAL HANDLING

A. Types of materials handled and/or stored on site: (Check all that apply)

1. ☐ Solvents
2. ☐ Scrap Metal
3. ☒ Petroleum Products
4. ☐ Plating Products
5. ☐ Pesticides
6. ☐ Hazardous Wastes
7. ☑ Paints
8. ☐ Wood Treating Products
99. ☐ Other (Please list)

B. Identify existing management practices employed to reduce pollutants in industrial storm water discharges: (Check all that apply)

1. ☒ Oil/Water Separator
2. ☒ Containment
3. ☐ Berms
4. ☐ Leachate Collection
5. ☒ Overhead Coverage
6. ☐ Recycling
7. ☒ Retention Facilities
8. ☐ Chemical Treatment
99. ☒ Other (Please list)

SPCCP compliance; monitoring

VII. FACILITY INFORMATION

A. Total size of site: (Check one)

483 ☒ Acres ☐ Sq. Ft.

B. Percent of site impervious: (Including rooftops)

93 %

VIII. REGULATORY STATUS (Check all that apply)

A. ☐ Regulated by Storm water Effluent Guidelines (40 CFR Subchapter N)

B. ☐ Waste Discharge Requirements

(Order Number) _____

C. ☐ NPDES Permit

CA _____

D. ☐ RCRA Permit

Number _____

E. ☐ Regulated by California Code of Regulations Article 6, Chapter 15 (Fresno).

IX. COMMENTS (Enter additional information for SECTIONS II AND III)

A. Additional Parcel Numbers:

B. Billing Information: (Enter Name and Address)

X. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment." In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan, will be complied with.

Printed Name: Manuel I. Aceves

Signature: Manuel I. Aceves

Date: 3-27-02

Title: Deputy Port Director, Engineering and Development

STATE USE ONLY

WDID	Regional Board Office	Date Received
NPDES Permit Number CA	Order Number	Fee Amount Received	Date NOI Received

FOR005R3

NOTICE OF INTENT
SITE MAP

ATTACHED

MAP INFORMATION

TYPE N/A

NUMBER N/A

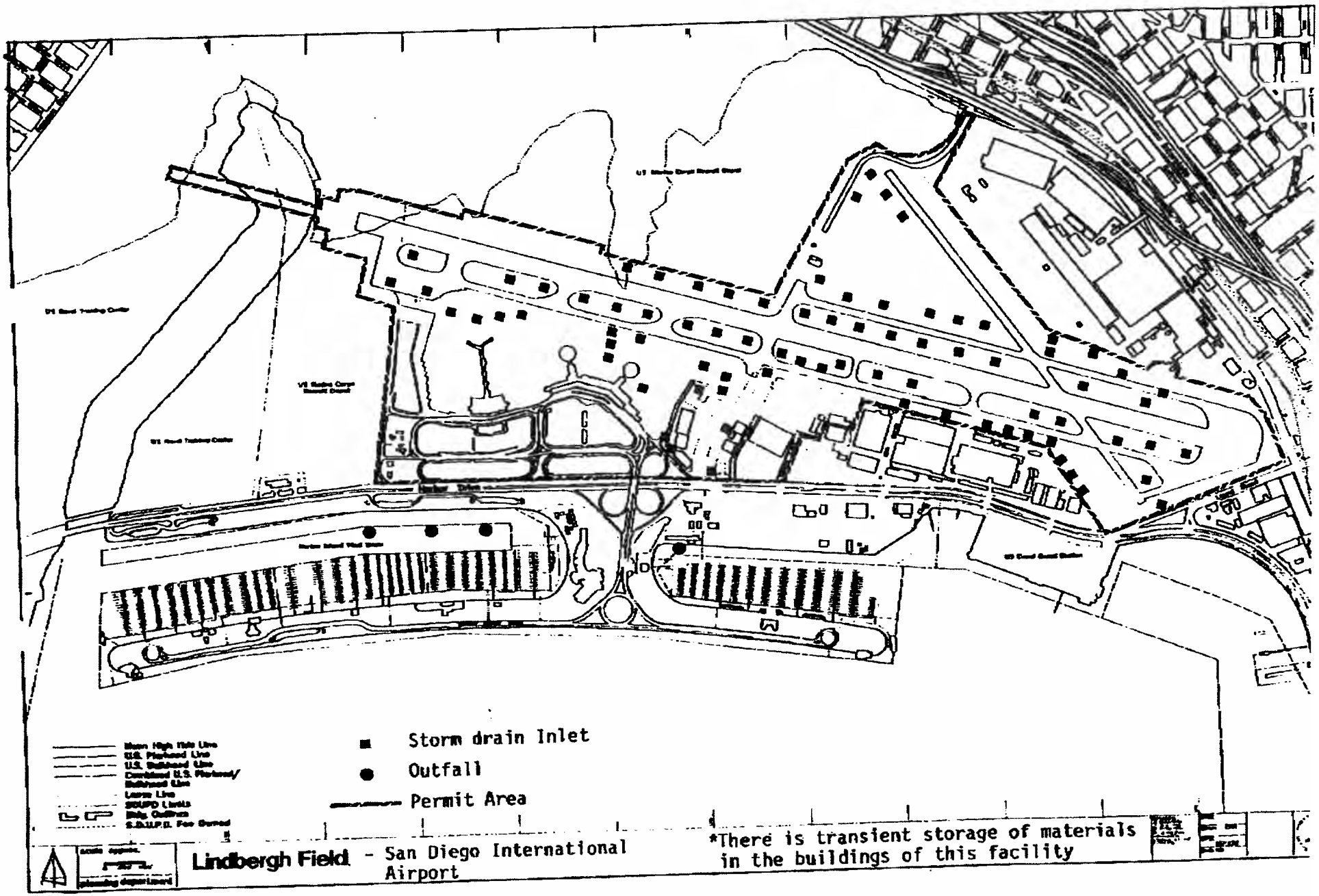
SCALE 1" = 1200'

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

FACILITY San Diego International Airport

COUNTY San Diego

DATE	DRAWN	CHECKED
3/26/92		Planning



SAN DIEGO INTERNATIONAL AIRPORT TENANTS, CO-PERMITTEES

Company	Operation
AERO CALIFORNIA S.A. DE C.V.	- airline
AIR SUPPORT FACILITIES, INC.	- air cargo facility operator
AIRBORNE EXPRESS, INC.	- air cargo carrier
AIRCRAFT SERVICE INTERNATIONAL, INC.	- air cargo/hangar facility operator
ALASKA AIRLINES, INC.	- airline
AMERICA WEST AIRLINES, INC.	- airline
AMERICAN AIRLINES, INC.	- airline
ATLANTIC-RICHFIELD	- fueling operator
BURLINGTON AIR EXPRESS, INC.	- air cargo carrier
CATERAIR AIRPORT PROPERTIES, INC.	- inflight food services
CHEVRON USA, INC.	- fueling operation
CONTINENTAL AIRLINES, INC.	- airline
DELTA AIR LINES, INC	- airline
EMERY AIR FREIGHT CORPORATION dba EMERY WORLD WIDE	- air cargo carrier
FEDERAL EXPRESS CORPORATION	- air cargo carrier
GRAND RENT A CAR CORP. dba AVIS RENT A CAR	- car rental
HERTZ CORPORATION	- car rental
HOST INTERNATIONAL	- food, beverage, gift, news concessions
JIMSAIR AVIATION SERVICES, INC.	- FBO, maintenance, fueling, airplane parking, car rental, etc.
JOHN DOUGLAS CORPORATION, THE dba DOLLAR RENT A CAR	- car rental
LEE-AL, INC.	- car rental

dba BUDGET RENT A CAR OF
SAN DIEGO

LINDBERGH PARKING, INC.	- parking lot operator
MIDWEST EXPRESS AIRLINES, INC.	- airline
NATIONAL CAR RENTAL SYSTEM, INC.	- car rental
NORTHWEST AIRLINES, INC.	- airline
P.S. TRADING, INC.	- fuel distributor
ROSENBALM AVIATION, INC.	- air cargo carrier
SKY CHEFS, INC.	- inflight food services
SKYWEST AVIATION, INC. dba SKYWEST AIRLINES	- airline
SOUTHWEST AIRLINES, INC. dba USAIR EXPRESS	- airline
TRANS WORLD AIRLINES, INC.	- airline
UNITED AIRLINES, INC.	- airline
UNITED PARCEL SERVICE CO.	- air cargo carrier
USAIR, INC.	- airline
WESTAIR COMMUTER AIRLINES, INC. dba UNITED EXPRESS	- airline
WINGS WEST AIRLINES, INC.	- airline

APPENDIX B
BEST MANAGEMENT PRACTICES


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

BMP SC01	NON-STORM WATER MANAGEMENT

PURPOSE:
Eliminate non-storm water discharges to the storm water collection system.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing/Anti-Icing
- ✈ Aircraft Lavatory Service
- ✈ All Cleaning
- ✈ All Fueling
- ✈ All Maintenance
- ✈ All Storage
- ✈ All Washing
- ✈ Cargo Handling
- ✈ Fire Fighting Equipment Testing
- ✈ Floor Washdowns
- ✈ Garbage Collection
- ✈ Landscape Irrigation
- ✈ Painting/Stripping
- ✈ Potable Water System Flush
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges to the storm water collection system (also see Section 3 for authorized and unauthorized non-storm water discharges, and BMPs to control them):

- ☐ Perform visual inspections of discharge points to the storm drain system – observe uncharacteristic volumes, any staining, colors, turbidity, odors, deposition, floatables, and foaming characteristics of any flow.
- ☐ Locate illicit connections to the storm drain system by visual inspections, CCTV survey, smoke testing, dye testing, and electromagnetic radio frequency testing.
- ☐ Isolate problem areas and plug illicit discharge points.
- ☐ Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- ☐ Use "dry" cleaning and surface preparation techniques where feasible.
- ☐ Inspect waste and material containers frequently for leaks and proper closure seal.
- ☐ Maintain adequate supplies of spill response equipment and materials in accessible locations near areas where spills may occur.
- ☐ Investigate the use of automatic rain shutoff devices or smart controllers, micro irrigation systems, or low water use landscaping to minimize irrigation runoff.
  Experiment in new technologies and practices to conserve water.
  Implement mandatory water conservation measures.

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam
- ✈ Bacteria
- ✈ Battery Acid
- ✈ Deicing/Anti-Icing Fluid
- ✈ Dumpster Wastes
- ✈ Floatables
- ✈ Oil and Grease
- ✈ Fuel
- ✈ Landscape Waste
- ✈ Lavatory Chemical Wastes
- ✈ Metals
- ✈ Nutrients
- ✈ Paint
- ✈ Pesticides/Herbicides/Fertilizers
- ✈ Potable Water System Chemicals
- ✈ Rubber Particles
- ✈ Sediment
- ✈ Solvents/Cleaning Solutions
- ✈ Vehicle Fluids

BMP SC01	**NON-STORM WATER MANAGEMENT**	
☐	Use recycled or non-potable water for construction purposes when available.	
☐	Authorized non-stormwater discharges include the following (provided that BMPs are in place to control them): fire-hydrant and fire prevention or response system flushing; potable water sources and system flushing; drinking water fountains; air conditioning, refrigerator or compressor condensation; landscape irrigation watering provided that Integrated Pest Management practices have been used, seawater infiltration, incidental windblown cooling tower mist, and uncontaminated natural springs, groundwater, foundation drainage, and footing drainage. All other non-stormwater discharges are prohibited. **NEVER HOSE DOWN OR BURY MATERIAL SPILLS**	
OPERATIONS:		**APPLICABLE TENANTS/ DEPARTMENTS:**
Sub-BMPs		✈ ACE ✈ Air Canada ✈ Alaska ✈ Allegiant ✈ Allied Aviation ✈ American Airlines ✈ ARFF ✈ Bradford ✈ British Airways ✈ Cartwright ✈ Conrac ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HFF ✈ HMS Host ✈ JAL ✈ Jet Blue ✈ Lufthansa ✈ Menzies ✈ Mission Yogurt ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS
- 01 ☐	Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if there is any evidence of illicit connections or illegal discharges.	
- 02 ☐	Provide the appropriate level of employee, tenant and public training or education in non-storm water discharge management, i.e., spill response and prevention, non-storm water pollution prevention, and hazardous materials management.	
- 03 ☐	Limit the availability of outdoor water supplies (e.g. hose bibs, faucets) and post with appropriate use signs to discourage uses that may pollute the storm drain system/receiving water.	
- 04 ☐	Ensure the site is free of illicit connections and illegal discharges.	
- 05 ☐	Do not irrigate during forecasted rain events and 48 hours following a rain event.	
- 06 ☐	Periodically inspect and maintain irrigation systems and landscaped areas to prevent prohibited over-irrigation and to repair any leaks.	
- 07 ☐	Direct air conditioning or refrigerator condensation to landscaping, porous surface, into the sanitary sewer, or for reuse.	
- 08 ☐	Irrigate using the satellite water-tracking system to reach proper levels of soil moisture applicable for landscaping, and follow City water restriction guidelines.	
- 09 ☐	Use a hand-held hose equipped with positive shut-off nozzle, handheld water container, or timed sprinkler system to irrigate landscaped areas.	
- 10 ☐	Prohibit over-irrigation of landscaped areas	

<table>
<tr><td>BMP SC01</td><td colspan="2">NON-STORM WATER MANAGEMENT</td></tr>
<tr><td></td><td colspan="2">✈ WestJet</td></tr>
<tr><td colspan="2">STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.</td><td rowspan="5"></td></tr>
<tr><td colspan="2">BMP FREQUENCIES/EQUIPMENT/TOOLS: Observations of illicit discharges and connections are on a continual, ad hoc basis, during normal operations, and reported when observed. Formal inspections are conducted as described in Section 3.0 and Appendix D-2. Training frequencies and tools are described in Sections 7.0 and 9.0. Irrigation frequencies and tools are described in Section 3.0.</td></tr>
<tr><td colspan="2">AUTHORIZED LOCATIONS TO IMPLEMENT BMPs TO PREVENT NON-STORM WATER DISCHARGES:</td></tr>
<tr><td>☐</td><td>Implement BMPs for the prevention of non-storm water discharges within the entire airport boundary. In particular, do not discharge non-storm water to the designated areas (storm drains) as shown on the attached map.</td></tr>
<tr><td colspan="2">Date:</td><td>Version: 2.0</td></tr>
</table>

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Tenants Implementing SC-01 BMP:
Non-Storm Water Management

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	100 - Edelweiss
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	102 - SP Plus
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	103 - Lufthansa

SDIA Boundary

Outfall Storm Drain Inlet Stormwater Pipe (with flow direction) Surface Flow Direction

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

Document Path: P:\Projects-South\CAD\GIS\AUTOCAD\5025-18002_SD_Airport\GIS\SWMP_GIS_2018\Appendix_B_1_29_2019_1147.mxd

PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

N

0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-01 BMP:
Non-Storm Water Management

FIGURE
SC-01

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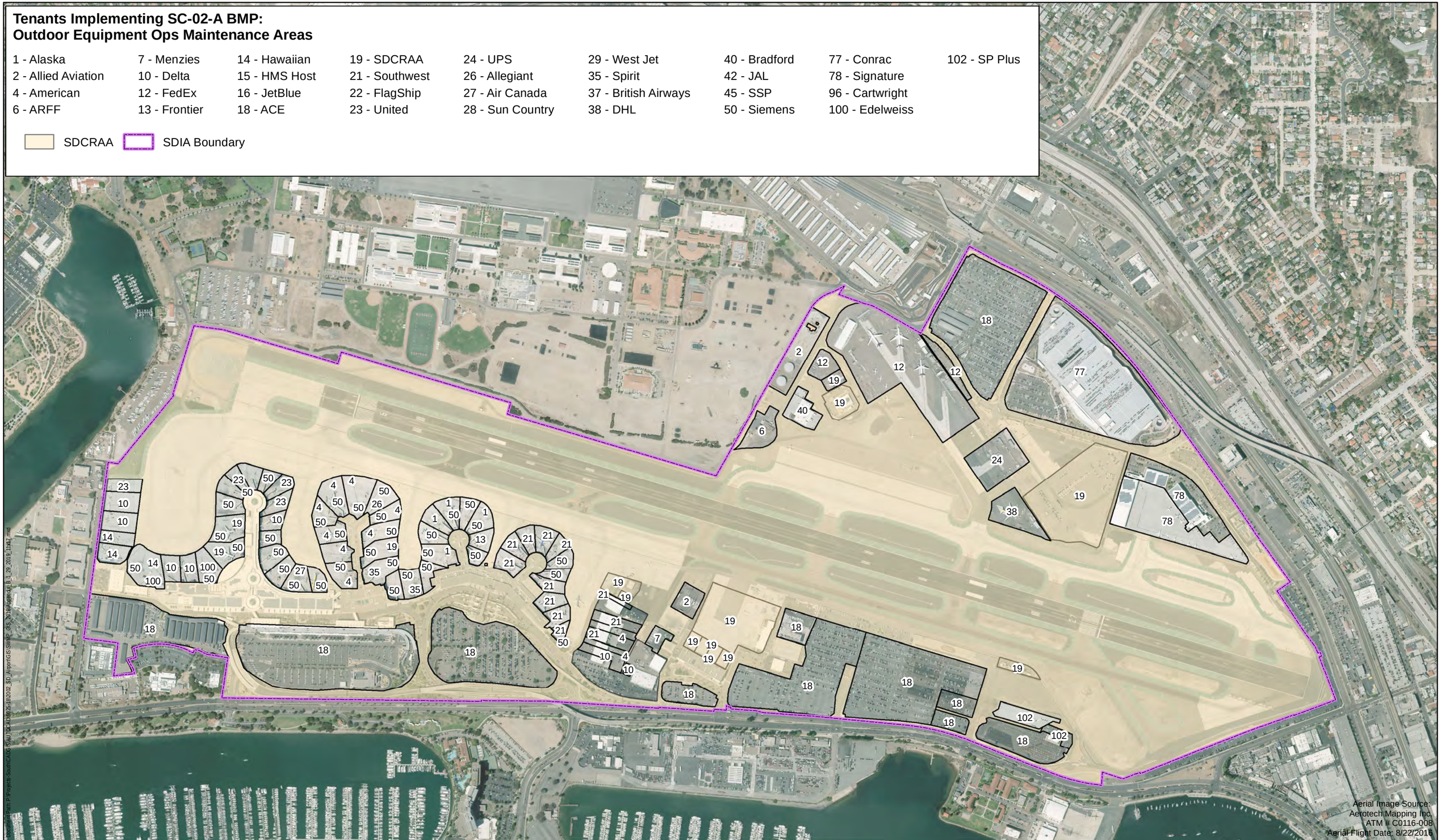
BMP SC02A	**OUTDOOR EQUIPMENT OPERATIONS AND MAINTENANCE AREAS**	
PURPOSE: To prevent the discharge of pollutants to storm water from outdoor equipment operations and general maintenance facilities.		**TARGETED ACTIVITIES:** ✈ All Outdoor Equipment Operations ✈ All Maintenance
POLLUTION PREVENTION:		**POLLUTANTS of CONCERN:** ✈ Bacteria ✈ Battery Acid ✈ Fuel ✈ Metals ✈ Nutrients ✈ Oil and Grease ✈ Organics ✈ Paint ✈ Sediments ✈ Solvents/Cleaning Solutions ✈ Trash ✈ Vehicle Fluids
☐ ☐ ☐ ☐ ☐	Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from outdoor equipment operations and maintenance activities to the storm water collection system: Provide covered maintenance areas when designing new facilities or upgrading existing facilities. If possible utilize indoor areas, lean-tos, or portable covers. Perform the activity during dry periods. Use non-toxic, biodegradable chemicals or products for maintenance, minimize or eliminate the use of solvents and substitute materials with less hazardous properties where feasible. Use absorbent materials at potential problem areas. Adequately collect/remove absorbent materials from area after use and dispose of them in an appropriate manner. **DO NOT HOSE DOWN WORK AREAS TO THE STORM DRAIN SYSTEM.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any evidence of the disposal of solvents or cleaning solutions to the storm drain has occurred.	
OPERATIONS:		**APPLICABLE TENANTS/ DEPARTMENTS:** ✈ ACE ✈ Air Canada ✈ Alaska ✈ Allegiant ✈ Allied Aviation ✈ American Airlines ✈ ARFF ✈ Bradford ✈ British Airways ✈ Cartwright ✈ Conrac ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier
Sub-BMPs - 01 ☐ - 02 ☐	Equipment operations and maintenance areas should not be located directly in the path of storm drains. Perform equipment operations and maintenance in designated areas with overhead cover for pollutant sources and/or activity areas. **SEE ALSO BMP SC02B**	

<table>
<tr><td>BMP SC02A</td><td colspan="2">OUTDOOR EQUIPMENT OPERATIONS AND MAINTENANCE AREAS</td></tr>
<tr><td></td><td></td><td>✈ Hawaiian
✈ HMS Host
✈ JAL
✈ Jet Blue
✈ Menzies
✈ SDCRAA
✈ Signature
✈ Southwest
✈ SP Plus
✈ Spirit
✈ SSP
✈ Sun Country
✈ United
✈ UPS
✈ WestJet</td></tr>
<tr><td colspan="2">STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.</td><td rowspan="4"></td></tr>
<tr><td colspan="2">BMP FREQUENCIES/EQUIPMENT/TOOLS: Maintenance is conducted as needed using either indoor shops, or under temporary or permanent cover when available and feasible.</td></tr>
<tr><td colspan="2">AUTHORIZED OUTDOOR OPERATIONS AND MAINTENANCE LOCATIONS:</td></tr>
<tr><td>☐</td><td>Use only the designated areas for outdoor operations and maintenance activities as shown in the attached map.</td></tr>
<tr><td colspan="2">Date:</td><td>Version: 2.0</td></tr>
</table>

Tenants Implementing SC-02-A BMP:
Outdoor Equipment Ops Maintenance Areas

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	77 - Conrac	102 - SP Plus
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	78 - Signature	
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	96 - Cartwright	
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	50 - Siemens	100 - Edelweiss	

SDCRAA SDIA Boundary



Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-02-A BMP:
Outdoor Equipment Ops Maintenance Areas

FIGURE
SC-02-A

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BMP SC02B	AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT MAINTENANCE

PURPOSE:
To prevent or reduce the discharge of pollutants to storm water from any type of aircraft, vehicle, or equipment maintenance and repair, including ground vehicle and equipment painting/stripping and floor washdowns.

TARGETED ACTIVITIES:

- ✈ Aircraft Maintenance
- ✈ Vehicle Maintenance
- ✈ Equipment Maintenance

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants to the storm water collection system:

☐ Provide covered maintenance areas when designing new facilities or upgrading existing facilities. Utilize indoor areas, lean-tos, or portable covers.

☐ Perform the activity during dry periods.

☐ Use non-toxic, biodegradable chemicals or products for maintenance, minimize or eliminate the use of solvents and substitute materials with less hazardous properties where feasible (e.g. non-chlorinated solvents or water-based solvents instead of chlorinated solvents, non-caustic detergents instead of caustic cleaners, or cleaning without liquid cleaners like a wire brush).

☐ Recycle or properly dispose of the following: greases, oils, antifreeze, brake fluid, cleaning solutions, hydraulic fluid, batteries and transmission fluid. Drain and crush oil filters and oil containers before recycling or disposal. Store crushed oil filters, empty lubricant containers, and cracked batteries in a covered, acid-proof container (for batteries), and leak-proof covered secondary containment (for all waste).

DO NOT HOSE DOWN WORK AREAS TO THE STORM DRAIN SYSTEM. Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if there is any evidence of the disposal of solvents, cleaning solutions or other materials to the storm drain, or hosing down of work areas.

POLLUTANTS of CONCERN:

- ✈ Battery Acid
- ✈ Fuel
- ✈ Metals
- ✈ Nutrients
- ✈ Oil and Grease
- ✈ Organics
- ✈ Paint
- ✈ Sediments
- ✈ Solvents/Cleaning Solutions
- ✈ Vehicle Fluids

OPERATIONS:

Sub-BMPs

- 01 ☐ Employees are trained in safe vehicle and equipment operations and maintenance.
- 02 ☐ Aircraft, vehicle and equipment maintenance areas should not be located directly in the path of storm drains.
- 03 ☐ Perform maintenance of aircraft, ground vehicles and equipment in designated areas that are either indoors or are covered, bermed, enclosed, or sloped/positioned away from the MS4.
- 04 ☐ Perform regular equipment inspection and testing.

APPLICABLE TENANTS/ DEPARTMENTS:

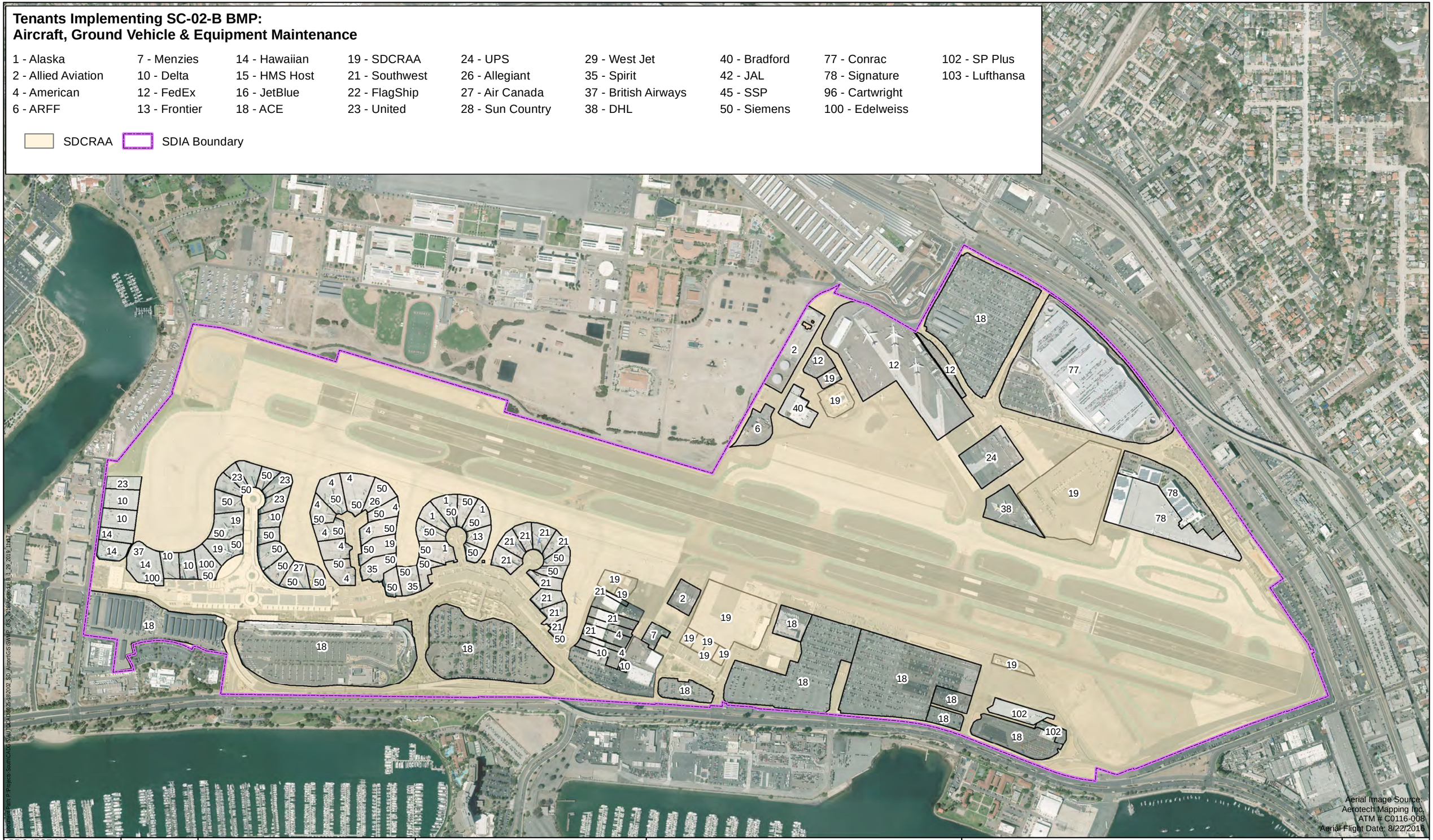
- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Cartwright
- ✈ Conrac
- ✈ Delta

BMP SC02B	**AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT MAINTENANCE**	
- 05 ☐	Inspect aircraft, vehicles and equipment on a regular basis for fluid leaks. Place drip pans under leaks as needed.	✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HMS Host ✈ JAL ✈ JetBlue ✈ Lufthansa ✈ Menzies ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
- 06 ☐	Maintain aircraft, vehicles and equipment in good condition to prevent or correct any leakage of oil or other fluids.	
- 07 ☐	Use drip pans during maintenance.	
- 08 ☐	Do not leave drip pans containing fluids or other open containers lying around. Regularly transfer fluids for recycling or proper disposal.	
- 09 ☐	Minimize the use of solvents or use less toxic solvents whenever possible. If solvents cannot be avoided, clean or drain parts in self-contained sinks or drum units, and check those units regularly for leaks.	
- 10 ☐	Store mechanical parts, equipment and vehicles awaiting repair/removal under cover and away from storm drains.	
- 11 ☐	Store spill response materials in maintenance areas and on maintenance vehicles. Adequately collect/remove absorbent materials from area after use and dispose of them in an appropriate manner.	
- 12 ☐	Remove fluids and batteries from salvage vehicles and equipment and dispose of properly.	
- 13 ☐	Properly dispose of obsolete and inoperable vehicles and equipment.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Maintenance is conducted as needed using either indoor shops, or under temporary or permanent cover when available and feasible. Equipment/tools to implement BMPs include drip pans, outdoor sheds, storage containers, tarps, secondary containment devices, spill kits and drums.		
AUTHORIZED AIRCRAFT, GROUND VEHICLE AND EQUIPMENT MAINTENANCE LOCATIONS:		
☐	Use only the designated areas for aircraft, ground vehicle and equipment maintenance as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-02-B BMP:
Aircraft, Ground Vehicle & Equipment Maintenance

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	77 - Conrac	102 - SP Plus
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	78 - Signature	103 - Lufthansa
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	96 - Cartwright	
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	50 - Siemens	100 - Edelweiss	

SDCRAA SDIA Boundary



Aerial Image Source:
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ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	FIGURE SC-02-B
DATE: JANUARY 2019					
DRAWN BY: CAB				**SC-02-B BMP: Aircraft, Ground Vehicle & Equipment Maintenance**	
CHECKED BY: AA/NP					

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BMP SC02C	ELECTRIC VEHICLE MAINTENANCE

PURPOSE:
To prevent or reduce the discharge of pollutants to storm water from electric ground vehicle charging, maintenance and repair.

TARGETED ACTIVITIES:

- ✈ Vehicle Maintenance
- ✈ Battery Charging

POLLUTION PREVENTION:

POLLUTANTS of CONCERN:

- ✈ Battery Acid
- ✈ Battery Acid Neutralizing Agents
- ✈ Metals
- ✈ Vehicle Fluids

☐	Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants to the storm water collection system:
☐	Develop a battery maintenance plan to provide procedures for cleaning and maintenance, develop a schedule for service, and to correct any issues that can potentially arise.
☐	Investigate use of smart chargers with multi-stage charging capability.

OPERATIONS:

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ American Airlines
- ✈ Delta
- ✈ JAL
- ✈ SDCRAA
- ✈ Siemens
- ✈ Signature
- ✈ Southwest
- ✈ Spirit
- ✈ SSP
- ✈ United
- ✈ WestJet

Sub-BMPs	
- 01 ☐	Do not overcharge batteries in electric vehicles.
- 02 ☐	Park electric vehicles in cool and dry areas (e.g. shade under building) when not in use.
- 03 ☐	Use acid resistant drip pans sprinkled with battery acid neutralizing agent (e.g. lime or baking soda) when filling or cleaning electric vehicle batteries and dispose of waste properly.
- 04 ☐	Maintain battery acid neutralizing kits adjacent to charging stations. Adequately recover spill response material from area after use and dispose of them in an appropriate manner.
-05 ☐	Avoid overfilling electric vehicle batteries.
-06 ☐	Do not fill batteries or perform electric vehicle maintenance during rain events.
-07 ☐	Store batteries inside in a cool and dry place if possible. If batteries are stored outside, store in a non-reactive container with a cover.
-08 ☐	Clean battery case and terminals regularly or when there is a buildup of corrosion with a rag dampened with a solution of water and battery acid neutralizing agent. Capture any wastewater to be treated as hazardous waste.
-09 ☐	Apply petroleum jelly or grease on battery terminals to slow down corrosion process.

SEE ALSO BMP SC02B

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Equipment/tools to implement BMPs include drip pans, neutralizing kits, outdoor sheds, storage containers,

BMP SC02C	**ELECTRIC VEHICLE MAINTENANCE**	
appropriate secondary containment devices, spill kits and drums.		
AUTHORIZED ELECTRIC VEHICLE MAINTENANCE LOCATIONS:		
☐	Use only the designated areas for electrical vehicle maintenance as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-02-C BMP:
Electric Vehicle Maintenance

1 - Alaska	10 - Delta	19 - SDCRAA	23 - United	27 - Air Canada	35 - Spirit	45 - SSP	78 - Signature
4 - American	18 - ACE	21 - Southwest	26 - Allegiant	29 - West Jet	42 - JAL	50 - Siemens	

SDIA Boundary

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

Document Path: P:\Projects-South\CAD\GIS\AUTOCAD\5025-18\2002_SD_Airport\GIS\SWMP_GIS_2019\Appendix B\1_29_2019_11x17.mxd

PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT San Diego, California	SC-02-C BMP: Electric Vehicle Maintenance
DATE: JANUARY 2019					FIGURE SC-02-C
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC03	AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT FUELING

PURPOSE:
To prevent fuel spills and leaks, and reduce their impacts to storm water.

TARGETED ACTIVITIES:

- ✈ Aircraft Fueling
- ✈ Vehicle Fueling
- ✈ Equipment Fueling

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent fuel discharges to the storm water collection system:

- ☐ Use pigs/mats over storm drains during fueling activities.
- ☐ Fuel pumps should be posted with signs stating "No Topping Off" to prevent overflow.
- ☐ Use absorbent materials and spot cleaning for small spills, and properly dispose of the spill response materials.
- ☐ Properly dispose of any fuel spills and leaks. If feasible, collect any fuel spills through vacuum equipment / trucks.
- ☐ Report leaking vehicles to fleet maintenance.
- ☐ Develop and implement a Spill Prevention, Control and Countermeasure (SPCC) Plan if required under guidelines set forth in 40 CFR, Section 112.
- ☐ **DO NOT DISCHARGE FUEL TO A CATCH BASIN OR STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any fuel spill or leak is observed.

POLLUTANTS of CONCERN:

- ✈ Fuel
- ✈ Metals
- ✈ Oil and Grease
- ✈ Organics

OPERATIONS:

Sub-BMPs

- 01 ☐ Perform aircraft, ground vehicle and equipment fueling in the designated areas that are covered, bermed, enclosed, or sloped/positioned away from the MS4.
- 02 ☐ Fueling areas should not be located directly in the path of storm drains.
- 03 ☐ Label, regularly inspect and keep in good condition all tanks, piping and valves.
- 04 ☐ Store absorbent booms, spill kits, or vacuum equipment in fueling areas or on fueling vehicles.
- 05 ☐ Regularly inspect fueling areas.
- 06 ☐ Monitor major fueling operations.
- 07 ☐ Use secondary containment or cover when transferring fuel from a

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ British Airways
- ✈ Conrac
- ✈ Delta
- ✈ DHL
- ✈ Edelweiss
- ✈ FedEx
- ✈ Flagship
- ✈ Frontier
- ✈ Hawaiian
- ✈ JAL

BMP SC03	**AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT FUELING**	
	tanker truck to a fuel tank.	✈ JetBlue ✈ Lufthansa
- 08 ☐	Use leak detection, overfill protection and spill prevention devices for tanks and piping.	✈ Menzies ✈ SDCRAA ✈ Signature
- 09 ☐	Use automatic shut-off mechanisms for fuel tankers and hose connections.	✈ Southwest ✈ Spirit ✈ Sun Country
- 10 ☐	Do not top off fuel tanks.	✈ United ✈ UPS
-11 ☐	Restrict access to fuel tanks and fueling vehicles.	✈ WestJet
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Fueling is conducted as needed using bermed, sloped areas or under cover if and where possible. Equipment/tools to implement BMPs include drip pans, pigs/mats, secondary containment devices, spill kits, shut-off mechanisms and drums.		
AUTHORIZED AIRCRAFT, GROUND VEHICLE AND EQUIPMENT FUELING LOCATIONS:		
☐	Use only the designated areas for aircraft, ground vehicle and equipment fueling as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-03 BMP:
Aircraft, Ground Vehicle & Equipment Fueling

1 - Alaska	6 - ARFF	12 - FedEx	16 - JetBlue	21 - Southwest	24 - UPS	28 - Sun Country	37 - British Airways	77 - Conrac
2 - Allied Aviation	7 - Menzies	13 - Frontier	18 - ACE	22 - FlagShip	26 - Allegiant	29 - West Jet	38 - DHL	78 - Signature
4 - American	10 - Delta	14 - Hawaiian	19 - SDCRAA	23 - United	27 - Air Canada	35 - Spirit	42 - JAL	100 - Edelweiss
								103 - Lufthansa

SDCRAA
SDIA Boundary
Fuel Storage
Fueling

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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CHECKED BY:	AA/NP

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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-03 BMP:
Aircraft, Ground Vehicle & Equipment Fueling

FIGURE
SC-03

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BMP SC04	AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT CLEANING

PURPOSE:

Prevent or reduce the discharge of pollutants to storm drains from aircraft, vehicle, and equipment washing, and equipment degreasing.

TARGETED ACTIVITIES:

- ✈ Aircraft Washing
- ✈ Vehicle Washing
- ✈ Equipment Washing
- ✈ Equipment Degreasing

POLLUTION PREVENTION:

POLLUTANTS of CONCERN:

- ✈ Cleaning Solutions
- ✈ Oil and Grease
- ✈ Solvents
- ✈ Vehicle Fluids
- ✈ Metals

Implement the following pollution prevention practices and BMPs to prevent discharges from the cleaning of aircraft, ground vehicles and equipment to the storm water collection system:

☐ Store significant cleaning materials in leak-free containers and within areas of secondary containment.

☐ Use biodegradable, phosphate-free, non-toxic cleaning solutions.

☐ Follow water conservation practices when performing cleaning.

☐ Wash vehicles at a commercial car wash when possible.

☐ **DO NOT DISCHARGE WASTE WASH WATER OR CLEANING AGENTS TO A CATCH BASIN OR STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any non-storm water discharges from cleaning activities to the storm drain system are observed.

OPERATIONS:

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Conrac
- ✈ Delta
- ✈ DHL
- ✈ Edelweiss
- ✈ FedEx
- ✈ Flagship
- ✈ Hawaiian
- ✈ JAL
- ✈ JetBlue
- ✈ Lufthansa
- ✈ Menzies
- ✈ SDCRAA
- ✈ Signature
- ✈ Southwest

Sub-BMPs

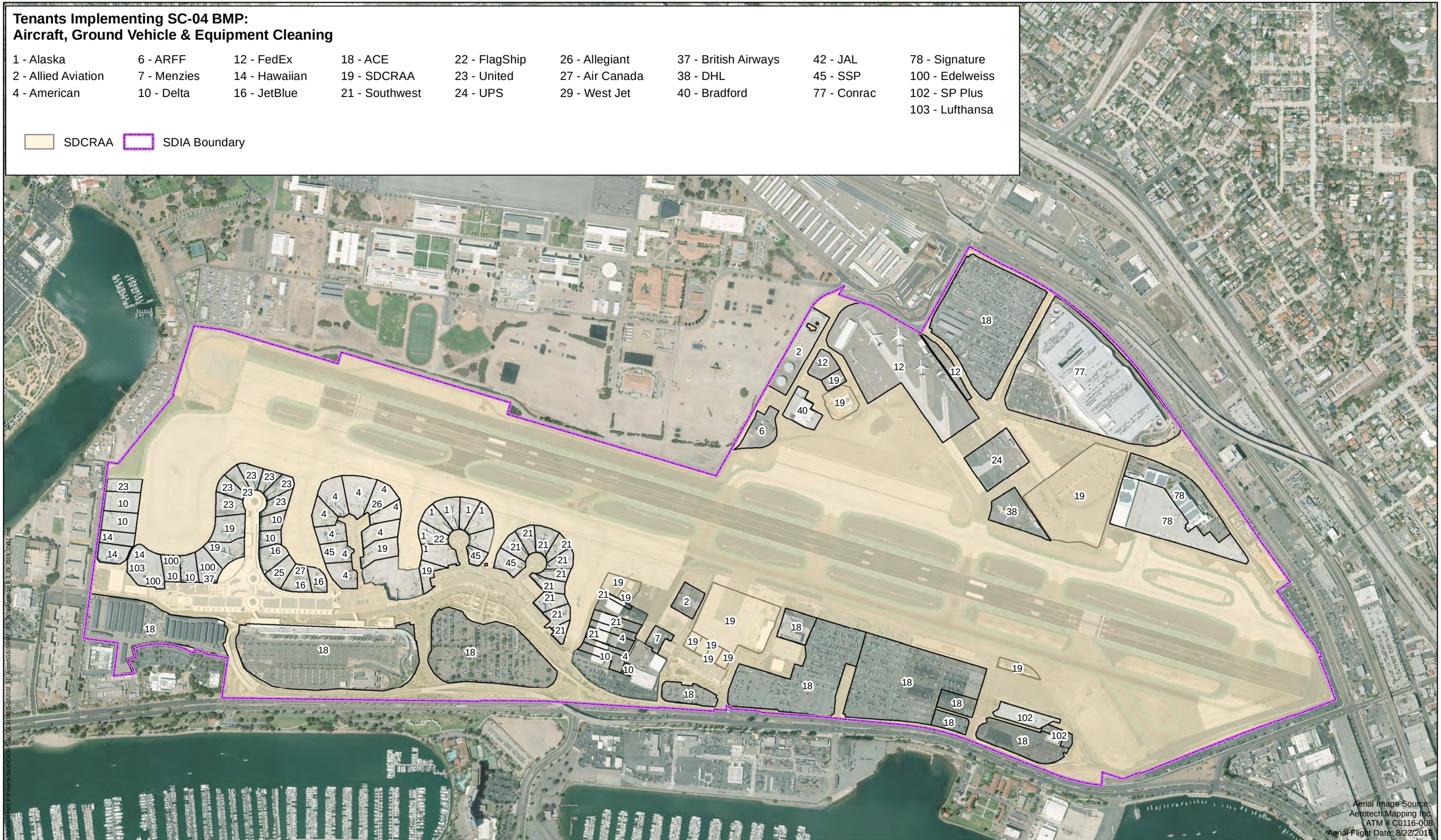
- 01 ☐ Keep vehicles, equipment, and washing areas clean and free of waste.
- 02 ☐ Use dry washing and surface preparation techniques where feasible.
- 03 ☐ Wash areas should not be located directly in the path of storm drains.
- 04 ☐ Use pigs and cover mats to cover all catch basins in the surrounding area to contain the wash water during washing activities.
- 05 ☐ Perform all washing activities in designated areas that capture, filter and recycle water (e.g. at new Wash Bay Facility), or use reclaimed water and divert wash water to a structural treatment control BMP, sanitary sewer or dead end sump with pump.
- 06 ☐ Perform routine visual observations of washing activities and inspect nearby storm drains to detect and prevent discharges from cleaning activities.
- 07 ☐ Remove all excess materials such as drippings and residue by
- 08 ☐

BMP SC04	AIRCRAFT, GROUND VEHICLE, AND EQUIPMENT CLEANING	
- 09 ☐	using vacuum methods. Properly dispose of all waste materials. Use a hand-held hose equipped with positive shut-off nozzle to wash vehicles. Wash vehicles, aircraft, and equipment between 4pm to 10am from November 1 to May 31 and between 6pm to 10am from June 1 to October 31.	✈ SP Plus ✈ SSP ✈ United ✈ UPS ✈ WestJet
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Cleaning is conducted as needed. Equipment/tools to implement BMPs include rags, the closed loop system wash rack or the aircraft wash rack, pigs and cover mats, and shop vacuums.		
AUTHORIZED AIRCRAFT, GROUND VEHICLE AND EQUIPMENT CLEANING:		
☐	Use only the designated areas for aircraft, ground vehicle and equipment cleaning as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-04 BMP:
Aircraft, Ground Vehicle & Equipment Cleaning

1 - Alaska	6 - ARFF	12 - FedEx	18 - ACE	22 - FlagShip	26 - Allegiant	37 - British Airways	42 - JAL	78 - Signature
2 - Allied Aviation	7 - Menzies	14 - Hawaiian	19 - SDCRAA	23 - United	27 - Air Canada	38 - DHL	45 - SSP	100 - Edelweiss
4 - American	10 - Delta	16 - JetBlue	21 - Southwest	24 - UPS	29 - West Jet	40 - Bradford	77 - Conrac	102 - SP Plus
								103 - Lufthansa

SDCRAA SDIA Boundary



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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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CHECKED BY:	AA/NP

N

0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-04 BMP:
Aircraft, Ground Vehicle & Equipment Cleaning

FIGURE
SC-04

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BMP SC05	AIRCRAFT DEICING/ANTI-ICING

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from aircraft deicing and anti-icing procedures.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing
- ✈ Aircraft Anti-Icing

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges to the storm water collection system from aircraft deicing and anti-icing activities:

- ☐ Depending on conditions, apply only enough fluid to surfaces to ensure the safe operation of the aircraft. Excess fluid dripped to the ground contaminates soil and water if not properly contained.
- ☐ Maintain adequate supplies of spill response equipment and materials in accessible locations near areas where spills may occur.
- ☐ Recycle or dispose of the fluids in accordance with local, state, and federal regulations.
- ☐ Implement forthcoming recommendations of the FAA technical committee on deicing.
- ☐ Provide the appropriate level of employee training in the following areas: spill response and prevention, storm water pollution prevention education, right-to-know awareness training, and hazardous materials management.
- ☐ **DO NOT OVERSPRAY OR ALLOW ANY DISCHARGE OF DEICING/ANTI-ICING AGENTS TO A CATCH BASIN OR STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any discharges of aircraft deicing or anti-icing fluids have occurred.

POLLUTANTS of CONCERN:

- ✈ Ethylene Glycol
- ✈ Propylene Glycol

OPERATIONS:

Sub-BMPs

- 01 ☐ Perform all anti-icing and deicing operations only in designated areas that are covered, bermed, enclosed or sloped/positioned away from the MS4.
- 02 ☐ Monitor deicing and anti-icing operations regularly to ensure quantities of fluids used are at a minimum while not jeopardizing aircraft safety and operation.
- 03 ☐ All fluids are captured or diverted to a structural treatment control BMP, recycling system, sanitary sewer or dead end sump with pump.
- 04 ☐ Clean the designated anti-icing and deicing ramp areas following deicing/anti-icing operations with wet-type sweepers to remove deicing fluids from the paved areas.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ Southwest

BMP SC05	**AIRCRAFT DEICING/ANTI-ICING**
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.	
BMP FREQUENCIES/EQUIPMENT/TOOLS: Aircraft deicing is conducted as needed away from storm drains. Equipment/tools to implement BMPs include capture devices, spill kits, ramp scrubbers, and drums.	
AUTHORIZED LOCATIONS TO PERFORM AIRCRAFT ANTI-ICING AND DEICING ACTIVITIES:	
☐	Use only the designated areas for aircraft anti-icing and deicing activities as shown in the attached map.
Date:	Version: 2.0

Tenants Implementing SC-05 BMP:
Aircraft Deicing/Anti-Icing

21 - Southwest

SDIA Boundary

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.: 5025-18-2002 DATE: JANUARY 2019 DRAWN BY: CAB CHECKED BY: AA/NP	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**SC-05 BMP:** **Aircraft Deicing/Anti-Icing**	FIGURE SC-05

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BMP SC06	OUTDOOR LOADING/UNLOADING OF MATERIALS

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from loading and unloading of material and cargo.

TARGETED ACTIVITIES:

- ✈ Cargo Handling
- ✈ Fuel Storage
- ✈ Chemical Storage
- ✈ Equipment Storage

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges of pollutants from outdoor loading and unloading of materials to the storm water collection system:

- ☐ Transfer materials in paved areas, away from storm drain inlets.
- ☐ Contain and absorb leaks during transfers and spillage from hose disconnections; dispose of residue properly.
- ☐ Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any evidence of illegal discharges from outdoor material loading and unloading is observed.

POLLUTANTS of CONCERN:

- ✈ Fuel
- ✈ Pesticides/Herbicides/Fertilizers
- ✈ Oil and Grease
- ✈ Solvents/Cleaning Solutions
- ✈ Battery Acid

OPERATIONS:

Sub-BMPs

- 01 ☐ Contractors and haulers should be made aware of and adhere to BMPs specifications that are relevant to the loading and unloading of materials.
- 02 ☐ Loading and unloading areas should not be located directly in the path of storm drains.
- 03 ☐ Loading and unloading areas should be graded, bermed, covered or otherwise protected to prevent contact with rainfall and storm water run-on and runoff.
- 04 ☐ Equipment used for loading and unloading should be checked on a regular basis for leaks.
- 05 ☐ Use drip pans or other containment measures under hoses.
- 06 ☐ Keep loading and unloading areas free of spills and debris by containing and absorbing leaks during transfers and spillage from hose disconnections or cargo pallets; dispose of residue or debris properly.
- 07 ☐ Spill kits or other measures are available in accessible locations near areas where spills may be likely to occur to contain spills and/or prevent tracking off-site.

APPLICABLE TENANTS/ DEPARTMENTS:

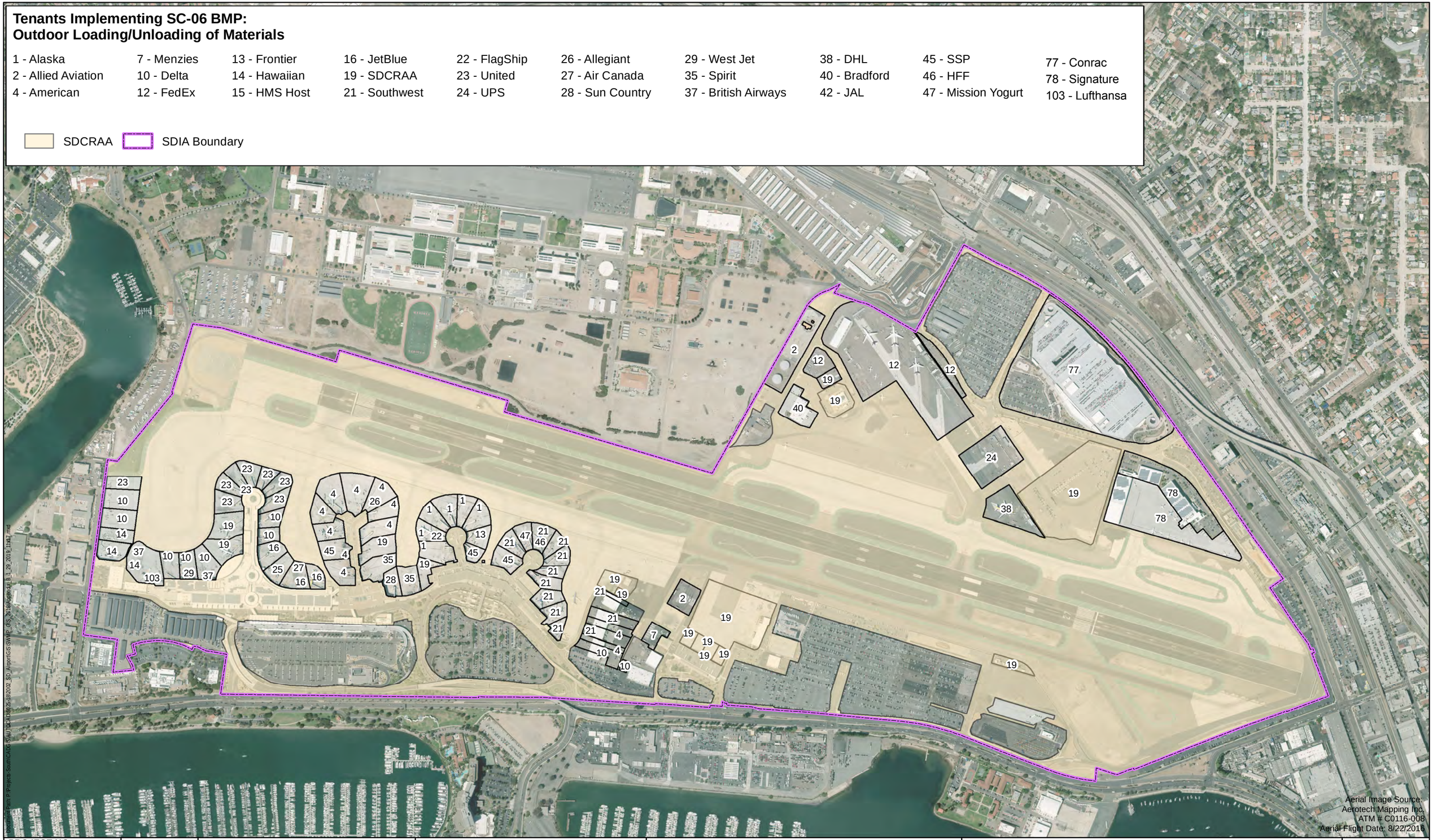
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ Bradford
- ✈ British Airways
- ✈ Conrac
- ✈ Delta
- ✈ DHL
- ✈ FedEx
- ✈ Flagship
- ✈ Frontier
- ✈ Hawaiian
- ✈ HFF
- ✈ HMS Host
- ✈ JAL
- ✈ JetBlue
- ✈ Lufthansa
- ✈ Menzies
- ✈ Mission Yogurt
- ✈ SDCRAA
- ✈ Signature
- ✈ Southwest
- ✈ Spirit
- ✈ SSP

BMP SC06	OUTDOOR LOADING/UNLOADING OF MATERIALS	
		✈ Sun Country ✈ United ✈ UPS ✈ WestJet
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Loading/unloading is conducted as on a daily basis. Equipment/tools to implement BMPs include capture devices, drip pans, spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS FOR THE OUTDOOR LOADING AND UNLOADING OF SIGNIFICANT MATERIALS:		
☐	Use only the designated areas for outdoor loading and unloading of significant materials as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-06 BMP:
Outdoor Loading/Unloading of Materials

1 - Alaska	7 - Menzies	13 - Frontier	16 - JetBlue	22 - FlagShip	26 - Allegiant	29 - West Jet	38 - DHL	45 - SSP	77 - Conrac
2 - Allied Aviation	10 - Delta	14 - Hawaiian	19 - SDCRAA	23 - United	27 - Air Canada	35 - Spirit	40 - Bradford	46 - HFF	78 - Signature
4 - American	12 - FedEx	15 - HMS Host	21 - Southwest	24 - UPS	28 - Sun Country	37 - British Airways	42 - JAL	47 - Mission Yogurt	103 - Lufthansa

SDCRAA SDIA Boundary



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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-06 BMP:
Outdoor Loading/Unloading of Materials

FIGURE
SC-06

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BMP SC07	OUTDOOR MATERIAL STORAGE

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from outdoor storage areas for significant material (e.g., fuels, chemicals, bagged material on pallets, soils or asphalt materials bulk storage, deicing, compounds, etc.)

TARGETED ACTIVITIES:

- ✈ Aircraft/Vehicle/Equipment Maintenance
- ✈ Aircraft/Vehicle Fueling
- ✈ Fuel/Chemical/Equipment Storage
- ✈ Cargo Handling

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from outdoor storage areas to the storm water collection system:

- ☐ Store all significant materials indoors or under cover areas with secondary containment (e.g. dog house design).
- ☐ Develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan if required.
- ☐ Install overflow protection devices on ASTs to warn the operator or install automatic shut-off transfer pumps.
- ☐ Restrict access to AST, piping, valves.
- ☐ Properly label all storage containers
- ☐ Train personnel in the handling and management of hazardous materials.
- ☐ Store hazardous materials away from high-traffic areas to prevent accidental spills or damage to storage containers. Make storage containers highly visible to traffic with traffic cones or posts.
- ☐ Use tarpaulins, plastic sheeting (e.g. storm resistant polyethylene, polypropylene, or hypalon covering), roofs, buildings, and other enclosures for temporary or permanent coverings that are effective in preventing storm water contamination.
- ☐ Stack storage containers in accordance with the manufacturers' directions.
- ☐ In hazardous materials storage areas ensure sufficient aisle space to provide access for inspections and to improve the ease of material transport.
- ☐ Place adequate spill kits in appropriate locations.

POLLUTANTS of CONCERN:

- ✈ Fuel
- ✈ Solvents/Cleaning Solutions
- ✈ Deicing/Anti-Icing Fluids

BMP SC07	OUTDOOR MATERIAL STORAGE

OPERATIONS:		APPLICABLE TENANTS/ DEPARTMENTS:
Sub-BMPs		✈ ACE ✈ Air Canada ✈ Alaska ✈ Allegiant ✈ Allied Aviation ✈ American Airlines ✈ ARFF ✈ Cartwright ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HMS Host ✈ JAL ✈ JetBlue ✈ Lufthansa ✈ Menzies ✈ SDCRAA ✈ Signature ✈ Southwest ✈ Spirit ✈ SSP ✈ United ✈ UPS ✈ WestJet
- 01 ☐	Outdoor material storage areas and equipment should not be located directly in the path of storm drains.	
- 02 ☐	Outdoor material storage areas have areas with overhead cover and secondary containment.	
- 03 ☐	Outdoor material storage areas are prevented from contacting stormwater run-on and run-off (e.g., by the use of berms, wood pallets etc).	
- 04 ☐	Cover and contain material stockpiles or implement erosion control practices at the perimeter of the site and at any inlets or catch basins to prevent the off-site transport of eroded material.	
- 05 ☐	Cover wood products treated with preservative chemicals with tarps or store them indoors.	
- 06 ☐	Install protection guards (bollards, posts, or guardrails) around ASTs and piping to prevent damage from vehicles or forklifts and any subsequent release.	
- 07 ☐	Regular inspections are performed on tanks, storage containers, and berms to check for corrosion, structural failure, loose fittings, poor welds, leaks etc. Repairs or replacements are performed as needed.	
- 08 ☐	Liquid materials in ASTs should be stored in double-walled, valved storage tanks or within concrete bermed secondary containment areas to provide the capacity to contain the entire volume of the single largest container, with sufficient freeboard to contain precipitation. The area inside the curb should slope to a locked or valved drain.	
- 09 ☐	Precipitation from bermed areas should be drained to the sanitary sewer if available, or inspected and tested according to applicable regulations prior to its release to a storm drain. The drain must have a positive control, such as a lock, valve, or plug, below the product level in the tank to prevent release of contaminated liquids.	
- 10 ☐	Properly dispose of ponded storm water removed from bermed or containment areas.	
- 11 ☐	The facility/operation has and displays a County hazardous materials permit for hazardous materials storage.	
- 12 ☐	Maintain an accurate, up-to-date inventory of the materials delivered and stored on site.	
- 13 ☐	Do not permanently store equipment and materials in the bed of a pickup truck. If storing temporarily, provide cover and containment.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on		

BMP SC07	OUTDOOR MATERIAL STORAGE	
structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Outdoor material storage occurs on a daily basis. Equipment/tools to implement BMPs include spill pallets, outdoor sheds, overpack containers, tarps, flammable materials storage lockers, bermed or containment areas, indoor or covered storage areas, fiber rolls, wooden pallets, spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS FOR THE OUTDOOR STORAGE OF SIGNIFICANT MATERIALS:		
☐	To implement BMPs for the prevention of discharges of pollutants from outdoor storage areas, store significant materials at the designated storage areas as shown in the attached map.	
Date:		Version: 2.0

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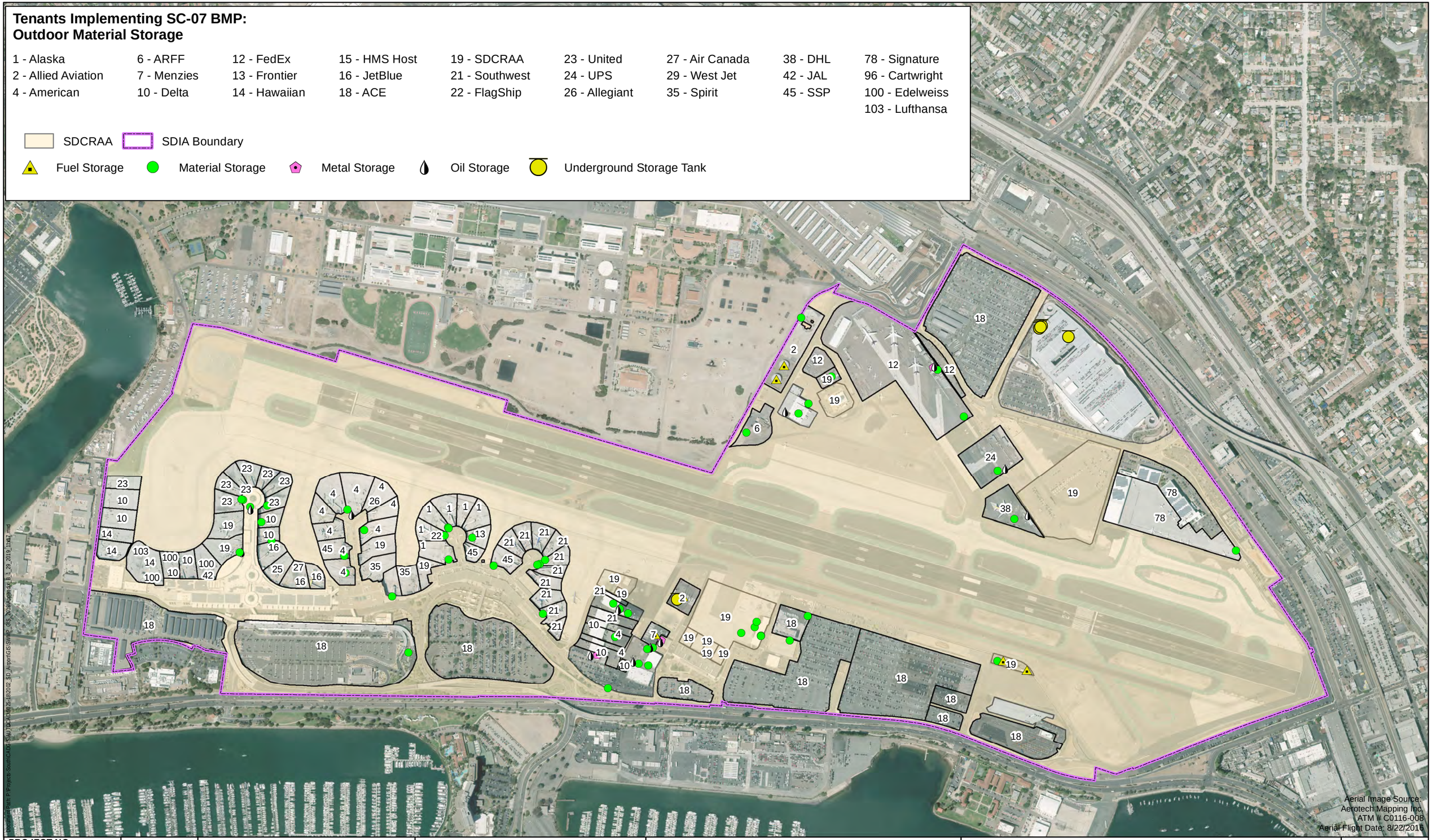
Tenants Implementing SC-07 BMP:
Outdoor Material Storage

1 - Alaska	6 - ARFF	12 - FedEx	15 - HMS Host	19 - SDCRAA	23 - United	27 - Air Canada	38 - DHL	78 - Signature
2 - Allied Aviation	7 - Menzies	13 - Frontier	16 - JetBlue	21 - Southwest	24 - UPS	29 - West Jet	42 - JAL	96 - Cartwright
4 - American	10 - Delta	14 - Hawaiian	18 - ACE	22 - FlagShip	26 - Allegiant	35 - Spirit	45 - SSP	100 - Edelweiss
								103 - Lufthansa

SDCRAA SDIA Boundary

Fuel Storage Material Storage Metal Storage Oil Storage Underground Storage Tank



Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT San Diego, California	SC-07 BMP: Outdoor Material Storage
DATE: JANUARY 2019					FIGURE SC-07
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC08	**WASTE HANDLING AND DISPOSAL**

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from waste handling, storage and disposal by through source reduction, re-use, and recycling; and preventing run-on and runoff from waste management areas, including waste/garbage collection areas.

TARGETED ACTIVITIES:

- ✈ Fuel/Chemical/Oil Waste Storage
- ✈ Painting/Stripping
- ✈ Waste/Garbage Collection

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from waste handling, storage and disposal to the storm water collection system:

- ☐ Inspect on a regular basis waste/garbage collection areas for spills and waste/garbage management containers for leaks.
- ☐ Enclose or berm waste/garbage storage areas, if possible, to prevent contact with storm water run-on and run-off.
- ☐ Place adequate spill kits in appropriate locations.
- ☐ Engage in waste reduction programs (e.g. recycling and food waste composting). Investigate new processes and techniques to turn waste into a resource for others in order to reduce the impact people have on the environment.

POLLUTANTS of CONCERN:

- ✈ Oil and Grease
- ✈ Paints
- ✈ Solvents/Cleaning Solutions
- ✈ Trash and Debris
- ✈ Vehicle Fluids

OPERATIONS:

Sub-BMPs

- 01 ☐ Reduce the amount of waste generated (e.g., use only amount needed, use solvents more than once, practice good inventory control, do not over-buying, purchase long-lasting products, etc.).
- 02 ☐ Recycle materials whenever possible.
- 03 ☐ Designate waste/recycling areas with restrict access.
- 04 ☐ Do not locate waste/recycling areas directly in the path of storm drains.
- 05 ☐ Provide secondary containment and cover for wastes.
- 06 ☐ Wastes that are not contained or covered are prevented from contacting storm water and run-on and run-off by the use of berms.
- 07 ☐ All dumpsters are covered and kept closed and any drain holes plugged.
- 08 ☐ Inspect on a frequent basis all waste collection and storage containers for evidence of leaks, spills, compromised structural integrity, and proper closure seal.
- 09 ☐ Train all employees in the proper handling and disposal of waste materials.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Cartwright
- ✈ Conrac
- ✈ Delta
- ✈ DHL
- ✈ FedEx
- ✈ Flagship
- ✈ Frontier
- ✈ Hawaiian
- ✈ HFF
- ✈ HMS Host
- ✈ JAL
- ✈ JetBlue
- ✈ Lufthansa
- ✈ Menzies
- ✈ Mission Yogurt

BMP SC08	**WASTE HANDLING AND DISPOSAL**	
- 10 ☐	Store wastes and recyclable materials in appropriate containers and segregate and properly labeled them.	✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
- 11 ☐	Wastes are properly characterized and disposed.	
- 12 ☐	Prevent overflow of waste containers by timely pickup/service and removal.	
- 13 ☐	Perform dumpster cleaning in designated areas that are bermed to contain wash water. Properly dispose of all fluids collected or discharge to the sanitary sewer.	
- 14 ☐	Track waste generated, stored, and disposed.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Waste handling and disposal occurs on a daily basis. Equipment/tools to implement BMPs include spill pallets, outdoor sheds, overpack containers, tarps, bermed or containment areas, sumps and underground tanks, wooden pallets, covered dumpsters, covered storage areas, spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS FOR WASTE HANDLING AND DISPOSAL:		
☐	Conduct waste handling and disposal activities in the designated areas as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-08 BMP:
Waste Handling & Disposal

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	102 - SP Plus
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	103 - Lufthansa
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	

SDCRAA | SDIA Boundary

Composting | Dumpster | Grease Trap | Industrial Waste | Recycling | Underground Storage Tank | Wash Area

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

Document Path: P:\Projects-South\CAD\ISM\AUTOCAD\5025-18\2002_SD_Airport\GIS\SWMP_GIS_2018\Appendix_B_1_29_2019_11x17.mxd

PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-08 BMP:
Waste Handling & Disposal

FIGURE
SC-08

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BMP SC09	BUILDING AND GROUNDS MAINTENANCE

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from building and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering storm drains, and maintaining the storm water collection system.

TARGETED ACTIVITIES:

- ✈ Building Maintenance
- ✈ Grounds Maintenance

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from building and grounds maintenance to the storm water collection system:

- ☐ Regularly clean paved surfaces that are exposed to industrial activity. Use "dry" cleaning techniques, such as sweeping, whenever possible.
- ☐ Clean any catch basins that receive runoff from maintenance areas on a regular basis. Use a vacuum truck to remove accumulated materials. Do not flush wastes into the storm drain system.
- ☐ Minimize use of pesticides, herbicides, and fertilizers and use according to directions. Seek less harmful/toxic products to replace ones currently used.
- ☐ Reduce the exposure of galvanized metal structures to rainfall. Possible actions to reduce exposure include; application of a coating of inert paint to the metal surface, replace uncoated galvanized metal fence with vinyl coated galvanized steel or polyester coated galvanized steel.
- ☐ Investigate the use of downspout filters on roof downspouts to minimize pollutants in roof runoff.
- ☐ Use safer non-toxic products for the outside painting of buildings and grounds maintenance. Recycle residual paints, solvents, lumber, and other materials (such as landscape waste) as much as possible.
- ☐ Reduce the exposure of galvanized metal structures to rainfall, by using coated galvanized structures or coating or painting existing structures with non-toxic paints or coatings.
- ☐ Encourage proper xeriscaping management and landscaping, including the use of native vegetation, to reduce irrigation needs.
- ☐ When applying pesticides, use the following practices: Do not use pesticides if rain is expected or is occurring, do not mix or prepare pesticides for application near storm drains, and apply pesticides only when wind speed is low.
- ☐ Prohibit over-irrigation of landscaped areas

POLLUTANTS of CONCERN:

- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Oil and Grease
- ✈ Sediment
- ✈ Landscape Waste
- ✈ Metals
- ✈ Cleaning Solutions
- ✈ Bacteria

BMP SC09	BUILDING AND GROUNDS MAINTENANCE

OPERATIONS:		APPLICABLE TENANTS/ DEPARTMENTS:
Sub-BMPs		✈ Allied Aviation ✈ American ✈ ARFF ✈ Bradford ✈ Cartwright ✈ Conrac ✈ DHL ✈ FedEx ✈ Flagship ✈ Menzies ✈ SDCRAA ✈ Signature ✈ Southwest ✈ UPS
- 01 ☐	Landscape, re-vegetate, or install erosion and sediment controls in areas of exposed soil.	
- 02 ☐	Use hand weeding when practical.	
- 03 ☐	Implement integrated pest management methods, minimize the use of pesticides, herbicides, and fertilizers and use according to directions.	
- 04 ☐	Use temporary BMPs such as portable booms and vacuum trucks to contain water from outdoor building or structure washdown activities. Use reclaimed water, where possible, and collect and properly dispose of all waste water through a permitted connection to the sanitary sewer.	
- 05 ☐	Compost or recycle grass trimmings, leaves, sticks, or other collected vegetation, where possible, or dispose of appropriately.	
- 06 ☐	Remove temporary stockpiled materials at the end of the day or place away from watercourses and drainage inlets, and berm and cover stockpiles to prevent material releases to the storm drain.	
- 07 ☐	Clean pavement or sidewalk (using dry methods or reclaimed water) of any residual materials or spills before applying irrigation water, and capture and properly dispose of any wash water.	
- 08 ☐	Repair damaged asphalt when degradation is observed.	
- 09 ☐	Reduce the exposure of galvanized or rusty metal structures to rainfall, where possible.	
	SEE ALSO BMP SC12	

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Building and grounds maintenance occurs on a daily basis. Equipment/tools to implement BMPs include portable booms, vacuum trucks, tarps, and fiber rolls.

AUTHORIZED BUILDING AND GROUNDS MAINTENANCE LOCATIONS:

☐	To implement BMPs for the prevention of discharges or pollutants from buildings and grounds maintenance, perform maintenance activities within the designated areas as shown in the attached map.

Date:	Version: 2.0

Tenants Implementing SC-09 BMP:
Building & Ground Maintenance

2 - Allied Aviation	6 - ARFF	12 - FedEx	21 - Southwest	24 - UPS	40 - Bradford	78 - Signature
4 - American	7 - Menzies	19 - SDCRAA	22 - FlagShip	38 - DHL	77 - Conrac	96 - Cartwright

Buildings | SDCRAA | SDIA Boundary

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT San Diego, California	SC-09 BMP: Building & Ground Maintenance
DATE: JANUARY 2019					FIGURE SC-09
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC10	EMPLOYEE TRAINING

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from activities through implementing an education program targeting employees, tenants, vendors, contractors and the public.

TARGETED ACTIVITIES:

- ✈ All Maintenance
- ✈ All Fueling
- ✈ All Washing
- ✈ Equipment Cleaning
- ✈ Cargo Handling
- ✈ All Storage
- ✈ Painting/Stripping
- ✈ Floor Washdowns
- ✈ Aircraft Deicing/Anti-Icing
- ✈ Garbage Collection
- ✈ Aircraft Lavatory Service
- ✈ Fire Fighting Equipment Testing
- ✈ Potable Water System Flush
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges to the storm water collection system:

☐ Implement an annual storm water pollution prevention education program for employees, tenants, contractors and the public that cover storm water issues, BMPs, spill cleanup, hazardous materials management, right-to-know awareness, and SWPPP implementation.

☐ Provide adequate implementation training for facilities with a Spill Prevention Control and Countermeasure (SPCC) Plan.

☐ Adequately train employees in the use of spill response equipment and materials.

☐ Train construction contractors on the regulations prohibiting cross connections between sanitary sewers and storm drains.

POLLUTANTS of CONCERN:

- ✈ Oil and Grease
- ✈ Vehicle Fluids
- ✈ Fuel
- ✈ Solvents/Cleaning Solutions
- ✈ Deicing/Anti-Icing
- ✈ Battery Acid
- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Paint
- ✈ Aircraft Fire Fighting Foam
- ✈ Metals
- ✈ Dumpster Wastes
- ✈ Sediment
- ✈ Landscape Waste\
- ✈ Floatables
- ✈ Lavatory Chemical Wastes
- ✈ Potable Water System Chemicals
- ✈ Rubber Particles

OPERATIONS:

Sub-BMPs

- 01 ☐ Update the Authority SWMP and tenant SWPPPs covering the facility or operation on a periodic basis and complete and insert the amendment pages for the SWMP or SWPPP, as needed.
- 02 ☐ Train Authority and tenant employees and contractors in storm water pollution prevention education covering all storm water issues, implementation and effectiveness of BMPs, spill prevention and cleanup, hazardous materials management, right-to-know awareness, and SWMP or SWPPP implementation.
- 03 ☐ Implement additional training programs for relevant Authority and

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Cartwright

BMP SC10	**EMPLOYEE TRAINING**	
	tenant employees and contractors covering any Spill Plan implementation, the prohibition on cross-connections between sanitary sewers and storm drains, and contractor responsibility to comply with adopted BMPs.	✈ Conrac ✈ Delta ✈ DHL ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HFF ✈ HMS Host ✈ JAL ✈ JetBlue ✈ Lufthansa ✈ Menzies ✈ Mission Yogurt ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
- 04 ☐	Maintain training records for 5 years of current employees that have participated in the storm water pollution prevention education program and other related training programs.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Training frequencies and tools are described in Sections 7.0 and 9.0.		
AUTHORIZED LOCATIONS TO IMPLEMENT BMPs TO PREVENT NON-STORM WATER DISCHARGES:		
☐	To implement BMPs for the prevention of non-storm water discharges, put into practice all lessons learnt from training in the designated areas as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-10 BMP:
Employee Training

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	100 - Edelweiss
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	102 - SP Plus
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	103 - Lufthansa

SDCRAA SDIA Boundary

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Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-10 BMP:
Employee Training

FIGURE
SC-10

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BMP SC11	LAVATORY SERVICE OPERATION

PURPOSE:
Eliminate discharges to the storm drain system associated with ground servicing of aircraft lavatory facilities.

TARGETED ACTIVITIES:

- ✈ Aircraft Lavatory Service
- ✈ Lavatory Truck/Cleanout Backflushing

POLLUTION PREVENTION:

	Implement the following pollution prevention practices and BMPs to prevent discharges to the storm drain system associated with ground servicing of aircraft lavatory facilities:
☐	Use only surfactants and disinfectants approved for discharge to the sanitary sewer system.

POLLUTANTS of CONCERN:

- ✈ Lavatory Chemicals
- ✈ Lavatory Waste
- ✈ Lavatory Truck Wash Water

OPERATIONS:

Sub-BMPs	
- 01 ☐	Triturator facilities are covered and have low roll-over type berming.
- 02 ☐	Triturator facilities should not be located directly in the path of storm drains.
- 03 ☐	Perform regular inspections of all hoses and fittings used for transferring lavatory waste and keep the equipment in good condition.
- 04 ☐	Absorbent booms, spill kits and other containment equipment are present on lavatory service equipment and at the triturator facility.
- 05 ☐	Perform all mixing and transfers of surfactants and disinfectants within the covered and bermed triturator area or under a cover.
- 06 ☐	Use drip pans when draining aircraft lavatory systems. Immediately dump the collected drippage into the bulk storage tank on the lavatory service cart or lavatory service truck.
- 07 ☐	Immediately clean and properly dispose of all spills of lavatory wastes and lavatory chemicals at the triturator facility.
- 08 ☐	Secure all hoses, valves, and equipment when transporting lavatory waste.
- 09 ☐	Perform lavatory truck cleanouts/backflushing and lavatory waste discharging to sanitary sewer connections ONLY at triturator facilities.
- 10 ☐	Completely drain all hoses.
- 11 ☐	Use lavatory service cart or truck with spill prevention equipment installed, where possible.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ American Airlines
- ✈ British Airways
- ✈ Delta
- ✈ DHL
- ✈ Edelweiss
- ✈ Frontier
- ✈ Hawaiian
- ✈ JAL
- ✈ Jet Blue
- ✈ Lufthansa
- ✈ SDCRAA
- ✈ Signature
- ✈ Southwest
- ✈ Spirit
- ✈ Sun Country
- ✈ United
- ✈ UPS
- ✈ WestJet

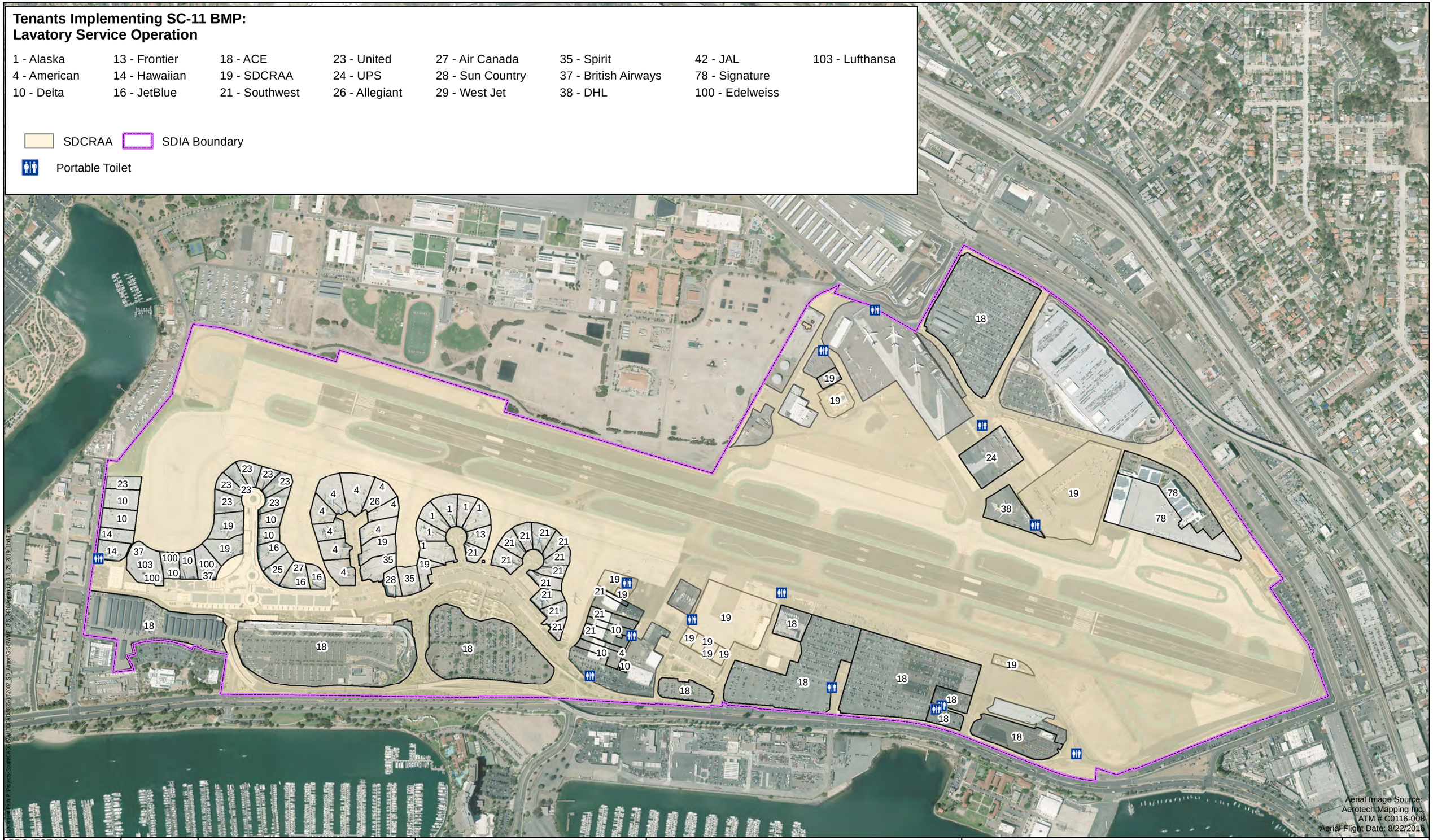
BMP SC11	**LAVATORY SERVICE OPERATION**	
- 12 ☐	Temporary sanitary facilities must have secondary containment and be located away from watercourses, drainage facilities, traffic circulation and high wind areas.	
- 13 ☐	Regularly inspect temporary sanitary facilities for leaks and spills and clean or replace when necessary.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Lavatory service operations occur on a daily basis. Equipment/tools to implement BMPs include secondary containment, bermed areas, overhead cover at triturator, drip pans, spill kits, and drums.		
AUTHORIZED LOCATIONS FOR LAVATORY SERVICE OPERATIONS:		
☐	Use only the designated areas for ground servicing of aircraft lavatory facilities as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-11 BMP:
Lavatory Service Operation

1 - Alaska	13 - Frontier	18 - ACE	23 - United	27 - Air Canada	35 - Spirit	42 - JAL	103 - Lufthansa
4 - American	14 - Hawaiian	19 - SDCRAA	24 - UPS	28 - Sun Country	37 - British Airways	78 - Signature	
10 - Delta	16 - JetBlue	21 - Southwest	26 - Allegiant	29 - West Jet	38 - DHL	100 - Edelweiss	

SDCRAA SDIA Boundary

Portable Toilet



Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
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STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-11 BMP:
Lavatory Service Operation

FIGURE
SC-11

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BMP SC12	OUTDOOR WASHDOWN/SWEEPING (APRON WASHING, RAMP SCRUBBING)

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from outdoor washdown and sweeping operations.

TARGETED ACTIVITIES:

- ✈ Apron Washing
- ✈ Ramp Scrubbing
- ✈ Outdoor Washdown
- ✈ Road Sweeping
- ✈ Ramp Sweeping

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges of pollutants from outdoor washdown and sweeping operations to the storm water collection system:

- ☐ Use biodegradable or non-toxic cleaning products for outdoor washdown activities.
- ☐ Investigate newer sweeping technologies such as high-efficiency sweepers or the CASQA-recommended regenerative air and vacuum-assisted dry sweepers.
- ☐ Investigate non-potable or alternative sources of water when performing outdoor washdowns. Reuse water as much as possible before disposing it.
- ☐ Follow water conservation practices when performing washdowns.
- ☐ **DO NOT DISCHARGE WASH WATER TO A STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any discharges associated with outdoor washdowns have occurred.

POLLUTANTS of CONCERN:

- ✈ Oil and Grease
- ✈ Solvents/Cleaning Solutions
- ✈ Fuel
- ✈ Aircraft Fire Fighting Foam
- ✈ Deicing/Anti-Icing Fluids
- ✈ Sediment
- ✈ Floatables

OPERATIONS:

Sub-BMPs

- 01 ☐ Inspect and maintain sweeping and scrubbing equipment regularly to ensure effectiveness at removing pollutants and to avoid leaks.
- 02 ☐ Roads, ramp areas, apron areas, and, if feasible, runway/taxiway areas are swept on a regular basis.
- 03 ☐ Perform sweeping during dry weather using dry sweeping techniques where feasible.
- 04 ☐ Operate sweepers at manufacturer-recommended optimal speeds.
- 05 ☐ Properly dispose of debris and sediment from sweeping.
- 06 ☐ Berm outdoor washdown areas to contain the wash water and to prevent run-on to adjacent areas.
- 07 ☐ Minimize the amount of water used during outdoor washdown

APPLICABLE TENANTS/ DEPARTMENTS:

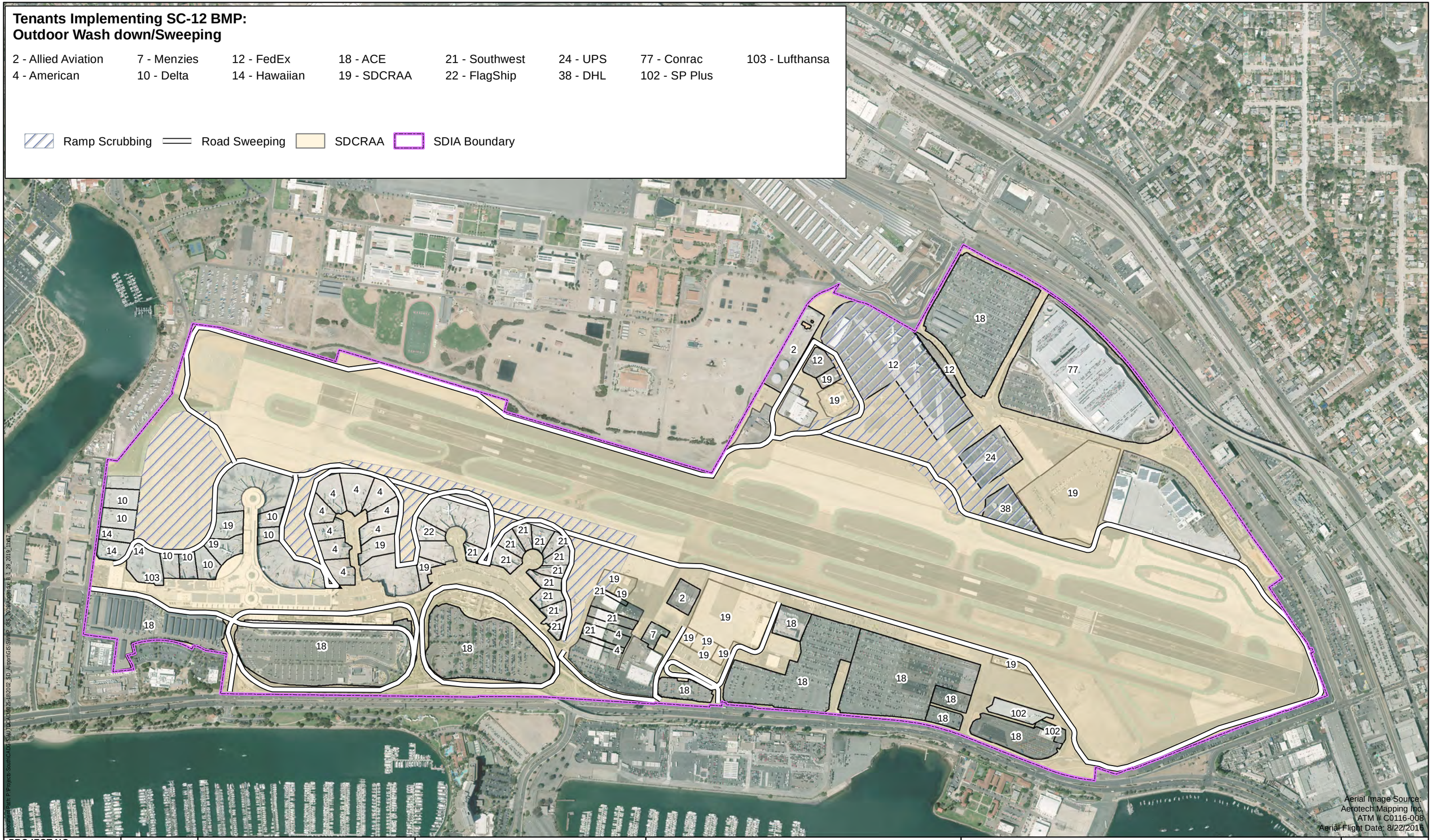
- ✈ ACE
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ Conrac
- ✈ Delta
- ✈ DHL
- ✈ FedEx
- ✈ Flagship
- ✈ Hawaiian
- ✈ Lufthansa
- ✈ Menzies
- ✈ SDCRAA
- ✈ SP Plus
- ✈ UPS

BMP SC12	OUTDOOR WASHDOWN/SWEEPING (APRON WASHING, RAMP SCRUBBING)	
	activities.	
- 08 ☐	Wash water is collected and filtered and reused, or discharged to the sanitary sewer system through a permitted connection at designated and approved discharge facilities (i.e., dewatering bin).	
- 09 ☐	Maintain records of the sweeping or scrubbing activities including the miles swept or scrubbed and the amount of waste collected.	
- 10 ☐	Do not use a running hose to wash down sidewalks, or other hard surface areas. A water-efficient, filtering and recycling device must be used and all wash water must be prevented from entering the storm drain system (curb gutters, streets, alleys, and inlets).	
- 11 ☐	Use reclaimed or recycled/filtered water.	
- 12 ☐	Roads, ramp areas, and apron areas are scrubbed on an as-needed basis.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Outdoor washdown/sweeping occurs on a daily basis. Equipment/tools to implement BMPs include recycling/filtering power washers, ramp scrubbers, mechanical and regenerative air sweepers, booms, containment devices, spill kits, brooms, dumpsters, dewatering bins and drums.		
AUTHORIZED LOCATIONS FOR OUTDOOR WASHDOWN AND SWEEPING ACTIVITIES:		
☐	To implement BMPs for the prevention of non-storm water discharges, perform outdoor washdown and sweeping activities in the designated areas as shown on the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-12 BMP:
Outdoor Wash down/Sweeping

2 - Allied Aviation	7 - Menzies	12 - FedEx	18 - ACE	21 - Southwest	24 - UPS	77 - Conrac	103 - Lufthansa
4 - American	10 - Delta	14 - Hawaiian	19 - SDCRAA	22 - FlagShip	38 - DHL	102 - SP Plus	

Ramp Scrubbing | Road Sweeping | SDCRAA | SDIA Boundary



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Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT San Diego, California	SC-12 BMP: Outdoor Wash down/Sweeping
DATE: JANUARY 2019					FIGURE SC-12
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC13	FIRE FIGHTING FOAM DISCHARGE

PURPOSE:
To prevent the discharge of pollutants to storm water associated with flushing or testing of fire fighting foam.

TARGETED ACTIVITIES:

- ✈ Fire Fighting Foam Testing

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from fire fighting foam testing entering the storm water collection system:

- ☐ Preform fire fighting foam testing during dry weather and in designated areas only.
- ☐ Before performing fire fighting foam testing, block off all storm drain inlets within the designated testing area.
- ☐ All discharges should be collected and disposed of properly.
- ☐ **DO NOT DISCHARGE AFFF OR WASTEWATER TO A CATCH BASIN OR STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any discharges of AFFF have occurred.

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam (AFFF)

OPERATIONS:

Sub-BMPs

- - 01 ☐ Do not perform fire fighting foam testing directly in the path of storm drains.
- - 02 ☐ Inspect and test fire fighting equipment on a regular basis.
- - 03 ☐ Perform fire fighting foam testing ONLY in a designated area that captures or divers all foam waste to a structural treatment control, sanitary sewer, or dead end sump with pump.
- - 04 ☐ Service sump(s) and/or oil/water separators on a regular basis.
- - 05 ☐ Prevent all designated testing areas from contacting storm water run on and run-off or from reaching storm drains (e.g. by the use of berms and sandbags).

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ Allied Aviation
- ✈ ARFF

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Firefighting operation frequencies and tools are described in Section 3.0.

AUTHORIZED LOCATIONS FOR FIRE FIGHTING FOAM TESTING:

- ☐ Use only the designated areas for fire fighting foam testing as shown in the attached map.

Date:

Version: 2.0

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Tenants Implementing SC-13 BMP:
Fire Fighting Foam Discharge

2 - Allied Aviation

6 - ARFF

SDIA Boundary

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Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.: 5025-18-2002 DATE: JANUARY 2019 DRAWN BY: CAB CHECKED BY: AA/NP	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**SC-13 BMP:** **Fire Fighting Foam Discharge**	FIGURE SC-13

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BMP SC14	POTABLE WATER SYSTEM FLUSHING	
PURPOSE: To prevent the discharge of pollutants to storm water drains associated with flushing and cleaning of aircraft potable water systems.		**TARGETED ACTIVITIES:** ✈ Aircraft potable water system cleaning and flushing ✈ Water truck cleaning and flushing
POLLUTION PREVENTION:		**POLLUTANTS of CONCERN:** ✈ Chlorine Bleach ✈ Purine
☐ ☐	Implement the following pollution prevention practices and BMPs to prevent discharges from potable water system flushing: Perform flushing activities within designated areas that divert the flushed water away from the storm drain system whenever possible. **DO NOT DISCHARGE WASTE WATER OR CLEANING AGENTS TO A CATCH BASIN OR STORM DRAIN.** Notify Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) if any discharges associated with flushing and cleaning of aircraft potable water systems have occurred.	
OPERATIONS:		**APPLICABLE TENANTS/ DEPARTMENTS:** ✈ Air Canada ✈ Alaska ✈ Allegiant ✈ American Airlines ✈ British Airways ✈ Edelweiss ✈ FedEx ✈ Frontier ✈ Hawaiian ✈ Jet Blue ✈ Southwest ✈ Spirit ✈ WestJet
Sub-BMPs - 01 ☐ - 02 ☐ - 03 ☐	The aircraft potable water system and water truck flushing/cleaning areas should not be located directly in the path of storm drains. Perform potable water system flushing only in designated flushing/cleaning areas that capture or divert all wastewater away from storm drains, or to a structural treatment control, sanitary sewer, or dead end sump with pump. Prevent flushing/cleaning areas from contacting storm water run-on and run-off.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Potable water system flushing frequencies and tools are described in Section 3.0.		
AUTHORIZED LOCATIONS FOR POTABLE WATER SYSTEM FLUSHING/CLEANING:		
☐	Use only the designated areas for aircraft potable water system flushing/cleaning as shown in the attached map.	
Date:		Version: 2.0

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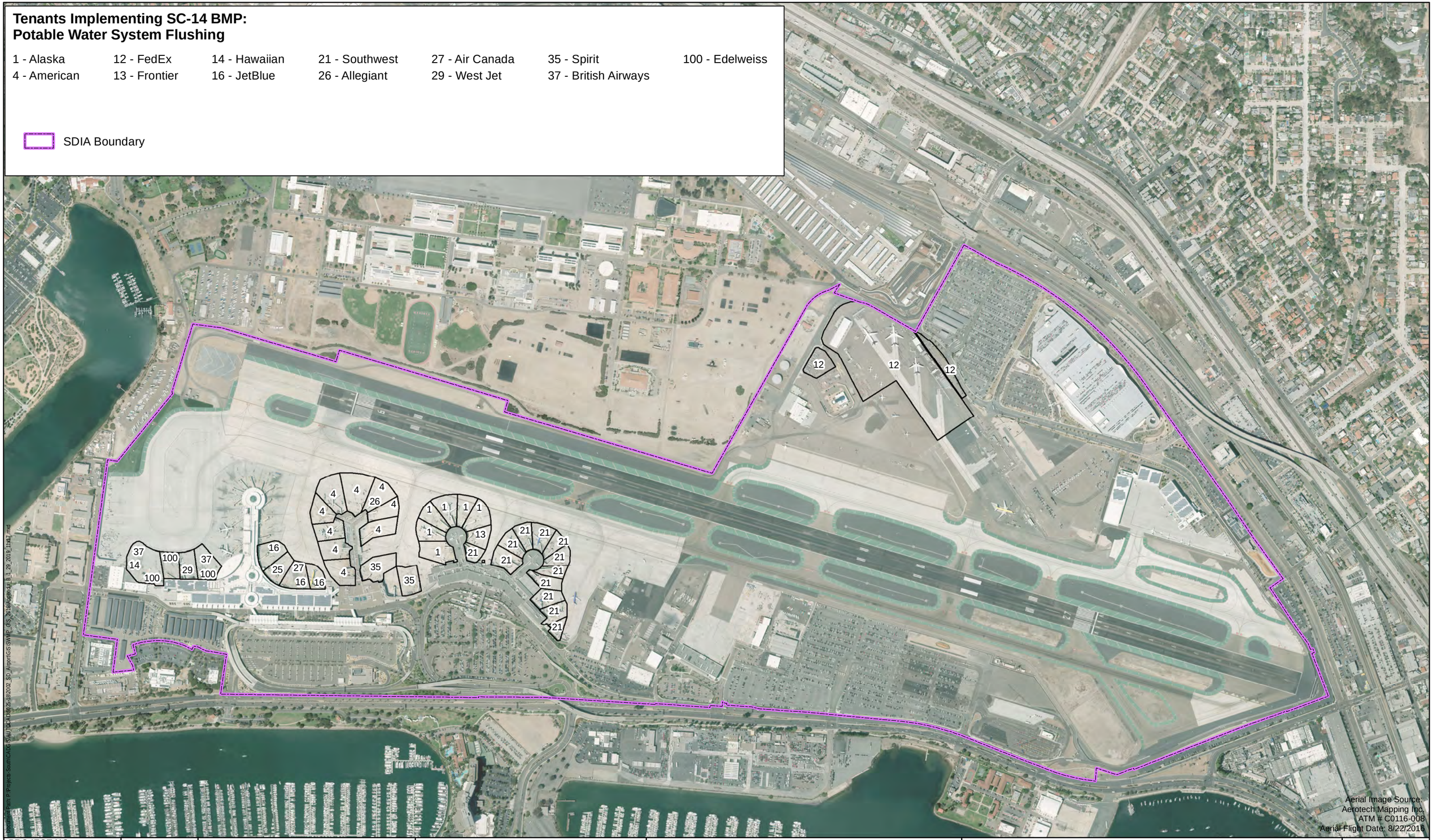
Tenants Implementing SC-14 BMP:
Potable Water System Flushing

1 - Alaska	12 - FedEx	14 - Hawaiian	21 - Southwest	27 - Air Canada	35 - Spirit	100 - Edelweiss
4 - American	13 - Frontier	16 - JetBlue	26 - Allegiant	29 - West Jet	37 - British Airways	

SDIA Boundary



Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-14 BMP:
Potable Water System Flushing

FIGURE
SC-14

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BMP SC15	RUNWAY RUBBER REMOVAL

PURPOSE:
Eliminate discharges to the storm drain of particulate rubber and other pollutants generated by runway rubber removal activities.

TARGETED ACTIVITIES:

- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges of particulate rubber and other pollutants generated by runway rubber removal activities to the storm water collection system:

☐ Use biodegradable or non-toxic cleaning products for runway rubber removal activities.

POLLUTANTS of CONCERN:

- ✈ Rubber particles
- ✈ Dirt particles
- ✈ Metals

OPERATIONS:

Sub-BMPs

- 01 ☐ Minimize the amount of water used during runway rubber removal activities.
- 02 ☐ Prevent waste water produced from runway rubber removal activities from entering the storm drainage system by immediately collecting and properly disposing of it.
- 03 ☐ Use manual or mechanical cleaning methods such as mechanical street sweepers to remove rubber particulates from the runway and adjacent paved areas following runway rubber removal activities.
- 04 ☐ Inspect storm drain inlets, catch basins, and runway drainage areas following runway rubber removal activities for any resulting debris, and remove and properly dispose of debris.
- 05 ☐ Use reclaimed water, where possible.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ SDCRAA

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Runway rubber removal frequencies and tools are described in Section 7.0.

AUTHORIZED LOCATIONS FOR RUNWAY RUBBER REMOVAL ACTIVITIES:

☐ Perform all runway rubber removal activities in the designated areas as shown in the attached map.

Date:

Version: 2.0

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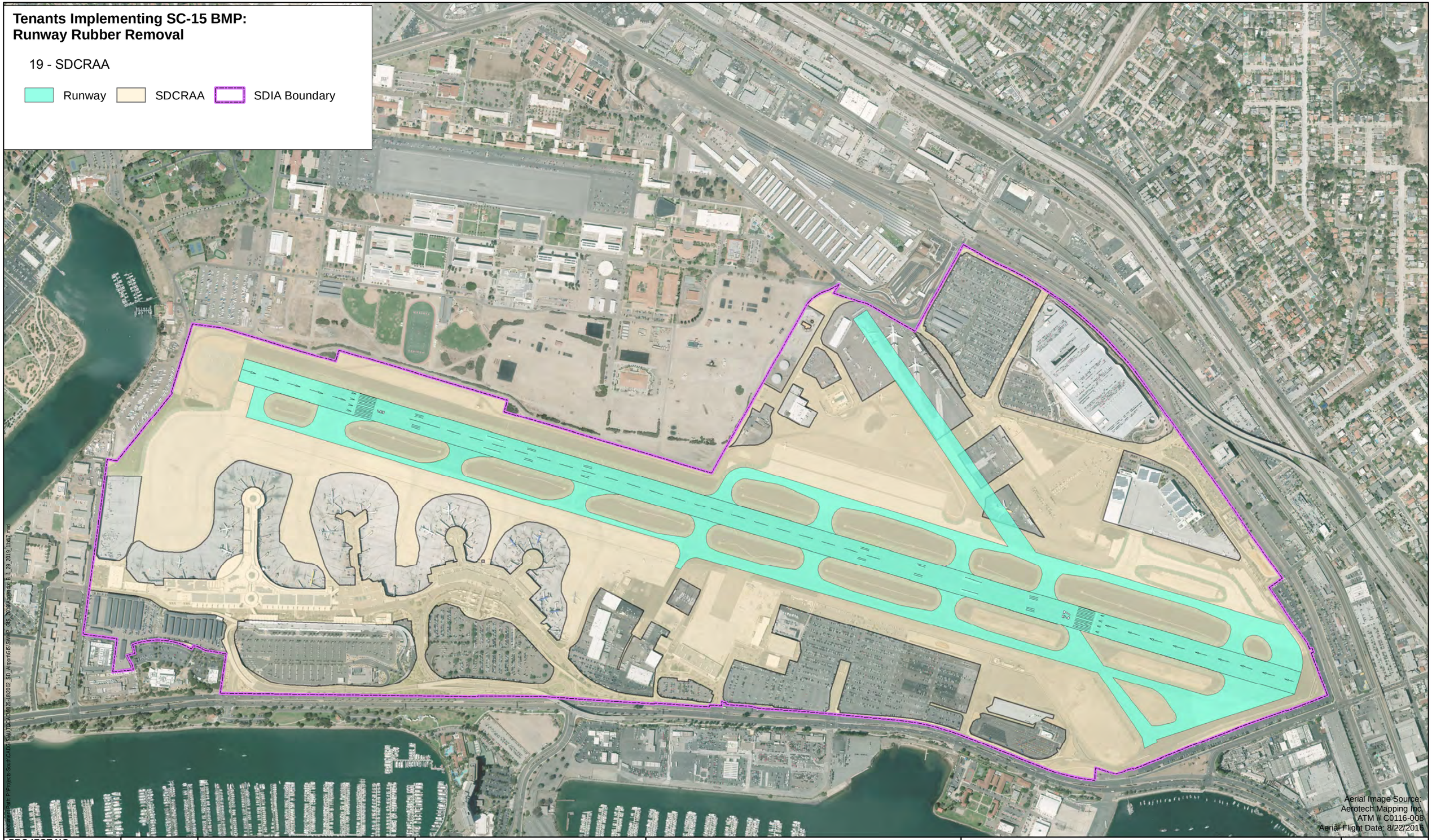
Tenants Implementing SC-15 BMP:
Runway Rubber Removal

19 - SDCRAA

Runway | SDCRAA | SDIA Boundary



Aerial Image Source:
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ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002 DATE: JANUARY 2019 DRAWN BY: CAB CHECKED BY: AA/NP	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**SC-15 BMP:** **Runway Rubber Removal**	FIGURE SC-15

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BMP SC16	PARKING LOTS

PURPOSE:
Prevent and reduce the discharge of pollutants from parking areas.

TARGETED ACTIVITIES:

- ✈ Vehicle parking
- ✈ Surface cleaning and maintenance
- ✈ Litter control

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent non-storm water discharges from parking areas to the storm water collection system:

- ☐ Install treatment control BMPs, where practicable, in parking lot areas to treat parking lot runoff.
- ☐ Design parking lot areas to include semi-permeable hardscape and Low Impact Development practices.
- ☐ Inspect and maintain sweeping equipment regularly to ensure effectiveness at removing pollutants and to avoid leaks.
- ☐ Sweep parking lots regularly and before onset of wet season.
- ☐ Prohibit over-irrigation of landscaped areas

POLLUTANTS of CONCERN:

- ✈ Trash
- ✈ Suspended solids
- ✈ Hydrocarbons
- ✈ Oil and grease
- ✈ Heavy Metals
- ✈ Bacteria
- ✈ Sediment
- ✈ Pesticides

OPERATIONS:

Sub-BMPs

- 01 ☐ Post "No Littering" signs around parking lots and regularly empty trash receptacles. Trash receptacles must be covered.
- 02 ☐ Sweep all parking lot areas on a regular basis to remove accumulated debris and sediment.
- 03 ☐ Operate sweepers at manufacturer-recommended optimal speeds.
- 04 ☐ Perform sweeping in parking lot areas when the number of parked vehicles is lowest to maximize areas swept.
- 05 ☐ Maintain records of the sweeping activities including the miles swept and the amount of waste collected.
- 06 ☐ Clean oily spots from parking lot surfaces with absorbent materials.
- 07 ☐ Perform all repairs to parking lot surfaces during periods of dry weather.
- 08 ☐ Cover and seal nearby storm drain inlets, catch basins, and manholes during parking lot repairs.
- 09 ☐ Use drip pans and absorbent materials to catch and collect drips and leaks from paving equipment that are not in use.

APPLICABLE TENANTS/ DEPARTMENTS:

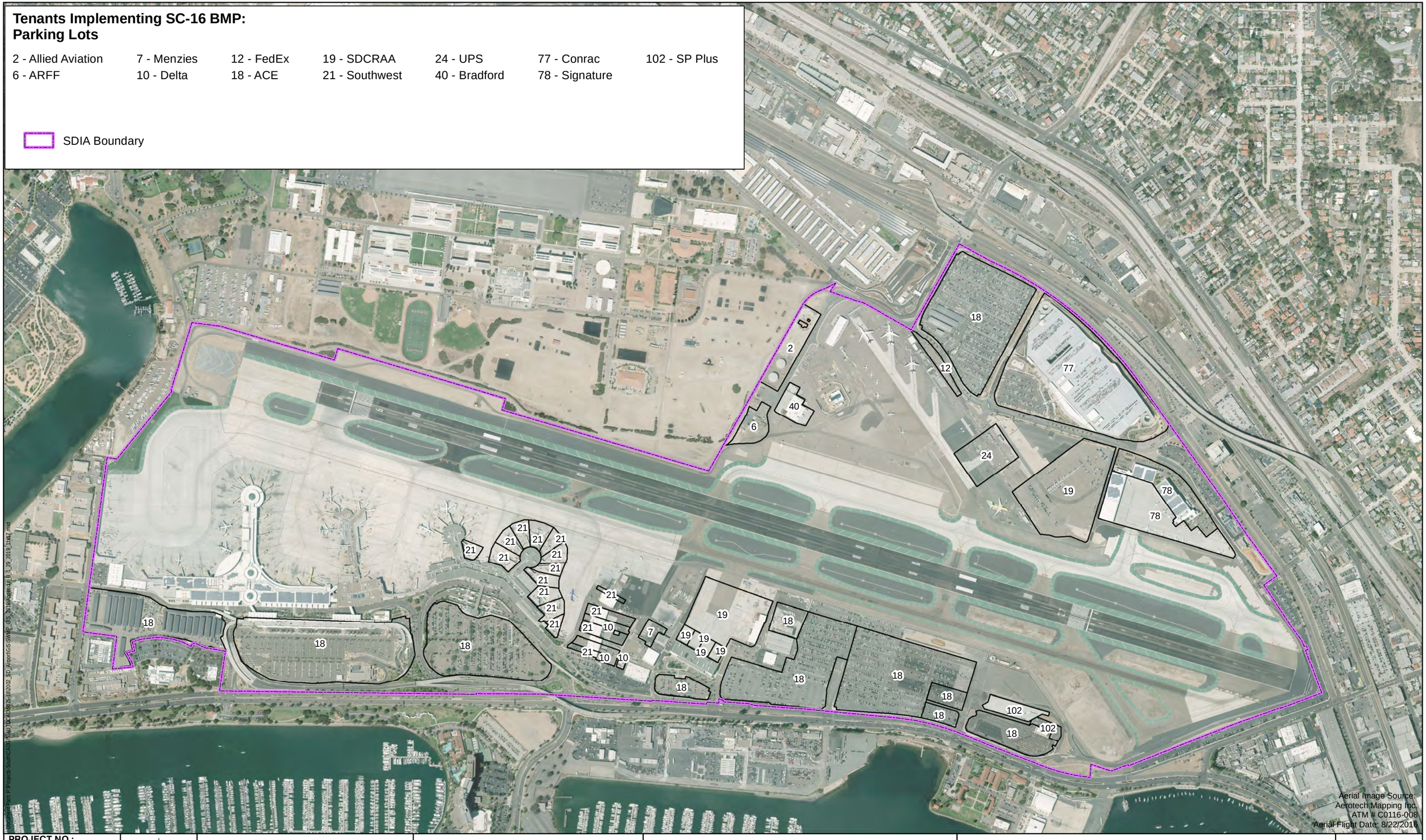
- ✈ ACE
- ✈ Allied Aviation
- ✈ ARFF
- ✈ Bradford
- ✈ Conrac
- ✈ Delta
- ✈ FedEx
- ✈ Menzies
- ✈ SDCRAA
- ✈ Signature
- ✈ Southwest
- ✈ SP Plus
- ✈ UPS

BMP SC16	**PARKING LOTS**	
- 10 ☐	Hot bituminous materials used for parking lot repairs are to be preheated and transferred or loaded away from storm drain inlets.	
- 11 ☐	Properly dispose of used absorbent materials, debris, and collected drips.	
- 12 ☐	Avoid draining rooftop downspout drains onto paved parking lot surfaces.	
- 13 ☐	Sweep, vacuum, or use other dry methods to remove waste materials generated from repairs.	
- 14 ☐	Temporarily store waste materials and debris generated from parking lot repairs in containers or in stockpiles with cover and berm around them and away from storm drain inlets. **SEE ALSO BMP SC21**	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Sweeping of parking lots occurs five days a week or as described in Section 6.0. Equipment/tools to implement BMPs include mechanical and regenerative air sweepers, drip pans, spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS TO IMPLEMENT BMPs FOR PARKING LOTS:		
☐	To reduce pollutants in parking lot storm water discharges, implement BMPs in areas as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-16 BMP:
Parking Lots

2 - Allied Aviation	7 - Menzies	12 - FedEx	19 - SDCRAA	24 - UPS	77 - Conrac	102 - SP Plus
6 - ARFF	10 - Delta	18 - ACE	21 - Southwest	40 - Bradford	78 - Signature	

SDIA Boundary



Aerial Image Source:
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ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

N

0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-16 BMP:
Parking Lots

FIGURE
SC-16

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BMP SC17	STORM DRAIN MAINTENANCE

PURPOSE:
Maintain catch basins, storm water inlets, and other storm water conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

TARGETED ACTIVITIES:

- ✈ Storm water conveyance system

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to remove pollutants, sediment, and debris from the storm water collection system:

☐ Look for evidence of illegal dumping, illegal discharges or illicit connections during routine inspection, cleaning, and maintenance of the storm drainage system and drainage structures.

POLLUTANTS of CONCERN:

- ✈ Trash
- ✈ Suspended solids
- ✈ Hydrocarbons
- ✈ Oil and grease
- ✈ Heavy Metals
- ✈ Bacteria
- ✈ Organics

OPERATIONS:

Sub-BMPs

- 01 ☐ Stencil storm drains with "No Dumping" messages.
- 02 ☐ Conduct routine self-inspections of the storm drainage system. The Authority should inspect the entire MS4 at least annually, between the dates of May 1 and September 30.
- 03 ☐ Use appropriate measures to prevent discharges during MS4 cleaning and maintenance.
- 04 ☐ Clean and maintain storm drain inlets, catch basins, pipes, and other conveyance structures before the wet season and as needed.
- 05 ☐ Clear open channels of accumulated litter in a timely manner.
- 06 ☐ Properly dispose of all accumulated sediments, contaminants, debris and waste water from cleaning and maintenance activities.
- 07 ☐ Maintain records for all inspections, cleaning, and maintenance, including the quantity of waste removed.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Allied Aviation
- ✈ ARFF
- ✈ Cartwright
- ✈ Delta
- ✈ SDCRAA
- ✈ Signature
- ✈ SP Plus

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Storm drain maintenance frequencies are described in Section 6.0. Equipment/tools to implement BMPs include stenciling equipment, measuring devices, flashlights, vactor trucks, spill kits, brooms, and drums.

BMP SC17	**STORM DRAIN MAINTENANCE**
AUTHORIZED LOCATIONS FOR STORM DRAIN MAINTENANCE:	
☐	To implement BMPs for the removal of pollutants, sediment, and debris from the storm drain system, maintenance of the storm drain system will be performed at the designated areas as shown on the attached map.
Date:	Version: 2.0

Tenants Implementing SC-17 BMP:
Drainage System Maintenance

2 - Allied Aviation 6 - ARFF 10 - Delta 18 - ACE 19 - SDCRAA 78 - Signature 96 - Cartwright 102 - SP Plus

Outfall Storm Drain Inlet Stormwater Pipe (with flow direction)

SDCRAA SDIA Boundary

PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**SC-17 BMP: Drainage System Maintenance**
DATE: JANUARY 2019					FIGURE SC-17
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC18	HOUSEKEEPING

PURPOSE:
Implement good housekeeping measures to eliminate non-storm water discharges and reduce the potential for pollutants to enter the storm water collection system.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing/Anti-Icing
- ✈ Aircraft Lavatory Service
- ✈ All Fueling
- ✈ All Maintenance
- ✈ All Storage
- ✈ All Washing
- ✈ Cargo Handling
- ✈ Equipment Cleaning
- ✈ Fire Fighting Equipment Testing
- ✈ Floor Washdowns
- ✈ Garbage Collection
- ✈ Painting/Stripping
- ✈ Potable Water System Flushing
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to eliminate non-storm water discharges and reduce the potential for pollutants to enter the storm water collection system:

☐ Clean operation areas and facilities using dry methods.

☐ Maintain adequate supplies of spill response equipment and absorbent materials in accessible locations where significant materials are stored and used.

☐ Apply integrated pest management mechanical and cultural controls to control for pests and reduce the need of pesticides. Cultural controls targets pest attractants using sanitation practices, education, and communication. Mechanical controls creates physical barriers as a means of prevention. Create partnerships with other organizations for better implementation of an integrated pest management program.

☐ **NEVER HOSE DOWN PAVED AREAS TO THE STORM DRAINS.**

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam
- ✈ Battery Acid
- ✈ Cleaning Solution
- ✈ Deicing/Anti-Icing Fluid
- ✈ Dirt particles
- ✈ Dumpster Wastes
- ✈ Floatables
- ✈ Fuel
- ✈ Heavy Metals
- ✈ Hydrocarbons
- ✈ Landscape Waste
- ✈ Lavatory Chemicals
- ✈ Lavatory Chemical Waste
- ✈ Lavatory Truck Wash Water
- ✈ Lavatory Waste
- ✈ Metals
- ✈ Oil and Grease
- ✈ Paint
- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Potable Water System Chemicals
- ✈ Rubber Particles
- ✈ Sediment
- ✈ Solvents
- ✈ Suspended solids
- ✈ Trash
- ✈ Vehicle Fluids

BMP SC18	HOUSEKEEPING

OPERATIONS:		APPLICABLE TENANTS/ DEPARTMENTS:
Sub-BMPs		✈ ACE ✈ Air Canada ✈ Alaska ✈ Allegiant ✈ Allied Aviation ✈ American Airlines ✈ ARFF ✈ Bradford ✈ British Airways ✈ Cartwright ✈ Conrac ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HFF ✈ HMS Host ✈ JAL ✈ JetBlue ✈ Lufthansa ✈ Menzies ✈ Mission Yogurt ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
- 01 ☐	Perform and document on a regular basis self-inspections and evaluations of the implemented BMPs.	
- 02 ☐	Keep all facility and operation areas clean and orderly.	
- 03 ☐	Place trash receptacles that have covers in appropriate locations.	
- 04 ☐	Sweep all facility and operation areas at least once per week to prevent the accumulation of sediments, debris, and contaminants.	
- 05 ☐	Properly dispose of all debris and sediment from sweeping.	
- 06 ☐	Store significant materials in the appropriate containers that are properly sealed and labeled.	
- 07 ☐	Store significant materials within secondary containment.	
- 08 ☐	Store significant materials in a restricted access area.	
- 09 ☐	Material Safety Data Sheets (MSDSs) are readily available for all significant materials.	

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Good housekeeping occurs on a daily basis. Equipment/tools to implement BMPs include trash receptacles, spill pallets, outdoor sheds, overpack containers, tarps, flammable materials storage lockers, bermed or containment areas, indoor or covered storage areas, fiber rolls, wooden pallets, spill kits, brooms, and drums.

AUTHORIZED LOCATIONS TO IMPLEMENT HOUSEKEEPING BMPs:

BMP SC18	**HOUSEKEEPING**	
☐	Prevent non-storm water discharges, and contact of pollutants with storm water discharges by implementing good housekeeping BMPs in the designated areas as shown in the attached map.	
Date:		Version: 2.0

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Tenants Implementing SC-18 BMP:
Housekeeping

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	100 - Edelweiss
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	102 - SP Plus
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	103 - Lufthansa

SDCRAA
SDIA Boundary
Composting
Fuel Storage
Grease Trap
Loading
Metal Storage
Recycling
Wash Area
Dumpster
Fueling
Industrial Waste
Material Storage
Oil Storage
Underground Storage Tank

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Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-18 BMP:
Housekeeping

FIGURE
SC-18

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BMP SC19	SAFER/ALTERNATIVE PRODUCTS

PURPOSE:
Reduce the use of harmful, toxic and non-biodegradable products that could pollute storm water runoff.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing/Anti-Icing
- ✈ Aircraft Lavatory Service
- ✈ All Fueling
- ✈ All Maintenance
- ✈ All Storage
- ✈ All Washing
- ✈ Cargo Handling
- ✈ Equipment Cleaning
- ✈ Fire Fighting Equip. Testing
- ✈ Floor Washdowns
- ✈ Garbage Collection
- ✈ Outdoor Washdown
- ✈ Painting/Stripping
- ✈ Potable Water System Flush
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent toxic, non-biodegrabable materials from entering the storm water collection system:

☐ Develop an Environmentally Preferable Purchasing Program to (1) minimize the purchase of products containing hazardous ingredients, (2) maximize the purchase of alternative products that pose less risk to employees and to the environment, and (3) maximize the purchase of products containing recycled materials.

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam
- ✈ Battery Acid
- ✈ Cleaning Solution
- ✈ Deicing/Anti-Icing Fluid
- ✈ Fuel
- ✈ Heavy Metals
- ✈ Hydrocarbons
- ✈ Lavatory Chemicals
- ✈ Metals
- ✈ Oil and Grease
- ✈ Paint
- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Potable Water System Chemicals
- ✈ Solvents
- ✈ Vehicle Fluids

OPERATIONS:

Sub-BMPs

- 01 ☐ Whenever possible, use alternative products that are "Regionally Accepted" and are identified as being non-toxic, less toxic, or biodegradable.

- 02 ☐ Whenever possible, maximize the purchase and use of products containing recycled materials.

APPLICABLE TENANTS/ DEPARTMENTS:

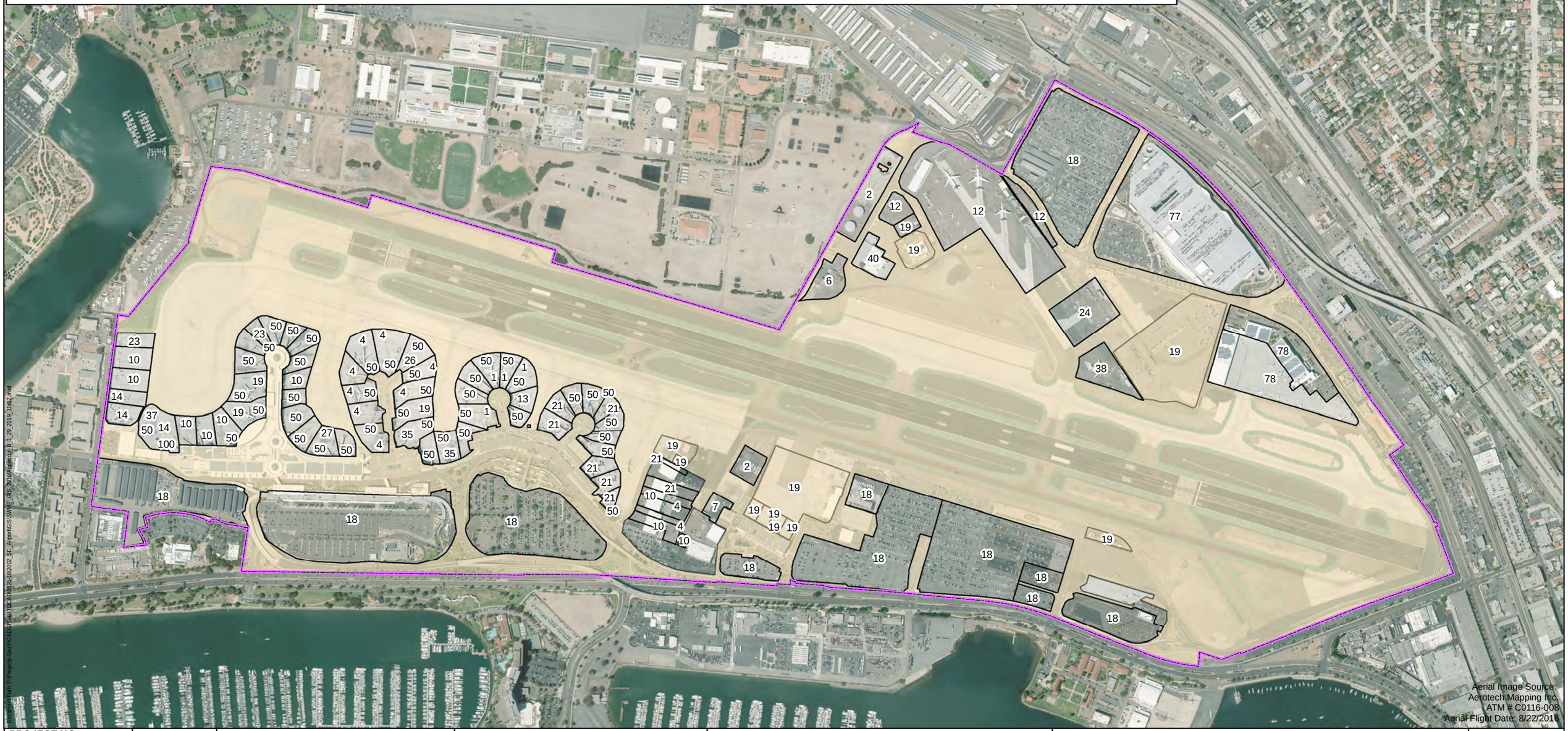
- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Cartwright

BMP SC19	SAFER/ALTERNATIVE PRODUCTS	
		✈ Conrac ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HFF ✈ HMS Host ✈ JAL ✈ Jet Blue ✈ Menzies ✈ Mission Yogurt ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Safer/alternative products are used whenever possible and according to the Authority's and tenant's policies.		
AUTHORIZED LOCATIONS TO USE SAFER/ALTERNATIVE PRODUCTS:		
☐	Use non-toxic, less toxic, biodegradable, alternative products whenever possible in the designated areas shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-19 BMP:
Safer/Alternative Products

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	100 - Edelweiss
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	

SDCRAA SDIA Boundary



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Aerial Flight Date: 8/22/2016

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PROJECT NO.: 5025-18-2002	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**SC-19 BMP: Safer/Alternative Products**
DATE: JANUARY 2019					FIGURE SC-19
DRAWN BY: CAB					
CHECKED BY: AA/NP					

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BMP SC20	ERODIBLE AREAS

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from erodible areas by implementation of erosion control BMPs to stabilize soils and reduce pollutant discharges. This does not apply to natural, undeveloped areas, except where erosion is occurring as a direct result of onsite human activity, such as paving, land disturbance, or vegetation removal.

TARGETED ACTIVITIES:

- ✈ Erodible Areas
- ✈ Grounds Maintenance
- ✈ Construction Activities

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent discharges of pollutants from building and grounds maintenance to the storm water collection system:

☐ Minimize site operations on erodible areas.

POLLUTANTS of CONCERN:

- ✈ Sediment

OPERATIONS:

Sub-BMPs

- 01 ☐ Implement erosion control BMPs to stabilize soils.
- 02 ☐ Implement wind erosion control BMPs to control dust.
- 03 ☐ Maintain effective perimeter controls.
- 04 ☐ Stabilize loose soils and slopes prior to a forecasted storm event.
- 05 ☐ Prevent material tracking offsite.
- 06 ☐ Divert all storm water away from erodible materials.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ SDCRAA

STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.

BMP FREQUENCIES/EQUIPMENT/TOOLS: Erosion and sediment controls, and diversionary measures are used as needed. Equipment/tools to implement BMPs include various erosion and sediment controls, as applicable for the area, such as fiber rolls.

AUTHORIZED BUILDING AND GROUNDS MAINTENANCE LOCATIONS:

☐ To implement BMPs for the prevention of discharges or pollutants from grounds maintenance, erodible areas and construction activities, perform maintenance activities within the designated areas as shown in the attached map.

Date:

Version: 2.0

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Tenants Implementing SC-20 BMP:
Erodible Areas

19 - SDCRAA

Erodible Area | SDCRAA | SDIA Boundary

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ATM # C0116-008
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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-20 BMP:
Erodible Areas

FIGURE
SC-20

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BMP SC21	BUILDING REPAIR AND CONSTRUCTION

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water from site modifications such as minor and normal building repair and remodeling to construction of new facilities by using soil erosion controls, enclosing or covering building materials storage areas, using good housekeeping practices, using safer alternative products, and training employees.

TARGETED ACTIVITIES:

- ✈ Building Remodeling/Repair
- ✈ Construction Activities

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to eliminate non-storm water discharges and reduce the potential for pollutants to enter the storm water collection system:

- ☐ Implementation of erosion control BMPs for temporary stabilization of inactive areas.
- ☐ Implementation of sediment control BMPs for perimeter control, runon/runoff control, and inlet protection.
- ☐ Implementation of tracking control BMPs to prevent offsite tracking.
- ☐ Implementation of wind erosion control BMPs to control dust that can contribute to air pollution.
- ☐ Implementation of materials and waste management BMPs to properly manage materials and waste on site.
- ☐ Implementation of non-stormwater BMPs to prevent discharge of pollutants and properly manage wastewater or wash water generated from the construction activities such as equipment or vehicle maintenance and fueling; saw cutting and grinding from pavement removal; pavement paving and sealing; concrete curing etc.
- ☐ Use recycled or non-potable water for construction purposes when available.

POLLUTANTS of CONCERN:

- ✈ Asphalt
- ✈ Basic Materials
- ✈ Concrete
- ✈ Construction Materials
- ✈ Construction Debris
- ✈ Floatables
- ✈ Fuel
- ✈ Metals
- ✈ Oil and Grease
- ✈ Paint
- ✈ Sediment
- ✈ Sealants
- ✈ Septic Wastes
- ✈ Solvents
- ✈ Suspended solids
- ✈ Synthetic Organics
- ✈ Trash
- ✈ Vehicle Fluids

OPERATIONS:

Sub-BMPs

- - 01 ☐ Avoid outdoor repairs and construction during rain events or during any period for which the National Weather Service is forecasting a 50% chance of precipitation.
- - 02 ☐ Stabilize inactive areas (where there will be no construction for 14 days) or finished slopes or erodible areas with erosion control.
- - 03 ☐ Implement wind erosion control BMPs to control dust, and limit traffic to stabilized roadways within the site, where possible.
- - 04 ☐ Maintain effective perimeter and run-on controls.
- - 05 ☐ Maintain effective inlet protection.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ SDCRAA
- ✈ Any tenant conducting targeted activities

BMP SC21	BUILDING REPAIR AND CONSTRUCTION	
- 06 ☐	Install a stabilized construction entrance to prevent offsite tracking.	
- 07 ☐	Sweep streets of any loose dirt or materials.	
- 08 ☐	Cover and contain all chemicals, liquids, erodible landscape materials, and fertilizers when not in use.	
- 09 ☐	Discontinue use of erodible landscape material within 2 days prior to forecasted rain event or when it's raining.	
- 10 ☐	Cover and berm material and waste stockpiles when inactive and before the onset of a rain event. Use plastic under-sheets when appropriate.	
- 11 ☐	Cover waste containers at the end of each work day and prior to a rain event, and have waste recycled or collected and properly disposed of frequently.	
- 12 ☐	Perform concrete washout in designated areas away from inlets and drainage courses, and in appropriately sized and designed pits or containers. Empty regularly.	
- 13 ☐	Temporary sanitary facilities must have secondary containment and be located away from storm drains and traffic circulation.	
- 14 ☐	Minimize water usage and use reclaimed water where possible.	
- 15 ☐	Contain any particulate generating activities.	
- 16 ☐	Designate areas for fueling equipment and vehicles away from inlets and drainage courses, or perform offsite.	
	SEE ALSO BMP SC20 AND INDIVIDUAL CONSTRUCTION SWPPPs OR WPCPs	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Building repair and construction BMPs are used as needed and as outlined in the SWPPPs or WPCPs. Equipment/tools to implement BMPs include fiber rolls, gravel bags, straw waddles, silt fences, mulch, hydraulic mulch, water trucks, rumble plates, sweepers, brooms, spill kits, drums, secondary containment devices, tarps, cover, covered dumpsters etc.		
AUTHORIZED LOCATIONS TO IMPLEMENT HOUSEKEEPING BMPs:		
☐	Prevent non-storm water discharges, and contact of pollutants with storm water discharges by implementing remodeling/repair, and construction BMPs in the designated areas as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SC-21 BMP:
Building Repair & Construction

19 - SDCRAA

Buildings | SDCRAA | SDIA Boundary

19

19

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

Document Path: P:\Projects_Soum\CAD\GIS\SAU\TCA\2025-18-2002_SD_Airport\GIS\SWMP_GIS_2019\Appendix_B_1_29_2019_11x17.mxd

PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SC-21 BMP:
Building Repair & Construction

FIGURE
SC-21

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BMP SR01	SPILL PREVENTION, CONTROL, AND CLEAN-UP

PURPOSE:
Prevent or reduce the discharge of pollutants to storm water resulting from spills, leaks and improper cleanup of significant and other materials.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing/Anti-Icing
- ✈ Aircraft Lavatory Service
- ✈ All Fueling
- ✈ All Maintenance
- ✈ All Storage
- ✈ All Washing
- ✈ Cargo Handling
- ✈ Equipment Cleaning
- ✈ Fire Fighting Equip. Testing
- ✈ Floor Washdowns
- ✈ Garbage Collection
- ✈ Outdoor Washdown
- ✈ Painting/Stripping
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to prevent spills and leaks of significant and other materials to the storm water collection system:

☐ Provide formal training in execution of the Spill Plan(s) to key personnel, with additional training for first responder level personnel. All employees should have basic knowledge of spill control procedures and potential dangers of spills on human health and the environment. Incorporate spill control procedures in regular safety meetings to reinforce practices.

☐ Maintain an inventory of appropriate cleanup materials and equipment on-site and strategically deploy cleanup materials and equipment based on the type and quantities of chemicals present.

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam
- ✈ Battery Acid
- ✈ Cleaning Solution
- ✈ Deicing/Anti-Icing Fluid
- ✈ Fuel
- ✈ Heavy Metals
- ✈ Hydrocarbons
- ✈ Lavatory Chemicals
- ✈ Metals
- ✈ Oil and Grease
- ✈ Paint
- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Potable Water System Chemicals
- ✈ Solvents
- ✈ Vehicle Fluids

OPERATIONS:

Sub-BMPs

- 01 ☐ Develop, implement and keep current Spill Plan, and develop facility spill prevention and response procedures.
- 02 ☐ Post a summary of the Spill Plan and spill response procedures, at key locations, identifying the spill cleanup coordinators, location of cleanup equipment, and phone numbers of regulatory agencies to be contacted in the event of a spill.
- 03 ☐ Train relevant employees and contractors in the implementation of the Spill Plan, if applicable, or spill control procedures.
- 04 ☐ Use leak and spill prevention devices.

APPLICABLE TENANTS/ DEPARTMENTS:

- ✈ ACE
- ✈ Air Canada
- ✈ Alaska
- ✈ Allegiant
- ✈ Allied Aviation
- ✈ American Airlines
- ✈ ARFF
- ✈ Bradford
- ✈ British Airways
- ✈ Cartwright

BMP SR01	SPILL PREVENTION, CONTROL, AND CLEAN-UP	
- 05 ☐	Place adequate spill kits in appropriate locations.	✈ Conrac ✈ Delta ✈ DHL ✈ Edelweiss ✈ FedEx ✈ Flagship ✈ Frontier ✈ Hawaiian ✈ HFF ✈ HMS Host ✈ JAL ✈ Jet Blue ✈ Lufthansa ✈ Menzies ✈ Mission Yogurt ✈ SDCRAA ✈ Siemens ✈ Signature ✈ Southwest ✈ SP Plus ✈ Spirit ✈ SSP ✈ Sun Country ✈ United ✈ UPS ✈ WestJet
- 06 ☐	Notify Airport Operations (619-400-2710), the Airport Authority Environmental Affairs Department (619-400-2784), and any agencies or companies identified in the Spill Plan or facility spill prevention and response procedures in the event of a spill.	
- 07 ☐	In the event of a spill or release, immediately follow procedures identified in the Spill Plan or facility spill prevention and response procedures.	
- 08 ☐	Use only dry cleaning methods.	
- 09 ☐	Properly dispose of all used spill control and clean-up materials.	
- 10 ☐	Waste water from washing activities is captured by vacuum and properly disposed of, or is diverted to a structural treatment control, sanitary sewer, or dead end sump with pump.	
STRUCTURAL TREATMENT BMPs: Refer to BMP TC01 for information on structural treatment BMPs.		
BMP FREQUENCIES/EQUIPMENT/TOOLS: Spill prevention and control occurs on a daily basis. Clean up is as needed. Equipment/tools to implement BMPs include spill pallets, outdoor sheds, overpack containers, tarps, flammable materials storage lockers, bermed or containment areas, fiber rolls, shop vacuums, spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS TO IMPLEMENT SPILL PREVENTION, CONTROL AND CLEANUP BMPs:		
☐	Implement BMPs for the prevention of non-storm water discharges from spills, leaks or improper cleanups at the designated areas as shown in the attached map.	
Date:		Version: 2.0

Tenants Implementing SR-01 BMP:
Spill Prevention, Control & Clean Up

1 - Alaska	7 - Menzies	14 - Hawaiian	19 - SDCRAA	24 - UPS	29 - West Jet	40 - Bradford	47 - Mission Yogurt	96 - Cartwright
2 - Allied Aviation	10 - Delta	15 - HMS Host	21 - Southwest	26 - Allegiant	35 - Spirit	42 - JAL	50 - Siemens	100 - Edelweiss
4 - American	12 - FedEx	16 - JetBlue	22 - FlagShip	27 - Air Canada	37 - British Airways	45 - SSP	77 - Conrac	102 - SP Plus
6 - ARFF	13 - Frontier	18 - ACE	23 - United	28 - Sun Country	38 - DHL	46 - HFF	78 - Signature	103 - Lufthansa

SDCRAA
SDIA Boundary
Composting
Fuel Storage
Grease Trap
Loading
Metal Storage
Recycling
Wash Area
Dumpster
Fueling
Industrial Waste
Material Storage
Oil Storage
Underground Storage Tank

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

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0 250 500 1,000 1,500
Feet

wood.

STORM WATER MANAGEMENT PLAN
AT SAN DIEGO INTERNATIONAL AIRPORT
San Diego, California

SR-01 BMP:
Spill Prevention, Control & Clean Up

FIGURE
SR-01

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BMP TC01	TREATMENT CONTROLS

PURPOSE:
Eliminate non-storm water discharges to the storm water collection system and remove petroleum compounds, grease, sediments, trash and debris, metals and other contaminants from storm water through the use of structural treatment control BMPs.

TARGETED ACTIVITIES:

- ✈ Aircraft Deicing/Anti-Icing
- ✈ Aircraft Lavatory Service
- ✈ All Fueling
- ✈ All Maintenance
- ✈ All Storage
- ✈ All Washing
- ✈ Cargo Handling
- ✈ Equipment Cleaning
- ✈ Fire Fighting Equip. Testing
- ✈ Floor Washdowns
- ✈ Garbage Collection
- ✈ Outdoor Washdown
- ✈ Painting/Stripping
- ✈ Potable Water System Flush
- ✈ Runway Rubber Removal

POLLUTION PREVENTION:

Implement the following pollution prevention practices and BMPs to reduce pollutants in storm water and non-storm water discharges and to maintain the proper functioning of structural treatment control BMPs:

☐ Properly dispose of any standing water and accumulated waste removed during cleaning operations in accordance with federal, state, and local requirements.

☐ CASQA recommends cleaning of water quality inlets (which includes oil water separators (OWS)) at least twice during the wet season. However, the schedule depends on the operating conditions of the SDIA OWS.

☐ Inspect and maintain OWS as follows:

1. Inspect OWS regularly to establish trends in operating conditions of the SDIA OWS.
2. Prior to the wet season, inspect for sediment accumulation in the pre-separator and/or separator chambers, and if it is greater than 12 inches deep, remove the accumulated material (for example, with a vactor truck), characterize it, and properly dispose of it.
3. Prior to the wet season, inspect for oil accumulation in the oil chamber, and if it is more than 50 percent of the chamber volume, remove the oil and grease, characterize it, and properly dispose of it.
4. Inspect coalescer for debris and gummy deposits. If these are present, wash the coalescer in an appropriate area with high pressure hot water.
5. Inspect for general mechanical integrity per manufacturer's guidelines at least annually and operate each mechanical component to ensure proper operation. Repair as needed.

POLLUTANTS of CONCERN:

- ✈ Aircraft Fire Fighting Foam
- ✈ Battery Acid
- ✈ Cleaning Solution
- ✈ Deicing/Anti-Icing Fluid
- ✈ Fuel
- ✈ Heavy Metals
- ✈ Hydrocarbons
- ✈ Lavatory Chemicals
- ✈ Metals
- ✈ Oil and Grease
- ✈ Paint
- ✈ Pesticides/Herbicides/ Fertilizers
- ✈ Potable Water System Chemicals
- ✈ Solvents
- ✈ Vehicle Fluids

BMP TC01	TREATMENT CONTROLS	
☐	Inspect and maintain drain inserts as follows: 1. Inspect inserts every 3 months in the dry season and prior to every storm event in the wet season. Remove any trash and debris that could interfere with the proper functioning of the insert. 2. Replace inserts if sediment reaches a depth of greater than 6 inches, or if rips or tears are observed. Properly characterize and dispose of the insert and sediment. 3. Inspect monthly for saturation of any oil absorbent material. Upon saturation, replace absorbent material.	
☐	Inspect and maintain Contech CDS units as follows: 1. Inspect CDS unit every 6 months. 2. Check for blockages or obstructions in inlet and separation screen. 3. Clean CDS unit during dry weather conditions when level of sediments reach 75% of capacity in isolated sump or when a sufficient level of hydrocarbon and trash has accumulated. Using a vactor truck is recommended. 4. Properly characterize and dispose of accumulated wastes.	
☐	Inspect and maintain Contech StormFilter units as follows: 1. Inspect and maintain StormFilter unit annually during the dry season or more frequently depending on high sediment accumulation after major storms. Maintenance will be done every 3 years as minimum. 2. Check level of sediment accumulation on vault floor and top of cartridge. Use vactor truck to remove sediments if sediment loading is >4" on vault floor or >1/4" on top of cartridge. 3. Check if cartridges are submerged 24 hours after rain event, and for plugged media, extended bypass condition, or pronounced scum line present above top cap; replace cartridges. 4. Properly characterize and dispose of accumulated wastes.	
☐	Inspect and maintain Clearwater BMP unit as follows: 1. Inspect and maintain BMP unit every 2 months during the rainy season and at the end of the rainy season. 2. Check hydrocarbon sock for full absorption. Replace if hard when squeezed. 3. Remove trash and debris in trash collection baskets. 4. Clean primary settling chamber of floatables and sediments when it is 50% full. Recommend using vactor truck to remove sediment area thoroughly. 5. Replace filter canister and filter media bag when media is spent. Replace filter matt if condition is poor. 6. Properly characterize and dispose of accumulated wastes and spent parts.	
☐	Inspect and maintain Bioclean trench drain filters as follows: 1. Inspect and maintain trench drain filters every 3 months for cleaning and debris removal. Remove all trash, debris, organics, and sediments collected and dispose of properly.	

BMP TC01	TREATMENT CONTROLS	
	2. Inspect and replace hydrocarbon booms in trench drain filters every 6 months. Properly dispose hydrocarbon boom as hazardous waste.	
☐	Inspect and clean Bioclean inlet skimmers at least once during the dry season. Clean catch basin filters that are at least 50% full of trash and debris and dispose of properly. Vactor truck is recommended for cleanout.	
☐	Inspect permeable surfaces and swales at least every 6 months and maintain permeable surfaces and swales by removing accumulations of sediments and debris, replacement of mulch, removal of dead plants, pruning or mowing, temporary watering, sweeping, or filling potholes or fill material.	
☐	Contact vector control agency if mosquito breeding is observed or suspected.	
OPERATIONS:		**APPLICABLE TENANTS/ DEPARTMENTS:**
Sub-BMPs		✈ Allied Aviation ✈ Bradford ✈ Conrac ✈ FedEx ✈ SDCRAA ✈ Signature
- 01 ☐	Regularly inspect, clean, and maintain all structural treatment control BMPs to prevent the accumulation or resuspension of oil, grease, floating debris and sediments.	
- 02 ☐	During cleaning operations, close any effluent valves at the treatment control device and properly dispose of any standing water and accumulated waste that are removed. Replace oil absorbent pads in the treatment control device prior to the start of the wet season and as needed.	
- 03 ☐	Document and maintain records for all inspections, cleaning, and maintenance of structural treatment control BMPs.	
- 04 ☐	Perform an annual inventory of all structural treatment control BMPs.	
BMP FREQUENCIES/EQUIPMENT/TOOLS: Treatment control BMP inspections and maintenance frequencies are described in Section 6.0. Equipment/tools to implement BMPs include measuring devices, flashlights, gloves, vactor trucks, sweepers, new parts for proprietary BMPs (e.g., cartridges), spill kits, brooms, and drums.		
AUTHORIZED LOCATIONS TO IMPLEMENT TREATMENT CONTROL BMPs AND TO MAINTAIN TREATMENT CONTROL BMPs:		
☐	To implement BMPs for the prevention of non-storm water discharges, and to reduce pollutants in storm water discharges, inspect and maintain water structural treatment control BMPs located within the designated areas as shown in the attached map.	
Date:		Version: 2.0

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Tenants Implementing TC-01 BMP:
Structural Treatment Control BMPs

2 - Allied Aviation 12 - FedEx 19 - SDCRAA 40 - Bradford 77 - Conrac 78 - Signature

- A Inlet Filter
- B Permeable Surface
- C Trench Drain Filter
- D Bio Clean Grate Inlet Skimmer Box
- E Bio Clean Curb Inlet Skimmer Box
- F Infiltration Trench
- G Contech Storm Filter
- H Contech CDS
- I ClearWater Solutions BMP Unit
- J Modular Wetland System
- K Detention Basin
- L Bioswale
- M Artificial Turf Infiltration
- N Aquashield HDS
- O Oil Water Separator
- P Pervious Gravel
- Q Bioretention Basin
- R Subsurface Infiltration Basin
- S Curb Inlet Box
- T Curb Cut with Rock Infiltration Bed
- U OldCastle/Kristar Perkfilter Unit
- V Contech Jellyfish Unit
- W CleanWay Metalzorb
- X Activated Alumina Filter Bags
- Y Biochar Boom

Permeable Strip SDCRAA SDIA Boundary

PROJECT NO.: 5025-18-2002 DATE: JANUARY 2019 DRAWN BY: CAB CHECKED BY: AA/NP	N	0 250 500 1,000 1,500 Feet	wood.	**STORM WATER MANAGEMENT PLAN AT SAN DIEGO INTERNATIONAL AIRPORT** San Diego, California	**TC-01 BMP:** **Structural Treatment Control BMPs**	FIGURE TC-01

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APPENDIX C
BMP DESIGN MANUAL


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

SAN DIEGO INTERNATIONAL AIRPORT

LET'S GO.

San Diego County Regional Airport Authority BMP Design Manual

For Permanent Site Design and Storm Water Treatment

February 2016

amec foster wheeler

Prepared by:

Geosyntec consultants

RICK ENGINEERING COMPANY

project clean water

San Diego County Regional Airport Authority BMP Design Manual

The Airport Authority BMP Design Manual conforms significantly to the Model BMP Design Manual developed by the following San Diego Region Municipal Copermittees:

City of Carlsbad
www.carlsbadca.gov

City of Chula Vista
www.chulavistaca.gov

City of Coronado
www.coronado.ca.us

City of Del Mar
www.delmar.ca.us

City of El Cajon
www.ci.el-cajon.ca.us

City of Encinitas
www.ci.encinitas.ca.us

City of Escondido
www.ci.escondido.ca.us

City of Imperial Beach
www.imperialbeachca.gov

City of La Mesa
www.ci.la-mesa.ca.us

City of Lemon Grove
www.lemongrove.ca.gov

City of National City
www.ci.national-city.ca.us

City of Oceanside
www.ci.oceanside.ca.us

City of Poway
www.ci.poway.ca.us

City of San Diego
www.sandiego.gov

City of San Marcos
www.ci.san-marcos.ca.us

City of Santee
www.santeeh2o.org

City of Solana Beach
www.ci.solana-beach.ca.us

City of Vista
www.ci.vista.ca.us

County of San Diego
www.sandiegocounty.gov

San Diego Unified Port District
www.portofsandiego.org

San Diego County Regional Airport Authority
www.san.org

Summary

The San Diego County Regional Airport Authority (Authority) Best Management Practice (BMP) Design Manual (Manual) addresses post-construction urban runoff pollution from new development and redevelopment projects. This Manual provides airport tenants and Authority staff with information on how to comply with the urban runoff management requirements for development projects at the San Diego International Airport (SAN). This Manual guides the project manager or engineer through the selection, design, and incorporation of storm water BMPs or storm water treatment control/management facilities into project design plans. This Manual also provides information on the Authority Alternative Compliance Program regulating post-construction storm water discharges offsite.

In May 2013, the California Regional Water Quality Control Board for the San Diego Region (SDRWQCB) reissued a municipal storm water, National Pollutant Discharge Elimination System permit (Municipal Separate Storm Sewer Systems [MS4] Permit) that covered its region. The San Diego Region comprises San Diego, Orange, and Riverside County Copermittees. The MS4 Permit (also referred to as the Municipal Permit) reissuance to the San Diego County Copermittees went into effect in 2013 (Order No. R9-2013-0001).

The reissued MS4 Permit updates and expands storm water requirements for new developments and redevelopments. In February 2015, the MS4 Permit was amended by Order No. R9-2015-0001, and again in November 2015 by Order No. R9-2015-0100. As required by the reissued MS4 Permit, the Copermittees prepared a Model BMP Design Manual to replace the current Countywide Model Standard Urban Stormwater Mitigation Plan (SUSMP), dated March 25, 2011, which was based on the requirements of the 2007 MS4 Permit. The effective date of this Manual is **February 16, 2016**.

Each Copermittee was required to update the Model BMP Design Manual with jurisdiction-specific information. This Manual represents the Authority's update to the Authority SUSMP Requirements for Development Applications (Authority, 2011) to conform to the Model BMP Design Manual and comply with requirements of the MS4 Permit.

What this Manual is intended to address:

This Manual addresses updated onsite post-construction storm water requirements for Standard Projects and Priority Development Projects (PDPs), and provides updated procedures for planning, preliminary design, selection, and design of permanent storm water BMPs based on the performance standards presented in the MS4 Permit.

The intended users of the Manual include project applicants, for both Authority and tenant developments, their representatives responsible for preparation of Storm Water Quality Management Plans (SWQMPs), and Authority Environmental Affairs Department (EAD) personnel responsible for review of these plans.

The following are significant updates to storm water requirements of the MS4 Permit compared with the 2007 MS4 Permit and 2011 Countywide Model SUSMP:

- PDP categories have been updated, and the minimum threshold of impervious area to qualify as a PDP has been reduced.

- Many of the low impact development (LID) requirements for site design that were applicable only to PDPs under the 2007 MS4 Permit are applicable to all projects (Standard Projects and PDPs) under the MS4 Permit.
- The standard for storm water pollutant control (formerly treatment control) is retention of the 24-hour 85th percentile storm volume, defined as the event that has a precipitation total greater than or equal to 85 percent of all daily storm events larger than 0.01 inch over a given period of record in a specific area or location.
- For situations where onsite retention of the 85th percentile storm volume is technically not feasible, biofiltration must be provided to satisfy specific "biofiltration standards." These standards consist of a set of siting, selection, sizing, design, and operation and maintenance (O&M) criteria that must be met for a BMP to be considered a "biofiltration BMP" – see Section 2.2.1 and Appendix F.
- Alternative (offsite) compliance approaches are provided as an option to satisfy pollutant control standards if a Copermittee implements an alternative compliance program. Copermittees are given discretion by the MS4 Permit to allow the project applicants to participate in an alternative compliance program without demonstrating technical infeasibility of retention and/or biofiltration BMPs onsite.

What this Manual does <u>not</u> address:

This Manual does not directly discuss the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ) (the Construction General Permit [CGP]). These requirements are provided in Section 5 of the Authority's SWMP, available for download at www.san.org/green. This Manual is not intended to serve as a guidance or criteria document for construction-phase storm water controls. This Manual does not substantially address hydromodification management requirements or protection of critical coarse sediment yield areas, as drainages from the Authority's jurisdiction are generally exempt from hydromodification management requirements. Section 1.6 of this Manual provides further details of this exemption.

Disclaimer

Currently, some of the Copermittees are pursuing a subvention of funds from the State of California (State) to pay for certain activities required by the 2007 MS4 Permit, including activities that require Copermittees to perform activities outside their jurisdictional boundaries and on a regional or watershed basis. Nothing in this Manual should be viewed as a waiver of those claims or as a waiver of the rights of Copermittees to pursue a subvention of funds from the State to pay for certain activities required by the MS4 Permit, including the preparation and implementation of the BMP Design Manual. In addition, several Copermittees have filed petitions with the State Water Quality Control Board (State Board) challenging some of the requirements of Provision E of the MS4 Permit. Nothing in this Manual should be viewed as a waiver of those claims. Because the State Board has not issued a stay of the 2013 MS4 Permit, Copermittees must comply with the MS4 Permit's requirements while the State Board process is pending.

This Manual is organized in the following manner:

An introductory section entitled **"How to Use this Manual"** provides a practical orientation to intended uses and provides examples of recommended workflows for using the Manual.

Chapter 1 provides information to help the Manual user determine which of the storm water management requirements are applicable to the project, and addresses source controls/site design, and pollutant controls. This chapter also introduces the procedural requirements for preparation, review, and approval of project submittals. General Authority requirements for processing project submittals are provided in this chapter.

Chapter 2 defines the performance standards for source control and site design BMPs, and storm water pollutant control BMPs, based on the MS4 Permit. These are the underlying criteria that must be met by projects, as applicable. Hydromodification management BMPs do not apply to Authority projects, because of the MS4 Permit exemption for projects discharging runoff to existing underground storm drains discharging directly to an enclosed embayment (MS4 Permit Provision E.3.c(2)(d)(ii)). This chapter also presents information on the underlying concepts associated with these performance standards to provide the project applicant with technical background; explains why the performance standards are important; and gives a general description of how the performance standards can be met.

Chapter 3 describes the essential steps in preparing a comprehensive storm water management design and explains the importance of starting the process early during the preliminary design phase. By following the recommended procedures in Chapter 3, project applicants can develop a design that complies with the complex and overlapping storm water requirements. This chapter is intended to be used by both Standard Projects and PDPs; however, certain steps will not apply to Standard Projects (as identified in the chapter).

Chapter 4 presents the source control and site design requirements to be met by all development projects and is therefore intended to be used by Standard Projects and PDPs.

Chapter 5 applies to PDPs. It presents the specific process for determining which category of onsite pollutant control BMP, or combination of BMPs, is most appropriate for the PDP site and how to design the BMP to meet the storm water pollutant control performance standard. The prioritization order of onsite pollutant control BMPs begins with retention, then biofiltration, and finally flow-through treatment control (in combination with offsite alternative compliance). Chapter 5 does not apply to Standard Projects.

Chapter 6 applies to PDPs that are subject to hydromodification management requirements. No Authority Standard Projects or PDPs are subject to hydromodification management requirements. As such, this section is significantly abbreviated from the Model BMP Design Manual.

Chapter 7 addresses the long-term O&M requirements of structural BMPs presented in this Manual, and the mechanisms to ensure O&M in perpetuity. Chapter 7 also addresses Authority-specific O&M requirements. Chapter 7 applies to PDPs only and is not required for Standard Projects; however, Standard Projects may use this chapter as a reference.

Chapter 8 describes the specific requirements for the content of project submittals to facilitate the Authority's review of project plans for compliance with applicable requirements of the Manual and the MS4 Permit. This chapter is applicable to Standard Projects and PDPs. This chapter pertains specifically to the content of project submittals, and not to specific details of Authority requirements for processing of submittals; it is intended to complement the requirements for processing of project submittals that are included in Chapter 1, and as described in Section 4 of the SWMP.

Appendices to this Manual provide detailed guidance for BMP design, calculation procedures, worksheets, maps, and other figures to be referenced for BMP design. These appendices are not

intended to be used independently from the overall Manual – rather they are intended to be used only as referenced in the main body of the Manual.

This Manual is organized on the basis of project category. Requirements that are applicable to both Standard Projects and PDPs are presented in Chapter 4. Additional requirements applicable only to PDPs are presented in Chapters 5 through 7. While source control and site design BMPs are required for all projects inclusive of Standard Projects and PDPs, structural BMPs are required only for PDPs. Throughout this Manual, "structural BMP" refers to a pollutant control BMP.

Chronology of Storm Water Regulations and San Diego Region Model Guidance Documents

Date	Document	Notes
July 16, 1990	MS4 Permit	The SDRWQCB issued general storm water requirements to all jurisdictions within the County of San Diego via the MS4 Permit
February 21, 2001	MS4 Permit	Land Development SUSMP requirements were written into the MS4 Permit during permit reissuance
February 14, 2002	Model SUSMP	Countywide model guidance document was issued for implementation of the 2001 MS4 Permit requirements
January 24, 2007	MS4 Permit	LID and HMP requirements were written into the MS4 Permit during reissuance
July 24, 2008	Model SUSMP	Countywide model guidance document for implementation of the 2007 MS4 Permit requirements, including interim HMP criteria, was prepared
March 2011	Final HMP	Final HMP addresses HMP requirements of the 2007 MS4 Permit
March 25, 2011	Model SUSMP	Countywide model guidance document for implementation of the 2007 MS4 Permit requirements, including final HMP, was completed
May 8, 2013	MS4 Permit	Storm water retention requirements and requirements for protection of critical coarse sediment yield were written into the MS4 Permit during reissuance
February 11, 2015	MS4 Permit	Amends 2013 MS4 Permit and provides clarification on water quality equivalency and provides other technical revisions Permit coverage extended to Orange County Copermittees
June 27, 2015	Model BMP Design Manual	Countywide model guidance document for implementation of the MS4 Permit requirements "Model BMP Design Manual" updates former "Model SUSMP"
November 18, 2015	MS4 Permit	Amends 2013 MS4 permit and provides clarification on Prior Lawful Approval requirements Permit coverage extended to Riverside County Copermittees
December 17, 2015	Water Quality Equivalency Guidelines	Draft Water Quality Equivalency Guidelines (WQE) accepted by the SDRWQCB WQE provides the basis for determining approval of Alternative Compliance projects
February 16, 2016	Model BMP Design Manual	Updates to June 2015, version, including updated PDP definitions and definition of redevelopment, updates to storm water requirements applicability timeline, and updates to hydromodification management performance criteria and procedures

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Table of Contents

Appendices

Figures

Tables

List of Acronyms and Abbreviations

303(d)	Refers to Clean Water Act Section 303(d) list of impaired and threatened waters
ADC	San Diego County Regional Airport Authority Airport Design and Construction
ASTM	American Society for Testing and Materials
Authority	San Diego County Regional Airport Authority
BF	Biofiltration (BMP Category)
BMPs	Best Management Practices
CGP	Construction General Permit
CIC	Airport Capital Improvement Committee
CEQA	California Environmental Quality Act
DCV	Design Capture Volume
DMA	Drainage Management Area
EAD	San Diego County Regional Airport Authority Environmental Affairs Department
ESA	Environmentally Sensitive Area
FAA	Federal Aviation Administration
FDD	San Diego County Regional Airport Authority Facilities Development Department
FMD	San Diego County Regional Airport Authority Facilities Management Department
FT	Flow-through Treatment Control BMP (BMP Category)
ft^3	cubic feet
GLUs	Geomorphic Landscape Units
GR	General Requirements
HMP	Hydromodification Management Plan
HSPF	Hydrologic Simulation Program-FORTRAN
HU	Harvest and Use
HVAC	heating, ventilation, and air conditioning
INF	Infiltration (BMP Category)
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
Manual	Authority BMP Design Manual
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NRCS	Natural Resource Conservation Service
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PDP	Priority Development Project
POC	Point of Compliance
PR	Partial Retention (BMP Category)
SAN	San Diego International Airport
SC	Source Control
SCCWRP	Southern California Coastal Water Research Project
SD	Site Design
SDHM	San Diego Hydrology Model

SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
State	State of California
State Board	State Water Quality Control Board
SUSMP	Standard Urban Stormwater Mitigation Plan
SWMM	Storm Water Management Model
SWMP	Storm Water Management Plan
SWQMP	Storm Water Quality Management Plan
TN	Total Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

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How to Use This Manual

This Manual is intended to help a project applicant/proponent, in coordination with Airport Authority Environmental Affairs Department (EAD) staff, develop a Storm Water Quality Management Plan (SWQMP) for a development project that complies with local and MS4 Permit requirements. Most applicants will require the assistance of a qualified civil engineer, architect, and/or landscape architect to prepare a SWQMP. The applicant should begin by checking specific requirements with EAD storm water program staff, because every project is different.

As described in the Authority's Storm Water Management Plan (SWMP), the Authority is a special government entity, created in 2003 by the California legislature and granted responsibility for managing the San Diego International Airport. Several tenants and subtenants operate businesses at SAN under the Authority's jurisdiction. In addition, the Authority operates its own "municipal" facilities, including the terminals, parking lots, and other support buildings.

Article 8 of the Authority Code, referred to as the Storm Water Code, consists of its storm water management and discharge controls. Section 8.74(a)(3) addresses New Development and Redevelopment and states that "the Executive Director may establish controls on the volume and rate of storm water runoff from new developments and redevelopments as may be reasonably necessary to minimize the discharge and transport of pollutants." The Authority BMP Design Manual represents one mechanism by which the Executive Director has established such controls in order to comply with the MS4 Permit.

New development and redevelopment projects are conducted by two major categories of project proponents: projects conducted by tenants of the airport (hereafter referred to as "tenant projects") and projects conducted by the Authority itself (hereafter referred to as "capital projects"). The Authority has a different project approval process for each of these two project proponent categories and these differences are reflected in the Authority BMP Design Manual project review and approval processes. The Authority BMP Design Manual approval process, including roles and responsibilities of Authority departments, is described below for both tenant and capital projects.

Tenant Projects

Whenever an airport tenant desires to make surface or subsurface improvements or perform new construction, reconstruction, modification, or demolition, the tenant must submit a request for approval to the Terminals & Tenants Department prior to commencing work. The request must be accompanied by plans and specifications that indicate the nature and extent of the proposed work and conform to Authority policies and all relevant laws, ordinances, rules, and regulations. The plans may include references to specific sections or parts of the Uniform Building Code or other applicable codes, ordinances, or laws. The Terminals & Tenants Department, in conjunction with the Facilities Development Department (FDD), assigns a project manager to evaluate the project application for completeness and to coordinate technical review with the other Authority departments. EAD must determine whether the current BMP Design Manual requirements are applicable to the project, as described in Section 1.2 of this Manual. For both Standard Projects and PDPs, in order for the project application to be considered complete, the project proponent must submit a Storm Water Quality Management Plan (SWQMP) with the project application in accordance with the Authority BMP Design Manual describing how the project will meet the Manual requirements. EAD reviews the finalized project plans and documents to ensure that all environmental requirements are met.

The approval of a SAN tenant project becomes part of the lease or part of a use and occupancy permit once all documents in the project application have been approved. Any California Environmental Quality Act (CEQA) mitigation measures or conditions of approval required by the review process of these departments become part of the lease or use permit and may be adopted by the Airport Authority Board (Board) as a CEQA Mitigation Monitoring and Reporting Program. Sustainability and Leadership in Energy and Environmental Design (LEED) criteria commitments are also incorporated. Written approval must be obtained from the Authority before development may begin, regardless of the scope of work.

Capital Projects

Development projects at the airport that are carried out by the Authority itself are considered Capital Projects or Major Maintenance Projects.

Whenever an Authority department desires to make surface or subsurface improvements or to perform new construction, reconstruction, modification, or demolition, the project sponsor, proponent, or manager must submit appropriate information to the Authority's Capital Improvements Committee (CIC). The CIC evaluates each development project on the basis of its financial funding capacity, and prepares a development program with the accepted projects. The Airport Planning & Noise Mitigation Department and EAD assess the environmental impacts of the program. EAD must determine whether the current BMP Design Manual requirements are applicable to the project, as described in Section 1.2 of this Manual. For both Standard Projects and PDPs, in order for the project submittal to be considered complete, the submittal must include Storm Water Quality Management Plan (SWQMP) in accordance with the Authority BMP Design Manual describing how the project will meet the Manual requirements. Once reviewed by the relevant Authority departments, the development program is submitted to the Board for approval. The Board evaluates the development program and determines whether the program will be included as part of the Authority's budget. Any mitigation measures or conditions of approval required by the review process of these departments become part of the project design, contract, and/or implementation and are formalized, as necessary, as a CEQA Mitigation Monitoring and Reporting Program adopted by the Board at the time of project approval. Again, commitments to sustainability or LEED initiatives are also incorporated into the project design and contracts

Departmental Responsibilities

The general responsibilities of those departments involved in the implementation of the Authority's process to implement the BMP Design Manual are listed in the following table. The inspectors of FDD ensure that structural BMPs are installed according to approved plans. The Business & Financial Management Department and EAD are responsible for ensuring that tenants properly operate and maintain any storm water pollution control measures that were required as part of the project approval. The Facilities Maintenance Department (FMD), the Airside Operations, Security, & Public Safety Department, and the Terminal & Tenants Department staffs are involved with the operation and proper maintenance of BMPs installed for capital projects and major maintenance projects.

Department	Education	Tenant Project Review	Tenant Project Approval	Capital Project Planning	Capital Project Review	Capital Project Approval	Construction Inspection	Capital Project Operations and Maintenance	Enforcement
Airport Planning & Noise Mitigation Department	O	O		X					
Airside Operations, Security, & Public Safety	O						O	X	O
Environmental Affairs	X	X	X	O	X	X	O	O	X
Airport Design and Construction	O			X	X	X	X		
Facilities Development	O	X	X	X	X	X	X		
Facilities Maintenance	O							X	
Terminals & Tenants	O						O	X	O
Business & Financial Management	X	X	X				O		X
X – Primary Responsibility O – Secondary Responsibility									

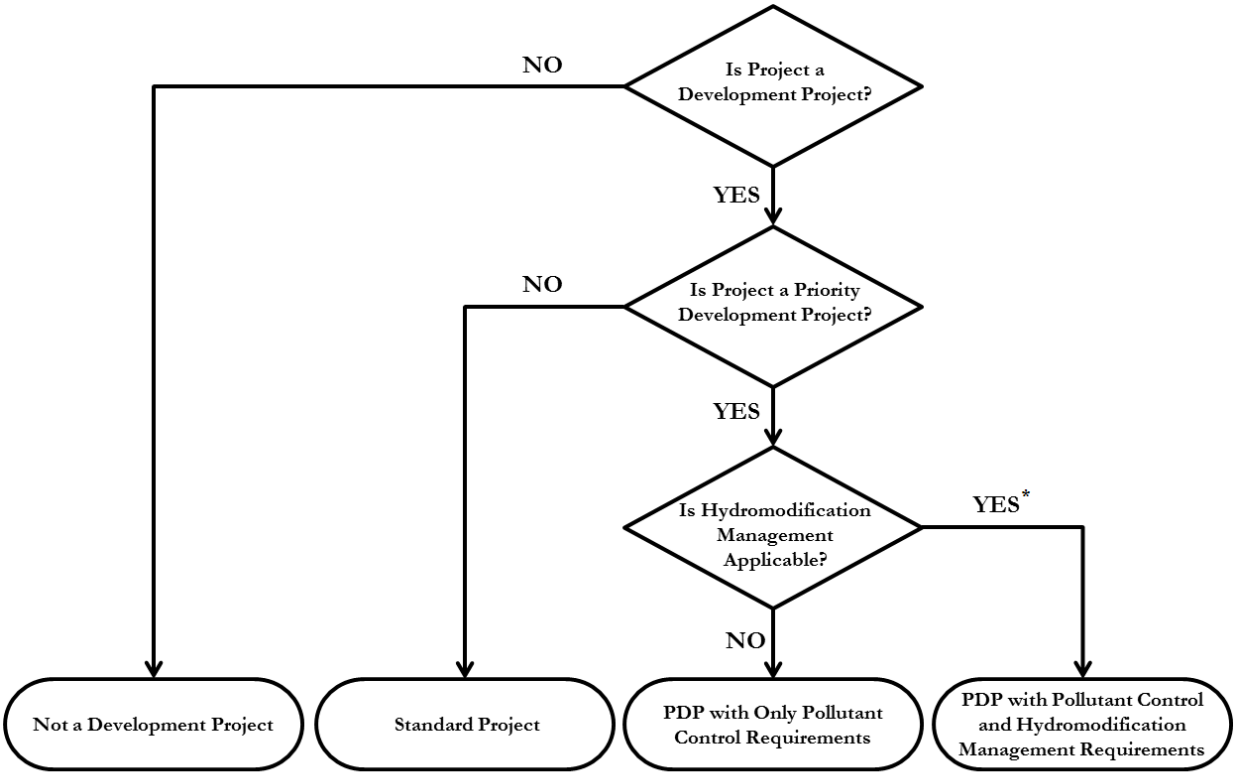
Adequacy of Proposed Plans

EAD will review SWQMP documents and other relevant plans for compliance with the applicable BMP Design Manual requirements. EAD may approve proposed alternatives to the BMP requirements in the Authority BMP Design Manual if they are determined to be applicable and equally effective. Additional analysis or information may be required to enable staff to determine the adequacy of proposed BMPs and will be requested following the conclusion of a staff review cycle. The SWQMP will be deemed complete once EAD determines that the project's compliance with the Authority BMP Design Manual is adequately described in the SWQMP and related plans.

Beginning Steps for All Projects: What requirements apply?

To use this Manual, start by reviewing **Chapter 1** to determine whether your project is a "Standard Project" or a "PDP" (refer also to local requirements) and which storm water quality requirements apply to your project.

Not all of the requirements and processes described in this Manual apply to all projects. Therefore, it is important to begin with a careful analysis of which requirements apply to Authority projects. Chapter 1 also provides an overview of the process of planning, design, construction, operation, and maintenance, with associated Authority review and approval steps, leading to compliance. A flow chart that shows how to categorize a project in terms of applicable post-construction storm water requirements is included below. The flow chart is followed by a table that lists the applicable section of this Manual for each project type.



*Note: Hydromodification management requirements do not apply to Authority projects.

Project Type	Applicable Requirements		
	Source Control and Site Design (Chapter 4)	Storm Water Pollutant Control BMPs (Chapter 5)	Hydromodification Management BMPs (Chapter 6)
Not a Development Project (without impact to storm water quality or quantity – e.g., interior remodels, routine maintenance; refer to Section 1.3)	Requirements in this Manual do not apply		
Standard Projects	X		
PDPs With Only Pollutant Control Requirements	X	X	
PDPs With Pollutant Control and Hydromodification Management Requirements	Requirements do not apply to Authority projects		

Once an applicant has determined which requirements apply, **Chapter 2** describes the specific performance standards associated with each requirement. For example, an applicant may learn from Chapter 1 that the project must meet storm water pollutant control requirements. Chapter 2 describes what these requirements entail. This chapter also provides background on key storm water concepts to help understand why these requirements are in place and how they can be met. Refer to the list of acronyms and glossary as guidance to understanding the meaning of key terms within the context of this Manual.

Next Steps for All Projects: How should an applicant approach a project storm water management design?

Most projects will then proceed to **Chapter 3** to follow the step-by-step guidance to prepare a storm water project submittal for the site. This chapter does not specify any regulatory criteria beyond those already specified in Chapters 1 and 2 – rather it is intended to serve as a resource for project applicants to help navigate the task of developing a compliant storm water project submittal. Note that the first steps in Chapter 3 apply to both Standard Projects and PDPs, while other steps in Chapter 3 only apply to PDPs.

The use of a step-by-step approach is highly recommended because it helps ensure that the right information is collected, analyzed, and incorporated into project plans and the plans are submitted at the appropriate time in the Authority review process. It also helps facilitate a common framework for discussion between the applicant and the reviewer. However, each project is different and it may be appropriate to use a different approach as long as the applicant demonstrates compliance with the MS4 Permit requirements that apply to the project.

Final Steps in Using This Manual: How should an applicant design BMPs and prepare documents for compliance?

Standard Projects	PDPs
Standard Projects will proceed to **Chapter 4** for guidance on implementing source control and site design requirements. After Chapter 4, Standard Projects will proceed to **Chapter 8** for project submittal requirements.	PDPs will also proceed to **Chapter 4** for guidance on implementing source control and site design requirements. PDPs will use **Chapters 5 through 7** and associated Appendices to implement pollutant control requirements (hydromodification management controls are not required) for the project site, as applicable. These projects will proceed to **Chapter 8** for project submittal requirements.

Plan Ahead to Avoid Common Mistakes

The following list identifies some common errors made by applicants that delay or compromise development approvals with respect to storm water compliance:

- Not planning for compliance early enough. The strategy for storm water quality compliance should be considered before completing a conceptual site design or sketching a layout of project site or subdivision lots (see Chapter 3). Planning early is crucial under current requirements compared to previous requirements; for example, LID/site design is required for all development projects and onsite retention of storm water runoff is required for PDPs. Additionally, collection of necessary information early in the planning process (e.g., geotechnical conditions, groundwater conditions) can help avoid delays resulting from redesign.

- Assuming that proprietary storm water treatment facilities will be adequate for compliance and/or relying on strategies acceptable under previous MS4 Permits. Under the MS4 Permit, the standard for pollutant control for PDPs is **retention of the 85th percentile storm volume** (see Chapter 5). Flow-through treatment cannot be used to satisfy permit requirements unless the project also participates in an alternative compliance program. Under some conditions, certain proprietary BMPs may be classified as "biofiltration" according to Appendix F of this Manual and can be used for primary compliance with storm water pollutant treatment requirements (i.e., without alternative compliance).

  Not planning for ongoing inspections and maintenance of PDP structural BMPs in perpetuity. It is essential to secure a mechanism for funding of long-term O&M of structural BMPs, select structural BMPs that can be effectively operated and maintained by the ultimate property owner, and include design measures to ensure access for maintenance and to control maintenance costs (see Chapter 7)

Policies and Procedural Requirements

This chapter introduces storm water management policies and is intended to help categorize a project and determine the applicable storm water management requirements as well as options for compliance. This chapter also introduces the procedural requirements for preparation, review, and approval of project submittals.

1.1 Introduction to Storm Water Management Policies

MS4 Permit Provision E.3.a-c; E.3.d.(1)

Storm water management requirements for development projects are derived from the MS4 Permit and are implemented by local jurisdictions.

On May 8, 2013, the SDRWQCB reissued a municipal storm water permit entitled "National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the MS4s Draining the Watersheds Within the San Diego Region" (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100; referred to as MS4 Permit) to the municipal Copermittees. The MS4 Permit was issued by the SDRWQCB pursuant to section 402 of the federal Clean Water Act and implementing regulations (Code of Federal Regulations Title 40, Part 122) adopted by the United States Environmental Protection Agency (USEPA), and Chapter 5.5, Division 7 of the California Water Code. The MS4 Permit, in part, requires each Copermittee, including the Authority, to use its land use and planning authority to implement a development planning program

to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the maximum extent practicable (MEP). MEP is defined in the MS4 Permit.

Different requirements apply to different project types.

The MS4 Permit requires all development projects to implement source control and site design practices that will minimize the generation of pollutants. While all development projects are required to implement source control and site design/LID practices, the MS4 Permit has additional requirements for development projects that exceed size thresholds and/or fit under specific use categories. These projects, referred to as PDPs, are required to incorporate structural BMPs into the project plan to reduce the discharge of pollutants, and, for those jurisdictions where it applies, address potential hydromodification impacts from changes in flow and sediment supply.

1.2 Purpose and Use of the Manual

This Manual presents a "unified BMP design approach."

To assist the land development community, streamline project reviews, and maximize cost-effective environmental benefits, the regional Copermittees have developed a unified BMP design approach[1] that meets the performance standards specified in the MS4 Permit. By following the process outlined in this Manual, project applicants (for both capital and tenant developments) can develop a single integrated design that complies with the complex and overlapping MS4 Permit source control and site design requirements, and storm water pollutant control requirements (i.e., water quality). Figure 1-1 presents a flow chart of the decision process that the Manual user should use to:

1. Categorize a project;
2. Determine storm water requirements; and
3. Understand how to submit projects for review and verification.

This figure also indicates where specific procedural steps associated with this process are addressed in Chapter 1.

Alternative BMP design approaches that meet applicable performance standards may also be acceptable.

Applicants may choose not to use the unified BMP design approach present in this Manual; in this case, they will need to demonstrate to the satisfaction of the Authority, in their submittal, compliance with applicable performance standards. These performance standards are described in **Chapter 2** and in Section E.3.c of the MS4 Permit.

[1] The term "unified BMP design approach" refers to the standardized process for site and watershed investigation, BMP selection, BMP sizing, and BMP design that is outlined and described in this manual with associated appendices and templates. This approach is considered to be "unified" because it represents a pathway for compliance with the MS4 Permit requirements that is anticipated to be reasonably consistent across the local jurisdictions in San Diego County. In contrast, applicants may choose to take an alternative approach where they demonstrate to the satisfaction of the Authority, in their submittal, compliance with applicable performance standards without necessarily following the process identified in this manual.

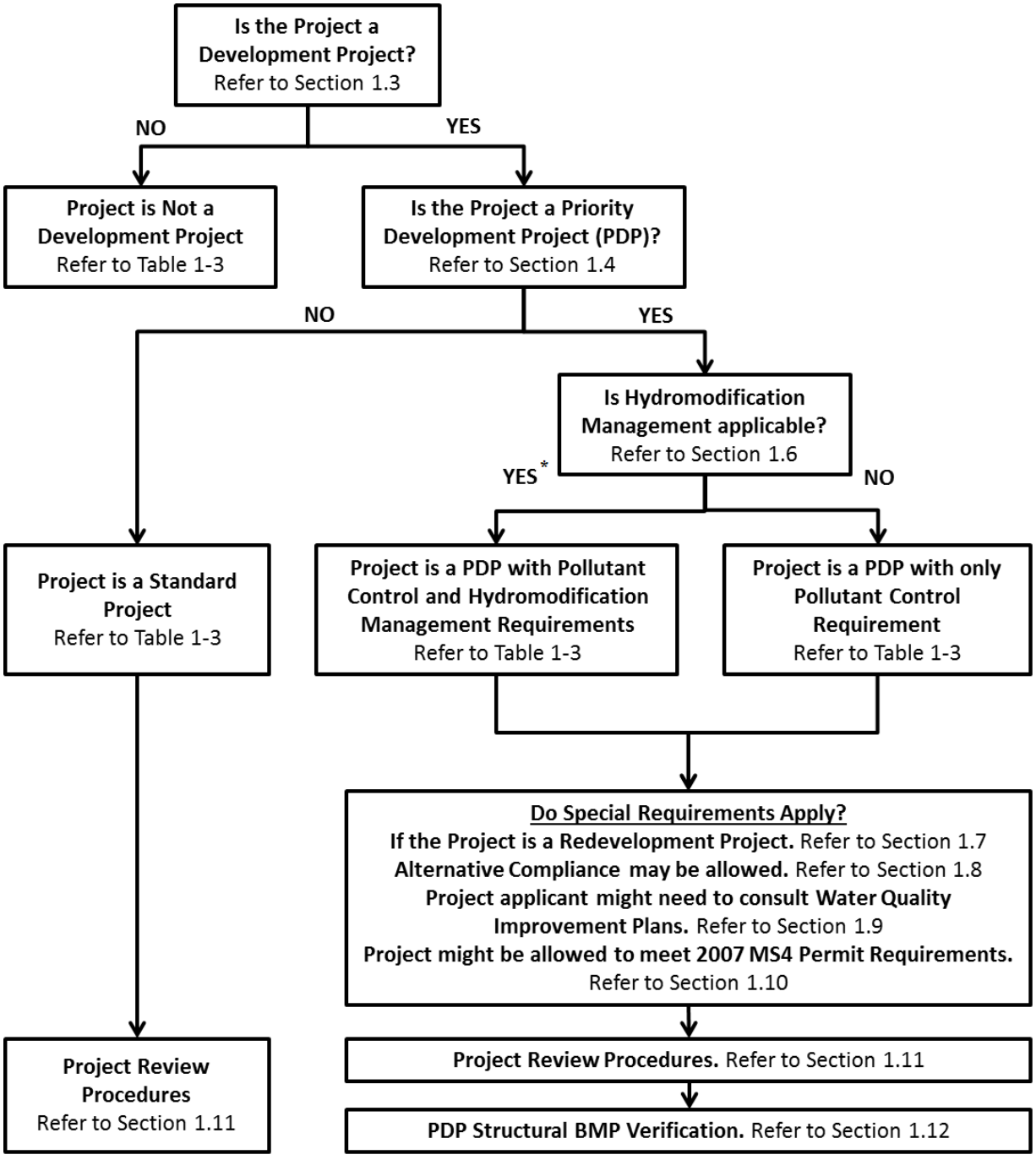


FIGURE 1-1. Procedural Requirements for a Project to Identify Storm Water Requirements

1.1.1 Determining Applicability of Permanent BMP Requirements

Table 1-1 reiterates the procedural requirements indicated in Figure 1-1 in a step-wise checklist format. The purpose of Table 1-1 is to guide applicants to appropriate sections in Chapter 1 to identify the post-construction storm water requirements applicable for a project. Table 1-1 is **not** intended to be

used as a project intake form. Applicability checklist of permanent, post-construction storm water BMP requirements that may be used as a project intake form is provided in Appendix A.

TABLE 1-1. Checklist for a Project to Identify Applicable Post-Construction Storm Water Requirements

Step 1. Is the project a Development Project? See Section 1.3 for guidance. A phase of a project can also be categorized as a development project. If "Yes" then continue to Step 2. If "No" then stop here; Permanent BMP requirements do not apply; i.e., requirements in this Manual are not applicable to the project.	☐ Yes ☐ No
Step 2. Is the project a PDP?	
Step 2a. Does the project fit one of the PDP definitions a-f? See Section 1.4.1 for guidance. If "Yes" then continue to Step 2b. If "No" then stop here; only Standard Project requirements apply.	☐ Yes ☐ No
Step 2b. Do any of the exceptions to PDP definitions in this Manual apply to the project? See Section 1.4.3 for guidance. If "Yes" then stop here; Standard Project requirements apply, along with additional requirements that qualify the project for the exception. If "No" then continue to Step 3; the project is a PDP.	☐ Yes ☐ No
Step 3. Do hydromodification control requirements apply? See Section 1.6 for guidance. All Authority projects to say "No" then stop here; PDP with only pollutant control requirements, apply to the project.	☐ Yes ■ No

1.2.1 Determine Applicability of Construction BMP Requirements

All projects, or phases of projects, even if exempted from meeting some or all of the Permanent BMP Requirements, are required to implement temporary erosion, sediment, good housekeeping and pollution prevention BMPs to mitigate storm water pollutants during the construction phase. See the Authority SWMP Section 5 and Appendix B (www.san.org/green) for detailed information on these requirements.

1.3 Defining a Project

Not all site improvements are considered "development projects" under the MS4 Permit.

This Manual is intended for new development and redevelopment projects, inclusive of both private- and public-funded projects. Development projects are defined by the MS4 Permit as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects." Development projects are issued local permits to allow construction activities. To further clarify, this Manual applies only to development or redevelopment activities that have the potential to contact storm water and contribute an anthropogenic source of pollutants, or reduce the natural absorption and infiltration abilities of the land.

A project must be defined consistent with the California Environmental Quality Act (CEQA) definitions of "project."

CEQA defines a project as a discretionary action being undertaken by a public agency that would have a direct or reasonably foreseeable indirect impact on the physical environment. This includes actions by the agency, financing and grants, and permits, licenses, plans, regulations or other entitlements granted by the agency. CEQA requires that the project include "the whole of the action" before the agency. This requirement precludes "piecemealing," which is the improper (and often artificial) separation of a project into smaller parts to avoid preparing EIR-level documentation.

In the context of this Manual, the "project" is the "whole of the action" that has the potential for adding or replacing or resulting in the addition or replacement of, roofs, pavement, or other impervious surfaces and thereby resulting in increased flows and storm water pollutants. "Whole of the action" means the project may not be segmented or phased into small parts either onsite or offsite if the effect is to reduce the quantity of impervious area and fall below thresholds for applicability of storm water requirements.

When defining the project, the following questions are considered:

- What are the project activities?
- Do they occur onsite or offsite?
- What are the limits of the project (project boundary)?
- What is the whole of the action associated with the project (i.e., what is the total amount of new or replaced impervious area considering all of the collective project components through all phases of the project)?
- Are any facilities or agreements to build facilities offsite in conjunction with providing service to the project (street widening, utilities)?

Table 1-2 is used to determine whether storm water management requirements defined in the MS4 Permit and presented in this Manual apply to the project.

If a project meets one of the exemptions in Table 1-2, then permanent BMP requirements do not apply to the project; i.e., requirements in this Manual are not applicable. If permanent BMP requirements apply to a project, Sections 1.4 through 1.7 will further define the extent of the applicable requirements based on the MS4 Permit. The MS4 Permit contains standard requirements that are applicable to all projects (Standard Projects and PDPs), and more specific requirements for projects that are classified as PDPs.

TABLE 1-2. Applicability of Permanent, Post-Construction Storm Water Requirements

Do permanent storm water requirements apply to your project?
Requirements DO NOT apply to:
Replacement of impervious surfaces that are part of a routine maintenance activity, such as: • Replacing roof material on an existing building • Rebuilding a structure to original design after damage from earthquake, fire or similar disasters • Restoring pavement or other surface materials affected by trenches from utility work • Resurfacing existing roads and parking lots, including slurry, overlay, and restriping • Routinely replacing damaged pavement, including full depth replacement, if the sole purpose is to repair the damaged pavement • Resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads • Restoring a historic building to its original historic design **Note**: Work that creates impervious surface outside of the existing impervious footprint is not considered routine maintenance. Repair or improvements to an existing building or structure that do not alter the size: • Plumbing, electrical, and heating, ventilation, and air conditioning (HVAC) work • Interior alterations, including major interior remodels and tenant build-out within an existing commercial building • Exterior alterations that do not change the general dimensions and structural framing of the building (does not include building additions or projects where the existing building is demolished)

Please note that EAD may choose to designate a project that is not defined within any of the categories in Table 1-2 as a standard project or PDP, based on the project's potential impacts to storm water quality.

1.4 Is the Project a PDP?

MS4 Permit Provision E.3.b.(1)

PDP categories are defined by the MS4 Permit, but the PDP categories can be expanded by the Authority, and the Authority can offer specific exemptions from PDP categories.

Section 1.4.1 presents the PDP categories defined in the MS4 Permit. Section 1.4.2 presents additional PDP categories and/or expanded PDP definitions that apply to the Authority. Section 1.4.3 presents specific Authority exemptions.

1.4.1 PDP Categories

In the MS4 Permit, PDP categories are defined on the basis of project size, type, and design features.

Projects shall be classified as PDPs if they are in one or more of the PDP categories presented in the MS4 Permit, which are listed below. Review each category, defined in (a) through (f), below. A PDP applicability checklist for these categories is also provided in Appendix A. If any of the categories match the project, the entire project is a PDP. For example, if a project feature such as a parking lot falls into a PDP category, then the entire development footprint, including project components that otherwise would not have been designated a PDP on their own (such as other impervious components that did not meet PDP size thresholds, and/or landscaped areas), shall be subject to PDP requirements. Note that size thresholds for impervious surface created or replaced vary on the basis of land use, land characteristics, and whether the project is a new development or redevelopment project. Therefore, all definitions must be reviewed carefully. Also, note that categories are defined by the total quantity of "added or replaced" impervious surface, not the **net change** in impervious surface.

For example, consider a redevelopment project that adds 7,500 square feet of new impervious surface and removes 4,000 square feet of existing impervious surface. The project has a net increase of 3,500 square feet of impervious surface. However, the project is still classified as a PDP because the total added or replaced impervious surface is 7,500 square feet, which is greater than 5,000 square feet.

"**Collectively**" for the purposes of the Manual means that all contiguous and non-contiguous parts of the project that represent the whole of the action must be summed. For example, consider a residential development project that will include the following impervious components:

- 3,600 square feet of roadway
- 350 square feet of sidewalk
- 4,800 square feet of roofs
- 1,200 square feet of driveways
- 500 square feet of walkways/porches

The collective impervious area is 10,450 square feet.

PDP Categories Defined by the MS4 Permit:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification [SIC] code 5812).

Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html.

(ii) Hillside development projects. This category includes development on any natural slope that is 25 percent or greater. This category is not applicable to SAN.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area (ESA). "Discharge directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or is conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e., not commingled with flows from adjacent lands).

Note: ESAs are areas that include, but are not limited to, all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Board and SDRWQCB; and any other equivalent environmentally sensitive areas that have been identified by the Copermittee (see Section 1.4.2 below to determine whether any other local areas have been identified).

For projects adjacent to an ESA, but not discharging to an ESA, the 2,500 square-foot threshold does not apply as long as the project does not physically disturb the ESA and the ESA is upstream of the project. Drainage from SAN discharges to San Diego Bay, which is designated as an ESA, as portions are contained in the 303(d) list. Certain areas of San Diego Bay are also subject to TMDLs; however, SAN does not directly drain to these areas.

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, and that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html.

(ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

Exclusions that apply to this category only: Projects creating less than 5,000 square feet of impervious surface and where any added landscaping does not require regular use of pesticides and fertilizers, such as a slope stabilization project using native plants, are excluded from this category. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as for emergency or maintenance access or for bicycle or pedestrian use, if they are built with pervious surfaces or if they sheet flow to surrounding pervious surfaces. See Section 1.4.2 for additional guidance.

Area that may be excluded from impervious area calculations for determining whether the project is a PDP:

(a) Consistent with Table 1-2, areas of a project that are considered exempt from storm water requirements (e.g., routine maintenance activities, resurfacing, etc.) shall not be included as part of "added or replaced" impervious surface in determining project classification.

(b) Decorative ponds with adequate freeboard or an overflow structure that does not release overflow to the MS4 are not considered PDPs.

Redevelopment projects may have special considerations with regard to the total area required to be treated. Refer to Section 1.7.

1.4.2 Local Additional PDP Categories and/or Expanded PDP Definitions

The Authority has not designated additional or expanded PDP categories, but may choose to designate a project that is not defined within any of the categories in Section 1.4.1 as a PDP, based on the project's potential impacts to storm water quality.

1.4.3 Local PDP Exemptions or Alternative PDP Requirements

The following types of development projects may be exempt from being defined as a PDP by the Authority if they meet the following conditions. Projects seeking PDP exemptions will be reviewed by EAD for eligibility.

1) New or retrofit paved sidewalks that are:
   - Designed to divert storm water runoff to vegetated or permeable areas;
   - Designed to be hydraulically disconnected from impervious streets or roads; or
   - Include permeable pavement or surfaces in accordance with USEPA Green Streets Guidance (Appendix I).
2) Retrofitting or redevelopment of existing paved alleys, streets or roads that are:
   - Designed in accordance with USEPA Green Streets Guidance (Appendix I).

1.5 Determining Applicable Storm Water Management Requirements

MS4 Permit Provision E.3.c.(1)

Depending on project type and receiving water, different storm water management requirements apply.

New development or redevelopment projects that are subject to this Manual requirement pursuant to Section 1.3, but are not classified as PDPs based on Section 1.4, are called "Standard Projects." Source control and site design requirements apply to all projects, including Standard Projects and PDPs. Additional structural BMP requirements (i.e., pollutant control) apply only to PDPs. Storm water management requirements for a project, and the applicable sections of this Manual, are summarized in Table 1-3.

TABLE 1-3. Applicability of Manual Sections for Different Project Types

Project Type	**Project Development Process** (Chapter 3 and 8)	**Source Control and Site Design** (Section 2.1 and Chapter 4)	**Structural Pollutant Control** (Section 2.2 and Chapter 5 and 7)	**Structural Hydromodification Management** (Section 2.3, 2.4 and Chapter 6 and 7)
Not a Development Project	The requirements of this Manual do not apply			
Standard Project	☑	☑	NA	NA
PDP With Only Pollutant Control Requirements*	☑	☑	☑	NA
PDPs with Pollutant Control and Hydromodification Management Requirements	Hydromodification management requirements do not apply to Authority projects.			

1.6 Applicability of Hydromodification Management Requirements

MS4 Permit Provision E.3.c.(2)

As allowed by the MS4 Permit, projects discharging directly to enclosed embayments (e.g., San Diego Bay or Mission Bay), by either existing underground storm drain systems or conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to the enclosed embayment, are exempt. This exemption applies to all discharges from SAN, which discharges only to San Diego Bay. Development projects are to confirm within their SWQMP that this exemption applies.

- This exemption is subject to the following additional criteria defined by this Manual:
    a) The outfall must not be located within a wildlife refuge or reserve area (e.g., Kendall-Frost Mission Bay Marsh Reserve, San Diego Bay National Wildlife Refuge, San Diego National Wildlife Refuge).
    b) A properly sized energy dissipation system must be provided to mitigate outlet discharge velocity from the direct discharge to the enclosed embayment for the ultimate condition peak design flow of the direct discharge.
    c) The invert elevation of the direct discharge conveyance system (at the point of discharge to the enclosed embayment) should be equal to or below the mean high tide water surface elevation at the point of discharge, unless the outfall discharges to a quay or other non-erodible shore protection.
- Exceptions to criteria b and c may be allowed on a case-by-case basis at the discretion of EAD.

1.7 Special Considerations for Redevelopment Projects (50% Rule)

MS4 Permit Provision E.3.b.(2)

Redevelopment PDPs (PDPs on previously developed sites) may need to meet storm water management requirements for ALL impervious areas (collectively) within the ENTIRE project site.

If the project is a redevelopment project, the structural BMP performance requirements apply to redevelopment PDPs as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than 50 percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than 50 percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply to the entire development.

These requirements for managing storm water on an entire redevelopment project site are commonly referred to as the "50% rule." For the purpose of calculating the ratio, the surface area of the previously existing development shall be the area of impervious surface within the previously existing development. The following steps shall be followed to estimate the area that requires treatment to satisfy the MS4 Permit requirements:

1. How much total impervious area currently exists on the site?
2. How much existing impervious area will be replaced with new impervious area?

3. How much new impervious area will be created in areas that are pervious in the existing condition?
4. Total created and/or replaced impervious surface = Step 2 + Step 3.
5. **50% rule test**: Is step 4 more than 50% of Step 1? If yes, treat all impervious surface on the site. If no, then treat only Step 4 impervious surface and any area that comingles with created and/or replaced impervious surface area.

Note: Step 2 and Step 3 must not overlap because it is fundamentally not possible for a given area to be both "replaced" and "created" at the same time. Also, activities that occur as routine maintenance shall not be included in Step 2 and Step 3 calculation.

For example, a 10,000-square-foot development proposes replacement of 4,000 square feet of impervious area. The treated area is less than 50 percent of the total development area and only the 4,000-square-foot area is required to be treated.

1.8 Alternative Compliance Program

MS4 Permit Provision E.3.c.(1).(b); E.3.c.(2).(c); E.3.c.(3)

PDPs may be allowed to participate in an alternative compliance program.

The Authority has the discretion to independently develop an alternative compliance program for its jurisdiction.

Participation in an alternative compliance program would allow a PDP to fulfill the requirement of providing retention and/or biofiltration pollutant controls onsite that completely fulfill the performance standards specified in Chapter 5 (pollutant controls) with onsite flow-through treatment controls and offsite mitigation of the design capture volume (DCV) not retained onsite.

PDPs may be allowed to participate in an alternative compliance program by using onsite BMPs to treat offsite runoff. PDPs must consult EAD for specific guidelines and requirements for using onsite facilities for alternative compliance.

The PDP utilizing the alternative compliance program would (at a minimum) provide flow-through treatment control BMPs onsite, and then fund, contribute to, or implement an offsite alternative compliance project deemed by the Authority alternative compliance program to provide a greater overall water quality benefit for the portion of the pollutants not addressed onsite through retention and/or biofiltration BMPs. Offsite alternative compliance program locations for the purpose of this Manual are defined as locations within the Authority's jurisdiction, but offsite of the PDP project area. Due to Federal Aviation Administration (FAA) funding restrictions, the Authority cannot fund or sponsor programs outside of its jurisdiction.

Figure 1-2 generally represents two potential pathways for participating in alternative compliance (i.e., offsite projects that supplement the PDPs onsite BMP obligations).

- The first pathway (illustrated using solid line, left side) ultimately ends at alternative compliance if the PDP cannot meet all of the onsite pollutant control obligations via retention

and/or biofiltration. This pathway requires performing feasibility analysis for retention and biofiltration BMPs prior to participation in an alternative compliance project.

- The second pathway (illustrated using dashed line, right side) is a discretionary pathway along which jurisdictions may allow for PDPs to proceed directly to an alternative compliance project without demonstrating infeasibility of retention and/or biofiltration BMPs onsite.

Participation in an alternative compliance program also requires onsite flow-through treatment control BMPs.

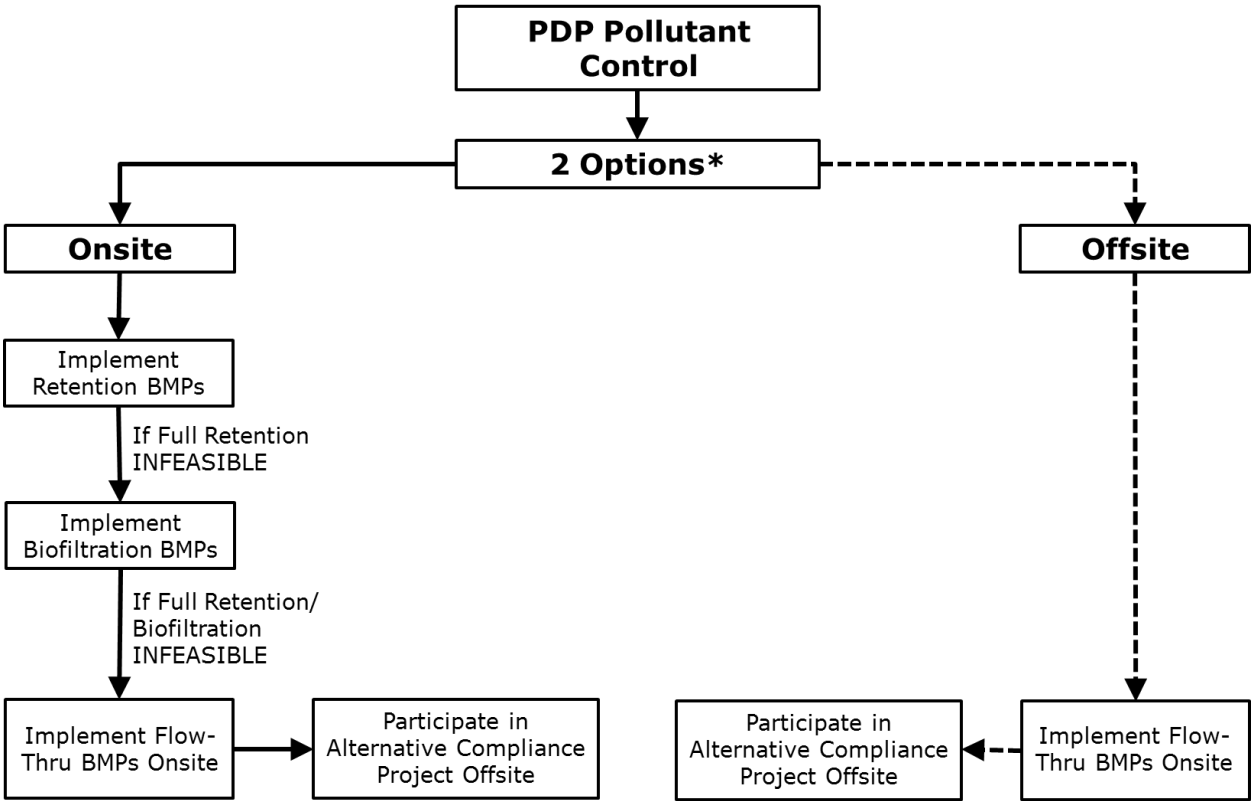
Participation in an offsite alternative compliance project, **and** the obligation to implement flow-through treatment controls for the DCV not reliably retained or biofiltered onsite, are linked and cannot be separated. Therefore, if the Authority does not allow the PDP to participate in the alternative compliance program or to propose a project-specific offsite alternative compliance project, then the PDP may not utilize flow-through treatment control. The PDP should consult with EAD regarding processing requirements if this is the case.

PDPs may be required to provide temporal mitigation when participating in an alternative compliance program.

Finally, if the PDP is allowed to participate in an offsite alternative compliance project that is constructed after the completion of the development project, the PDP must provide temporal mitigation to address this interim time period. Temporal mitigation must provide equivalent or better pollutant removal and/or hydrologic control (as applicable) as compared to the case where the offsite alternative compliance project is completed at the same time as the PDP.

Water Quality Equivalency calculations must be accepted by the SDRWQCB

The Water Quality Equivalency (WQE) calculation must be accepted by the SDRWQCB's Executive Officer prior to administering an alternative compliance program. The Water Quality Equivalency provides currency calculations to assess water quality and hydromodification management benefits for a variety of potential offsite project types and provides a regional and technical basis for demonstrating a greater water quality benefit for the watershed. The Water Quality Equivalency guidelines are available on the Project Clean Water website (www.projectcleanwater.org).



*PDP may be allowed to directly participate in an offsite project without demonstrating infeasibility of retention and/or biofiltration BMPs onsite. Consult EAD for specific guidelines.

FIGURE 1-2. Pathways to Participating in Alternative Compliance Program

Please see Appendix J for a discussion of the Authority's Alternative Compliance Program.

Tenant Implemented Alternative Compliance Project: The Authority may allow a tenant project applicant to implement an alternative compliance project in lieu of complying onsite. In this scenario, the applicant is fully responsible for the alternative compliance project design, construction, operation, and long-term maintenance. Applicant-proposed alternative compliance projects shall not be authorized by the Copermittee prior to acceptance of the water quality equivalency calculations by the SDRWQCB.

1.9 Relationship Between This Manual and Water Quality Improvement Plans

This Manual is connected to other permit-specified planning efforts.

The MS4 Permit requires each Watershed Management Area within the San Diego Region to develop a Water Quality Improvement Plan (WQIP**)** that identifies priority and highest priority water quality conditions and strategies that will be implemented with associated goals to demonstrate progress toward addressing the conditions in the watershed. The MS4 Permit also provides an option to perform a Watershed Management Area Analysis (WMAA**)** as part of the WQIP to develop watershed-specific requirements for structural BMP implementation in the watershed management

area. PDPs should expect to consult either of these separate planning efforts as appropriate when using this Manual as follows:

1. For PDPs that implement flow-through treatment BMPs, selection of the type of BMP shall consider the pollutants and conditions of concerns. Among the selection considerations, the PDP must consult the highest priority water quality condition as identified in the WQIP for that particular watershed management area. The highest priority water quality condition identified in the San Diego Bay WQIP by the Authority is impairment due to metals (copper and zinc).

2. There may be watershed management area specific BMPs or strategies that are identified in WQIPs for which PDPs should consult and incorporate as appropriate.

3. PDPs may have the option of participating in an alternative compliance program. Refer to Section 1.8.

These relationships between this Manual and WQIPs are presented in Figure 1-3.

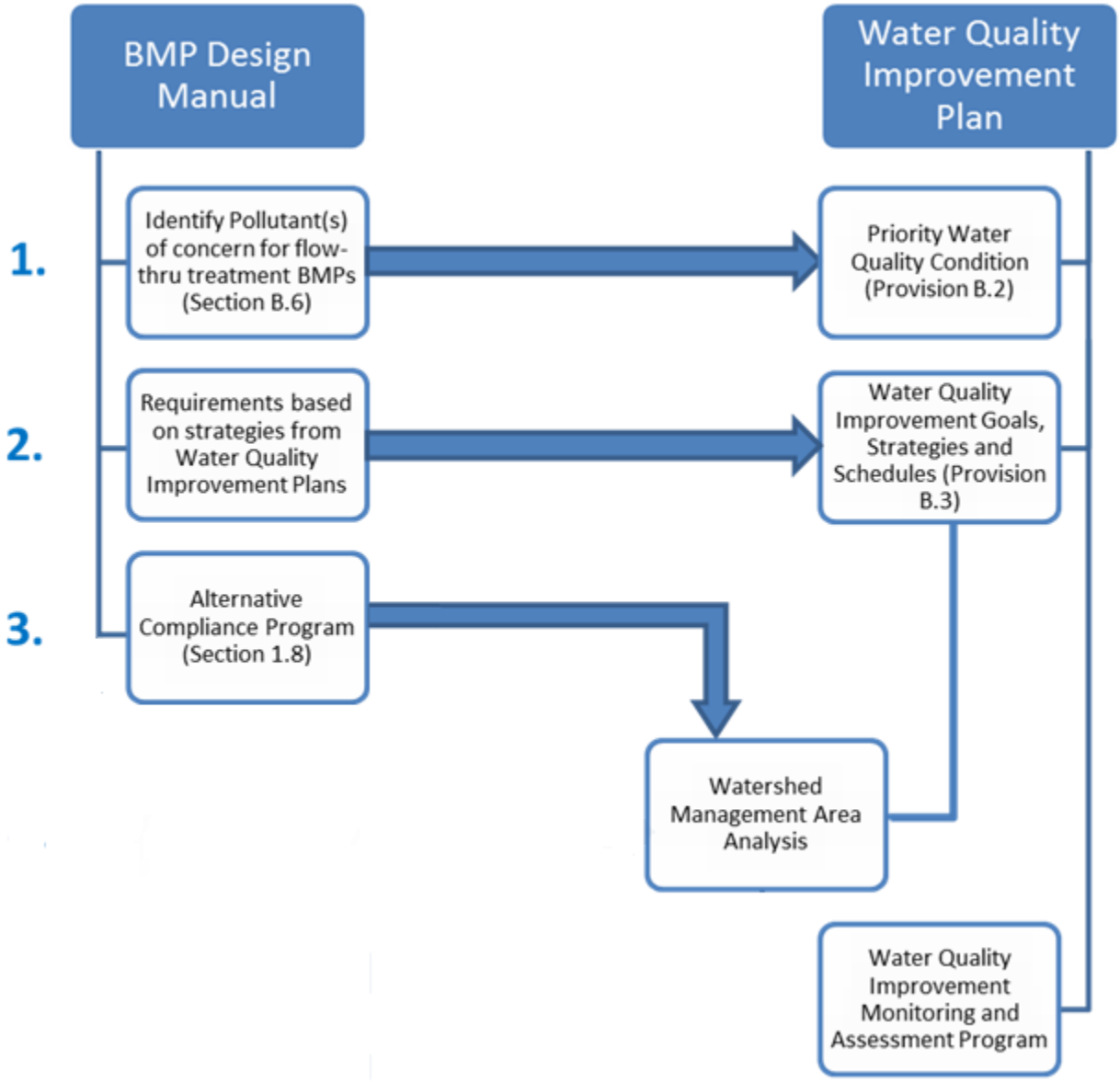


FIGURE 1-3. Relationship Between This Manual and the WQIP

1.10 Project Review Procedures

EAD reviews project plans for compliance with applicable requirements of this Manual and the MS4 Permit.

Specific submittal requirements for documentation of permanent, post-construction storm water BMPs may vary by jurisdiction and project type; however, in all cases, the project applicant must provide sufficient documentation to demonstrate that applicable requirements of the BMP Design Manual and the MS4 Permit will be met.

For Standard Projects, this typically means using forms and/or a Standard Project SWQMP or other equivalent documents approved by EAD to document that the following general requirements of the MS4 Permit are met, and showing applicable features, including onsite grading, building, improvement, and landscaping plans:

- BMP Requirements for All Development Projects, which include general requirements, source control BMP requirements, and narrative (i.e., not numerically sized) site design requirements (MS4 Permit Provision E.3.a).

For PDPs, this typically means preparing a PDP SWQMP to document that the following general requirements of the MS4 Permit are met, and showing applicable features including onsite grading and landscaping plans:

- BMP Requirements for All Development Projects, which include general requirements for siting of permanent, post-construction BMPs, source control BMP requirements, and narrative (i.e., not numerically sized) site design requirements (MS4 Permit Provision E.3.a); and
- Storm Water Pollutant Control BMP Requirements, for numerically sized onsite structural BMPs to control pollutants in storm water (MS4 Permit Provision E.3.c.(1)).

Detailed submittal requirements are provided in Chapter 8 of this Manual. Documentation of the permanent, post-construction storm water BMPs at the discretion of EAD must be provided with the first submittal of a project or another preliminary planning stage defined by the Authority. Storm water requirements will directly affect the layout of the project. Therefore storm water requirements must be considered from the initial project planning phases, and will be reviewed with each submittal, beginning with the first submittal.

1.11 PDP Structural BMP Verification

MS4 Permit Provision E.3.e.(1)

Structural BMPs must be verified by the Authority prior to project occupancy.

Pursuant to MS4 Permit Provision E.3.e.(1), each Copermittee must require and confirm the following with respect to PDPs constructed within their jurisdiction:

(a) "Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership."

(b) "Each Copermittee must require and confirm that, prior to occupancy and/or intended use of any portion of the [PDP], each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of [the MS4 Permit]."

For PDPs, this means that after structural BMPs have been constructed, EAD may request the project owner provide a certification that the site improvements for the project have been constructed in conformance with the approved storm water management documents and drawings.

EAD may require inspection of the structural BMPs at each significant construction stage and at completion. Following construction, EAD may require an addendum to the SWQMP and As-Builts to address any changes to the structural BMPs that occurred during construction that were approved by EAD. The Authority may also require a final update to the O&M Plan and/or execution of a maintenance agreement that will be recorded for the facility. A maintenance agreement that is recorded with the facility can then be transferred to future operators.

Certification of structural BMPs, updates to reports, and documentation of a maintenance agreement may occur concurrently with project closeout, but could be required sooner per Authority practices. In all cases, it is required prior to occupancy and/or intended use of the project. Specific procedures are provided in Chapter 8 of this Manual.

Performance Standards and Concepts

Projects must meet three separate performance standards, as applicable.

The MS4 Permit establishes separate performance standards for (1) source control and site design practices, (2) storm water pollutant control BMPs, and (3) hydromodification management BMPs. Chapter 1 provided guidance for determining which performance standards apply to a given project. This chapter defines these performance standards based on the MS4 Permit, and presents concepts that provide the project applicant with technical background, explains why the performance standards are important, and gives a general description of how these performance standards can be met. Detailed procedures for meeting the performance standards are presented in Chapters 4, 5, and 6.

Performance standards can be met through an integrated approach.

While three separate performance standards are defined by this Manual, an overlapping set of design features can be used as part of demonstrating conformance to each standard. Further discussion of the relationship between performance standards is provided in Section 2.4.

2.1 Source Control and Site Design Requirements for All Development Projects

2.1.1 Performance Standards

MS4 Permit Provision E.3.a

This section defines performance standards for source control and site design practices that are applicable to all projects (regardless of project type or size; both Standard Projects and PDPs) when local permits are issued, including unpaved roads and flood management projects.

2.1.1.1 General Requirements

All projects shall meet the following general requirements:

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the United States (U.S.); and

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g., mosquitoes, rodents, or flies).

2.1.1.2 Source Control Requirements

Pollutant source control BMPs are features that must be implemented to address specific sources of pollutants.

The following source control BMPs must be implemented at all development projects where applicable and technically feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protection of outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protection of materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protection of trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Use of any additional BMPs determined to be necessary by the Authority to minimize pollutant generation at each project.

Further guidance is provided in Section 2.1.2 and Chapter 4. Additionally, all BMPs relevant to the Authority's jurisdiction are contained in Appendix B of the SWMP.

2.1.1.3 Site Design Requirements

Site design requirements are qualitative requirements that apply to the layout and design of ALL development project sites (Standard Projects and PDPs).

Site design performance standards define minimum requirements for how a site must incorporate LID BMPs, including the location of BMPs and the use of integrated site design practices. The following site design practices must be implemented at all development projects, where applicable and technically feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)[2];

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e., the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and use of precipitation.

A key aspect of this performance standard is that these design features must be used where applicable and feasible. Responsible implementation of this performance standard depends on evaluating applicability and feasibility. Further guidance is provided in Section 2.1.2 and Chapter 4.

Additional site design requirements may apply to PDPs.

Site design decisions may influence the ability of a PDP to meet applicable performance standards for pollutant control (as defined in Section 2.2). For example, the layout of the site drainage and reservation of areas for BMPs relative to areas of infiltrative soils may influence the feasibility of capturing and managing storm water to meet storm water pollutant control requirements. As such, the Authority may require additional site design practices, beyond those listed above, to be considered and documented as part of demonstrating conformance to storm water pollutant control requirements.

2.1.2 Concepts and References

Land development tends to increase the amount of pollutants in storm water runoff.

[2] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or affecting placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces facilitate entrainment of urban pollutants in storm water runoff (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not generally found in high concentrations in the runoff from the natural environment. Pollutants that accumulate on impervious surfaces and actively landscaped pervious surfaces may contribute to elevated levels of pollutants in runoff relative to the natural condition.

Land development also impacts site hydrology.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration, retention, evapotranspiration, and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically and has traditionally been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek beds and banks. Compaction of pervious areas can have a similar effect as impervious surfaces on natural hydrology.

Site Design LID involves attempting to maintain or restore the predevelopment hydrologic regime.

LID is a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds. LID designs seeks to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system. Site design LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Examples of site design LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Site design must be considered early in the design process.

Site designs tend to be more flexible in the early stages of project planning than later on when plans become more detailed. Because of the importance of the location of BMPs, site design shall be considered as early as the planning/tentative design stage. Site design is critical for feasibility of storm water pollutant control BMPs (Section 2.2).

Source control and site design (LID) requirements help avoid impacts by controlling pollutant sources and changes in hydrology.

Source control and site design practices prescribed by the MS4 Permit are the minimum management practices, control techniques and system, design and engineering methods to be included in the planning procedures to reduce the discharge of pollutants from development projects, regardless of size or purpose of the development. In contrast to storm water pollutant control BMPs, which are intended to mitigate impacts, source control and site design BMPs are intended to avoid or minimize these impacts by managing site hydrology, providing treatment features integrated within the site, and reducing or preventing the introduction of pollutants from specific sources. Implementation of site

design BMPs will result in reduction in storm water runoff generated by the site. Methods to estimate effective runoff coefficients and the storm water runoff produced by the site after site design BMPs are implemented are presented in Appendix B.2. This methodology is applicable for PDPs that are required to estimate runoff produced from the site with site design BMPs implemented so that they can appropriately size storm water pollutant control BMPs.

The location of BMPs matters.

The site design BMPs listed in the performance standard include practices that either prevent runoff from occurring or manage runoff as close to the source as possible. These BMPs help create a more hydrologically effective site and reduce the requirements that pollutant control BMPs must meet, where required. Additionally, because sites may have spatially variable conditions, the locations reserved for structural BMPs within the site can influence whether these BMPs can feasibly retain, treat, and/or detain storm water to comply with structural pollutant control requirements, where applicable. Finally, the performance standard specifies that onsite BMPs must remove pollutants from runoff prior to discharge to any receiving waters or the MS4, must be located/constructed as close to the pollutant generating source as possible, and must not be constructed within waters of the U.S.

The selection of BMPs also matters.

The lists of source control and site design BMPs specified in the performance standard must be used "where applicable and feasible." This is an important concept – BMPs should be selected to meet the R9-2013-0001 permit requirements and are feasible with consideration of site conditions and project type. By using BMPs that are applicable and feasible, the project can achieve benefits of these practices, while not incurring unnecessary expenses (associated with using practices that do not apply or would not be effective) or creating undesirable conditions (e.g., infiltration-related issues, vector concerns including mosquito breeding, etc.).

Methods to select and design BMPs and demonstrate compliance with source control and site design requirements are presented in Chapter 4 of this Manual.

2.2 Storm Water Pollutant Control Requirements for PDPs

2.2.1 Storm Water Pollutant Control Performance Standard

MS4 Permit Provision E.3.c.(1)

Storm Water Pollutant Control BMPs for PDPs shall meet the following performance standards:

(a) Each PDP shall implement BMPs that are designed to retain (i.e., intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour, 85th percentile storm event (Design Capture Volume [DCV]). The 24-hour, 85th percentile storm event shall be based on Figure B.1-1 in Appendix B or an approved site-specific rainfall analysis.

    (i) If it is not technically feasible to implement retention BMPs for the full DCV onsite for a PDP, then the PDP shall utilize biofiltration BMPs for the remaining volume not reliably retained. Biofiltration BMPs must be designed as described in Appendix F to

have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:

[a]. Treat 1.5 times the DCV not reliably retained onsite, OR

[b]. Treat the DCV not reliably retained onsite with a flow-through design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite.

(ii) If biofiltration BMPs are not technically feasible, then the PDP shall utilize flow-through treatment control BMPs (selected and designed per Appendix B.6) to treat runoff leaving the site, AND participate in alternative compliance to mitigate for the pollutants from the DCV not reliably retained onsite pursuant to Section 2.2.1.(b). Flow-through treatment control BMPs must be sized and designed to:

[a]. Remove pollutants from storm water to the maximum extent practicable (MEP) (defined by the MS4 Permit) by following the guidance in Appendix B.6; and

[b]. Filter or treat either (1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or (2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two (both methods may be adjusted for the portion of the DCV retained onsite as described in Appendix B.6); and

[c]. Meet the flow-through treatment control BMP treatment performance standard described in Appendix B.6.

(b) A PDP may be allowed to participate in an alternative compliance program in lieu of fully complying with the performance standards for storm water pollutant control BMPs onsite if the alternative compliance program outlined in Section 1.8 is followed. When an alternative compliance program is utilized:

(i) The PDP must mitigate for the portion of the DCV not reliably retained onsite.

(ii) Flow-through treatment control BMPs must be implemented to treat the portion of the DCV that is not reliably retained onsite. Flow-through treatment control BMPs must be selected and sized in accordance with Appendix B.6.

(iii) A PDP may be allowed to propose an alternative compliance project not identified in the WMAA of the WQIP if the requirements in Section 1.8 are met at the discretion of EAD.

Demonstrations of feasibility findings and calculations to justify BMP selection and design shall be provided by the project applicant in the SWQMP to the satisfaction of EAD. Methodology to demonstrate compliance with the performance standards, described above, applicable to storm water pollutant control BMPs for PDPs, is detailed in Chapter 5.

2.2.2 Concepts and References

Retention BMPs are the most effective type of BMPs to reduce pollutants discharging to MS4s when they are sited and designed appropriately.

Retention of the required DCV will achieve 100 percent pollutant removal efficiency (i.e., prevent pollutants from discharging directly to the MS4). Thus, retention of as much storm water onsite as technically feasible is the most effective way to reduce pollutants in storm water discharges to, and consequently from, the MS4, and to remove pollutants in storm water discharges from a site to the MEP.

However, to accrue these benefits, retention BMPs must be technically feasible and suitable for the project. Retention BMPs that fail prematurely, under-perform, or result in unintended consequences as a result of improper selection or siting may achieve performance that is inferior to other BMP types while posing other issues for tenants and the Authority. Therefore, this Manual provides criteria for evaluating feasibility and provides options for other types of BMPs to be used if retention is not technically feasible.

Biofiltration BMPs can be sized to achieve approximately the same pollutant removal as retention BMPs.

In the case, where the entire DCV cannot be retained onsite because it is not technically feasible, PDPs are required to use biofiltration BMPs with specific sizing and design criteria listed in Appendix B.5 and Appendix F. These sizing and design criteria are intended to provide a level of long-term pollutant removal that is reasonably equivalent to retention of the DCV.

Flow-through treatment BMPs are required to treat the pollutant loads in the DCV not retained or biofiltered onsite to the MEP.

If the pollutant loads from the full DCV cannot feasibly be retained or biofiltered onsite, then PDPs are required to implement flow-through treatment control BMPs to remove the pollutants to the MEP for the portion of the DCV that could not be feasibly retained or biofiltered. Flow-through treatment BMPs may be implemented to address onsite storm water pollutant control requirements only if coupled with an offsite alternative compliance project that mitigates for the portion of the pollutant load in the DCV not retained or biofiltered onsite.

Offsite Alternative Compliance Program may be available.

The MS4 Permit allows the Authority discretion to grant PDPs permission to utilize an alternative compliance program for meeting the pollutant control performance standard. Onsite and offsite mitigation is required when a PDP is allowed to use an alternative compliance program. The specific parameters of the Authority's alternative compliance program are contained in Appendix J.

Methods to design and demonstrate compliance with storm water pollutant control BMPs are presented in Chapter 5 of this Manual. Definitions and concepts that should be understood when sizing storm water pollutant control BMPs to be in compliance with the performance standards are explained below:

2.2.2.1 Best Management Practices

To minimize confusion, this Manual considers all references to "facilities," "features," or "controls" to be incorporated into development projects as BMPs.

2.2.2.2 DCV

The MS4 Permit requires pollutants be addressed for the runoff from the 24-hour 85th percentile storm event ("DCV") as the design standard to which PDPs must comply.

The 85th percentile, 24-hour storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, the following steps would be followed:

- Obtain representative precipitation data, preferably no less than 30-year period, if possible.
- Divide the recorded precipitation into 24-hour precipitation totals.
- Filter out events with no measurable precipitation (less than 0.01 inch of precipitation).
- Of the remaining events, calculate the 85th percentile value (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile, 24-hour storm).

The 85th percentile, 24-hour storm event depth is then used in hydrologic calculations to calculate the DCV for sizing storm water pollutant control BMPs. An exhibit showing the 85th percentile, 24-hour storm depth across San Diego County and the methodology used to develop this exhibit is included in Appendix B.1.3. The 85th percentile, 24-hour storm event depth for SAN is 0.5 inch. Guidance to estimate the DCV is presented in Appendix B.1.

2.2.2.3 Implementation of Storm Water Pollutant Control BMPs

The MS4 Permit requires that the PDP applicants proposing to meet the performance standards onsite implement storm water pollutant control BMPs in the order listed below. That is, the PDP applicant first needs to implement **all** feasible onsite retention BMPs needed to meet the storm water pollutant control BMP requirements prior to installing onsite biofiltration BMPs, and then onsite biofiltration BMPs prior to installing onsite flow-through treatment control BMPs.

PDPs may be allowed to participate in an alternative compliance program. Refer to Section 1.8 for additional guidance.

Retention BMPs: Structural measures that provide retention (i.e., intercept, store, infiltrate, evaporate, and evapotranspire) of storm water as part of pollutant control strategy. Examples include infiltration BMPs and cisterns, bioretention BMPs, and biofiltration with partial retention BMPs.

Biofiltration BMPs: Structural measures that provide biofiltration of storm water as part of the pollutant control strategy. Example includes biofiltration BMPs.

Flow-through treatment control BMPs: Structural measures that provide flow-through treatment as part of the pollutant control strategy. Examples include vegetated swales and media filters.

For example, if the DCV from a site is 10,000 cubic feet (ft^3) and it is technically feasible to implement 2,000 ft^3 of retention BMPs and 9,000 ft^3 of biofiltration BMPs sized using Section 2.2.1.(a)(i)[a], and the jurisdiction has an alternative compliance program to satisfy the requirements of this Manual the project applicant should:

1) First, design retention BMPs for 2,000 ft^3.
2) Then complete a technical feasibility form for retention BMPs (included in Appendix C and Appendix D) demonstrating that it is only technically feasible to implement retention BMPs for 2,000 ft^3.
3) Then design biofiltration BMPs for 9,000 ft^3 (calculate equivalent volume for which the pollutants are retained = 9,000/1.5 = 6,000 ft^3).
4) Then complete a technical feasibility for biofiltration BMPs demonstrating that it is only technically feasible to implement biofiltration BMPS for 9,000 ft^3.
5) Estimate the DCV that could not be retained or biofiltered = 10,000 ft^3 – (2,000 ft^3 + 6,000 ft^3) = 2,000 ft^3.
6) Implement flow-through treatment control BMPs to treat the pollutants in the remaining 2,000 ft^3. Refer to Appendix B.6 for guidance for designing flow-through treatment control BMPs.
7) Also participate in an alternative compliance project for 2,000 ft^3. Refer to Section 1.8 for additional guidance on participation in an alternative compliance program.

2.2.2.4 Technical Feasibility

MS4 Permit Requirement E.3.c.(5)

Analysis of technical feasibility is necessary to select the appropriate BMPs for a site.

PDPs are required to implement pollutant control BMPs in the order of priority in Section 2.2.2.3 based on determinations of technical feasibility. To assist the project applicant in selecting BMPs, this Manual includes a defined process for evaluating feasibility. Conceptually, the feasibility criteria contained in this Manual are intended to:

- Promote reliable and effective long-term operations of BMPs by providing a BMP selection process that eliminates the use of BMPs that are not suitable for site conditions, project type or other factors;
- Minimize significant risks to property, human health, and/or environmental degradation (e.g., geotechnical stability, groundwater quality) as a result of selection of BMPs that are undesirable for a given site; and
- Describe circumstances under which regional and watershed-based strategies, as part of an approved WMAA **and** an alternative compliance program developed by the Authority, may be selected.

Steps for performing technical feasibility analyses are described in detail in Chapter 5. More specific guidance related to geotechnical investigation guidelines for feasibility of storm water infiltration and groundwater quality and water balance factors is provided in Appendices C and D, respectively.

2.2.2.5 Biofiltration BMPs

The MS4 Permit requires that biofiltration BMPs be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Appendix F of this Manual has guidance for hydraulic loading rates and other biofiltration design criteria to meet these required goals. Appendix F also has a checklist to be completed by the project SWQMP preparer during plan submittal. Guidance for sizing biofiltration BMPs is included in Chapter 5 and Appendices B.5 and F.

2.2.2.6 Flow-through Treatment Control BMPs (for use with Alternative Compliance)

MS4 Permit Requirement E.3.d.2-3

The MS4 Permit requires that the flow-through treatment control BMP selected by the PDP applicant be ranked with high or medium pollutant removal efficiency for the most significant pollutant of concern. Steps to select the flow-through treatment control BMP include:

- Step 1: Identify the pollutant(s) of concern by considering the following at a minimum (1) receiving water quality; (2) highest priority water quality conditions identified in the Watershed Management Areas Water Quality Improvement Plan; (3) land use type of the project and pollutants associated with that land use type, and (4) pollutants expected to be present onsite
- Step 2: Identify the most significant pollutant of concern. A project could have multiple most significant pollutants of concerns and shall include the highest priority water quality condition identified in the watershed WQIP (i.e., copper and zinc in wet weather for the Authority) and pollutants expected to be presented onsite/from land use.
- Step 3: Determine the effectiveness of the flow-through treatment control BMP for the identified most significant pollutant of concern.

Methodology for sizing flow-through treatment control BMPs and the resources required to identify the pollutant(s) of concern and effectiveness of flow-through treatment control BMPs are included in Chapter 5 and Appendix B.6.

2.3 Hydromodification Management Requirements for PDPs

2.3.1 Hydromodification Management Performance Standards

MS4 Permit Provision E.3.c.(2)

The MS4 Permit defines performance standards for hydromodification management, including flow control of post-project storm water runoff and protection of critical sediment yield areas, that shall be met by all PDPs unless exempt from hydromodification management requirements per Section 1.6 of this Manual. Hydromodification management requirements apply to both new development and redevelopment PDPs, except those that are exempt on the basis of discharging to downstream channels or water bodies that are not subject to erosion, as defined in either the MS4 Permit (Provision

E.3.c.(2).(d)) or the WMAA for the watershed in which the project resides. Exemptions from hydromodification management requirements are described in Section 1.6 of this Manual.

All projects discharging storm water from SAN are exempt from hydromodification management requirements because all discharges drain to an enclosed embayment (San Diego Bay). Project applicants will state in the project SWQMP that the hydromodification management exemption outlined in Section 1.6 applies to their project.

2.4 Relationship Among Performance Standards

An integrated approach can provide significant cost savings by utilizing design features that meet multiple standards.

Site design/LID and storm water pollutant control are separate requirements to be addressed in development project design. Each has its own purpose and each has separate performance standards that must be met. However, effective project planning involves understanding the ways in which these standards are related and how single suites of design features can meet more than one standard.

Site design features (aka LID) can be effective at reducing the runoff to downstream BMPs.

Site design BMPs serve the purpose of minimizing impervious areas and therefore reducing post-project runoff, reducing the potential transport of pollutants offsite, and reducing the potential for downstream erosion caused by increased flow rates and durations. By reducing post-project runoff through site design BMPs, the amount of runoff that must be managed for pollutant control can be reduced.

Single structural BMPs, particularly retention BMPs, can meet or contribute to pollutant control objectives.

The objective of structural BMPs for pollutant control is to reduce offsite transport of pollutants. The most effective structural BMPs to meet the objective are BMPs that are based on retention of storm water runoff where feasible. Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). However, demonstrating that the separate performance requirements for pollutant control and hydromodification management are met must be shown separately. Because hydromodification management is not required by the Authority, only pollutant control requirements must be demonstrated.

The design process should start with an assessment of the feasibility to retain or partially retain the DCV for pollutant control, and then determine what kind of BMPs will be used for pollutant control.

A typical design process for a single structural BMP to meet the pollutant control performance standard involves initiating the structural BMP design based on the performance standard that is expected to require the largest volume of storm water to be retained.

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Chapter

3

Development Project Planning and Design

Compliance with source control/site design, and pollutant control BMPs, as applicable, requires coordination of site, landscape, and project storm water plans. It also involves provisions for O&M of structural BMPs. To effectively comply with applicable requirements, a step-wise approach is recommended. This chapter outlines a step-wise, systematic approach (Figure 3-1) to preparing a comprehensive storm water management design for Standard Projects and PDPs.

STEP 1: **Coordinate Between Disciplines** Refer to Section 3.1	*Purpose:* Engage and coordinate with owner and other project disciplines (e.g., architect, engineer) early in the design and throughout the design process to support appropriate project decisions.
⇓	
STEP 2: **Gather Project Site Information** Refer to Section 3.2	*Purpose:* Gather information necessary to inform overall storm water planning process and specific aspects of BMP selection; determine the applicable storm water requirements for the project.
⇓	
STEP 3: **Develop Conceptual Site Layout and Storm Water Control Strategies** Refer to Section 3.3	*Purpose:* Use the information obtained in Step 2 to inform the preliminary site design and storm water management strategy. The scope of this step varies depending on whether the project is a Standard Project or a PDP.
⇓	
STEP 4: **Develop Complete Storm Water Management Design** Refer to Section 3.4	*Purpose:* Develop the complete storm water management design by incorporating the site design and storm water management strategies identified in Step 3 and conducting design level analyses. Integrate the storm water design with the site plan and other infrastructure plans.

FIGURE 3-1. Approach for Developing a Comprehensive Storm Water Management Design

A step-wise approach is not mandatory, and adaptation of this step-wise approach to better fit with unique project features is encouraged. However, taking a step-wise, systematic approach of some sort for planning and design has a number of advantages. First, it helps ensure that applicable requirements and design goals are identified early in the process. Second, it helps ensure that key data about the site, watershed, and project are collected at the appropriate time in the project development process, and the analyses are suited to the decisions that need to be made at each phase. Third, taking a systematic approach helps identify opportunities for retention of storm water that may not be identified in a less systematic process. Finally, a systematic approach helps ensure that constraints and unintended consequences are considered and used to inform BMP selection and design, and related project decisions.

Authority-specific special requirements are listed in Section 3.5 and requirements for phased projects are in Section 3.6. EAD recommends that a preliminary site design be submitted prior to formally applying for project approvals. The preliminary site design should incorporate a conceptual plan for site drainage, including self-treating and self-retaining areas and the location and approximate sizes of any treatment facilities. Any initial feasibility assessments for retaining the full DCV onsite should also be provided. This additional up-front design effort will likely save time and avoid potential delays later in the review process.

3.1 Coordination Among Disciplines

Storm water management design requires close coordination among multiple disciplines, as storm water management design will affect the site layout and should therefore be coordinated among the project team as necessary from the start. The following list describes entities/disciplines that are frequently involved with storm water management design and potential roles that these entities/disciplines may plan.

Owner:

- Engage the appropriate disciplines needed for the project and facilitate exchange of information between disciplines.
- Identify who will be responsible for long-term O&M of storm water management features, and initiate maintenance agreements when applicable.
- Ensure that whole life cycle costs are considered in the selection and design of storm water management features and that a source of funding is provided for long-term maintenance.
- Identify the party responsible for inspecting structural BMPs at each significant construction stage and at completion to provide certification of structural BMPs following construction.

Planner:

- Communicate overall project planning criteria to the team, such as planned development density, parking requirements, project-specific planning conditions, conditions of approval from prior entitlement actions (e.g., CEQA, 401 certifications), and locations of open space and environmentally sensitive areas that are protected from disturbance (e.g., the least tern nesting area in the southwestern corner of SAN).
- Consider location of storm water facilities early in the conceptual site layout process.

- Assist in developing the site plan.

Architect:

- Participate in siting and design (architectural elements) of storm water BMPs.

Civil Engineer:

- Determine storm water requirements applicable to the site (e.g., Standard Project vs. PDP).
- Obtain site-specific information (e.g., watershed information, infiltration rates) and develop viable storm water management options that meet project requirements.
- Reconcile storm water management requirements with other site requirements (e.g., fire access, Americans with Disabilities Act accessibility, parking, open space).
- Develop site layout and site design, including preliminary and final design documents or plans.
- Select and design BMPs; conduct and document associated analyses; and prepare BMP design sheets, details, and specifications.
- Prepare project SWQMP submittals.

Landscape Architect and/or Horticulturist/Agronomist:

- Select appropriate plants for vegetated storm water features and BMPs, and prepare planting plans.
- Develop specifications for planting, vegetation establishment, and maintenance.
- Assist in developing irrigation plans/rates to minimize water application and non-storm water runoff from the project site.

Geotechnical Engineer

- Assist in preliminary infiltration feasibility screening of the site to help inform project layout and initial BMP selection, including characterizing soil, groundwater, geotechnical hazards, utilities, and any other factors applicable for the site.
- Conduct detailed analyses at proposed infiltration BMP locations to confirm or revise feasibility findings and provide design infiltration rates.
- Provide recommendations for infiltration testing that must be conducted during the construction phase, if needed to confirm pre-construction infiltration estimates.

3.2 Gathering Project Site Information

In order to make decisions related to selection and design of storm water management BMPs, it is necessary to gather relevant project site information, including physical site information, proposed uses of the site, level of storm water management requirements (i.e., determination of whether it is a Standard Project or a PDP), proposed storm water discharge locations, potential/anticipated storm water pollutants based on the proposed uses of the site, receiving water sensitivity to pollutants and susceptibility to erosion, and other site requirements and constraints.

The amount and type of information that should be collected depend on the project type (i.e., whether it is a Standard Project, a PDP with all requirements, or a PDP with only pollutant control requirements). Refer to Figure 1-1 in Chapter 1 to identify the project type.

Information should be gathered only to the extent necessary to inform the storm water management design. In some cases, it is not necessary to conduct site-specific analyses to precisely characterize conditions. For example, if depth to groundwater is known to be approximately 100 feet based on regional surveys, it is not necessary to also conduct a site-specific assessment of depth to groundwater to determine whether it is actually 90 feet or 110 feet on the project site. The difference between these values would not influence the storm water management design. In other cases, some information will not be applicable. For example, on an existing development site, there may be no natural hydrologic features remaining; therefore, these features do not need to be characterized. The lack of natural hydrologic features can be simply noted without further effort required.

Submittal templates (in Appendix A) are provided to facilitate gathering information about the project site for BMP selection and design. The checklists in Appendix H may also be necessary, depending on the type of BMP selected. As part of planning for the site investigation, it is helpful to review the subsequent steps (Section 3.3 and 3.4) to gain familiarity with how the site information will be used in making decisions about site layout and storm water BMP selection and design. This can help prioritize the data that are collected.

3.3 Developing Conceptual Site Layout and Storm Water Control Strategies

Once preliminary site information has been obtained, the site can be assessed for storm water management opportunities and constraints that will inform the overall site layout. Considering the project site data discussed above, it is essential to identify potential locations for storm water management features at a conceptual level during the site planning phase. Storm water management requirements must be considered as a key factor in laying out the overall site. Preliminary design of permanent storm water BMPs is partially influenced by whether the project is a Standard Project or a PDP. Table 3-1 presents the applicability of different subsections in this Manual based on project type and must be used to determine which requirements apply to a given project.

TABLE 3-1. Applicability of Section 3.3 Subsections for Different Project Types

Project Type	Section 3.3.1	Section 3.3.2	Section 3.3.3	Section 3.3.4
Standard Project	☑	NA	NA	NA
PDP With Only Pollutant Control Requirements	☑	NA	☑	☑
PDP With Pollutant and Hydromodification Management Requirements	Requirements not applicable to Authority projects.			

3.3.1 Preliminary Design Steps for All Development Projects

All projects must incorporate source control and site design BMPs. The following systematic approach outlines these site planning considerations for all development projects:

1 Review Chapter 4 of this Manual to become familiar with the menu of source control and site design practices that are required.
2 Review the preliminary site information gathered in Section 3.2, specifically related to:
    a. Natural hydrologic features that can be preserved and/or protected;
    b. Soil information;
    c. General drainage patterns (i.e., general topography, points of connection to the storm drain or receiving water);
    d. Pollutant sources that require source controls; and
    e. Information gathered and summarized in the Site Information Checklist for Standard Projects (Appendix A.3).
3 Create opportunities for source control and site design BMPs by developing an overall conceptual site layout that allocates space for site design BMPs and promotes drainage patterns that are effective for hydrologic control and pollutant source control. For example:
    a. Locate pervious areas down gradient from buildings where possible to allow for dispersion.
    b. Identify parts of the project that could be drained via overland vegetated conveyance rather than piped connections.
    c. Develop traffic circulation patterns that are compatible with minimizing street widths.
4 As part of Section 3.4, refine the selection and placement of source control and site design BMPs and incorporate them into project plans. Compliance with site design and source control requirements shall be documented as described in Chapter 4.

3.3.2 Evaluation of Critical Coarse Sediment Yield Areas

For PDPs that are required to meet hydromodification management requirements, an evaluation of whether critical coarse sediment yield areas exist within or upstream of the project site is to be conducted. However, this requirement does not apply to Authority projects, as all development discharges directly to an enclosed embayment.

3.3.3 Drainage Management Areas

Drainage management areas (DMAs) provide an important framework for feasibility screening, BMP prioritization, and storm water management system configuration. BMP selection, sizing, and feasibility determinations must be made at the DMA level; therefore, delineation of DMAs is highly recommended at the conceptual site planning phase and is mandatory for completing the project design and meeting submittal requirements. This section provides guidance on delineating DMAs that is intended to be used as part of Section 3.3 and 3.4.

DMAs are defined on the basis of the proposed drainage patterns of the site and the BMPs to which they drain. During the early phases of the project, DMAs shall be delineated on the basis of onsite drainage patterns and possible BMP locations identified in the site planning process. DMAs should not overlap and should be similar with respect to BMP opportunities and feasibility constraints. More than one DMA can drain to the same BMP. However, because the BMP sizes are determined by the runoff from the DMA, a single DMA may not drain to more than one BMP. See Figure 3-2.

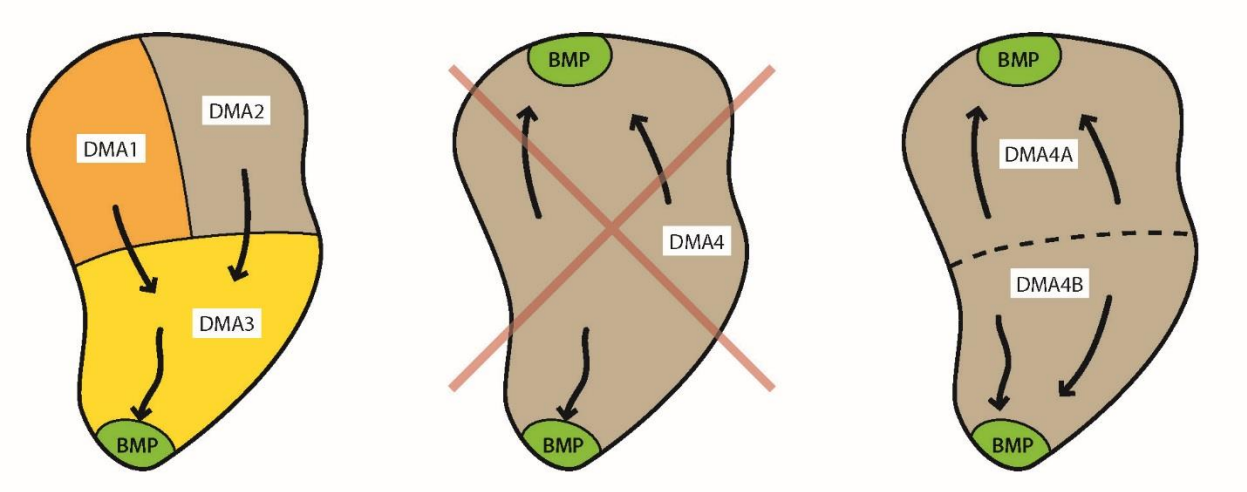


FIGURE 3-2. DMA Delineation

In some cases, in early planning phases, it may be appropriate to generalize the proposed treatment plan by simply assigning a certain BMP type to an entire planning area (e.g., Parking lot X will be treated with bioretention) and calculating the total sizing requirement without identifying the specific BMP locations at that time. This planning area would be later subdivided for design-level calculations. Section 5.2 provides additional guidance on DMA delineation. A runoff factor (similar to a "C" factor used in the rational method) should be used to estimate the runoff draining to the BMP. Appendix B.1 provides guidance in estimating the runoff factor for the drainage area draining to a BMP.

BMPs must be sized to treat the DCV from the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drains to the BMP. To minimize offsite flows treated by project BMPs, consider diverting upgradient flows subject to local drainage and flood control regulation. An example is shown in Figure 3-3.

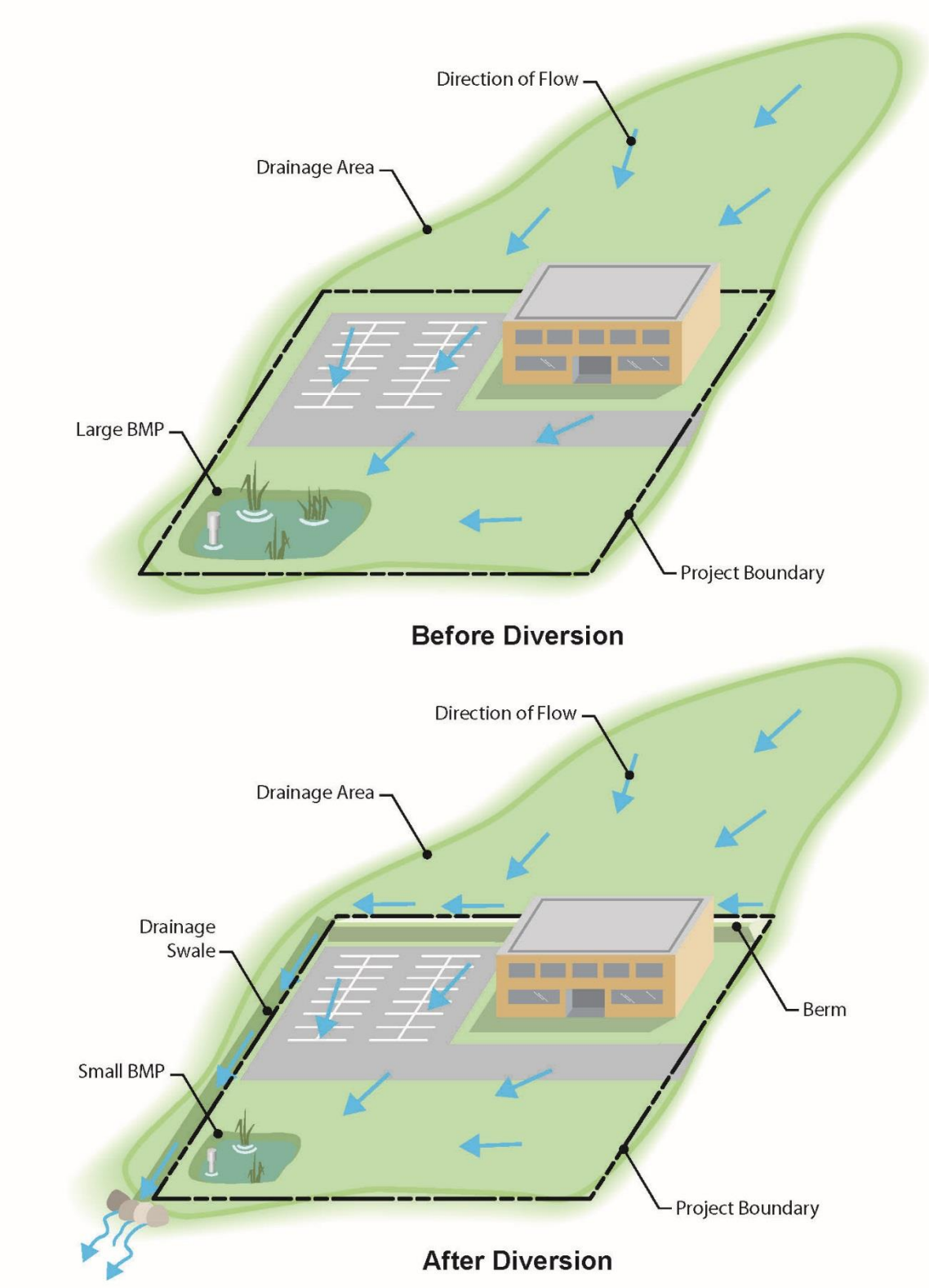


FIGURE 3-3. Tributary Area for BMP Sizing

3.3.4 Developing Conceptual Storm Water Control Strategies

This step applies to PDPs only. The goal of this step is to develop conceptual storm water control strategies that are compatible with the site conditions, including siting and preliminary selection of structural BMPs. At this phase of project planning, it is typically still possible for storm water considerations to influence the site layout to better accommodate storm water design requirements. The end product of this step should be a general, but concrete, understanding of the storm water management parameters for each DMA, the compatibility of this approach with the site design, and preliminary estimates of BMP selection. For simpler sites, this step could be abbreviated in favor of skipping forward to design-level analyses in Section 3.4. However, for larger and/or more complex sites, this section can provide considerable value and can help evaluation of storm water management requirements on common ground with other site planning considerations.

The following systematic approach is recommended:

1. Review the preliminary site information gathered in Section 3.2, specifically related to information gathered and summarized in the Site Information Checklist for PDPs (Appendix A.4).
2. Identify self-mitigating, *de minimis* areas, and/or potential self-retaining DMAs that can be isolated from the remainder of the site (see Section 5.2).
3. Estimate DCV for each remaining DMAs (see Appendix B.1).
4. Determine whether there is a potential opportunity for harvest and use of storm water from the project site. See Section 5.4.1 for harvest and use feasibility screening, which is based on water demand at the project site. For most sites, there is limited opportunity; therefore, evaluating this factor early can help simplify later decisions.
5. Estimate potential runoff reduction and the DCV that could be achieved with site design BMPs (see Section 5.3 and Appendix B.2) and harvest and use BMPs (see Appendix B.3).
6. Based on the remaining runoff after accounting for Steps 2 to 5, estimate BMP space requirements. Identify applicable structural BMP requirements (i.e., storm water pollutant control) and conduct approximate sizing calculations to determine the overall amount of storage volume and/or footprint area required for BMPs. Use worksheets presented in Appendices B.4 and B.5 to estimate sizing requirements for different types of BMPs.
7. Conduct a preliminary screening of infiltration feasibility conditions. A preliminary screening of infiltration feasibility should be conducted as part of site planning to identify areas that are more or less conducive to infiltration. Recommended factors to consider include:
    a. Soil types (determined from available geotechnical testing data, soil maps, site observations, and/or other data sources),
    b. Approximate infiltration rates at various points on the site, obtained via approximate methods (e.g., simple pit test), if practicable,
    c. Groundwater elevations,
    d. Proposed depths of fill,
    e. New or existing utilities that will remain with development,
    f. Soil or groundwater contamination issues within the site or in the vicinity of the site,

g. Slopes and other potential geotechnical hazards that are unavoidable as part of site development, and

h. Safety and accessibility considerations.

This assessment is not intended to be final or to account for all potential factors. Rather, it is intended to help identify site opportunities and constraints as they relate to site planning. After potential BMP locations are established, a more detailed feasibility analysis is necessary (see Section 3.4 and 5.4.2). Additionally, Appendices C and D provide methods for geotechnical and groundwater assessment applicable for screening at the planning level and design level. The jurisdiction may allow alternate assessment methods with appropriate documentation at the discretion of EAD.

8. Identify tentative BMP locations on the basis of preliminary feasibility screening, natural opportunities for BMPs (e.g., low areas of the site, areas near storm drain or stream connections), and other BMP sites that can potentially be created through effective site design (e.g., oddly configured or otherwise unbuildable parcels, easements and landscape amenities, including open space and buffers that can double as locations for bioretention or biofiltration facilities).

9. Determine tentative BMP feasibility categories for infiltration for each DMA or specific BMP location. Based on the results of feasibility screening and tentative BMP locations, determine the general feasibility categories that would apply to BMPs in these locations. Categories are described in Section 5.4.2 and include:

   a. Full infiltration condition;

   b. Partial infiltration condition; and

   c. No infiltration condition.

   Adapt the site layout to attempt to achieve infiltration to the greatest extent feasible.

10. Consider how storm water management BMPs will be accessed for inspection and maintenance and provide necessary site planning allowances (access roads, inspection openings, setbacks, etc.).

11. Document site planning and opportunity assessment activities as a record of the decisions that led to the development of the final storm water management plan. The SWQMP primarily shows the complete design rather than the preliminary steps in the process. However, to comply with the requirements of this Manual, the applicant is required to describe how storm water management objectives have been considered as early as possible in the site planning process and how opportunities to incorporate BMPs have been identified.

3.4 Developing Complete Storm Water Management Design

The complete storm water management design consists of all of the elements describing the BMPs to be implemented, as well as integration of the BMPs with the site design and other infrastructure. The storm water management design shall be developed by taking into consideration the opportunities and/or constraints identified during the site planning phase of the project and then performing the final design level analysis. The scope of this step varies depending on whether the project is a Standard Project or a PDP with pollutant control BMP requirements. The following systematic approach is

recommended to develop a final site layout and storm water management design. Table 3-2 presents the applicability of different subsections based on project type and must be used to determine which requirements apply to a given project.

TABLE 3-2. Applicability of Section 3.4 Subsections for Different Project Types

Project Type	Section 3.4.1	Section 3.4.2	Section 3.4.3
Standard Project	☑	NA	NA
PDP With Only Pollutant Control Requirements	☑	☑	NA
PDP With Pollutant Control and Hydromodification Management Requirements	Requirements do not apply to Authority projects.		

3.4.1 Steps for All Development Projects

Standard Projects need to satisfy only the source control and site design requirements of Chapter 4 of this Manual, and then proceed to Chapter 8 to determine submittal requirements:

1. Select, identify, and detail specific source control BMPs. See Section 4.2.
2. Select, identify, and detail specific site design BMPs. See Section 4.3.
3. Document that all applicable source control and site design BMPs have been used. See Chapter 8.

3.4.2 Steps for PDPs With Only Pollutant Control Requirements

The steps below primarily consist of refinements to the conceptual steps completed as part of Section 3.3, accompanied by design-level detail and calculations. More detailed instructions for selection and design of storm water pollutant treatment BMPs are provided in Chapter 5:

1. Select locations for storm water pollutant control BMPs, and delineate and characterize DMAs using information gathered during the site planning phase.
2. Conduct feasibility analysis for harvest and use BMPs. See Section 5.4.1.
3. Conduct feasibility analysis for infiltration to determine the infiltration condition. See Section 5.4.2.
4. Based on the results of Steps 2 and 3, select the BMP category that is most appropriate for the site. See Section 5.5.
5. Calculate required BMP sizes and footprints. See Appendix B (sizing methods) and Appendix E (design criteria).
6. Evaluate whether the required BMP footprints will fit within the site, considering the site constraints; if not, then document infeasibility and move to the next step.

7. If using biofiltration BMPs, document conformance with the criteria for biofiltration BMPs found in Appendix F, including Appendix F.1, as applicable.
8. If needed, implement flow-through treatment control BMPs (for use with Alternative Compliance) for the remaining DCV. See Section 5.5.4 and Appendix B.6 for additional guidance.
9. If flow-through treatment control BMPs (for use with Alternative Compliance) were implemented, refer to Section 1.8.
10. Prepare a SWQMP documenting site planning and opportunity assessment activities, final site layout, and storm water management design. See Chapter 8.
11. Determine and document O&M requirements. See Chapters 7 and 8.

3.4.3 Steps for Projects With Pollutant Control and Hydromodification Management Requirements

The steps to consider when hydromodification management is required primarily consist of refinements to the conceptual steps completed as part of Section 3.3, accompanied by design-level detail and calculations. However, hydromodification management is not a requirement of Authority projects because all development drains directly to an enclosed embayment.

3.5 Project Planning and Design Requirements Specific to the Authority

It should be decided during initial project design whether FMD, SAN tenants, site operators, or another entity will be responsible for maintaining the selected structural BMPs for PDPs. While the Authority is responsible for overall operation of SAN, certain areas are operated by tenants under short- and long-term leases. Tenants may be responsible for maintenance of BMPs within their operational areas, as designated on their lease agreement. The Authority retains ultimate responsibility for oversight and enforcement of maintenance activities, and may levy penalties, including fines, to compel compliance with maintenance requirements. During project design, project proponents should consult with EAD to determine the appropriate responsible party for maintenance.

3.6 Phased Projects

Phased projects typically require a conceptual or master PDP SWQMP followed by more detailed submittals.

For phased projects, EAD may request a conceptual or master SWQMP that describes and illustrates, in broad outline, how the drainage for the project will comply with BMP Design Manual requirements. The level of detail in the conceptual or master SWQMP should be consistent with the scope and level of detail of the development approval being considered. The conceptual or master SWQMP should specify that a more detailed SWQMP for each later phase or portion of the project will be submitted with subsequent applications for approval of various project components.

As stated in Section 1.3, a project may not be segmented or phased into small parts either onsite or offsite if the effect is to reduce the quantity of impervious area and fall below thresholds for

applicability of storm water requirements. Phased projects must consider the total area of new or replaced impervious surface, and applicants cannot phase work to evade PDP requirements.

Source Control and Site Design Requirements for All Development Projects

This chapter presents the source control and site design requirements to be met by all projects, inclusive of Standard Projects and PDPs. Checklists H.4 for source control and H.5 for site design included in Appendix A can be used by both Standard Projects and PDPs to document conformance with the requirements.

4.1 General Requirements (GR)

GR-1: Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible.

The location of the BMP affects the ability of the BMP to retain, and/or treat, the pollutants from the contributing drainage area. BMPs must remove pollutants from runoff and should be placed as close to the pollutant source as possible.

> **How to comply**: Projects shall comply with this requirement by implementing source control (Section 4.2) and site design BMPs (Section 4.3) that are applicable to their project and site conditions.

GR-2: Structural BMPs must not be constructed within the waters of the U.S.

Construction, operation, and maintenance of a structural BMP in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

How to comply: Projects shall comply with this requirement by preparing project plans that illustrate the locations of all storm water BMPs and describe or depict the location of receiving waters.

GR-3: Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisances or pollutions associated with vectors (e.g., mosquitoes, rodents, or flies).

According to the California Department of Health, structural BMPs that retain standing water for over 96 hours are particularly concerning for facilitating mosquito breeding. Certain site design features that hold standing water may similarly produce mosquitoes.

How to comply: Projects shall comply with this requirement by incorporating design, construction, and maintenance principles to drain retained water within **96 hours** and minimize standing water. Design calculations shall be provided to demonstrate that the potential for standing water ponding at surface level and accessible to mosquitoes has been addressed. For water retained in biofiltration facilities that are not accessible to mosquitoes, this criterion is not applicable (i.e., water ponding in the gravel layer, water retained in the amended soil, etc.).

4.2 Source Control (SC) BMP Requirements

Source control BMPs avoid and reduce pollutants in storm water runoff. Everyday activities, such as recycling, trash disposal, and irrigation, generate pollutants that have the potential to drain to the storm water conveyance system. Source control BMPs are defined as an activity that reduces the potential for storm water runoff to come into contact with pollutants. An activity could include an administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, and inspection of an area.

Where applicable and feasible, all development projects are required to implement source control BMPs. Source control BMPs required by the MS4 Permit (SC-1 through SC-6) are discussed below. These correspond to existing source control BMPs required by the Authority in the Authority SWMP; the corresponding Authority BMP numbering is noted in the discussion of each BMP. Additional source control BMPs may be required by the Authority, depending on project type. The full list of Authority source control BMPs is provided in Appendix B of the Authority SWMP.

How to comply: Projects shall comply with this requirement by implementing source control BMPs listed in this section that are applicable to their project. Applicability shall be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E provides guidance for identifying source control BMPs applicable to a project. The "Source Control BMP Checklist for All Development Projects" located in Appendix A.3 for Standard Projects and A.4 for PDPs shall be used to document compliance with source control BMP requirements.

SC-1: Prevent illicit discharges into the MS4

An illicit discharge is any discharge to the MS4 that is not composed entirely of storm water, except discharges pursuant to a National Pollutant Discharge Elimination System permit and discharges resulting from firefighting activities. Projects must effectively eliminate discharges of non-storm water into the MS4. This may involve a suite of housekeeping BMPs that could include effective irrigation, dispersion of non-storm water discharges into landscaping for infiltration, and control of wash water from vehicle washing. This BMP corresponds to Authority BMPs SC01 (Non-Storm Water Management), SC04 (Aircraft, Ground Vehicle, and Equipment Cleaning), SC05 (Aircraft Deicing/Anti-Icing), SC09 (Building and Grounds Maintenance), SC11 (Lavatory Service Operation),

SC12 (Outdoor Washdown/Sweeping), SC13 (Fire Fighting Foam Discharge), SC14 (Potable Water System Flushing), SC15 (Runway Rubber Removal), and SC18 (Housekeeping).

SC-2: Identify the storm drain system using stenciling or signage

Storm drain signs and stencils are visible source controls typically placed adjacent to the inlets. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Stenciling shall be provided for all storm water conveyance system inlets and catch basins within the project area. Inlet stenciling may include concrete stamping, concrete painting, placards, or other methods approved by the Authority. This BMP corresponds to Authority BMP SC17 (Storm Drain Maintenance).

Language used on signs and stencils will include the words "No Dumping! Flows to Bay" or similar as approved by the EAD.

SC-3: Protect *outdoor material storage areas* from rainfall, run-on, runoff, and wind dispersal

Materials with the potential to pollute storm water runoff shall be stored in a manner that prevents contact with rainfall and storm water runoff. Contaminated runoff shall be managed for treatment and disposal (e.g., secondary containment directed to sanitary sewer). All development projects shall incorporate the following structural or pollutant control BMPs for outdoor material storage areas, as applicable and feasible:

- Materials with the potential to contaminate storm water shall be:
    - Placed in an enclosure such as, but not limited to, a cabinet, or similar structure, or under a roof or awning that prevents contact with rainfall runoff or spillage to the storm water conveyance system; or
    - Protected by secondary containment structures such as berms, dikes, or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills, where necessary.
- The storage area shall be sloped towards a sump or another equivalent measure that is effective to contain spills.
- Runoff from downspouts/roofs shall be directed away from storage areas.
- The storage area shall have a roof or awning that extends beyond the storage area to minimize collection of storm water within the secondary containment area. A manufactured storage shed may be used for small containers.

This BMP corresponds to Authority BMP SC07 (Outdoor Material Storage).

SC-4: Protect *materials stored in outdoor work areas* from rainfall, run-on, runoff, and wind dispersal

Outdoor work areas have an elevated potential for pollutant loading and spills. All development projects shall include the following structural or pollutant control BMPs for any outdoor work areas with potential for pollutant generation, as applicable and feasible:

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the size needed to protect the materials.
- Cover the area with a roof or other acceptable cover.
- Berm the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff to sanitary sewer or other specialized containment system(s), as needed and where feasible. This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
- Locate the work area away from storm drains or catch basins.

This BMP corresponds to Authority BMPs SC02A (Outdoor Equipment Operations and Maintenance Areas), SC02B (Aircraft, Ground Vehicle, and Equipment Maintenance), SC02C (Electric Vehicle Maintenance), SC03 (Aircraft, Ground Vehicle, and Equipment Fueling), SC06 (Outdoor Loading/Unloading of Materials), SC09 (Building and Grounds Maintenance), and SC21 (Construction and Remodeling/Repair).

SC-5: Protect *trash storage areas* from rainfall, run-on, runoff, and wind dispersal

Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. All development projects shall include the following structural or pollutant control BMPs, as applicable:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This can include berming or grading the waste handling area to prevent run-on of storm water.
- Ensure trash container areas are screened or walled to prevent offsite transport of trash.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Locate storm drains away from immediate vicinity of the trash storage area and vice versa.
- Post signs on all dumpsters informing users that hazardous material are not to be disposed.

This BMP corresponds to Authority BMP SC08 (Waste Handling and Disposal).

SC-6: Use any additional BMPs determined to be necessary by the Authority to minimize pollutant generation at each project site

Appendix E provides guidance on permanent controls and operational BMPs that are applicable at a project site based on potential sources of runoff pollutants at the project site. The applicant shall implement all applicable and feasible source control BMPs listed in Appendix E.

The full list of Authority source control BMPs is provided in Appendix B of the Authority SWMP (www.san.org/green). The following source control BMPs may apply, depending on project type:

1) SC01 – Non-Storm Water Management
2) SC02A – Outdoor Equipment Operations and Maintenance Areas
3) SC02B – Aircraft, Ground Vehicle, and Equipment Preventive Maintenance
4) SC02C – Electric Vehicle Maintenance
5) SC03 – Aircraft, Ground Vehicle, and Equipment Fueling
6) SC04 – Aircraft, Ground Vehicle, and Equipment Cleaning
7) SC05 – Aircraft Deicing/Anti-Icing
8) SC06 – Outdoor Loading/Unloading of Materials
9) SC07 – Outdoor Material Storage
10) SC08 – Waste Handling and Disposal
11) SC09 – Building and Grounds Maintenance
12) SC10 – Employee Training
13) SC11 – Lavatory Service Operations
14) SC12 – Outdoor Washdown/Sweeping (Apron Washing, Ramp Scrubbing)
15) SC13 – Firefighting Foam Discharge
16) SC14 – Potable Water System Flushing
17) SC15 – Runway Rubber Removal
18) SC16 – Parking Lots
19) SC17 – Storm Drain Maintenance
20) SC18 – Good Housekeeping
21) SC19 – Safer/Alternative Products
22) SC20 – Erodible Areas
23) SC21 – Construction and Remodeling/Repair
24) SR01 – Spill Prevention, Control, and Clean-up

4.3 Site Design (SD) BMP Requirements

Site design BMPs (also referred to as LID BMPs) are intended to reduce the rate and volume of storm water runoff and associated pollutant loads. Site design BMPs include practices that reduce the rate and/or volume of storm water runoff by minimizing surface soil compaction, reducing impervious surfaces, and/or providing flow pathways that are "disconnected" from the storm drain system, such as by routing flow over pervious surfaces. Site design BMPs may incorporate interception, storage, evaporation, evapotranspiration, infiltration, and/or filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site.

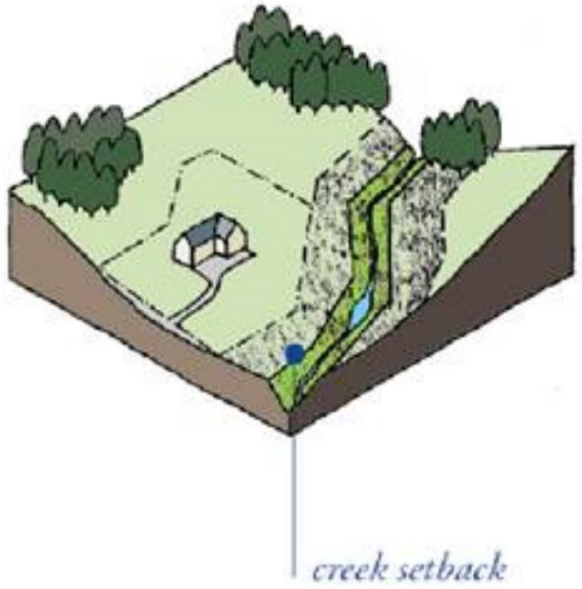
Site design BMPs shall be applied to all development projects as appropriate and practicable for the project site and project conditions. Site design BMPs are described in the following subsections.

> **How to comply**: Projects shall comply with this requirement by using all of the site design BMPs listed in this section that are applicable and practicable to their project type and site conditions. Applicability of a given site design BMP shall be determined on the basis of project type, soil conditions, presence of natural features (e.g., streams), and presence of site features (e.g., parking areas). Explanation shall be provided by the applicant when a certain site design BMP is considered to be not applicable or not practicable/feasible. Site plans shall show site design BMPs and provide adequate details necessary for effective implementation of site design BMPs. The "Site Design BMP Checklist for All Development Projects" located in Appendix A.3 for Standard Projects and Appendix A.4 for PDPs shall be used to document compliance with site design BMP requirements.

SD-1: Maintain natural drainage pathways and hydrologic features

- Maintain or restore natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)
- Include buffer zones for natural water bodies (where buffer zones are technically infeasible, include other buffers such as trees, access restrictions, etc.)

During the site assessment, natural drainages must be identified along with their connection to creeks and/or streams, if any. Natural drainages offer a benefit to storm water management as the soils and habitat already function as a natural filtering/infiltrating swale. When determining the development footprint of the site, altering natural drainages should be avoided. By providing a development envelope set back from natural drainages, the drainage can retain some water quality benefits to the watershed. In some situations, site constraints, regulations, economics, or other factors may not allow avoidance of drainages and sensitive areas. Projects proposing to dredge or fill materials in Waters of the U.S. must obtain Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain waste discharge requirements. Both the Section 401 Certification and the Waste Discharge Requirements are administered by the SDRWQCB. The project applicant shall consult EAD for other specific requirements.



Source: County of San Diego LID Handbook

Projects can incorporate SD-1 into a project by implementing the following planning and design phase techniques as applicable and practicable:

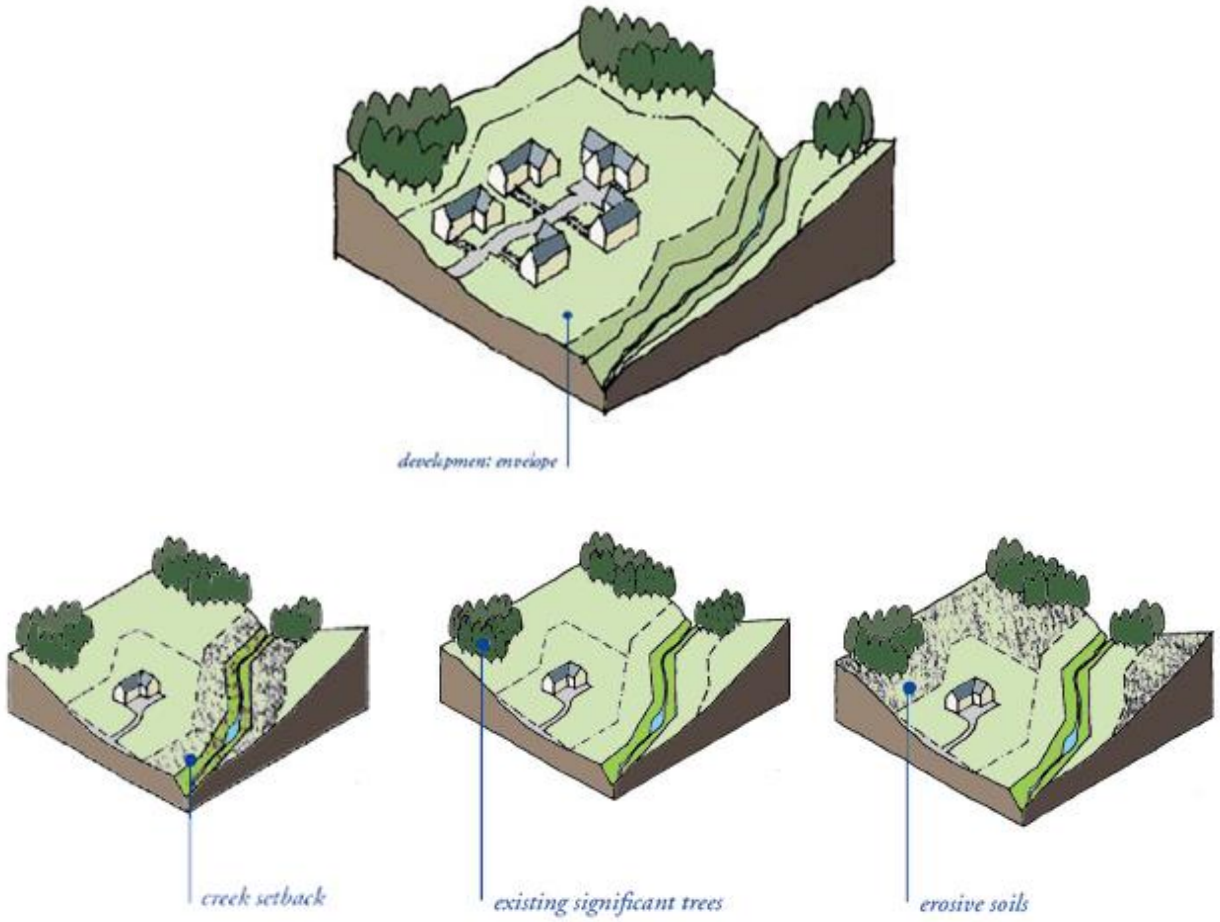
- Evaluate surface drainage and topography in considering selection of site design BMPs that will be most beneficial for a given project site. Where feasible, maintain topographic depressions for infiltration.

- Optimize the site layout and reduce the need for grading. Where possible, conform the site layout along natural landforms, avoid grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Integrating existing drainage patterns into the site plan will help maintain the site's predevelopment hydrologic function.
- Preserve existing drainage paths and depressions, where feasible and applicable, to help maintain the time of concentration and infiltration rates of runoff, and decrease peak flow.
- Do not locate structural BMPs in buffer zones if a state and/or federal resource agency (e.g., SDRWQCB, California Department of Fish and Wildlife; U.S. Army Corps of Engineers, etc.) prohibits maintenance or activity in the area.

SD-2: Conserve natural areas, soils and vegetation

- Conserve natural areas within the project footprint, including existing trees, other vegetation, and soils

To enhance a site's ability to support source control and reduce runoff, the conservation and restoration of natural areas must be considered in the site design process. By conserving or restoring the natural drainage features, natural processes are able to intercept storm water, thereby reducing the amount of runoff. SAN is highly developed and no natural areas exist; however, preservation of existing landscaped areas and the least tern nesting ovals should be considered in site design.

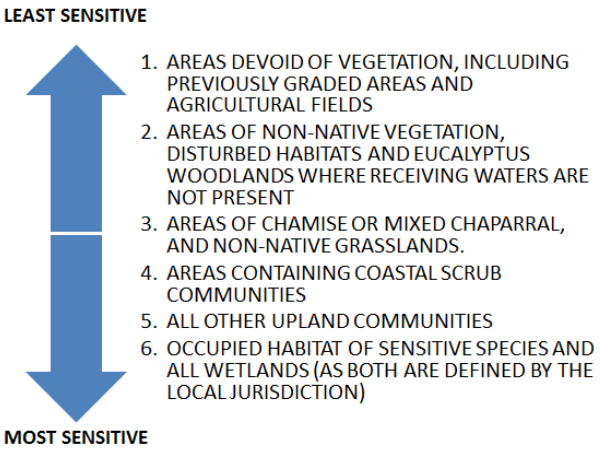


Source: County of San Diego LID Handbook

The upper soil layers of a natural area contain organic material, soil biota, vegetation, and a configuration favorable for storing and slowly conveying storm water and establishing or restoring vegetation to stabilize the site after construction. The canopy of existing native trees and shrubs also provides a water conservation benefit by intercepting rain water before it hits the ground. By minimizing disturbances in these areas, natural processes are able to intercept storm water, providing a water quality benefit. By keeping the development concentrated to the least environmentally sensitive areas of the site and set back from natural areas, storm water runoff is reduced, water quality can be improved, environmental impacts can be decreased, and many of the site's most attractive native landscape features can be retained. In some situations, site constraints, regulations, economics, and/or other factors may not allow avoidance of all sensitive areas on a project site. Project applicant shall consult EAD for specific requirements for mitigation of removal of sensitive areas.

Projects can incorporate SD-2 by implementing the following planning and design phase techniques as applicable and practicable:

- Identify areas most suitable for development and areas that should be left undisturbed. Additionally, reduced disturbance can be accomplished by increasing building density and increasing height, if possible.
- Cluster development on the least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Avoid areas with thick, undisturbed vegetation. Soils in these areas have a much higher capacity to store and infiltrate runoff than disturbed soils, and reestablishment of a mature vegetative community can take decades. Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events.



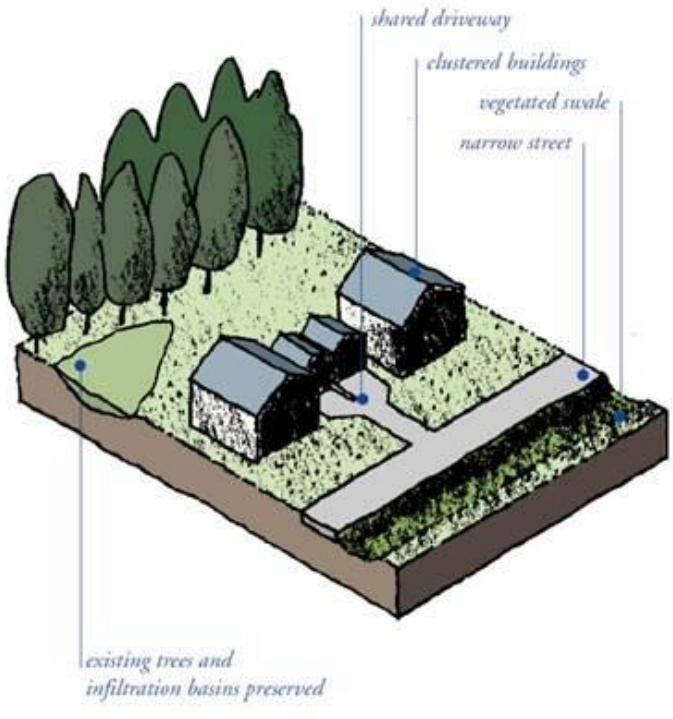
- Preserve trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs.
- In areas of disturbance, remove topsoil before construction and replace it after the project is completed. When handled carefully, such an approach limits the disturbance to native soils and reduces the need for additional (purchased) topsoil during later phases.
- Avoid sensitive areas, such as wetlands, biological open space areas, biological mitigation sites, streams, floodplains, or particular vegetation communities, such as coastal sage scrub and intact forest. Also, avoid areas that are habitat for sensitive plants and animals, particularly those, State or federally listed as endangered, threatened or rare (e.g., the least tern nesting ovals). Development in these areas is often restricted by federal, state and local laws.

SD-3: Minimize impervious area

- Construct streets, sidewalks, or parking lots aisles to the minimum widths necessary, provided public safety is not compromised
- Minimize the impervious footprint of the project

One of the principal causes of environmental impacts by development is the creation of impervious surfaces. Imperviousness links urban land development to degradation of aquatic ecosystems in two ways:

- First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust and be washed from the atmosphere during rainfall, or may be generated by automobiles and outdoor work activities.
- Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat.



Source: County of San Diego LID Handbook

Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Reducing impervious surfaces retains the permeability of the project site, allowing natural processes to filter and reduce sources of pollution.

Projects can incorporate SD-3 by implementing the following planning and design phase techniques as applicable and practicable:

- Decrease building footprints through the design of compact and taller structures when allowed by Authority zoning and design standards and provided that public safety and flight security are not compromised.
- Construct walkways, trails, patios, overflow parking lots, alleys, and other low-traffic areas with permeable surfaces.
- Construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and alternative transportation (e.g., pedestrians, bikes) are not compromised.

- Consider the implementation of shared parking lots and driveways where possible.
- Implement a landscaped area in the center of a parking lot or road to reduce impervious area, depending on configuration. Design of a landscaped parking lot or road must be coordinated with fire department personnel to accommodate turning radii and other operational needs.
- Design smaller parking lots with fewer stalls, smaller stalls, and more efficient lanes.
- Design indoor or underground parking.
- Minimize the use of impervious surfaces in the landscape design.

SD-4: Minimize soil compaction

- Minimize soil compaction in landscaped areas

The upper soil layers contain organic material, soil biota, and a configuration favorable for storing and slowly conveying storm water down gradient. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development, the site can retain some of its existing beneficial hydrologic function. Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates. It is important to recognize that areas adjacent to and under building foundations, roads, and manufactured slopes must be compacted with minimum soil density requirements in compliance with local building and grading ordinances.

Projects can incorporate SD-4 by implementing the following planning and design phase techniques as applicable and practicable:

- Avoid disturbance in planned green space and proposed landscaped areas where feasible. These areas that are planned for retaining their beneficial hydrological function should be protected during the grading/construction phase so that vehicles and construction equipment do not intrude and inadvertently compact the area.
- In areas planned for landscaping where compaction could not be avoided, re-till the soil surface to allow for better infiltration capacity. Soil amendments are recommended and may be necessary to increase permeability and organic content. Soil stability, density requirements, and other geotechnical considerations associated with soil compaction must be reviewed by a qualified landscape architect or licensed geotechnical, civil or other professional engineer.

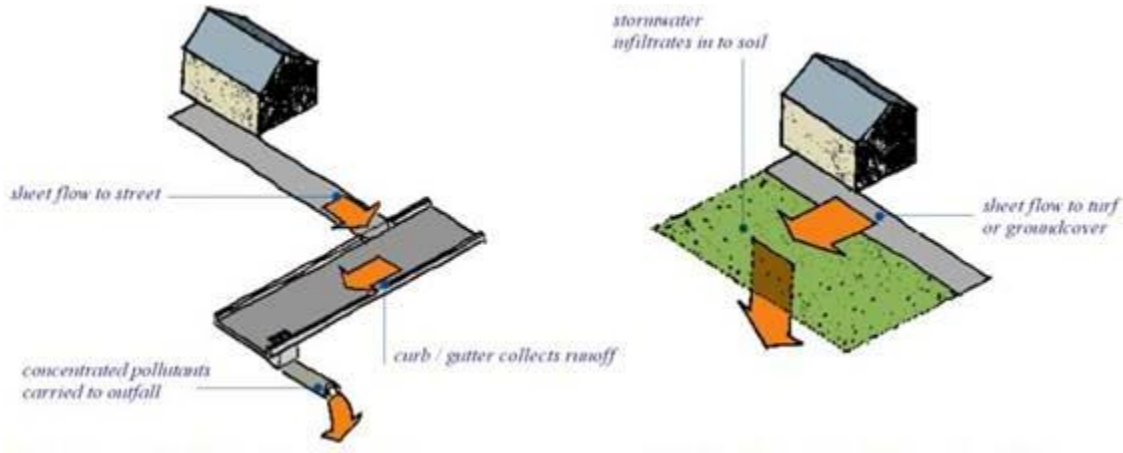
SD-5: Disperse impervious areas

- Disconnect impervious surfaces through disturbed pervious areas
- Design and construct landscaped or other pervious areas to effectively receive and infiltrate, retain and/or treat runoff from impervious areas prior to discharging to the MS4

Impervious area dispersion (dispersion) refers to the practice of essentially disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops, walkways, and roads onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes while achieving incidental treatment. Volume reduction from dispersion is dependent on the infiltration characteristics of the pervious area and the amount of impervious area draining to the pervious area. Treatment is achieved through filtration, shallow sedimentation, sorption, infiltration, evapotranspiration, biochemical processes, and plant uptake.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention of runoff reduces peak flows and volumes and allows pollutants to settle out or adhere to soils before they can be transported downstream. Disconnection practices may be applied in almost any location, but impervious surfaces must discharge into a suitable receiving area for the practices to be effective. Information gathered during the site assessment will help determine appropriate receiving areas.

Project designs should direct runoff from impervious areas to adjacent landscaping areas that have higher potential for infiltration and surface water storage. This will limit the amount of runoff generated, and therefore the size of the mitigation BMPs downstream. The design, including consideration of slopes and soils, must reflect a reasonable expectation that runoff will soak into the soil and produce no runoff of the DCV.



Source: County of San Diego LID Handbook

Projects can incorporate SD-5 by implementing the following planning and design phase techniques as applicable and practicable:

- Implement design criteria and considerations listed in impervious area dispersion fact sheet (SD-5) presented in Appendix E.
- Drain rooftops into adjacent landscape areas.
- Drain impervious parking lots, sidewalks, walkways, trails, and roads into adjacent landscape areas.
- Reduce or eliminate curb and gutters from roadway sections, thus allowing roadway runoff to drain to adjacent pervious areas.
- Replace curbs and gutters with roadside vegetated swales and direct runoff from the paved street or parking areas to adjacent LID facilities. Such an approach for alternative design can reduce the overall capital cost of the site development while improving the storm water quantity and quality issues and the site's aesthetics.
- Plan site layout and grading to allow for runoff from impervious surfaces to be directed into distributed permeable areas such as turf, landscaped or permeable recreational areas, medians, parking islands, planter boxes, etc.

- Detain and retain runoff throughout the site. On flatter sites, landscaped areas can be interspersed among the buildings and pavement areas. On hillside sites, drainage from upper areas may be collected in conventional catch basins and conveyed to landscaped areas in lower areas of the site.
- Ensure that pervious areas that receive run-on from impervious surfaces shall have a minimum width of 10 feet and a maximum slope of 5 percent.

SD-6: Collect runoff

- Use small collection strategies located at, or as close to as possible to, the sources (i.e., the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters
- Use permeable material for projects with low traffic areas and appropriate soil conditions

Distributed control of storm water runoff from the site can be accomplished by applying small collection techniques (e.g., green roofs), or integrated management practices, on small sub-catchments. Small collection techniques foster opportunities to maintain the natural hydrology and provide a much greater range of control practices. Integration of storm water management into landscape design and natural features of the site reduces site development and long-term maintenance costs, and provides redundancy if one technique fails. On flatter sites, it typically works best to intersperse landscaped areas and integrate small-scale retention practices among the buildings and paved areas.

Permeable pavements contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete, permeable asphalt). Project applicants should identify locations where permeable pavements could be substituted for impervious concrete or asphalt paving. The O&M of the site must ensure that permeable pavements will not be sealed in the future. In areas where infiltration is not appropriate, permeable paving systems can be fitted with an under drain to allow filtration, storage, and evaporation, prior to drainage into the storm drain system.

Projects can incorporate SD-6 by implementing the following planning and design phase techniques as applicable and practicable:

- Implementing distributed small collection techniques to collect and retain runoff
- Installing permeable pavements (see SD-6B in Appendix E)

SD-7: Landscape with native or drought tolerant species

All development projects are required to select a landscape design and plant palette that minimizes required resources (irrigation, fertilizers, and pesticides) and pollutants generated from landscaped areas. Native plants require less fertilizers and pesticides because they are already adapted to the rainfall patterns and soils conditions. Plants should be selected to be drought tolerant and should not require watering after establishment (2 to 3 years). Watering should only be required during prolonged dry periods after plants are established. Final selection of plant material needs to be made by a landscape architect experienced with LID techniques. Microclimates vary significantly throughout the region and consulting local municipal resources will help to select plant material suitable for a specific geographic location.

Projects can incorporate SD-7 by landscaping with native and drought tolerant species. Recommended plant list is included in Appendix E (Fact Sheet PL).

Photograph Courtesy of Arid Solutions, Inc.

SD-8: Harvest and use precipitation

Harvest and use BMPs capture and stores storm water runoff for later use. Harvest and use can be applied at smaller scales (Standard Projects) using rain barrels or at larger scales (PDPs) using cisterns. This harvest and use technique has been successful in reducing runoff discharged to the storm drain system conserving potable water and recharging groundwater.

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. The temporary storage of roof runoff reduces the runoff volume from a property and may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of storm water runoff that flows overland into a storm water conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into San Diego Bay. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater. The SD-8 fact sheet in Appendix E provides additional details for designing Harvest and Use BMPs. Projects can incorporate SD-8 by installing rain barrels or cisterns, as applicable.

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Storm Water Pollutant Control Requirements for PDPs

In addition to the site design and source control BMPs discussed in Chapter 4, PDPs are required to implement storm water pollutant control BMPs to reduce the quantity of pollutants in storm water discharges. Storm water pollutant control BMPs are engineered facilities that are designed to retain (i.e., intercept, store, infiltrate, evaporate, and evapotranspire), biofilter, and/or provide flow-through treatment of storm water runoff generated on the project site.

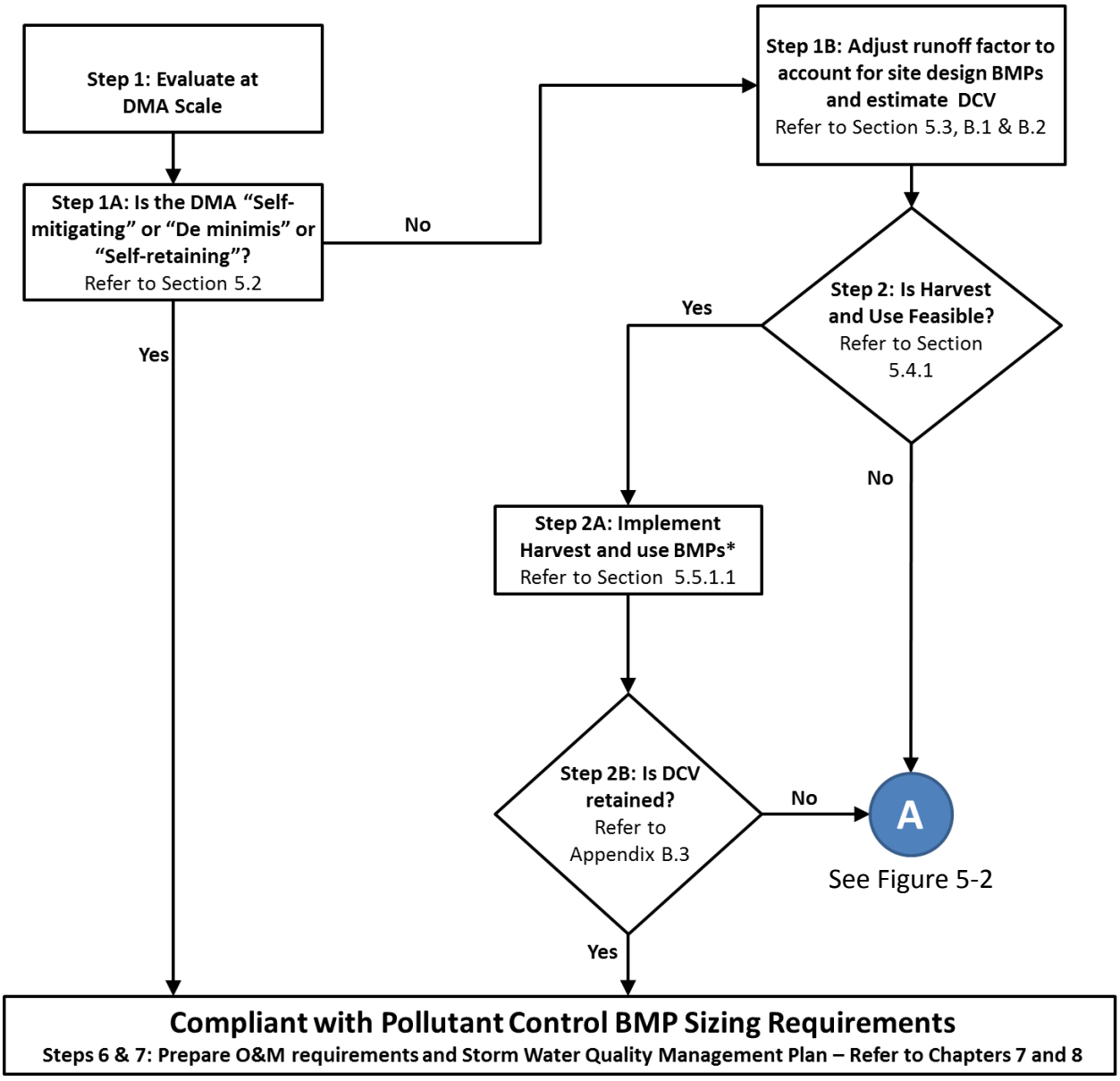
This chapter describes the specific process for determining which category of pollutant control BMP, or combination of BMPs, is most appropriate for the PDP site and how to design the BMP to meet the storm water pollutant control performance standard (per Section 2.2).

This chapter by itself is not a complete design guide for project development. It is intended to provide guidance for selecting and designing storm water pollutant control BMPs. Specifically, this chapter should be followed after having conducted site planning that maximizes opportunities for storm water retention and biofiltration as discussed in Chapter 3.

5.1 Steps for Selecting and Designing Storm Water Pollutant Control BMPs

Figures 5-1 and 5-2 present the flow chart for complying with storm water pollutant control BMP requirements. The steps associated with this flow chart are described below. A project is considered to be in compliance with storm water pollutant control performance standards if it follows and

implements this flow chart and follows the supporting technical guidance referenced from this flow chart.



* Step 2C: Project applicant has an option to also conduct feasibility analysis for infiltration and if infiltration is fully or partially feasible has an option to choose between infiltration and harvest and use BMPs. But if infiltration is not feasible and harvest and use is feasible, project applicant must implement harvest and use BMPs

FIGURE 5-1. Storm Water Pollutant Control BMP Selection Flow Chart

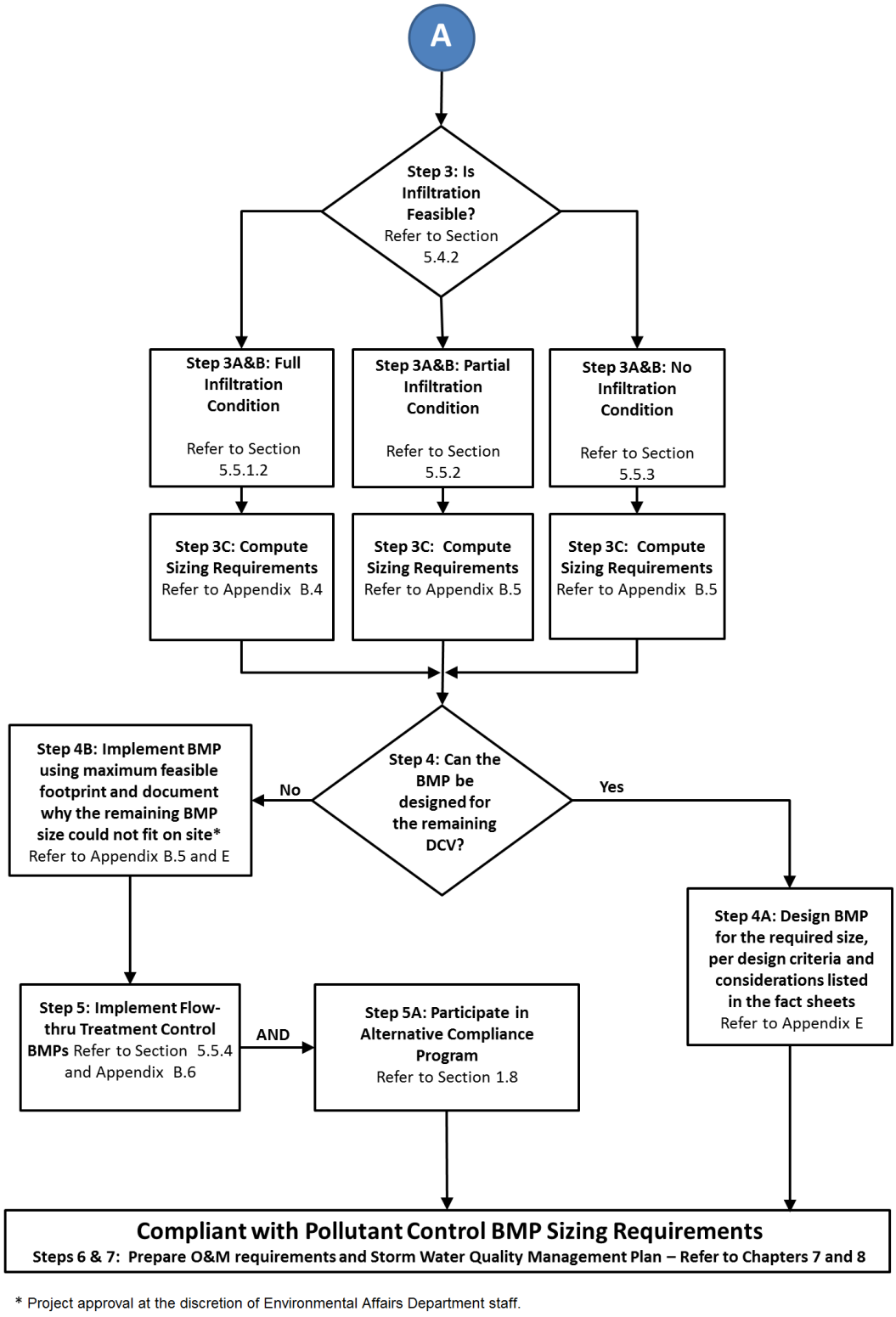


FIGURE 5-2. Storm Water Pollutant Control BMP Selection Flow Chart

Description of Steps:

Step 1. Based on the locations for storm water pollutant control BMPs and the DMA delineations developed during the site planning phase (See Section 3.3.3), calculate the DCV.

A. Identify DMAs that meet the criteria in Section 5.2 (self-mitigating and/or *de minimis* areas and/or self-retaining via qualifying site design BMPs).

B. Estimate the DCV for each remaining DMA. See Section 5.3.

Step 2. Conduct feasibility screening analysis for harvest and use BMPs. See Section 5.4.1.

A. If it is feasible, implement harvest and use BMPs (See Section 5.5.1.1) or go to Step 3.

B. Evaluate whether the DCV can be retained onsite using harvest and use BMPs. See Appendix B.3. If the DCV can be retained onsite, then the pollutant control performance standards are met.

C. (Optional): Conduct a feasibility analysis for infiltration and, if infiltration is feasible, choose between infiltration and harvest and use BMPs. If the analysis finds infiltration is not feasible and harvest and use is feasible, the applicant must implement harvest and use BMPs.

Step 3. Conduct a feasibility analysis for infiltration for the BMP locations selected. See Section 5.4.2.

A. Determine the preliminary feasibility categories of BMP locations on the basis of available site information. Determine the additional information needed to conclusively support findings. Use the "Categorization of Infiltration Feasibility Condition" checklist located in Appendix H.8 to conduct preliminary feasibility screening.

B. Select the storm water pollutant control BMP category on the basis of the preliminary feasibility condition.

i. Full Infiltration Condition– Implement infiltration BMP category, See Section 5.5.1.2

ii. Partial Infiltration Condition – Implement partial retention BMP category. See Section 5.5.2

iii. No Infiltration Condition – Implement biofiltration BMP category. See Section 5.5.3

C. After selecting BMPs, conduct design level feasibility analyses at BMP locations. The purpose of these analyses is to conform or adapt selected BMPs to maximize storm water retention and develop design parameters (e.g., infiltration rates, elevations). Document findings to substantiate BMP selection, feasibility, and design in the SWQMP. See Appendices C and D for additional guidance.

Step 4. Evaluate whether the required BMP footprint will fit considering the site design and constraints.

A. If the calculated footprint fits, then size and design the selected BMPs accordingly using design criteria and considerations from fact sheets presented in Appendix E. The project has met the pollutant control performance standards.

B. If the calculated BMP footprint does not fit, evaluate additional options to make space for BMPs. Examples include revising potential designs, reconfiguring DMAs, evaluating other or additional BMP locations, and evaluating other BMP types. If no additional options are practicable for making adequate space for the BMPs, then document why the remaining DCV could not be treated onsite and then implement the BMP using the maximum feasible footprint, design criteria, and considerations from fact sheets presented in Appendix E. Then continue to the next step. Project approval if the entire DCV could not be treated because the BMP size could not fit within the project footprint is at the discretion of EAD.

Step 5. Implement flow-through treatment control BMPs for the remaining DCV. See Section 5.5.4 and Appendix B.6 for additional guidance.

A. When flow-through treatment control BMPs are implemented, participate in an alternative compliance program. See Section 1.8.

Step 6. Prepare a SWQMP documenting site planning and opportunity assessment activities, final site layout, and storm water management design. See Chapter 8.

Step 7. Identify and document O&M requirements and confirm acceptability to the responsible party. See Chapters 7 and Chapter 8.

5.2 DMAs Excluded from DCV Calculation

This Manual provides project applicants the option to exclude DMAs from DCV calculations if they meet the criteria specified below. These DMAs must implement source control and site design BMPs from Chapter 4 as applicable and feasible. These exclusions will be evaluated on a case-by-case basis and approvals of these exclusions are at the discretion of EAD.

5.2.1 Self-mitigating DMAs

Self-mitigating DMAs consist of natural or landscaped areas that drain directly offsite or to the public storm drain system. Self-mitigating DMAs must meet **ALL** the following characteristics to be eligible for exclusion:

- Vegetation in the natural or landscaped area is native and/or non-native/non-invasive drought tolerant species that do not require regular application of fertilizers and pesticides.
- Soils are undisturbed native topsoil, or disturbed soils that have been amended and aerated to promote water retention characteristics equivalent to undisturbed native topsoil.
- The incidental impervious areas are less than 5 percent of the self-mitigating area.
- The impervious area within the self-mitigated area should not be hydraulically connected to other impervious areas unless it is a storm water conveyance system (such as brow ditches).
- The self-mitigating area is hydraulically separate from DMAs that contain permanent storm water pollutant control BMPs.

Figure 5.3 illustrates the concept of self-mitigating DMAs.

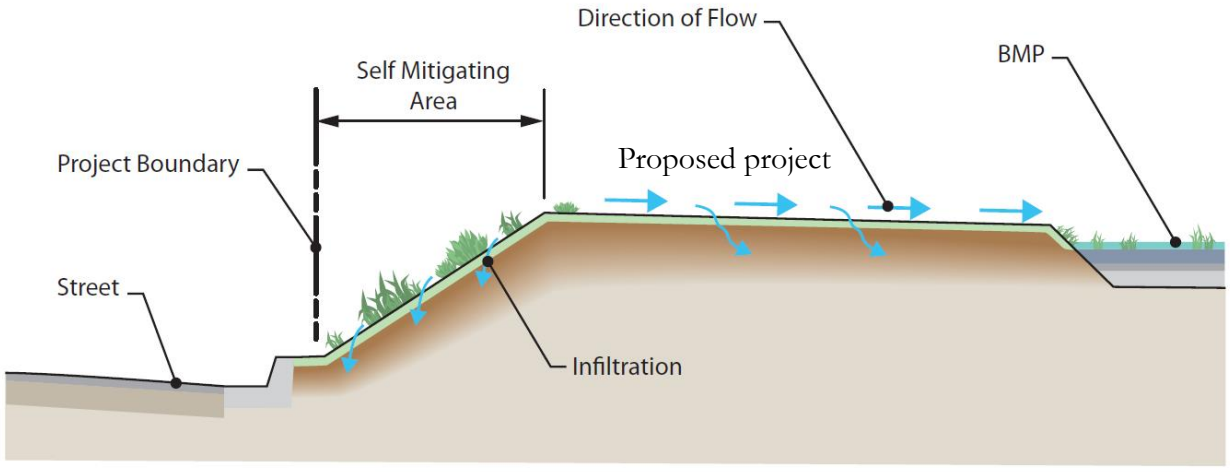


FIGURE 5-3. Self Mitigating Area

5.2.2 *De Minimis* DMAs

De minimis DMAs consist of areas that are very small, and therefore are not considered to be significant contributors of pollutants, and are considered by the project proponent and EAD not to be practicable to drain to a BMP. It is anticipated that only a small subset of projects will qualify for *de minimis* DMA exclusion. Examples include driveway aprons connecting to existing streets, portions of sidewalks, retaining walls at the external boundaries of a project, and similar features. *De minimis* DMAs must include **ALL** of the following characteristics to be eligible for exclusion:

- Areas abut the perimeter of the development site.
- Topography constraints make BMP construction to reasonably capture runoff technically infeasible.
- The portion of the site falling into this category is minimized through effective site design
- Each DMA should be less than 250 square feet and the sum of all *de minimis* DMAs should represent less than 2 percent of the total added or replaced impervious surface of the project. Except for projects where 2 percent of the total added or replaced impervious surface of the project is less than 250 square feet, a *de minimis* DMA of 250 square feet or less is allowed.
- Two *de minimis* DMAs cannot be adjacent to each other and hydraulically connected.
- The SWQMP must document the reason that each *de minimis* area could not be addressed otherwise.

5.2.3 Self-retaining DMAs via Qualifying Site Design BMPs

Self-retaining DMAs are areas that are designed with site design BMPs to retain runoff to a level equivalent to pervious land. BMP Fact Sheets for impervious area dispersion (SD-5 in Appendix E) and permeable pavement (SD-6B in Appendix E) describe the design criteria by which BMPs can be

considered self-retaining. DMAs that are categorized as self-retaining DMAs are considered to **only** meet the storm water pollutant control obligations.

Requirements for utilizing this category of DMA include the following:

- Site design BMPs such as impervious area dispersion and permeable pavement may be used individually or in combination to reduce or eliminate runoff from a portion of a PDP.
- If a site design BMP is used to create a self-retaining DMA, then the site design BMPs must be designed and implemented per the criteria in the applicable fact sheet. These criteria are conservatively developed to anticipate potential changes in DMA characteristics with time. The fact sheet criteria for impervious area dispersion and permeable pavement for meeting pollutant control requirement developed using continuous simulation are summarized as follows
    - SD-5 Impervious Area Dispersion: a DMA is considered self-retaining if the impervious to pervious ratio is:
        - 2:1 when the pervious area is composed of Hydrologic Soil Group A
        - 1:1 when the pervious area is composed of Hydrologic Soil Group B
    - SD-6B Self-retaining permeable pavement: a DMA is considered self-retaining if the ratio of total drainage area (including permeable pavement) to area of permeable pavement of 1.5:1 or less.
    - Note: The left side of ratios presented above represents the portion of the site that receives volume reduction and the right side of the ratio represents the site design BMP that promotes the achieved volume reduction.
- Site design BMPs used as part of a self-retaining DMA or as part of reducing runoff coefficients from a DMA must be clearly called out on project plans and in the SWQMP.
- EAD may accept or reject a proposed self-retaining DMA meeting these criteria at its discretion. Examples of rationale for rejection may include the potential for negative impacts (such as infiltration or vector issues), potential for significant future alteration of this feature, inability to visually inspect and confirm the feature, etc.

Other site design BMPs can be considered self-retaining for meeting storm water pollutant control obligations if the long-term annual runoff volume (estimated using continuous simulation following guidelines listed in Appendix G) from the DMA is reduced to a level equivalent to pervious land and the applicant provides supporting analysis and rationale for the reduction in long term runoff volume. Approval of other self-retaining areas is at the discretion of EAD. Figure 5.4 illustrates the concept of self-retaining DMAs.

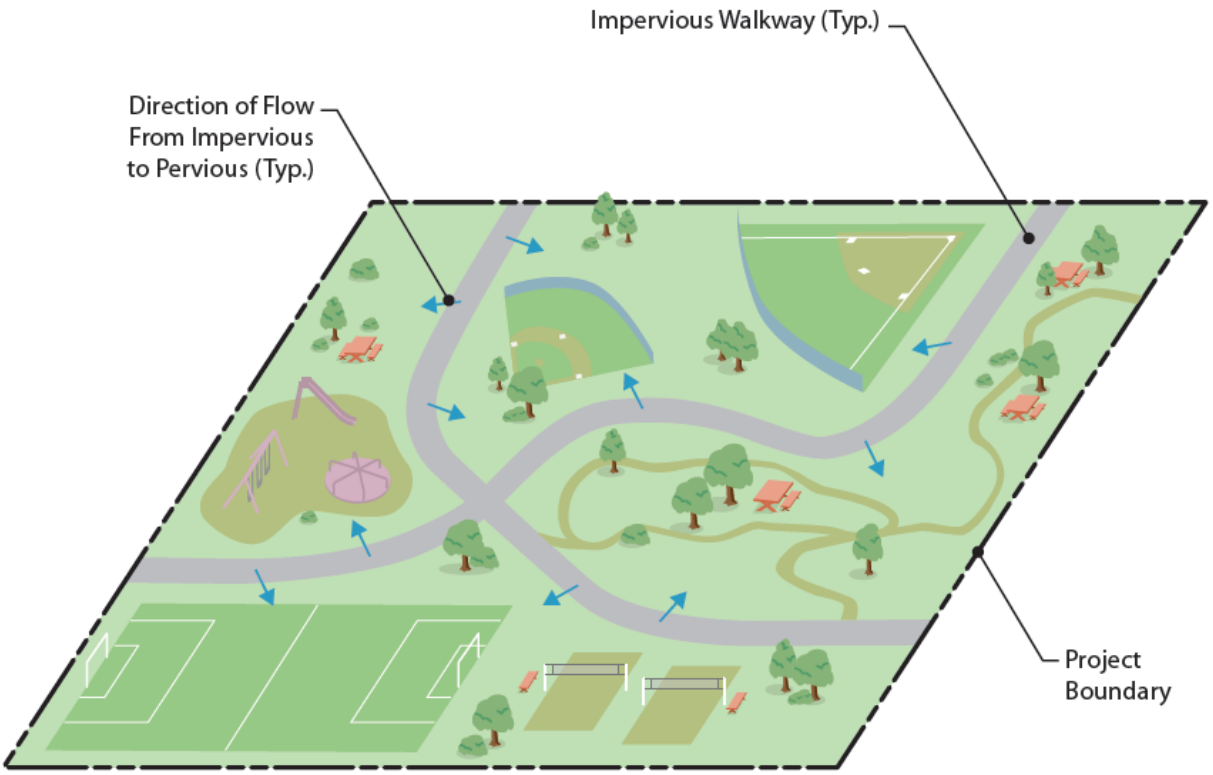


FIGURE 5-4. Self-retaining Site

5.3 DCV Reduction Through Site Design BMPs

Site design BMPs as discussed in Chapter 4 reduce the rate and volume of storm water runoff from the project site. This Manual provides adjustments to runoff factors for the following site design BMPs that may be incorporated into the project as part of an effective site design so that the downstream structural BMPs can be sized appropriately:

- SD-1 Street trees
- SD-5 Impervious area dispersion
- SD-6A Green roofs
- SD-6B Permeable pavement
- SD-8 Rain barrels

Methods for adjusting runoff factors for the site design BMPs listed above are presented in Appendix B.2. Site design BMPs used for reducing runoff coefficients from a DMA must be clearly called out on project plans and in the SWQMP. Approval of the claimed reduction of runoff factors is at the discretion of EAD.

5.4 Evaluating Feasibility of Storm Water Pollutant Control BMP Options

This section provides the fundamental process to establish which category, or combination of categories, of pollutant control BMP is feasible and to determine the volume of onsite retention that is feasible, either through harvest and use, or infiltration of the DCV. The feasibility screening process presented below establishes the volume of retention that can be achieved to fully or partially meet the pollutant control performance standards.

5.4.1 Feasibility Screening for Harvest and Use Category BMPs

Harvest and use is a BMP that captures and stores storm water runoff for later use. The primary question to be evaluated is:

- Is there a demand for harvested water within the project or project vicinity that can be met or partially met with rainwater harvesting in a practical manner?

Appendix B.3 provides guidance for determining the feasibility for using harvested storm water based on onsite demand. Step 2 from Section 5.1 describes how the feasibility results need to be considered in the pollutant control BMP selection process.

5.4.2 Feasibility Screening for Infiltration Category BMPs

After accounting for any potential onsite use of storm water, the next step is to evaluate how much storm water can be retained onsite primarily through infiltration of the DCV. Infiltration of storm water is dependent on many important factors that must be evaluated as part of infiltration feasibility screening. The key questions to determining the degree of infiltration that can be accomplished onsite are:

- Is infiltration potentially feasible and desirable?
- If so, what quantity of infiltration is potentially feasible and desirable?

These questions must be addressed in a systematic fashion to determine whether full infiltration of the DCV is potentially feasible. If when answering these questions it is determined that full infiltration is not feasible, then the portion of the DCV that could be infiltrated must be quantified, or a determination that infiltration in any appreciable quantity is infeasible or must be avoided. **This process is illustrated in Figure 5-5.** As a result of this process, conditions can be characterized as one of the three categories listed and defined below.

- **Full Infiltration Condition**: Infiltration of the full DCV is potentially feasible and desirable. More rigorous design-level analyses should be used to confirm this classification and establish specific design parameters such as infiltration rate and factor of safety. BMPs in this category may include bioretention and infiltration basins. See Section 5.5.1.2.
- **Partial Infiltration Condition**: Infiltration of a significant portion of the DCV may be possible, but site factors may indicate that infiltration of the full DCV is either infeasible or not desirable. Select BMPs that provide opportunity for partial infiltration, e.g., biofiltration with partial retention. See Section 5.5.2.

- **No Infiltration Condition**: Infiltration of any appreciable volume should be avoided. Some incidental volume losses may still be possible, but any appreciable quantity of infiltration would introduce undesirable conditions. Other pollutant control BMPs should be considered e.g., biofiltration or flow-through treatment control BMPs and participation in alternative compliance (Section 1.8) for the portion of the DCV that is not retained or biofiltered onsite. See Section 5.5.3 and 5.5.4.

The "Categorization of Infiltration Feasibility Condition" checklist in Appendix H must be used to document the findings of the infiltration feasibility assessment and must be supported by all associated information used in the feasibility findings. Appendices C and D in this Manual provide additional guidance and criteria for performing feasibility analysis for infiltration. All PDPs are required to complete this worksheet. At the site planning phase, this worksheet can help guide the design process by influencing project layout and selection of infiltration BMPs, and identifying whether more detailed studies are needed. At the design and final report submittal phase, planning level categorizations related to infiltration must be confirmed or revised and rigorously documented and supported on the basis of design-level investigations and analyses, as needed. A Geological Investigation Report must be prepared for all PDPs implementing onsite structural BMPs. This report should be attached to the SWQMP. Geotechnical and groundwater investigation report requirements are listed in Appendix C.

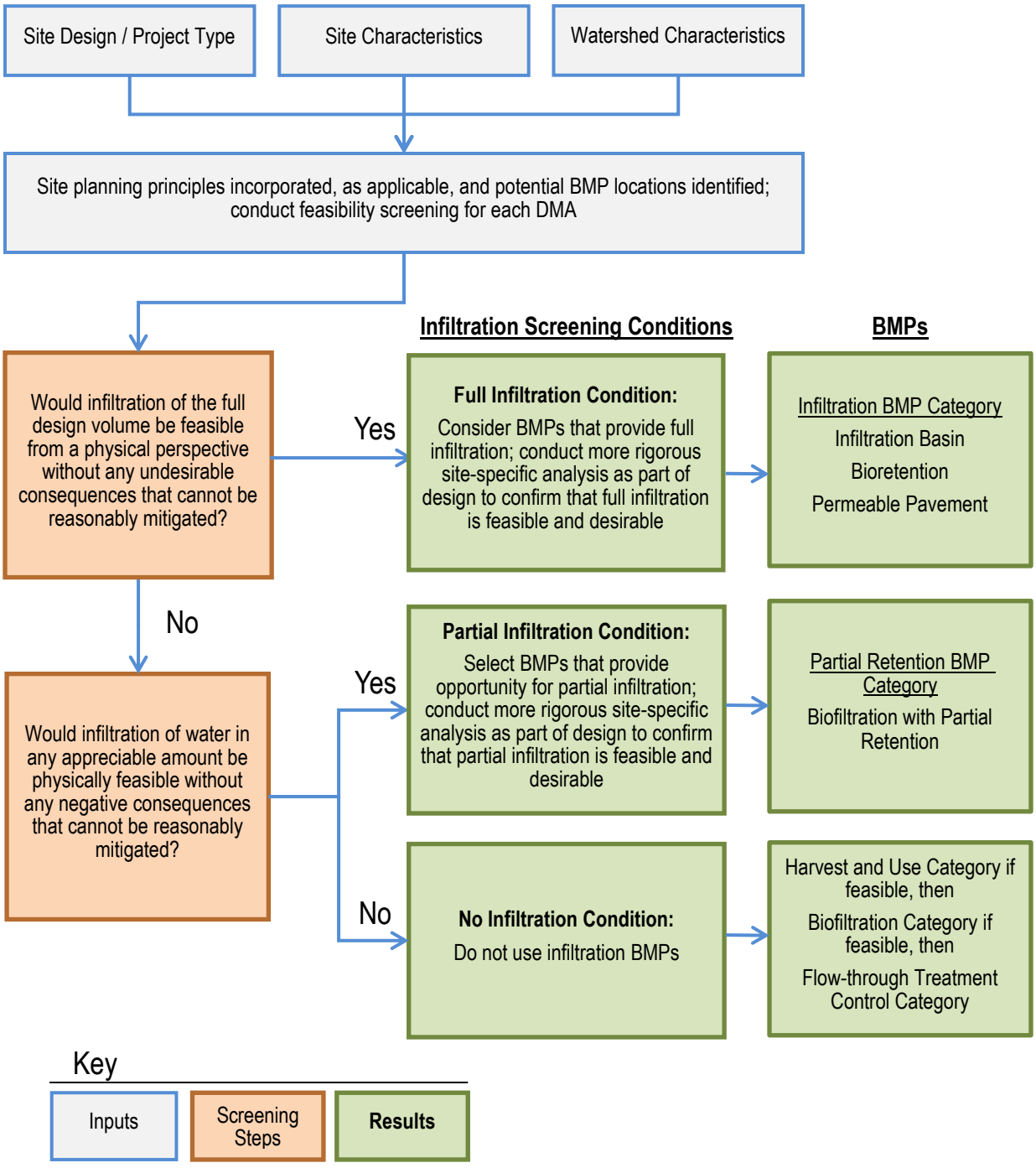


FIGURE 5-5. Infiltration Feasibility and Desirability Screening Flow Chart

5.5 BMP Selection and Design

BMP selection shall be based on steps listed in Section 5.1 and the feasibility screening process described in Section 5.4. Selected BMPs must be designed on the basis of accepted design standards. The BMP designs described in the BMP Fact Sheets (Appendix E) shall constitute the allowable storm water pollutant control BMPs for the purpose of meeting storm water management requirements. Other BMP types and variations on these designs may be approved at the discretion of EAD if documentation is provided demonstrating that the BMP is functionally equivalent or better than those described in this Manual.

This section provides an introduction to each category of BMP and provides links to fact sheets that contain recommended criteria for the design and implementation of BMPs. Table 5-1 maps the BMP category to the fact sheets provided in Appendix E. Criteria specifically described in these fact sheets override guidance contained in outside referenced source documents. Where criteria are not specified, the applicant and the project review staff should use best professional judgment based on the recommendations of the referenced guidance material or other published and generally accepted sources. When an outside source is used, the preparer must document the source in the SWQMP.

TABLE 5-1. Permanent Structural BMPs for PDPs

MS4 Permit Category	Manual Category	BMPs
Retention	Harvest and Use (HU)	HU-1: Cistern
Retention	Infiltration (INF)	INF-1: Infiltration basin INF-2: Bioretention INF-3: Permeable pavement
NA	Partial Retention (PR)	PR-1: Biofiltration with partial retention
Biofiltration	Biofiltration (BF)	BF-1: Biofiltration BF-2: Nutrient Sensitive Media Design BF-3: Proprietary Biofiltration
Flow-through treatment control	Flow-through treatment control with Alternative Compliance (FT)	FT-1: Vegetated swales FT-2: Media filters FT-3: Sand filters FT-4: Dry extended detention basins FT-5: Proprietary flow-through treatment control

5.5.1 Retention Category

5.5.1.1 Harvest and Use BMP Category

Harvest and use (typically referred to as rainwater harvesting) BMPs capture and store storm water runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. Uses of captured water shall not result in runoff to storm drains or receiving waters. Potential uses of captured water may include irrigation demand, indoor non-potable demand, industrial process water demand, or other demands.

Selection: Harvest and use BMPs shall be selected after performing a feasibility analysis per Section 5.4.1. Based on findings from Section 5.4, if both harvest and use and full infiltration of the DCV are feasible onsite, the project applicant has an option to implement either harvest and use BMPs and/or infiltration BMPs to meet the storm water requirements.

Design: A worksheet for sizing harvest and use BMPs is presented in Appendix B.3 and the fact sheet for sizing and designing the harvest and use BMP is presented in Appendix E. Figure 5-6 shows a schematic of a harvest and use BMP.

BMP option under this category:

- HU-1: Cistern

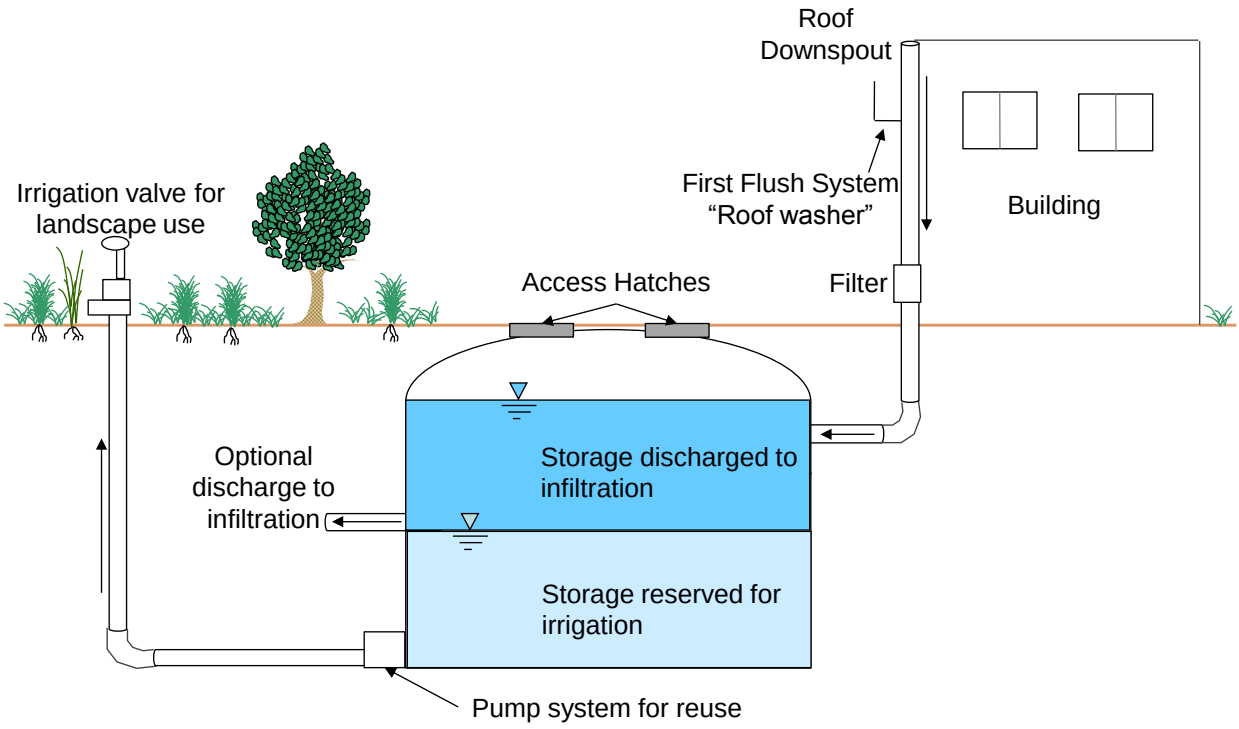


FIGURE 5-6. Schematic of a Typical Cistern

5.5.1.2 Infiltration BMP Category

Infiltration BMPs are structural measures that capture, store, and infiltrate storm water runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. These types of BMPs may also support evapotranspiration processes, but are characterized by having their most dominant volume losses due to infiltration. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality for areas draining to infiltration BMPs and runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration.

Selection: Selection of this BMP category shall be based on analysis according to Sections 5.1 and 5.4.2. Dry wells are considered Class V injection wells and are subject to underground injection control (UIC) regulations. Dry wells are only allowed when registered with the USEPA.

Design: Appendix B.4 has a worksheet for sizing infiltration BMPs, Appendix D has guidance for estimating infiltration rates for use in design the BMP, and Appendix E provides fact sheets to design the infiltration BMPs. Appendices B.6.2.1, B.6.2.2, and D.5.3 have guidance for selecting appropriate pretreatment for infiltration BMPs. Figure 5-7 shows a schematic of an infiltration basin.

BMP options under this category:

- INF-1: Infiltration Basins
- INF-2: Bioretention
- INF-3: Permeable Pavement
- Dry Wells

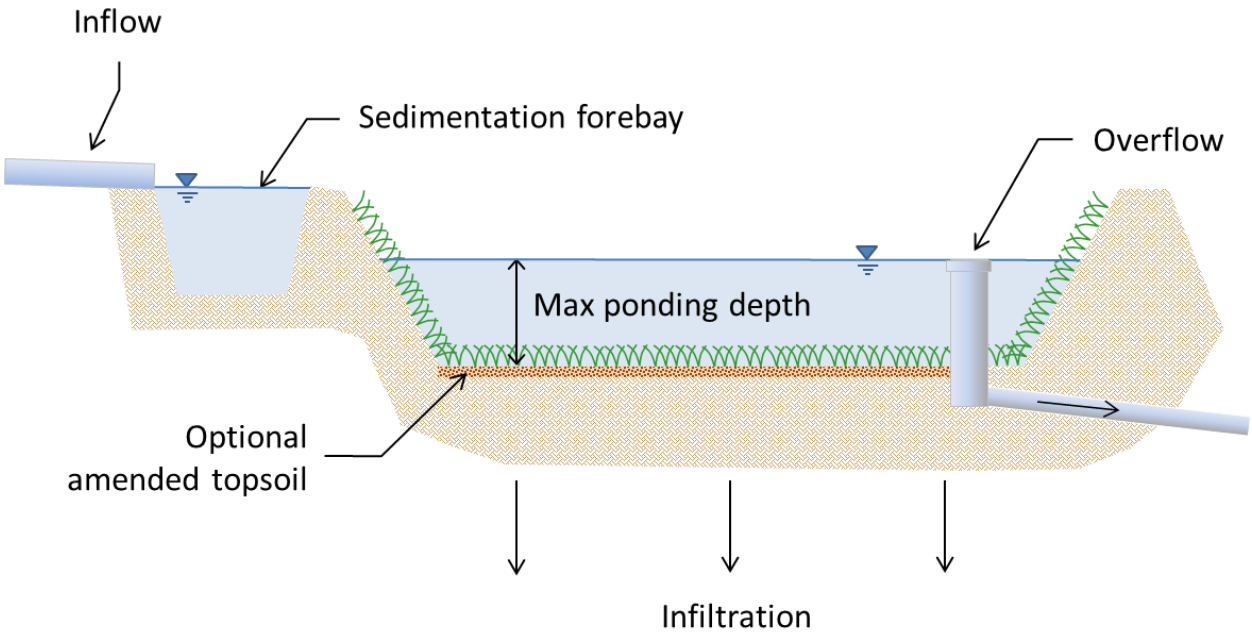


FIGURE 5-7. Schematic of a Typical Infiltration Basin

5.5.2 Partial Retention BMP Category

Partial retention category is defined by structural measures that incorporate both infiltration (in the lower treatment zone) and biofiltration (in the upper treatment zone). Example includes biofiltration with partial retention BMP.

5.5.2.1 Biofiltration With Partial Retention BMP

Biofiltration with partial retention BMPs are shallow basins filled with treatment media and drainage rock that manage storm water runoff through infiltration, evapotranspiration, and biofiltration. These BMPs are characterized by a subsurface stone infiltration storage zone in the bottom of the BMP below the elevation of the discharge from the underdrains. The discharge of biofiltered water from the underdrain occurs when the water level in the infiltration storage zone exceeds the elevation of the underdrain outlet. The storage volume can be controlled by the elevation of the underdrain outlet (shown in Figure 5-8), or other configurations. Other typical biofiltration with partial retention components include a media layer and associated filtration rates, drainage layer with associated in-situ soil infiltration rates, and vegetation.

Selection: Biofiltration with partial retention BMP shall be selected if the project site feasibility analysis performed according to Section 5.4.2 determines a partial infiltration feasibility condition.

Design: Appendix B.5 provides guidance for sizing biofiltration with partial retention BMP and Appendix E provides a fact sheet to design biofiltration with partial retention BMP.

BMP option under this category:

- PR-1: Biofiltration With Partial Retention

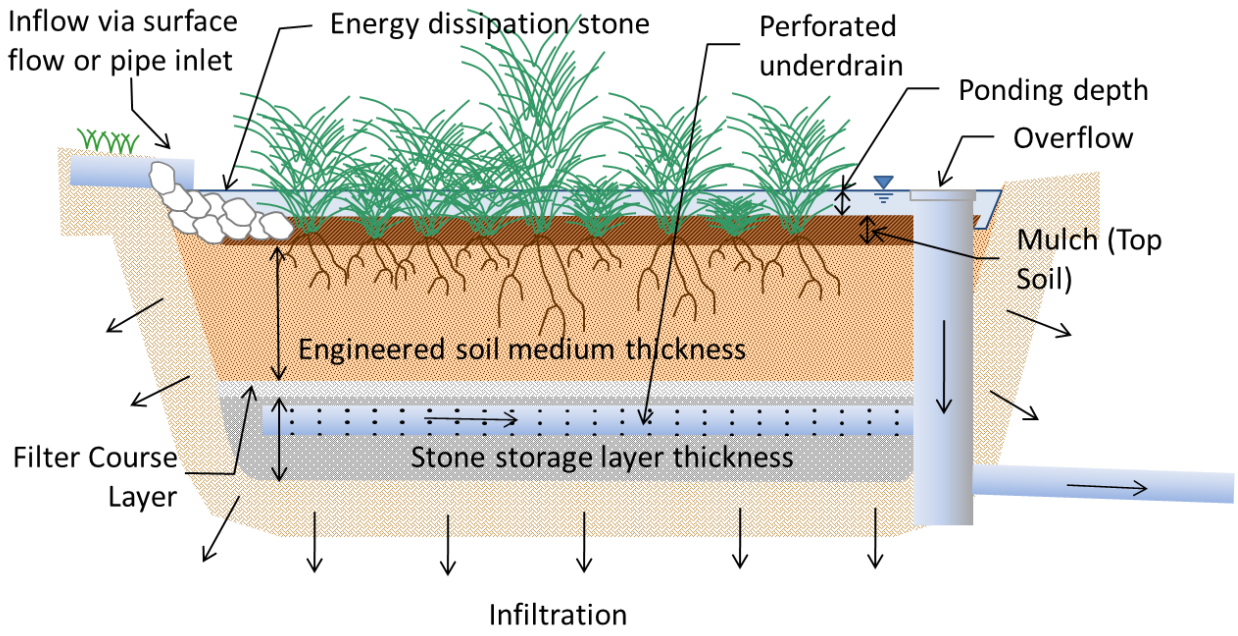


FIGURE 5-8. Schematic of a Typical Biofiltration with Partial Retention BMP

5.5.3 Biofiltration BMP Category

Biofiltration BMPs are shallow basins filled with treatment media and drainage rock that treat storm water runoff by capturing and detaining inflows prior to controlled release through minimal incidental infiltration, evapotranspiration, or discharge via underdrain or surface outlet structure. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes, and/or vegetative uptake. Biofiltration BMPs can be designed with or without vegetation, provided that biological treatment processes are present throughout the life of the BMP via maintenance of plants, media base flow, or other biota-supporting elements. By default, BMP BF-1 shall include vegetation unless it is demonstrated, to the satisfaction of EAD, that effective biological treatment process will be maintained without vegetation. Typical biofiltration components include a media layer with associated filtration rates, drainage layer with associated in-situ soil infiltration rates, underdrain, inflow and outflow control structures, and vegetation, with an optional impermeable liner installed on an as needed basis due to site constraints.

Selection: Biofiltration BMPs shall be selected if the project site feasibility analysis performed according to Section 5.4.2 determines a No Infiltration Feasibility Condition.

Design: Appendix B.5 has a worksheet for sizing biofiltration BMPs and Appendix E provides fact sheets to design the biofiltration BMP. Figure 5-9 shows the schematic of a biofiltration Basin.

BMP option under this category:

- BF-1: Biofiltration
- BF-2: Nutrient Sensitive Media Design
- BF-3: Proprietary Biofiltration

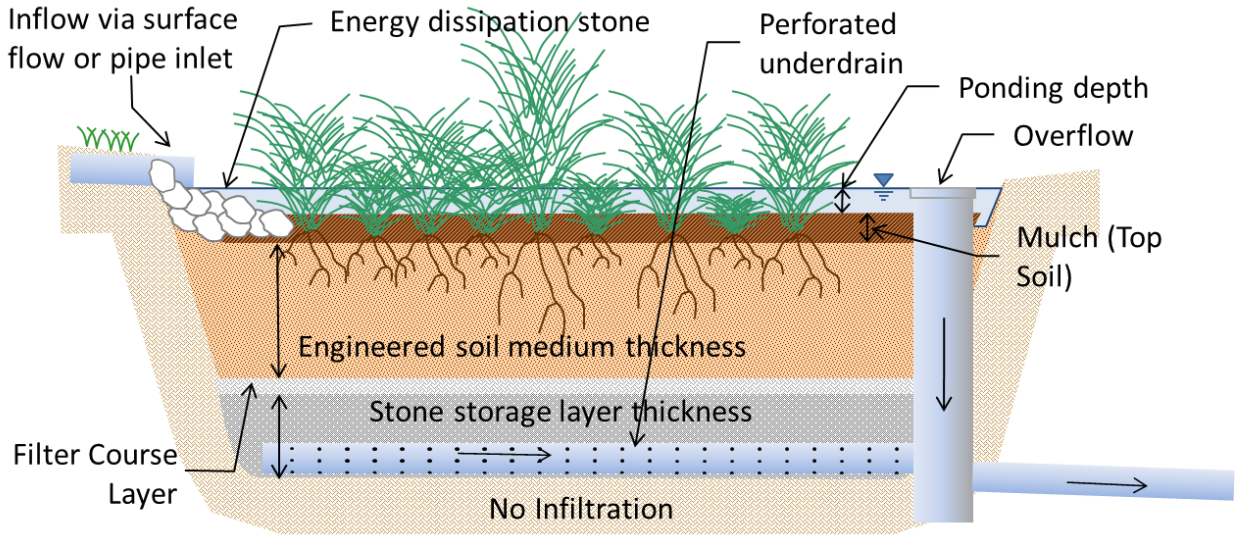


FIGURE 5-9. Schematic of a Typical Biofiltration Basin

Alternative Biofiltration Options: Other BMPs, including proprietary BMPs (See fact sheet BF-3) may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in Appendix F, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with its performance certifications, if applicable, and (3) are acceptable at the discretion of EAD. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met. In determining the acceptability of an alternative biofiltration BMP, the Authority will consider, as applicable, (1) the data submitted; (2) representativeness of the data submitted; (3) consistency of the BMP performance claims with pollutant control objectives and certainty of the BMP performance claims; (4) for projects within the public right of way and/or public projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, and ability to continue to operate the system in event that the vending company is no longer operating as a business; and (5) other relevant factors. If a proposed BMP is not accepted by EAD, a written explanation/reason will be provided to the applicant.

5.5.4 Flow-through Treatment Control BMPs (for Use With Alternative Compliance) Category

Flow-through treatment control BMPs are structural, engineered facilities that are designed to remove pollutants from storm water runoff using treatment processes that do not incorporate significant biological methods.

Selection: Flow-through treatment control BMPs shall be selected on the basis of the criteria in Appendix B.6. Flow-through treatment control BMPs may be implemented to satisfy PDP structural BMP performance requirements only if an appropriate offsite alternative compliance project is also constructed to mitigate for the pollutant load in the portion of the DCV not retained onsite. The alternative compliance program is an optional element that may be developed by each jurisdiction (see Section 1.8).

Design: Appendix B.6 provides the methodology, required tables, and worksheet for sizing flow-through treatment control BMPs and Appendix E provides fact sheets to design the following flow-through treatment control BMPs. Figure 5-10 shows a schematic of a Vegetated Swale as an example of a flow-through treatment control BMP.

BMP options under this category:

- FT-1: Vegetated Swales
- FT-2: Media Filters
- FT-3: Sand Filters
- FT-4: Dry Extended Detention Basin
- FT-5: Proprietary Flow-Through Treatment Control

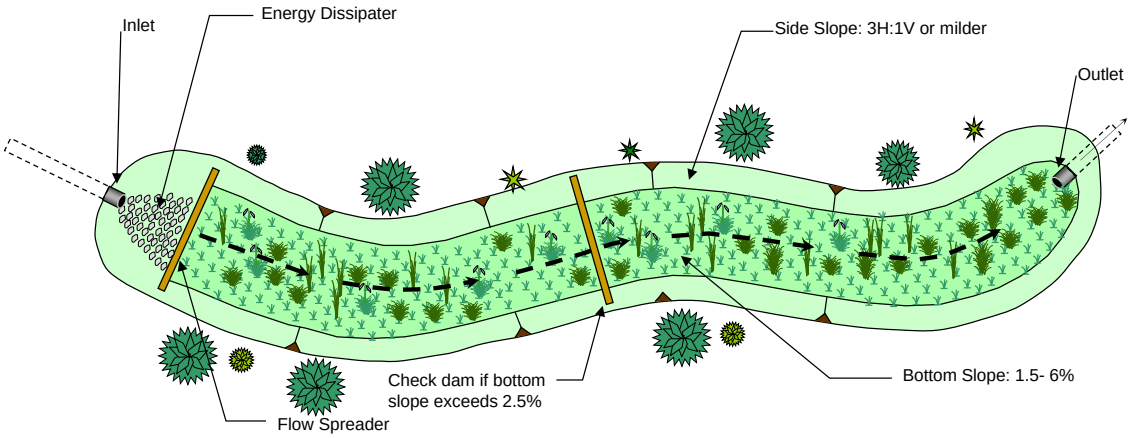


FIGURE 5-10. Schematic of a Vegetated Swale

Use of Proprietary BMP Options: A proprietary BMP (see fact sheet FT-5) can be classified as a flow-through treatment control BMP if (1) it is demonstrated to meet the flow-through treatment performance criteria in Appendix B.6, (2) is designed and maintained in a manner consistent with its applicable performance certifications, and (3) is acceptable at the discretion of the EAD. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to justify the use of a proprietary flow-through treatment control BMP. In determining the acceptability of an proprietary flow-through treatment control BMP, the Authority will consider, as applicable, (1) the data submitted; (2) representativeness of the data submitted; (3) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (4) for projects within the public right of way and/or public projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to and continue to operate the system in event that the vending company is no longer operating as a business; and (5) other relevant factors. If a proposed BMP is not accepted by EAD, a written explanation/reason will be provided to the applicant.

5.5.5 Alternate BMPs

New and proprietary BMP technologies may be available that meet the performance standards in Chapter 2 but are not discussed in this Manual. Use of these alternate BMPs to comply with permit obligations is at the discretion of the EAD. Alternate BMPs must meet the standards for biofiltration BMPs or flow-through BMPs (depending on how they are used), as described in Appendix F and Appendix B.6, respectively.

Chapter

6

Hydromodification Management Requirements for PDPs

The purpose of hydromodification management requirements for PDPs is to minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters. As discussed in Section 1.6, development within Authority jurisdiction is not subject to hydromodification management requirements. All discharges drain directly to San Diego Bay, an enclosed embayment. Therefore, this section, as written in the Model BMP Design Manual, is not included here.

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Long Term Operation & Maintenance

Permanent structural BMPs require ongoing inspection and maintenance into perpetuity to preserve the intended pollution control and/or flow control performance.

This chapter addresses procedural requirements for implementation of long-term O&M and the typical maintenance requirements of structural BMPs presented in the Manual. Specific requirements for O&M Plan reports will be discussed in Chapter 8 with the Submittal Requirements.

7.1 Need for Permanent Inspection and Maintenance

7.1.1 MS4 Permit Requirements

The MS4 Permit requires that the Authority implement a program that requires and confirms structural BMPs on all PDPs are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

Routine inspection and maintenance of BMPs will preserve the design and MS4 Permit objective to remove pollutants in storm water to the MEP. The MS4 Permit requirement specifically applies to PDP structural BMPs. However, source control BMPs and site design/LID BMPs within a PDP are components in the storm water management scheme that determine the amount of runoff to be treated by structural BMPs; when source control, site design, or LID BMPs are not maintained, this can lead to clogging or failure of structural BMPs due to greater delivery of runoff and pollutants than intended. Therefore, EAD may also require confirmation of maintenance of source control BMPs and site design/LID BMPs as part of their PDP structural BMP maintenance documentation requirements (see Section 7.4).

7.1.2 Practical Considerations

Why do permanent structural BMPs require ongoing inspection and maintenance into perpetuity?

By design, structural BMPs will trap pollutants transported by storm water. Structural BMPs are subject to deposition of solids such as sediment, trash, and other debris. Some structural BMPs are also subject to growth of vegetation, either by design (e.g., biofiltration) or incidentally. The pollutants and any overgrown vegetation must be removed on a periodic basis for the life of the BMP to maintain the capacity of the structural BMP to process storm water and capture pollutants from every storm event. Structural BMP components are also subject to clogging from trapped pollutants and growth of vegetation. Clogged BMPs can result in flooding, standing water, and mosquito breeding habitat. Maintenance is critical to ensure the ongoing drainage of the facility. All components of the BMP must be maintained, including both the surface and any subsurface components.

Vegetated structural BMPs, including vegetated infiltration or partial infiltration BMPs and above-ground detention basins, also require routine maintenance so that they do not inadvertently become wetlands, waters of the state, or sensitive species habitat under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and Wildlife Service. A structural BMP that is constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of one or more of the above-mentioned resource agencies. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, routine maintenance is key to preventing this scenario.

7.2 Summary of Steps to Maintenance Agreement

Ownership and maintenance responsibility for structural BMPs should be discussed at the *beginning of project planning*, typically at the pre-application meeting with EAD.

Experience has shown provisions to finance and implement maintenance of BMPs can be a major stumbling block to project approval. Project owners shall be aware of their responsibilities regarding storm water BMP maintenance and need to be familiar with the contents of the O&M Plan prepared for the project. Chapter 8 provides the guidelines for preparation of a site specific O&M Plan. A maintenance mechanism must be determined prior to the issuance of any construction, grading, building permit, site development permit, or any other applicable permit. Below are typical steps and schedule for establishing a plan and mechanism to ensure on-going maintenance of structural BMPs.

The final O&M plan submitted to EAD must describe the designated responsible party to manage the structural BMP(s), any necessary employee or tenant training and duties, operating schedule, maintenance frequency, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, the O&M Plan will require the inspection and servicing of all structural BMPs on an annual basis. The tenant shall document all maintenance and shall retain records for at least 5 years. These documents shall be made available to the Authority for inspection upon request at any time. O&M Plans will also be prepared for capital projects that include structural BMPs.

The Authority maintains the rights to access tenant properties as part of lease provisions. These rights extend to any access required related to structural BMPs.

TABLE 7-1. Schedule for Developing O&M Plan and Agreement

Item	Description	Time Frame
1	Determine structural BMP ownership, party responsible for permanent O&M, and maintenance funding mechanism	Prior to first submittal of a project application – discuss with staff at pre-application meeting
2	Identify expected maintenance actions	First submittal of a project application – identify in SWQMP
3	Develop detailed O&M Plan	As required by EAD, prior to issuance of project approvals
4	Update/finalize O&M Plan to reflect constructed structural BMPs with as-built plans and baseline photos	As required by EAD, upon completion of construction of structural BMPs
5	Prepare draft O&M Agreement	As required by EAD and Business & Financial Management Department
6	Execute O&M Agreement	As required by EAD and Business & Financial Management Department

7.3 Maintenance Responsibility

Who is responsible for the maintenance of the permanent structural BMPs into perpetuity?

The project owner is responsible to ensure inspection, and O&M of permanent structural BMPs within their facility (i.e., either the Authority itself or a tenant, unless responsibility has been formally transferred from the tenant to the Authority). For tenant projects, when tenant areas change (i.e., the area falls under a new tenant lease) maintenance responsibility also transfers to the new tenant. For Authority projects, FMD is responsible for maintenance. If property ownership changes (i.e., the property is sold or otherwise transferred to a new owner), maintenance responsibility also transfers to the new owner. For tenant structural BMPs that will be transferred to the Authority, there may be an interim period during which the tenant is responsible until maintenance responsibility is formally transferred.

From the time that the structural BMP is constructed and activated (i.e., it is operating and processing storm water from storm events), it requires inspection and maintenance to ensure that it continues to function as designed. Because of this, the MS4 Permit requires that each jurisdiction must "require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted." The various jurisdictions have different allowable maintenance mechanisms (e.g., privately funded or publicly funded maintenance) and/or requirements for proof of the maintenance mechanism (e.g., maintenance agreements). Requirements for proof of the maintenance mechanism may also differ depending on whether the long term O&M will be provided by a public or private party.

For projects within the Authority jurisdiction, structural BMP maintenance will be provided by the Authority for capital projects (i.e., public entity maintenance) and will be provided by the individual tenants for tenant projects (i.e., through lease provisions). As part of the project review for both capital and tenant PDPs that include structural BMPs, the Authority will verify that appropriate mechanisms are in place. The maintenance mechanisms include:

1) Public entity maintenance: The Authority will provide storm water BMP maintenance for its capital projects. Funding will be provided on an ongoing basis through the inclusion of maintenance costs in annual operating budgets for any department having BMP maintenance responsibility.

2) Lease provisions: The Authority will ensure storm water BMP maintenance, repair, and replacement of tenant projects through conditions in tenant leases. An example Tenant Condition of Approval is included in Appendix A.4.

3) Other mechanisms: On a case-by-case basis, the Authority may consider other mechanisms for structural BMP maintenance such as inclusion of maintenance conditions in a use permit, or alternative mechanisms, subject to EAD approval.

7.4 Long-Term Maintenance Documentation

As part of ongoing structural BMP maintenance into perpetuity, property owners are required to provide documentation of maintenance for the structural BMPs on their property to support the Authority's reporting requirements to the SDRWQCB.

The MS4 Permit requires the Authority to verify that structural BMPs on each PDP "are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches." The Authority must also identify the party responsible for structural BMP maintenance for the PDP and report the dates and findings of structural BMP maintenance verifications, and corrective actions and/or resolutions when applicable, in their PDP inventory. The PDP inventory and findings of maintenance verifications must be reported to the SDRWQCB annually.

EAD annually inspects the Authority-owned PDP structural BMPs for the need for clean out or maintenance and advises FMD of the need for such work. FMD then determines the appropriate maintenance required to continue to operate the BMPs in accordance with the manufacturer's recommendations, and to ensure effective operation of the BMP in removing pollutants in storm water to the MEP. FMD records the maintenance of these BMPs. Before October 1 of each year, EAD inspects the FMD documentation of maintenance.

Structural BMPs constructed by tenants are generally maintained by tenants, unless the Authority and FMD have assumed responsibility under the terms of the tenant's lease or some other mechanism. Structural BMPs constructed by tenants are either inspected by EAD annually before October 1 or the tenant is allowed to self-certify inspection and maintenance. Structural BMPs associated with PDPs designated high priority by the Authority will not be eligible for self-certification and will be inspected by EAD directly. Tenants who have been authorized by EAD to perform their own inspections and maintenance of structural BMPs are required to submit documentation and self-certification that inspection and maintenance were performed prior to October 1.

7.5 Inspection and Maintenance Frequency

How often is a project owner required to inspect and maintain permanent structural BMPs on their facility?

The minimum inspection and maintenance frequency is annually and must be reported annually. However, actual maintenance needs are site specific, and maintenance may be needed more frequently than annually. The need for maintenance depends on the amount and quality of runoff delivered to the structural BMP. Maintenance must be performed whenever needed, based on maintenance indicators presented in Section 7.7. The optimum maintenance frequency is each time the maintenance threshold for removal of materials (sediment, trash, debris, or overgrown vegetation) is met. If this maintenance threshold has been exceeded by the time the structural BMP is inspected, the BMP has been operating at reduced capacity. This would mean it is necessary to inspect and maintain the structural BMP more frequently. Routine maintenance will also help avoid more costly rehabilitative maintenance to repair damages that may occur when BMPs have not been adequately maintained on a routine basis.

During the first year of normal operation of a structural BMP (i.e., when the project is fully built out and occupied), inspection by the project owner's representative is recommended at least once prior to August 31 and then monthly from September through May of each year. Inspection during a storm event is also recommended. It is during and after a rain event that one can determine whether the components of the BMP are functioning properly. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined on the basis of the results of the first year inspections.

The EAD may require an increased inspection frequency by the project owner in cases where an annual inspection has proven insufficient based upon documentation provided to EAD or independent inspections conducted by EAD.

7.6 Measures to Control Maintenance Costs

Because structural BMPs must be maintained into perpetuity, it is essential to include measures to control maintenance costs.

The most effective way to reduce maintenance of structural BMPs is to prevent or reduce pollutants generated onsite and delivered to the structural BMP by implementation of source control and site design BMPs onsite, as required and described in Chapter 4 of this Manual. Second, vegetated BMPs should be placed properly to reduce the potential to come under the jurisdiction of one or more resource agencies that could require permits and costly mitigation to perform maintenance of the structural BMP. Third, the structural BMP should include design features to facilitate maintenance, as listed below.

Considerations for placement of vegetated BMPs:

- Locate structural BMPs outside of floodway, floodplain, and other jurisdictional areas.
- Avoid direct connection to a natural surface water body.
- Discuss the location of the structural BMP with a wetland biologist to avoid placing a structural BMP in a location where it could become jurisdictional or be connected to a jurisdictional area.

Measures to facilitate collection of the trapped pollutants:

- Design a forebay to trap gross pollutants in a contained area that is readily accessible for maintenance. A forebay may be a dedicated area at the inlet entrance to an infiltration BMP, biofiltration BMP, or detention basin, or may be a gross pollutant separator installed in the storm drain system that drains to the primary structural BMP.

Measures to access the structural BMP:

- The BMP must be accessible to equipment needed for maintenance. Access requirements for maintenance will vary with the type of facility selected.
- Infiltration BMPs, biofiltration BMPs, and most above-ground detention basins and sand filters will typically require routine landscape maintenance using the same equipment that is used for general landscape maintenance. At times these BMPs may require excavation of clogged media (e.g., bioretention soil media, or sand for the sand filter), and should be accessible to appropriate equipment for excavation and removal/replacement of media.
- Above-ground detention basins should include access ramps for trucks to enter the basin to bring equipment and to remove materials.
- Underground BMPs such as detention vaults, media filters, or gross pollutant separators used as forebays to other BMPs typically require access for a vactor truck to remove materials. Proprietary BMPs such as media filters or gross pollutant separators may require access by a forklift or other truck for delivery and removal of media cartridges or other internal components. Access requirements must be verified with the manufacturer of proprietary BMPs.
- Vactor trucks are large, heavy, and difficult to maneuver. Structural BMPs that are maintained by vactor truck must include a level pad adjacent to the structural BMP, preferably with no vegetation or irrigation system (otherwise vegetation or irrigation system may be destroyed by the vactor truck).
- The sump area of a structural BMP should not exceed 20 feet in depth because of the loss of efficiency of a vactor truck. The water removal rate is three to four times longer when the depth is greater than 20 feet. Deep structures may require additional equipment (stronger vactor trucks, ladders, more vactor pipe segments).
- All manhole access points to underground structural BMPs must include a ladder or steps.

Measures to facilitate inspection of the structural BMP

- Structural BMPs shall include inspection ports for observing all underground components that require inspection and maintenance.
- Silt level posts or other markings shall be included in all BMP components that will trap and store sediment, trash, and/or debris, so that the inspector may determine how full the BMP is, and the maintenance personnel may determine where the bottom of the BMP is. Posts or other markings shall be indicated and described on structural BMP plans.
- Vegetation requirements, including plant type, coverage, and minimum height when applicable, shall be provided on the structural BMP and/or landscaping plans as appropriate or as required by Environmental Affairs.
- Signage indicating the location and boundary of the structural BMP is recommended.

When designing a structural BMP, the engineer should review the typical structural BMP maintenance actions listed in Section 7.7 to determine the potential maintenance equipment and access needs.

When selecting permanent structural BMPs for a project, the engineer and project owner should consider the long-term cost of maintenance and what type of maintenance contracts a future project owner will need to manage. The types of materials used (e.g., proprietary vs. non-proprietary parts), equipment used (e.g., landscape equipment vs. vactor truck), and actions/labor expected in the maintenance process and required qualifications of maintenance personnel (e.g., confined space entry) affect the cost of long-term O&M of the structural BMPs presented in the Manual.

7.7 Maintenance Indicators and Actions for Structural BMPs

This section presents typical maintenance indicators and expected maintenance actions (routine and corrective) for typical structural BMPs.

There are many different variations of structural BMPs, and structural BMPs may include multiple components. For the purpose of maintenance, the structural BMPs have been grouped into four categories on the basis of common maintenance requirements:

- Vegetated infiltration or filtration BMPs
- Non-vegetated infiltration BMPs
- Non-vegetated filtration BMPs
- Detention BMPs

The project civil engineer is responsible for determining which categories are applicable based on the components of the structural BMP, and for identifying the applicable maintenance indicators from within the category. Maintenance indicators and actions shall be shown on the construction plans and in the project-specific O&M Plan.

During inspection, the inspector checks the maintenance indicators. If one or more thresholds are met or exceeded, maintenance must be performed to ensure the structural BMP will function as designed during the next storm event.

7.7.1 Maintenance of Vegetated Infiltration or Filtration BMPs

"Vegetated infiltration or filtration BMPs" are BMPs that include vegetation as a component of the BMP. Applicable fact sheets may include INF-2 (bioretention), PR-1 (biofiltration with partial retention), BF-1 (biofiltration), or FT-1 (vegetated swale). The vegetated BMP may or may not include amended soils, subsurface gravel layer, underdrains, and/or impermeable liners. The project civil engineer is responsible for determining which maintenance indicators and actions shown below in Table 7-2 are applicable based on the components of the structural BMP.

TABLE 7-2. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g., a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or performing minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or performing minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

7.7.2 Maintenance of Non-Vegetated Infiltration BMPs

"Non-vegetated infiltration BMPs" are BMPs that store storm water runoff until it infiltrates into the ground, and do not include vegetation as a component of the BMP (refer to the "vegetated BMPs" category for infiltration BMPs that include vegetation). Non-vegetated infiltration BMPs generally include non-vegetated infiltration trenches and infiltration basins, dry wells, underground infiltration galleries, and permeable pavement with underground infiltration gallery. Applicable fact sheets may include INF-1 (infiltration basin) or INF-3 (permeable pavement). The non-vegetated infiltration BMP may or may not include a pre-treatment device, and may or may not include above-ground

storage of runoff. The project civil engineer is responsible for determining which maintenance indicators and actions shown below in Table 7-3 are applicable based on the components of the structural BMP.

TABLE 7-3. Maintenance Indicators and Actions for Non-Vegetated Infiltration BMPs

Typical Maintenance Indicator(s) for Non-Vegetated Infiltration BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris in infiltration basin or pre-treatment device, or on permeable pavement surface	Remove and properly dispose of accumulated materials.
Standing water in infiltration basin without subsurface infiltration gallery for longer than 96 hours following a storm event	Remove and replace clogged surface soils.
Standing water in subsurface infiltration gallery for longer than 96 hours following a storm event	Investigate the reason that infiltration is not occurring. If feasible, corrective action shall be taken to restore infiltration (e.g., flush fine sediment or remove and replace clogged soils). BMP may require retrofit if infiltration cannot be restored. If retrofit is necessary, the engineer shall be contacted prior to any repairs or reconstruction.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel. Provide routine vacuuming of permeable paving areas to prevent clogging.
Damage to permeable paving surface	Repair or replace damaged surface as appropriate.
Note: When inspection or maintenance indicates sediment is accumulating in an infiltration BMP, the DMA draining to the infiltration BMP should be examined to determine the source of the sediment, and corrective measures should be made as applicable to minimize the sediment supply.	

7.7.3 Maintenance of Non-Vegetated Filtration BMPs

"Non-vegetated filtration BMPs" include media filters (FT-2) and sand filters (FT-3). These BMPs function by passing runoff through the media to remove pollutants. The project civil engineer is responsible for determining which maintenance indicators and actions shown below in Table 7-4 are applicable based on the components of the structural BMP.

TABLE 7-4. Maintenance Indicators and Actions for Filtration BMPs

Typical Maintenance Indicator(s) for Filtration BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Obstructed inlet or outlet structure	Clear obstructions.
Clogged filter media	Remove and properly dispose of filter media, and replace with fresh media.
Damage to components of the filtration system	Repair or replace as applicable.
Note: For proprietary media filters, refer to the manufacturer's maintenance guide.	

7.7.4 Maintenance of Detention BMPs

"Detention BMPs" include basins, cisterns, vaults, and underground galleries that are primarily designed to store runoff for controlled release to downstream systems. For the purpose of the maintenance discussion, this category does not include an infiltration component (refer to "vegetated infiltration or filtration BMPs" or "non-vegetated infiltration BMPs" above). Applicable fact sheets may include HU-1 (cistern) or FT-4 (extended detention basin). There are many possible configurations of above ground and underground detention BMPs, including both proprietary and non-proprietary systems. The project civil engineer is responsible for determining which maintenance indicators and actions shown below in Table 7-5 are applicable based on the components of the structural BMP.

TABLE 7-5. Maintenance Indicators and Actions for Detention BMPs

Typical Maintenance Indicator(s) for Detention Basins	Maintenance Actions
Poor vegetation establishment	Re-seed/re-establish vegetation.
Overgrown vegetation	Mow or trim as appropriate.
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary.
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials.
Standing water	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, or performing minor re-grading for proper drainage.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, or inlet or outlet structures	Repair or replace as applicable.

Submittal Requirements

It is necessary for EAD to review project plans for compliance with applicable requirements of this Manual and the MS4 Permit.

The review process must verify that storm water management objectives were considered in the project planning process and that opportunities to incorporate BMPs have been identified. The review process must confirm that the site plan, landscape plan, and project storm water documents are congruent. Therefore, the Authority requires a submittal documenting the storm water management design for every project that is subject to the requirements of this Manual. Herein the submittal is called a "SWQMP." A complete and thorough project submittal will facilitate and expedite the review and approval, and may result in fewer submittals by the applicant. The sections below discuss submittal requirements. In all cases, the project applicant must provide sufficient documentation to demonstrate that applicable requirements of this Manual and the MS4 Permit will be met.

8.1 Submittal Requirement for Standard Projects

8.1.1 Standard Project SWQMP

For Standard Projects, the project submittal shall include a "Standard Project SWQMP."

The Standard Project SWQMP is a compilation of checklists that document that all permanent source control and site design BMPs have been considered for the project and implemented where feasible. All applicable features shall be shown on site plans and landscaping plans. The Standard Project SWQMP shall consist of the following forms and/or checklists included in Appendix A.3 of this Manual:

- Form H-1: Applicability of Permanent BMP Requirements

- Form H-2: Project Type Determination (Standard Project or PDP)
- Form H-3A: Site Information for Standard Projects
- Form H-4: Source Control BMP Checklist
- Form H-5: Site Design BMP Checklist

The Standard Project SWQMP shall also include copies of the relevant plan sheets showing source control and site design BMPs.

8.2 Submittal Requirements for PDPs

8.2.1 PDP SWQMP

For PDPs, the project submittal shall include a "PDP SWQMP."

The PDP SWQMP shall document that all permanent source control and site design BMPs have been considered for the project and implemented where feasible; document the planning process and the decisions that led to the selection of structural BMPs; provide the calculations for design of structural BMPs to demonstrate that applicable performance standards are met by the structural BMP design; identify O&M requirements of the selected structural BMPs; and identify the maintenance mechanism (see Sections 7.2 and 7.3) for long-term O&M of structural BMPs. PDPs shall use the PDP SWQMP Template provided in Appendix A.4, which will include forms and/or checklists project intake and source control BMP documentation as well as checklists for documentation of pollutant control structural BMP design. The PDP SWQMP shall include copies of the relevant plan sheets showing site design, source control, and structural BMPs, and structural BMP maintenance requirements.

A PDP SWQMP must be provided with the first submittal of a project application.

Storm water requirements will directly affect the layout of the project. Storm water requirements must be considered from the initial project planning or in project concept stage, and will be reviewed upon each submittal, beginning with the first submittal. The process from initial project application through approval of the project plans often includes design changes to the site layout and features. Changes may be driven by storm water management requirements or other site requirements. Each time the site layout is adjusted, whether the adjustment is directly due to storm water management requirements identified during EAD review of the storm water submittal, or is driven by other site requirements, the storm water management design must be revisited to ensure that the revised project layout and features meet the requirements of this Manual and the MS4 Permit. An updated PDP SWQMP must be provided with each submittal of revised project plans. The updated PDP SWQMP should include documentation of changes to the site layout and features, and reasons for the changes. In the event that other site requirements identified during plan review render certain proposed storm water features infeasible (e.g., if fire department access requirements were identified that precluded use of certain surfaces or landscaping features that had been proposed), this must be documented as part of the decisions that led to the development of the final storm water management design.

Note that additional information may be required at the discretion of the reviewer based on the nature of the project but as a minimum the information listed in the submittal template in Appendix A.4 shall be included in the PDP SWQMP.

The Authority requires that the SWQMP be certified by an architect, landscape architect, or civil engineer licensed to practice in the State of California.

The certification should state: "The selection, sizing, and preliminary design of storm water treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R9-2013-0001 and subsequent amendments."

8.2.1.1 PDP O&M Plan

While the PDP SWQMP must include general O&M requirements for structural BMPs, the PDP SWQMP may not be the final O&M Plan.

The O&M requirements documented in the PDP SWQMP must be sufficient to show that O&M requirements have been considered in the project planning and design. However, a final O&M Plan should reflect actual constructed structural BMPs to be maintained. Photographs and as-built plans for the constructed structural BMPs should be included. Local jurisdictions may have varying requirements for a final O&M Plan. Requirements may also vary depending on whether long term O&M will be furnished by a public agency or private entity. See Section 8.2.3 for project closeout procedures, including Authority requirements for final O&M Plans, and Section 8.2.4 for additional requirements for tenant O&M of structural BMPs.

8.2.2 Requirements for Construction Plans

8.2.2.1 BMP Identification and Display on Construction Plans

Plans for construction of the project (grading plans, improvement plans, and landscaping plans, as applicable) must show all permanent site design, source control, and structural BMPs, and must be congruent with the PDP SWQMP.

When construction plans are submitted for EAD review and approval, Department staff will compare that submittal with the earlier SWQMP Submittal. Preparation and submittal of a Construction Plan SWQMP Checklist for the project will facilitate comparisons and likely speed review of the project.

TABLE 8-1. Format for Construction Plans SWQMP Checklist

SWQMP Page #	BMP Description	See Plan Sheet #s

Here's how:

1) Create a table similar to Table 8-1. Number and list each measure or BMP specified in the SWQMP submittal in Columns 1 and 2 of the table. Leave Column 3 blank. Incorporate the table into the SWQMP Submittal.

2) When submitting construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 3, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. Submit the updated table with the construction plans.

Note that the updated table—or Construction Plan SWQMP Checklist—is only a reference tool to facilitate comparison of the construction plans to the SWQMP. EAD can advise applicants about the process required to propose changes to the approved SWQMP.

8.2.2.2 Structural BMP Maintenance Information on Construction Plans

Plans for construction of the project must provide sufficient information to describe maintenance requirements (thresholds and actions) for structural BMPs such that in the event all other separate O&M documents were lost, a new party studying plans for the project could identify the structural BMPs and identify the required maintenance actions based on the plans.

For the purpose of long-term O&M, the project plans must identify the following:

- Instruction for how to access the structural BMP to inspect and perform maintenance;
- Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds);
- Manufacturer and part number for proprietary parts;
- Maintenance thresholds specific to the structural BMP, with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified on the basis of viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP);
- Recommended equipment to perform maintenance; and
- When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management.

8.2.3 Design Changes During Construction and Project Closeout Procedures

8.2.3.1 Design Changes During Construction

Prior to occupancy and/or intended use of any portion of a PDP, the site must be in compliance with the requirements of this Manual and the MS4 Permit.

During construction, any changes that affect the design of storm water management features must be reviewed and approved by EAD before work can proceed. Approved documents and additional design may be required prior to implementation of design changes during construction. This might include changes to drainage patterns that occurred on the basis of actual site grading and construction

of storm water conveyance structures, or substitutions to storm water management features. Just as during the design phase, when there are changes to the site layout and features, the storm water management design must be revisited to ensure that the revised project layout and features meet the requirements of this Manual and the MS4 Permit.

8.2.3.2 Certification of Constructed BMPs

As part of the "Structural BMP Approval and Verification Process" required by the MS4 Permit, each structural BMP must be inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of the MS4 Permit.

Because some portions of the structural BMP will not be readily visible after completion of construction (e.g., subsurface layers), EAD will require inspections during construction, photographs taken during construction, and/or other certification that the BMP has been constructed in conformance with the approved plans.

Prior to occupancy of each PDP, EAD, together with a project proponent engineer, will inspect each structural BMP to verify that it has been constructed in compliance with all specifications, plans, permits, and ordinances, and records verification and approval of the structural BMPs in the Authority's Web-based database. Initial BMP verification inspections are separate from the regular operation and maintenance inspections for each BMP. EAD may require forms, As-Builts, or other documentation be submitted prior to the inspection to facilitate the structural BMP inspection.

8.2.3.3 Final O&M Plan

Upon completion of project construction, the local agency may require a final O&M Plan to be submitted.

A final O&M Plan reflects project-specific constructed structural BMPs with project-specific drawings, photographs, and maps, and identifies specific maintenance requirements and actions for the constructed structural BMPs. Specific requirements and review procedures for this process may vary based on the planned maintenance entity (Authority, tenant, or other).

8.2.4 Additional Requirements for Tenant O&M

This section discusses structural BMPs associated with tenant projects to be operated and maintained by tenants as part of their lease agreement.

8.2.4.1 O&M Agreements for Tenant Structural BMP Maintenance

For structural BMPs associated with tenant projects, the Authority requires execution of an O&M Agreement through conditions in the tenant lease.

An O&M Agreement will be incorporated in the tenant lease and signed by the Authority and the tenant, committing the tenant to maintain the permanent structural BMPs. The O&M Agreement may provide that, if the tenant fails to maintain the storm water facilities, the Authority may restore the storm water facilities to operable condition, and obtain reimbursement, including administrative costs, from the tenant.

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SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

San Diego County Regional Airport Authority BMP Design Manual

Appendices

February 2016

amec foster wheeler

Prepared by:

Geosyntec consultants

RICK ENGINEERING COMPANY

project clean water

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Appendix

A

Airport Authority Data and SWQMP Templates

Appendix A Airport Authority Data and SWQMP Templates

Appendix A contains tables, figures, and templates prepared to assist the project applicant in development of their SWQMP. The following sections are included:

- Section A.1 Environmentally Sensitive Areas (ESAs): This section contains a description of receiving water conditions applicable to storm water drainage from SAN. A table of 303(d) listings is provided.

- Section A.2 Authority Figures: This section contains the following figures to assist project applicants:

    - Figure A.2-1 San Diego International Airport Storm Drain System: Shows storm drain lines and drainage basins at SAN.

    - Figure A.2-2 San Diego International Airport Land Uses: Displays industrial, commercial, and Airport Authority land use areas at SAN.

    - Figure A.2-3 Receiving Waters and Conveyance Systems Exempt from Hydromodification Management Requirements: Displays the conveyance systems at SAN that are concrete lined to the point of discharge in San Diego Bay, and thus are exempt from hydromodification management requirements.

    - Figure A.2-4 Potential Critical Course Sediment Yield Areas: Displays Potential Critical Course Sediment Yield Areas in the San Diego Bay Watershed Management Area and at SAN.

- Section A.3 Standard SWQMP Template: This checklist was developed to assist the project applicant and plan reviewer of a Standard Project.

- Section A.4 PDP SWQMP Template: This checklist was developed to assist the project applicant and plan reviewer of a PDP. It includes an example Tenant Condition of Approval that may be used in a tenant lease agreement to assure storm water BMP maintenance, repair, and replacement for tenant projects.

A.1 Environmentally Sensitive Areas (ESAs)

The Project Applicant should consider receiving water quality during the project planning stage and during selection of Structural BMPs. Specifically, BMPs selected for PDPs should be designed to reduce concentrations of the most significant pollutants of concern.

Storm water from SAN drains to San Diego Bay, portions of which are currently 303(d) listed for impacts due to polychlorinated biphenyls (PCBs), indicator bacteria, and metals, as well as benthic community effects and sediment toxicity. The 2010 303(d) list includes copper as a pollutant impacting water quality in the marinas along Harbor Island and PCBs as a pollutant impacting water quality throughout the San Diego Bay. Runoff from the airport commingles with runoff from other sources and discharges into the waters along Harbor Island. There are four Toxic Hot Spots in San Diego Bay, one of which (namely, the Downtown Anchorage, near the foot of Grape Street) is located near outfalls associated with runoff commingled from SAN and other sources. This area is currently the subject of an Investigative Order issued by the SDRWQCB. The San Diego Basin Plan designates San Diego Bay in its entirety as having rare beneficial use (RARE). Both the Sweetwater Marsh National Wildlife Refuge and the South Bay Unit of the San Diego National Wildlife Refuge are considered Areas of Special Biological Significance (ASBS), but neither is within close proximity to SAN.

Environmentally Sensitive Areas, as designated in the 2010 303(d) list, and their corresponding pollutants of concern are presented in Table A.1-1.

Table A.1-1: Environmentally Sensitive Areas (ESAs) and Pollutants of Concern

Receiving Water	Segment Name	Pollutant of Concern
San Diego Bay	San Diego Bay	PCBs (polychlorinated biphenyls)
	San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper
	San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper
	San Diego Bay Shoreline, at Spanish Landing	Indicator Bacteria
	San Diego Bay Shoreline, at Downtown Anchorage	Benthic Community Effects and Sediment Toxicity

A.2 Airport Authority Figures

This section contains Authority-specific figures to assist project applicants:

Figure A.2-1 shows existing storm drain lines and drainage basins at SAN. Project applicants may utilize this map to determine current drainage patterns during the preliminary project planning stage. It is the responsibility of the applicant, in consultation with EAD and FDD, to verify the location of the existing storm drain system as the project progresses (e.g., using GPS).

Figure A.2-2 displays the current land uses at SAN. Land uses can be broken down into tenant industrial areas such as terminals; Airport Authority industrial areas such as materials storage yards; commercial areas such as front-of house passenger walkways and concessions staging areas; and ground transportation areas such as parking lots. Appendix B of the Manual includes a table detailing the general pollutant categories associated with PDP land uses. An extended discussion of potential pollutants associated with land uses at SAN is provided in Sections 6 and 7 of the SAN SWMP.

Figure A.2-3 shows the existing storm drain lines and conveyance systems at SAN that are concrete lined and discharge directly to a waterbody that is exempt from hydromodification management requirements (San Diego Bay). As all conveyance systems at SAN are concrete lined and there are no natural streams or conveyances, all existing storm drain lines are exempt from hydromodification management requirements.

Figure A.2-4 displays the potential critical course sediment yield areas in the San Diego Bay Watershed Management Area, as determined during development of the Watershed Management Area Analysis (WMAA). There are no potential critical course sediment yield areas at SAN.

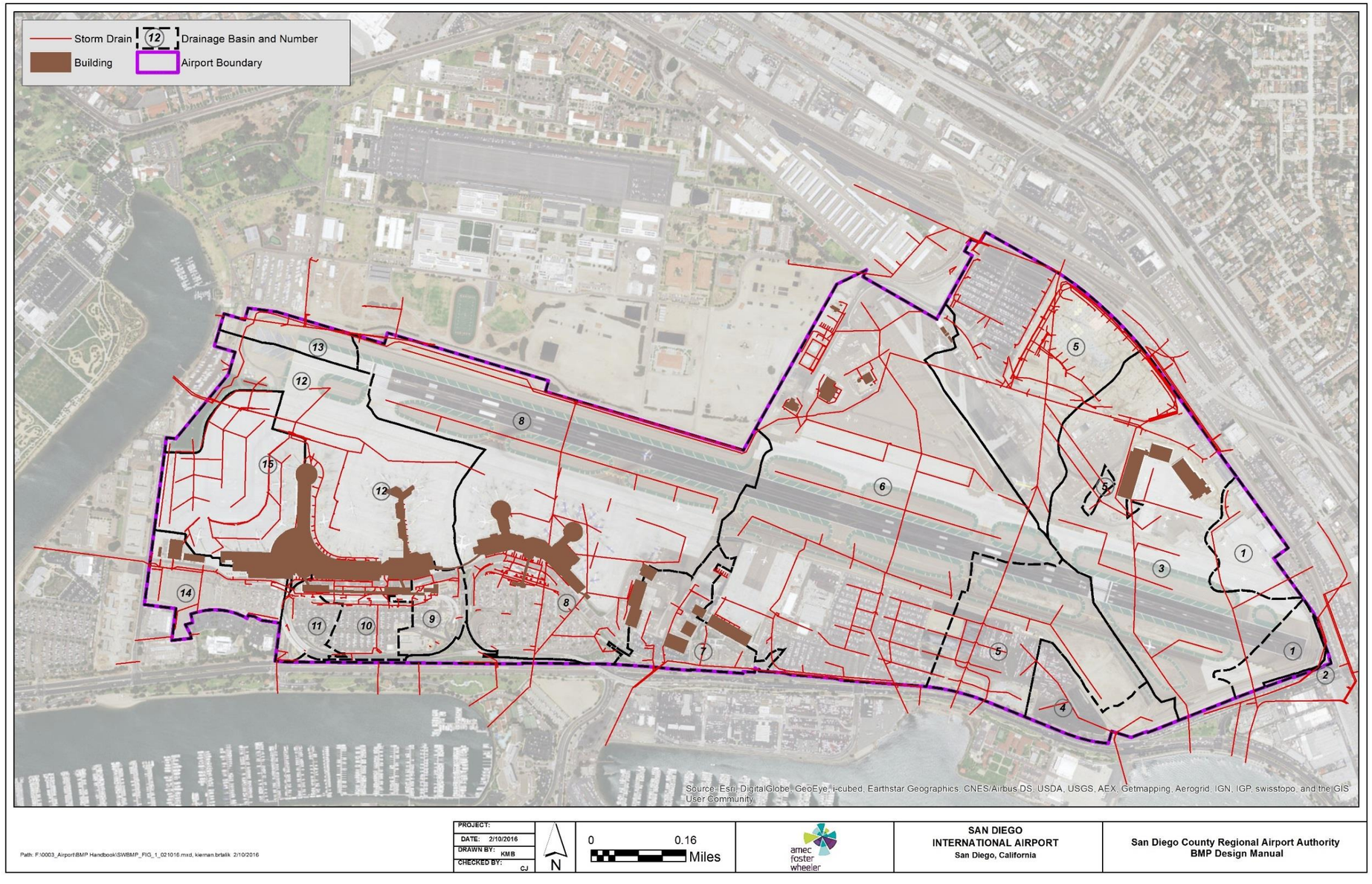

Figure A.2-1: San Diego International Airport Storm Drain System

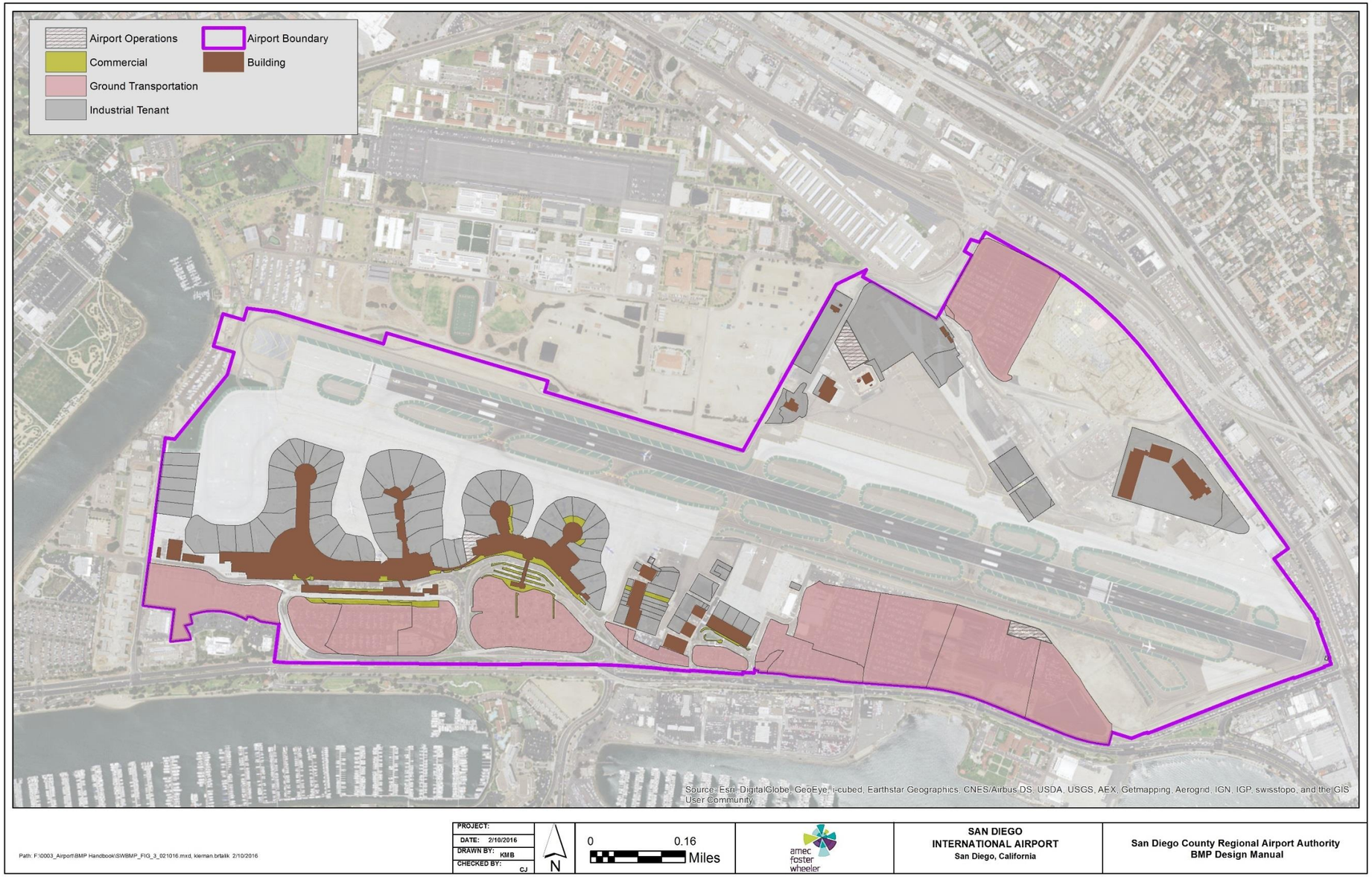

Figure A.2-2: San Diego International Airport Land Uses

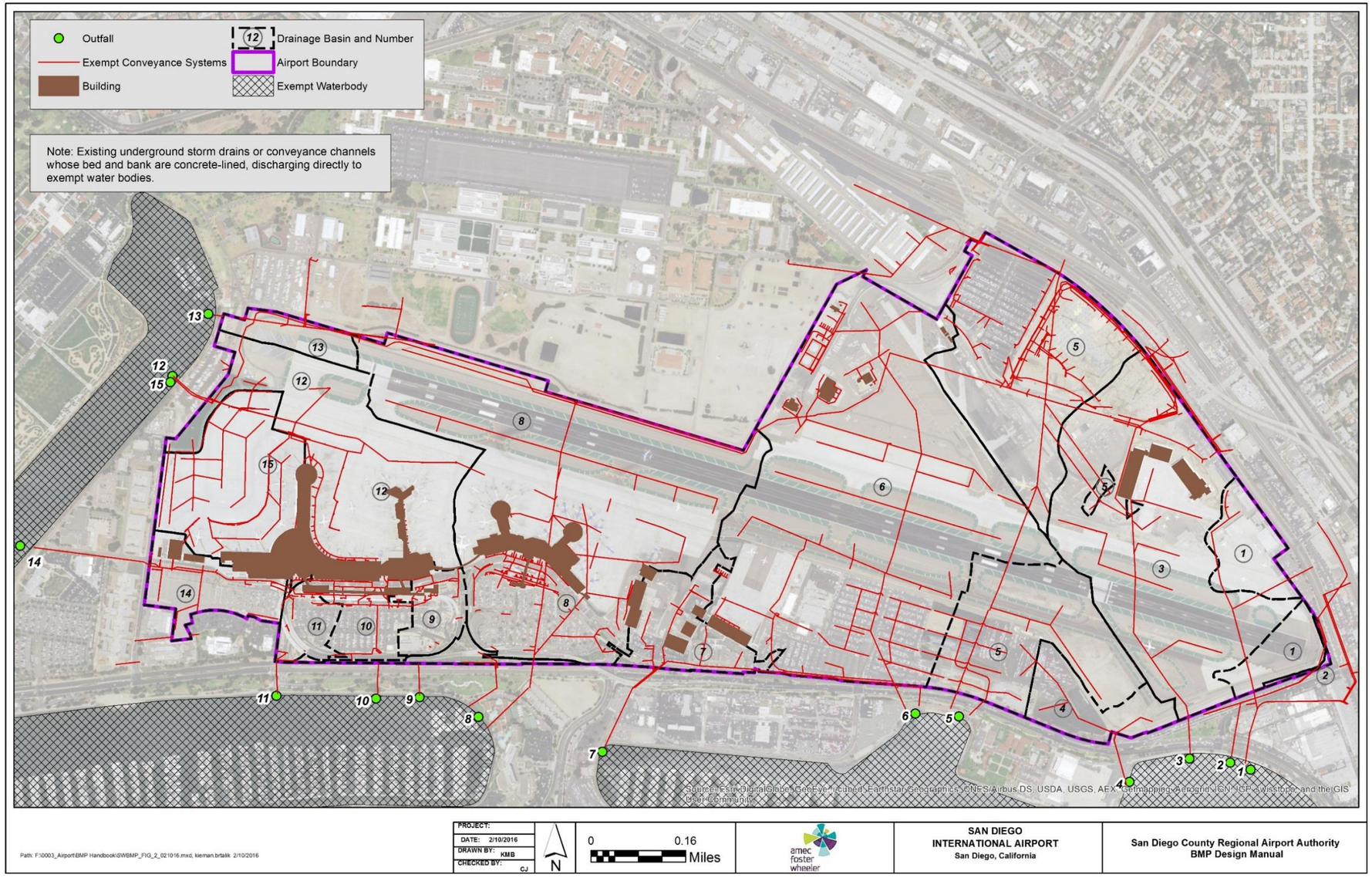

Figure A.2-3: Receiving Waters and Conveyance Systems Exempt from Hydromodification Management Requirements

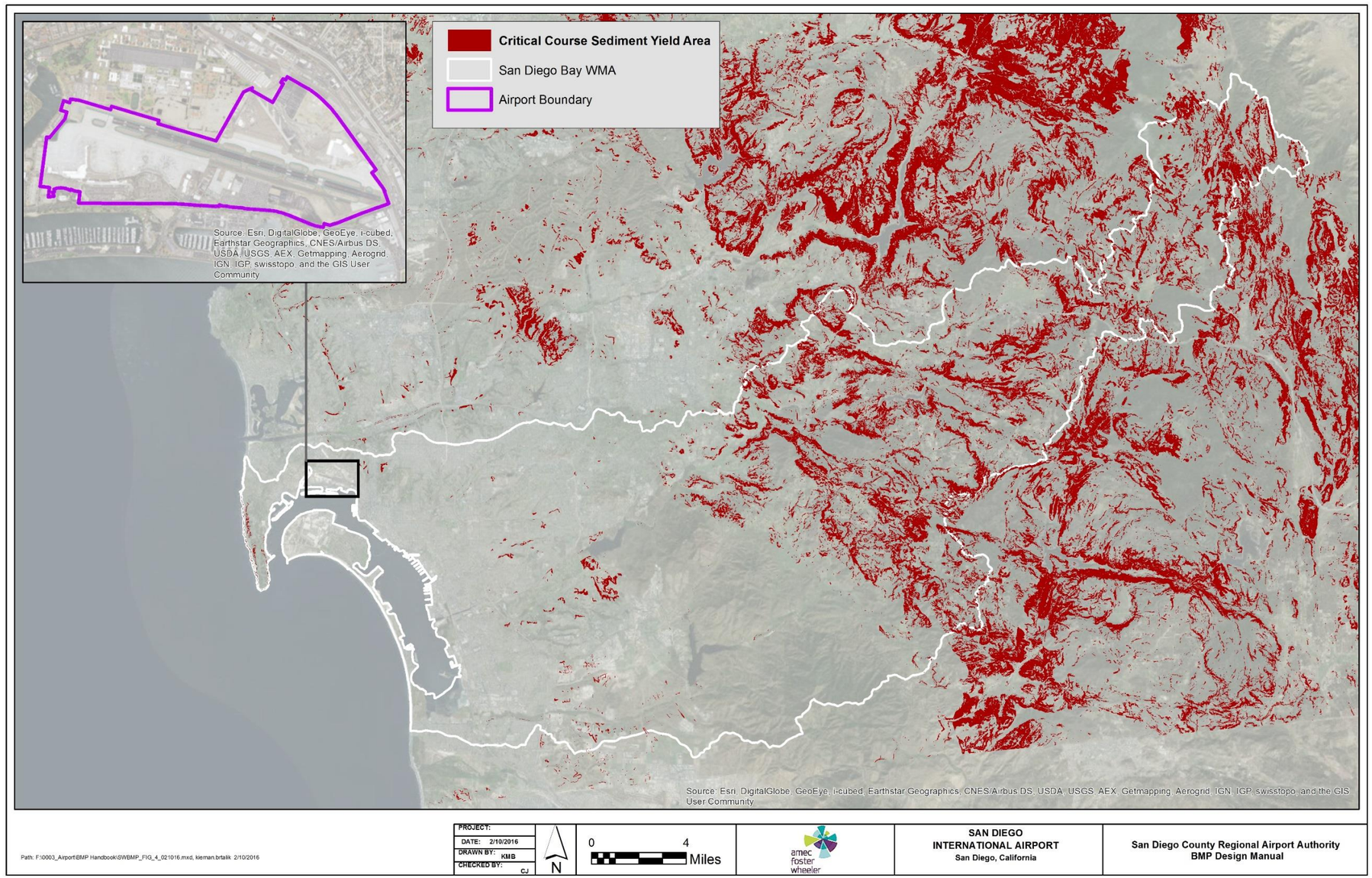

Figure A.2-4: Potential Critical Course Sediment Yield Areas

A.3 Standard SWQMP Template

The following template is provided for use by a Standard SWQMP applicant or reviewer. It is not intended to replace a thorough review of the Manual and all appendices.

SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

STANDARD (MINOR) DEVELOPMENT PROJECT
STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)
FOR
[INSERT PROJECT NAME]
[INSERT PERMIT APPLICATION NUMBERS]

[INSERT PROJECT ADDRESS]
[INSERT PROJECT CITY, STATE ZIP CODE]

ASSESSOR'S PARCEL NUMBER(S):
[INSERT APN(S)]

PREPARED FOR:

[INSERT APPLICANT NAME]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

STANDARD PROJECT SWQMP PREPARED BY:

[INSERT COMPANY NAME]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

DATE OF SWQMP:
[INSERT MONTH, DAY, YEAR]

PLANS PREPARED BY:
[INSERT CIVIL ENGINEER OR ARCHITECT]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

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ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan

STANDARD PROJECT SWQMP PROJECT OWNER'S CERTIFICATION PAGE

Project Name: [Insert Project Name]
Permit Application Number: [Insert Permit Application Number]

PROJECT OWNER'S CERTIFICATION

This Standard Project SWQMP has been prepared for [INSERT PROJECT OWNER'S COMPANY NAME] by [INSERT SWQMP PREPARER'S COMPANY NAME]. The Standard Project SWQMP is intended to comply with the Standard Project requirements of the San Diego County Regional Airport Authority BMP Design Manual, which is a design manual for compliance with local San Diego County Regional Airport Authority and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. 2013-0001, as amended by Order No. R9-2015-0001 and R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan. A signed copy of this document shall be available on the subject property into perpetuity.

_____
Project Owner's Signature

_____
Print Name

_____
Company

_____
Date

SUBMITTAL RECORD

Use this Table to keep a record of submittals of this Standard Project SWQMP. Each time the Standard Project SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
3		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT VICINITY MAP

Project Name: [Insert Project Name]
Permit Application Number: [Insert Permit Application Number]

[Insert Project Vicinity Map here]

Applicability of Permanent, Post-Construction Storm Water BMP Requirements **(Storm Water Intake Form for all Development Permit Applications)**	**Form H-1**

Project Identification	
Project Name:	
Permit Application Number:	Date:

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".
Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual for guidance.	☐ Yes	Go to Step 2.
	☐ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or exception to PDP definitions? To answer this item, see Section 1.4 of the manual *in its entirety* for guidance, AND complete Form H-2, Project Type Determination.	☐ Standard Project	Stop. Standard Project requirements apply, including Standard Project SWQMP.
	☐ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ Exception to PDP definitions	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form H-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Do hydromodification control requirements apply? See Section 1.6 of the manual for guidance. Note: Hydromodification control requirements do not apply to projects within Airport Authority jurisdiction that drain through concrete lined channels or conveyances that discharge directly to San Diego Bay.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 4.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply:		
Step 4. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual for guidance. Note: Critical course sediment yield areas are not present within Airport Authority jurisdiction. See Section 1.6 and Appendix A of the manual.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does not apply:		

Project Type Determination Checklist			Form H-2
Project Information			
Project Name:			
Permit Application Number:			
Project Type Determination: Standard Project or PDP			
The project is (select one): ☐ New Development ☐ Redevelopment			
The total proposed newly created or replaced impervious area is: _____ ft² (_____) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption SIC code 5812). (ii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iii) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Form H-2 Page 2 of 2			
Yes ☐	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance and Appendix A.
Yes ☐	No ☐	(e)	New development projects, or redevelopment project that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes ☐	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

☐ No – the project is not a PDP (Standard Project).

☐ Yes – the project is a PDP.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: _____ ft² (A)

The total proposed newly created or replaced impervious area is: _____ ft² (B)

Percent impervious surface created or replaced (B/A)*100: _____%

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

☐ greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For Standard Projects	Form H-3A (Standard Projects)
Project Summary Information	
Project Name	
Project Address	
Assessor's Parcel Number(s)	
Permit Application Number	
Project Watershed (Hydrologic Unit)	☐ Pueblo San Diego 908
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	_____ Acres (_____ Square Feet)
Area to be disturbed by the project (Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Pervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Form H-3A Page 2 of 4
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply) ☐ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information
Existing Land Cover Includes (select all that apply) ☐ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☐ Impervious Areas Description / Additional Information
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☐ NRCS Type D
Existing Natural Hydrologic Features (select all that apply) ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☐ None Description / Additional Information
Description of Existing Site Drainage [How is storm water runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe.]

Form H-3A Page 3 of 4
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities
List proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features)
List proposed pervious features of the project (e.g., landscape areas)
Does the project include grading and changes to site topography? ☐ Yes ☐ No Description / Additional Information
Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? ☐ Yes ☐ No Description / Additional Information

Form H-3A Page 4 of 4
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply) ☐ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☐ Need for future indoor & structural pest control ☐ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☐ Fire sprinkler test water ☐ Miscellaneous drain or wash water ☐ Plazas, sidewalks, parking lots, ramps, taxiways, and runways

Source Control BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form H-4

Project Identification

Project Name
Permit Application Number

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4 (Authority BMPs SC01, SC04, SC05, SC09, SC11, SC12, SC13, SC14, SC15, and SC18 as applicable)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage (Authority BMP SC17)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMP SC07)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-3 not implemented:			

Form H-4 Page 2 of 2			
Source Control Requirement	**Applied?**		
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMPs SC02A, SC02B, SC02C, SC03, SC06, SC09, and SC21 as applicable)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-4 not implemented:			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMP SC08)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐ Onsite storm drain inlets	☐ Yes	☐ No	☐ N/A
☐ Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☐ N/A
☐ Interior parking garages	☐ Yes	☐ No	☐ N/A
☐ Need for future indoor & structural pest control	☐ Yes	☐ No	☐ N/A
☐ Landscape/outdoor pesticide use	☐ Yes	☐ No	☐ N/A
☐ Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☐ N/A
☐ Food service	☐ Yes	☐ No	☐ N/A
☐ Refuse areas	☐ Yes	☐ No	☐ N/A
☐ Industrial processes	☐ Yes	☐ No	☐ N/A
☐ Outdoor storage of equipment or materials	☐ Yes	☐ No	☐ N/A
☐ Vehicle and equipment cleaning	☐ Yes	☐ No	☐ N/A
☐ Vehicle/equipment repair and maintenance	☐ Yes	☐ No	☐ N/A
☐ Fuel dispensing areas	☐ Yes	☐ No	☐ N/A
☐ Loading docks	☐ Yes	☐ No	☐ N/A
☐ Fire sprinkler test water	☐ Yes	☐ No	☐ N/A
☐ Miscellaneous drain or wash water	☐ Yes	☐ No	☐ N/A
☐ Plazas, sidewalks, parking lots, ramps, taxiways, and runways	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Clarify which additional source control BMPs from Appendix B of the Authority SWMP will be implemented. Justification must be provided for all "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form H-5

Project Identification

Project Name
Permit Application Number

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			
SD-3 Minimize Impervious Area	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			

Form H-5 Page 2 of 2			
Site Design Requirement	**Applied?**		
SD-5 Impervious Area Dispersion	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-8 not implemented:			

ATTACHMENT 1
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 1.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☐ Show all applicable permanent site design and source control BMPs as noted in Forms I-4 and I-5

A.4 PDP SWQMP Template

The following template is provided for use by a PDP SWQMP applicant or reviewer. It is not intended to replace a thorough review of the Manual and all appendices.

SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

PRIORITY DEVELOPMENT PROJECT (PDP)
STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)
FOR
[INSERT PROJECT NAME]
[INSERT PERMIT APPLICATION NUMBERS]

[INSERT PROJECT ADDRESS]
[INSERT PROJECT CITY, STATE ZIP CODE]

ASSESSOR'S PARCEL NUMBER(S):
[INSERT APN(S)]

ENGINEER OF WORK:

_____

[INSERT CIVIL ENGINEER'S NAME AND PE NUMBER HERE, PROVIDE WET SIGNATURE AND STAMP ABOVE LINE]

PREPARED FOR:

[INSERT APPLICANT NAME]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

PDP SWQMP PREPARED BY:

[INSERT COMPANY NAME]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

DATE OF SWQMP:
[INSERT MONTH, DAY, YEAR]

PLANS PREPARED BY:

[INSERT CIVIL ENGINEER OR ARCHITECT]
[INSERT ADDRESS]
[INSERT CITY, STATE ZIP CODE]
[INSERT TELEPHONE NUMBER]

TABLE OF CONTENTS

ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: [Insert Project Name]
Permit Application Number: [Insert Permit Application Number]

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the [INSERT AGENCY NAME] BMP Design Manual, which is a design manual for compliance with local [INSERT AGENCY NAME] and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the San Diego County Regional Airport Authority has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the San Diego County Airport Authority Environmental Affairs Department and/or Facilities Development Department is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

_____
Engineer of Work's Signature, PE Number & Expiration Date

_____
Print Name

_____
Company

_____
Date

Engineer's Seal:

PDP SWQMP PROJECT OWNER'S CERTIFICATION PAGE

Project Name: [Insert Project Name]
Permit Application Number: [Insert Permit Application Number]

PROJECT OWNER'S CERTIFICATION

This PDP SWQMP has been prepared for [INSERT PROJECT OWNER'S COMPANY NAME] by [INSERT SWQMP PREPARER'S COMPANY NAME]. The PDP SWQMP is intended to comply with the PDP requirements of the San Diego County Regional Airport Authority BMP Design Manual, which is a design manual for compliance with local San Diego County Regional Airport Authority and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

_____
Project Owner's Signature

_____
Print Name

_____
Company

_____
Date

SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
3		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT VICINITY MAP

Project Name: [Insert Project Name]
Permit Application Number: [Insert Permit Application Number]

[Insert Project Vicinity Map here]

Applicability of Permanent, Post-Construction Storm Water BMP Requirements **(Storm Water Intake Form for all Development Permit Applications)**	**Form H-1**
Project Identification	
Project Name:	
Permit Application Number:	Date:
Determination of Requirements	

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".
Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual for guidance.	☐ Yes	Go to Step 2.
	☐ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or exception to PDP definitions? To answer this item, see Section 1.4 of the manual *in its entirety* for guidance, AND complete Form H-2, Project Type Determination.	☐ Standard Project	Stop. Standard Project requirements apply, including Standard Project SWQMP.
	☐ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ Exception to PDP definitions	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form H-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Do hydromodification control requirements apply? See Section 1.6 of the manual for guidance. Note: Hydromodification control requirements do not apply to projects within Airport Authority jurisdiction that drain through concrete lined channels or conveyances that discharge directly to San Diego Bay.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 4.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply:		
Step 4. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual for guidance. Note: Critical course sediment yield areas are not present within Airport Authority jurisdiction. See Section 1.6 and Appendix A of the manual.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does not apply:		

Project Type Determination Checklist			Form H-2
Project Information			
Project Name:			
Permit Application Number:			
Project Type Determination: Standard Project or PDP			
The project is (select one): ☐ New Development ☐ Redevelopment			
The total proposed newly created or replaced impervious area is: _____ ft² (_____) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption SIC code 5812). (ii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iii) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Form H-2 Page 2 of 2			
Yes ☐	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance and Appendix A.
Yes ☐	No ☐	(e)	New development projects, or redevelopment project that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes ☐	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

☐ No – the project is not a PDP (Standard Project).

☐ Yes – the project is a PDP.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: _____ ft² (A)

The total proposed newly created or replaced impervious area is: _____ ft² (B)

Percent impervious surface created or replaced (B/A)*100: _____%

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

☐ greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For PDPs	Form H-3B (PDPs)
Project Summary Information	
Project Name	
Project Address	
Assessor's Parcel Number(s)	
Permit Application Number	
Project Watershed (Hydrologic Unit)	Select One: ☐ Pueblo San Diego 908
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	_____ Acres (_____ Square Feet)
Area to be disturbed by the project (Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Pervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Form H-3B Page 2 of 7
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☐ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information:
Existing Land Cover Includes (select all that apply): ☐ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☐ Impervious Areas Description / Additional Information:
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☐ NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☐ 10 feet < Groundwater Depth < 20 feet ☐ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☐ None Description / Additional Information:

Form H-3B Page 3 of 7
Description of Existing Site Topography and Drainage [How is storm water runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe]:

Form H-3B Page 4 of 7
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities:
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
List/describe proposed pervious features of the project (e.g., landscape areas):
Does the project include grading and changes to site topography? ☐ Yes ☐ No Description / Additional Information:
Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? ☐ Yes ☐ No Description / Additional Information:

Form H-3B Page 5 of 7
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☐ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☐ Need for future indoor & structural pest control ☐ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☐ Fire sprinkler test water ☐ Miscellaneous drain or wash water ☐ Plazas, sidewalks, parking lots, ramp, taxiway, and runway

Form H-3B Page 6 of 7		
Identification of Receiving Water Pollutants of Concern		
Describe path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs for the impaired water bodies:		
303(d) Impaired Water Body	**Pollutant(s)/Stressor(s)**	**TMDLs**

Identification of Project Site Pollutants*

***Identification of project site pollutants is only required if flow-through treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program)**

Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

Form H-3B Page 7 of 7

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the manual)?

- ☐ Yes, hydromodification management flow control structural BMPs required.
- ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

Source Control BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form H-4

Project Identification

Project Name
Permit Application Number

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4 (Authority BMPs SC01, SC04, SC05, SC09, SC11, SC12, SC13, SC14, SC15, and SC18 as applicable)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage (Authority BMP SC17)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMP SC07)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-3 not implemented:			

Form H-4 Page 2 of 2			
Source Control Requirement	**Applied?**		
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMPs SC02A, SC02B, SC02C, SC03, SC06, SC09, and SC21 as applicable)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-4 not implemented:			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal (Authority BMP SC08)	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐ Onsite storm drain inlets	☐ Yes	☐ No	☐ N/A
☐ Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☐ N/A
☐ Interior parking garages	☐ Yes	☐ No	☐ N/A
☐ Need for future indoor & structural pest control	☐ Yes	☐ No	☐ N/A
☐ Landscape/outdoor pesticide use	☐ Yes	☐ No	☐ N/A
☐ Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☐ N/A
☐ Food service	☐ Yes	☐ No	☐ N/A
☐ Refuse areas	☐ Yes	☐ No	☐ N/A
☐ Industrial processes	☐ Yes	☐ No	☐ N/A
☐ Outdoor storage of equipment or materials	☐ Yes	☐ No	☐ N/A
☐ Vehicle and equipment cleaning	☐ Yes	☐ No	☐ N/A
☐ Vehicle/equipment repair and maintenance	☐ Yes	☐ No	☐ N/A
☐ Fuel dispensing areas	☐ Yes	☐ No	☐ N/A
☐ Loading docks	☐ Yes	☐ No	☐ N/A
☐ Fire sprinkler test water	☐ Yes	☐ No	☐ N/A
☐ Miscellaneous drain or wash water	☐ Yes	☐ No	☐ N/A
☐ Plazas, sidewalks, parking lots, ramps, taxiways, and runways	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Clarify which additional source control BMPs from Appendix B of the Authority SWMP will be implemented. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form H-5

Project Identification

Project Name
Permit Application Number

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			
SD-3 Minimize Impervious Area	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			

Form H-5 Page 2 of 2			
Site Design Requirement	**Applied?**		
SD-5 Impervious Area Dispersion	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-8 not implemented:			

Summary of PDP Structural BMPs	Form H-6 (PDPs)
Project Identification	
Project Name	
Permit Application Number	
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the manual were followed, and the results (type of BMPs selected). (Continue on page 2 as necessary.)	

Form H-6 Page 2 of 3
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form H-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No.	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-through treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-through treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Combined pollutant control and hydromodification control (if desired) ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms if required by the EAD (See Section 1.12 of the manual)	
Who will be the final owner of this BMP?	
Who will maintain this BMP into perpetuity?	
What is the funding mechanism for maintenance?	
Discussion (as needed):	

ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☐ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☐ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form H-7 (Appendix H of the Manual), Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form H-7.	☐ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form H-8 (Appendix H of the Manual), Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form H-8.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	☐ Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- ☐ Underlying hydrologic soil group
- ☐ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐ Critical coarse sediment yield areas to be protected
- ☐ Existing topography and impervious areas
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed demolition
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form H-3B)
- ☐ Structural BMPs (identify location, type of BMP, and size/detail)

ATTACHMENT 2
Structural BMP Maintenance Information

This is the cover sheet for Attachment 2.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Structural BMP Maintenance Thresholds and Actions (Required)	□ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 2b	Tenant Condition of Approval (when applicable)	□ Included □ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

☐ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 2a must identify:

- ☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 2b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 2a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 2b: For tenant projects, Attachment 2b shall include a tenant condition of approval. An example is provided below, but the PDP applicant should contact the EAD to obtain the current condition of approval.

Attachment 2b: Example Tenant Condition of Approval

The following statement can be added as a condition of approval for all tenant projects:

"The San Diego County Regional Airport Authority (Authority) and San Diego International Airport is regulated under Regional Water Quality Control Board Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and R9-2015-0100 (MS4 Permit), as adopted, amended, and/or modified.

The MS4 Permit prohibits any activities that could degrade storm water quality. Post-construction / operational use of this project site must comply with the MS4 and Authority direction related to permitted activities including the requirements found in the Authority's Storm Water Management Plan (SWMP).

No discharges of any material or waste, including potable water, wash water, dust, soil, trash and debris, may contaminate storm water or enter the storm water conveyance system. Any such material that inadvertently contaminates storm water or enters the storm water conveyance system as part of site operations must be removed immediately. All unauthorized discharges to the storm water conveyance system or the Bay or the ocean must be reported immediately to the Environmental Affairs Department, in order to address any regulatory permit requirements regarding spill notifications.

Best management practices (BMPs) must be implemented by the Tenant to control the potential release of any materials or wastes being handled or stored on-site which could enter the storm water conveyance system due to wind or storm water runoff.

In addition, this project is subject to the Authority's BMP Design Manual. As such, approval of the project by the Authority is necessarily conditioned upon submission by the project proponent of a project specific Storm Water Quality Management Plan (SWQMP) that meets Authority requirements. Project approval requires full implementation of all SWQMP structural and non-structural BMPs throughout the life of the project. The implementation and maintenance of the SWQMP BMPs constitute regulatory obligations for the lessee, and failure to comply with the MS4 Permit, the SWMP, or the Authority approved SWQMP, including the specific BMPs contained therein, may be considered a default under the lease."

ATTACHMENT 3
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 3.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Form H-6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by the EAD
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number shall be provided. Photocopies of general brochures are not acceptable.

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Appendix

B

Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

February 2016

Appendix B Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

Table of Contents:

B.1 DCV

DCV is defined as the volume of storm water runoff resulting from the 85th percentile, 24-hr storm event. The following hydrologic method shall be used to calculate the DCV:

$$DCV = C \times d \times A \times 43{,}560\ sf/ac \times 1/12\ in/ft$$

$$DCV = 3{,}630 \times C \times d \times A$$

Where:

DCV = Design Capture Volume in cubic feet

C = Runoff factor (unitless); refer to section B.1.1

d = 85th percentile, 24-hr storm event rainfall depth (inches), refer to section B.1.3

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingles with project runoff and drains to the BMP. Refer to Chapter 3, Section 3.3.3 for additional guidance. Street redevelopment projects consult section 1.4.3.

B.1.1 Runoff Factor

Estimate the area weighted runoff factor for the tributary area to the BMP using runoff factor (from Table B.1-1) and area of each surface type in the tributary area and the following equation:

$$C = \frac{\sum C_x A_x}{\sum A_x}$$

Where:

C_x = Runoff factor for area X

A_x = Tributary area X (acres)

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs[1]	0.90
Concrete or Asphalt[1]	0.90
Unit Pavers (grouted)[1]	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Amended, Mulched Soils or Landscape	0.10
Compacted Soil (e.g., unpaved parking)	0.30

1. Surface is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.

Surface	Runoff Factor
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

B.1.2 Offline BMPs

Diversion flow rates for offline BMPs shall be sized to convey the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of every storm event. The following hydrologic method shall be used to calculate the diversion flow rate for off-line BMPs:

$$Q = C \times i \times A$$

Where:

Q = Diversion flow rate in cubic feet per second

C = Runoff factor, area weighted estimate using Table B.1

i = Rainfall intensity of 0.2 in/hr

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drain to the BMP. Refer to Chapter 3, Section 3.3.3 for additional guidance. Street redevelopment projects also consult Section 1.4.3.85th Percentile, 24-Hour Storm Event

The 85th percentile, 24-hour isopluvial map is provided as Figure B.1-1. The rainfall depth to estimate the DCV shall be determined using Figure B.1-1; SAN is located within the 0.5 inch rainfall depth zone. The methodology used to develop this map is presented below:

B.1.2.1 Gage data and calculation of 85th percentile

The method of calculating the 85th percentile is to produce a list of values, order them from smallest to largest, and then pick the value that is 85 percent of the way through the list. Only values that are capable of producing run off are of interest for this purpose. Lacking a legislative definition of rainfall values capable of producing runoff, Flood Control staff in San Diego County have observed that the point at which significant runoff begins is rather subjective, and is affected by land use type and soil moisture. In highly-urbanized areas, the soil has a high impermeability and runoff can begin with as little as 0.02" of rainfall. In rural areas, soil impermeability is significantly lower and even 0.30" of rain on dry soil will frequently not produce significant runoff. For this reason, San Diego County has chosen to use the more objective method of including all non-zero 24-hour rainfall totals when calculating the 85th percentile. To produce a statistically significant number, only stations with 30 years or greater of daily rainfall records are used.

B.1.2.2 Mapping the gage data

A collection of 56 precipitation gage points was developed with 85th percentile precipitation values based on multiple years of gage data. A raster surface (grid of cells with values) was interpolated from that set of points. The surface initially did not cover the County's entire jurisdiction. A total of 13 dummy points were added. Most of those were just outside the County boundary to enable the software to generate a surface that covered the entire County. A handful of points were added to enforce a plausible surface. In particular, one point was added in the desert east of Julian, to enforce a gradient from high precipitation in the mountains to low precipitation in the desert. Three points were added near the northern boundary of the County to adjust the surface to reflect the effect of elevation in areas lacking sufficient operating gages.

Several methods of interpolation were considered. The method chosen is named by Environmental Systems Research Institute as the Natural Neighbor technique. This method produces a surface that is highly empirical, with the value of the surface being a product of the values of the data points nearest each cell. It does not produce peaks or valleys of surface based on larger area trends, and is free of artifacts that appeared with other methods.

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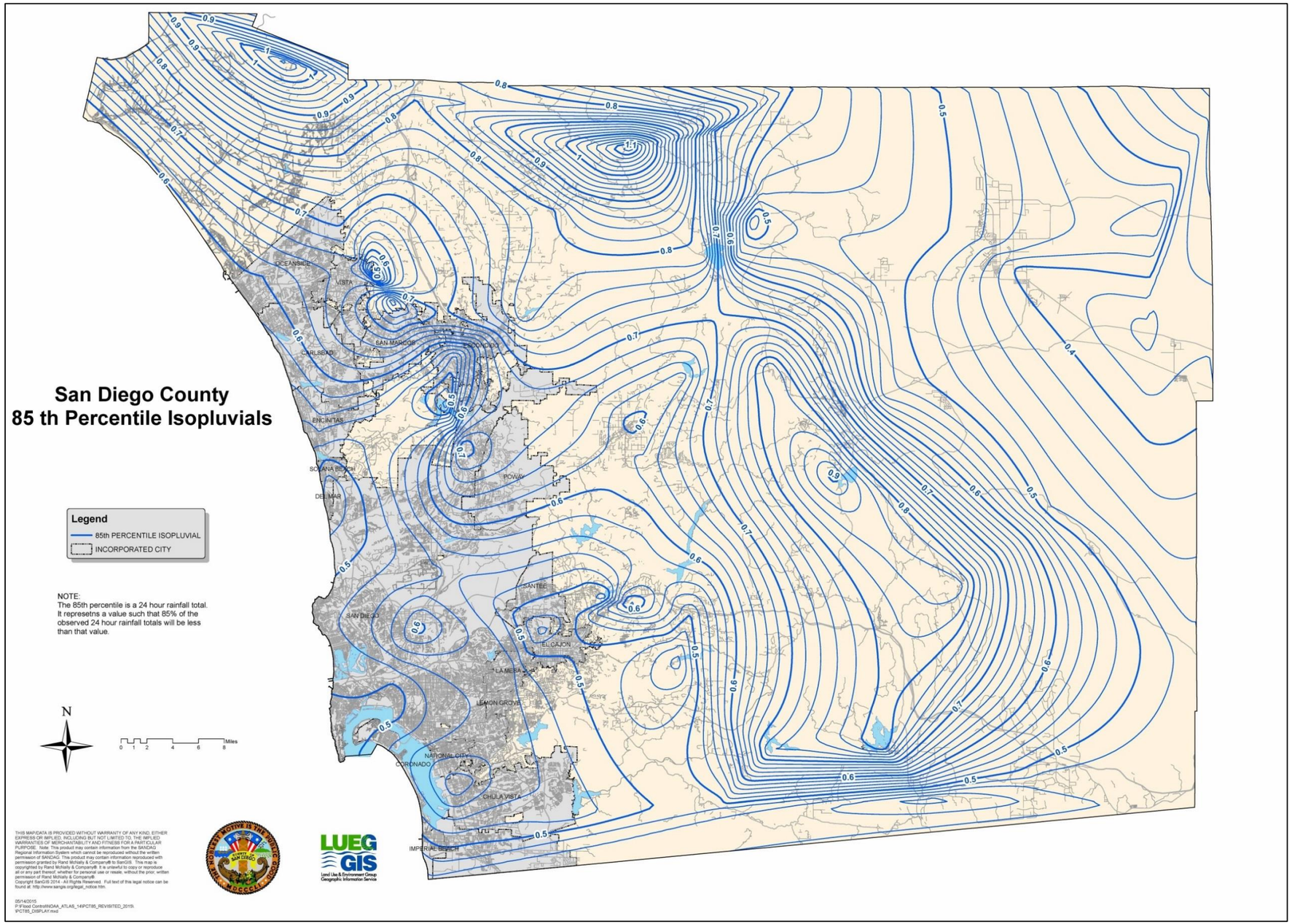

Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

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B.2 Adjustments to Account for Site Design BMPs

This section provides methods to adjust the DCV (for sizing pollutant control BMPs) as a result of implementing site design BMPs. The adjustments are provided by one of the following two methods:

- Adjustment to impervious runoff factor
- Adjustment to DCV

B.2.1 Adjustment to Impervious Runoff Factor

When one of the following site design BMPs is implemented the runoff factor of 0.9 for impervious surfaces identified in Table B.1-1 should be adjusted using the factors listed below and an adjusted area weighted runoff factor shall be estimated following guidance from Section B.1.1 and used to calculate the DCV.

- SD-5 Impervious area dispersion
- SD-6A Green roofs
- SD-6B Permeable pavement

B.2.1.1 Impervious area dispersion (SD-5)

Dispersion of impervious areas through pervious areas: The following adjustments are allowed to impervious runoff factors when dispersion is implemented in accordance with the SD-5 fact sheet (Appendix E). Adjustments are only credited up to a 4:1 maximum ratio of impervious to pervious areas. In order to adjust the runoff factor, the pervious area shall have a minimum width of 10 feet and a maximum slope of 5%. Based on the ratio of **impervious area to pervious area** and the hydrologic soil group of the pervious area, the adjustment factor from Table B.2-1 shall be multiplied with the unadjusted runoff factor (Table B.1-1) of the impervious area to estimate the adjusted runoff factor for sizing pollutant control BMPs. The adjustment factors in Table B.2-1 are **only** valid for impervious surfaces that have an unadjusted runoff factor of 0.9.

Table B.2-1: Impervious area adjustment factors that accounts for dispersion

Pervious area hydrologic soil group	Ratio = Impervious area/Pervious area			
	<=1	2	3	4
A	0.00	0.00	0.23	0.36
B	0.00	0.27	0.42	0.53
C	0.34	0.56	0.67	0.74
D	0.86	0.93	0.97	1.00

Continuous simulation modeling in accordance with Appendix G is required to develop adjustment factors for surfaces that have an unadjusted runoff factor less than 0.9. Approval of adjustment factors for surfaces that have an unadjusted runoff factor less than 0.9 is at the discretion of the FDD and EAD.

The adjustment factors in Table B.2-1 were developed by performing continuous simulations in SWMM with default parameters from Appendix G and impervious to pervious area ratios of 1, 2, 3, and 4. When using adjustment factors from Table B.2-1:

- **Linear interpolation** shall be performed if the impervious to pervious area ratio of the site is in between one of ratios for which an adjustment factor was developed;
- Use adjustment factor for a ratio of 1 when the impervious to pervious area ratio is less than 1; and
- Adjustment factor is not allowed when the impervious to pervious area ratio is greater than 4, when the pervious area is designed as a site design BMP.

Example B.2-1: DMA is comprised of one acre of impervious area that drains to a 0.4 acre hydrologic soil group B pervious area and then the pervious area drains to a BMP. Impervious area dispersion is implemented in the DMA in accordance with SD-5 factsheet. Estimate the adjusted runoff factor for the DMA.

- Baseline Runoff Factor per Table B.1-1 = [(1*0.9+0.4*0.14)/1.4] = 0.68.
- Impervious to Pervious Ratio = 1 acre impervious area/ 0.4 acre pervious area = 2.5; since the ratio is 2.5 adjustment can be claimed.
- From Table B.2-1 the adjustment factor for hydrologic soil group B and a ratio of 2 = 0.27; ratio of 3 = 0.42.
- Linear interpolated adjustment factor for a ratio of 2.5 = 0.27 + {[(0.42 -0.27)/(3-2)]*(2.5-2)} = 0.345.
- Adjusted runoff factor for the DMA = [(1*0.9*0.345+0.4*0.14)/1.4] = 0.26.
- Note only the runoff factor for impervious area is adjusted, there is no change made to the pervious area.

B.2.1.2 Green Roofs

When green roofs are implemented in accordance with the SD-6A factsheet the green roof footprint shall be assigned a runoff factor of 0.10 for adjusted runoff factor calculations.

B.2.1.3 Permeable Pavement

When a permeable pavement is implemented in accordance with the SD-6B factsheet and it does not have an impermeable liner and has storage greater than the 85th percentile depth below the underdrain, if an underdrain is present, then the footprint of the permeable pavement shall be

assigned a runoff factor of 0.10 for adjusted runoff factor calculations.

Permeable Pavement can also be designed as a structural BMP to treat run on from adjacent areas. Refer to INF-3 factsheet and Appendix B.4 for additional guidance.

B.2.2 Adjustment to DCV

When the following site design BMPs are implemented the anticipated volume reduction from these BMPs shall be deducted from the DCV to estimate the volume for which the downstream structural BMP should be sized for:

- SD-1: Street trees
- SD-8 Rain barrels

B.2.2.1 Street Trees

Street tree credit volume from tree trenches or boxes (tree BMPs) is a sum of three runoff reduction volumes provided by trees that decrease the required DCV for a tributary area. The following reduction in DCV is allowed per tree based on the mature diameter of the tree canopy, when trees are implemented in accordance with SD-1 factsheet and meet the following criteria:

- Total tree credit volume is less than 0.25DCV of the project footprint and
- Single tree credit volume is less than 400 ft^3

Credit for trees that do not meet the above criteria shall be based on the criteria for sizing the tree as a storm water pollutant control BMP in SD-1 fact sheet.

Mature Tree Canopy Diameter (ft)	Tree Credit Volume (ft^3/tree)
5	10
10	40
15	100
20	180
25	290
30	420

Basis for the reduction in DCV:

Tree credit volume was estimated based on typical characteristics of street trees as follows:

It is assumed that each tree and associated trench or box is considered a single BMP, with calculations based on the media storage volume and/or the individual tree within the tree BMP as appropriate. Tree credit volume is calculated as:

$$\boldsymbol{TCV = TIV + TCIV + TETV}$$

Where:

- *TCV* = Tree credit volume (ft^3)
- *TIV* = Total infiltration volume of all storage layers within tree BMPs (ft^3)
- *TCIV* = Total canopy interception volume of all individual trees within tree BMPs (ft^3)
- *TETV* = Total evapotranspiration volume, sums the media evapotranspiration storage within each tree BMP (ft^3)

Total infiltration volume was calculated as the total volume infiltrated within the BMP storage layers. Infiltration volume was assumed to be 20% of the total BMP storage layer volume, the available pore space in the soil volume (porosity – field capacity). Total canopy interception volume was calculated for all street trees within the tributary area as the average interception capacity for the entire mature tree total canopy projection area. Interception capacity was determined to be 0.04 inches for all street tree sizes, an average from the findings published by Breuer et al (2003) for coniferous and deciduous trees. Total evapotranspiration volume is the available evapotranspiration storage volume (field capacity – wilting point) within the BMP storage layer media. TEVT is assumed to be 10% of the minimum soil volume. The minimum soil volume as required by SD-1 fact sheet of 2 cubic feet per unit canopy projection area was assumed for estimating reduction in DCV.

B.2.2.2 Rain Barrels

Rain barrels are containers that can capture rooftop runoff and store it for future use. Credit can be taken for the full rain barrel volume when each barrel volume is smaller than 100 gallons, implemented per SD-8 fact sheet and meet the following criteria:

- Total rain barrel volume is less than 0.25 DCV and
- Landscape areas are greater than 30 percent of the project footprint.

Credit for harvest and use systems that do not meet the above criteria shall be based on the criteria in Appendix B.3 and HU-1 fact sheet.

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=		inches
2	Area tributary to BMP (s)	A=		acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=		unitless
4	Street trees volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=		cubic-feet

B.3 Harvest and Use BMPs

The purpose of this section is to provide guidance for evaluating feasibility of harvest and use BMPs, calculating harvested water demand and sizing harvest and use BMPs.

B.3.1 Planning Level Harvest and Use Feasibility

Harvest and use feasibility should be evaluated at the scale of the entire project, and not limited to a single DMA. For the purpose of initial feasibility screening, it is assumed that harvested water collected from one DMA could be used within another. Types of non-potable water demand that may apply within a project include:

- Toilet and urinal flushing
- Irrigation
- Vehicle washing
- Evaporative cooling
- Dilution water for recycled water systems
- Industrial processes
- Other non-potable uses

Worksheet B.3-1 provides a screening process for determining the preliminary feasibility for harvest and use BMPs. This worksheet should be completed for the overall project.

Worksheet B.3-1. Harvest and Use Feasibility Screening

<table>
<tr><th colspan="2">Harvest and Use Feasibility Screening</th><th>Worksksheet B.3-1</th></tr>
<tr><td colspan="3">1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:_____</td></tr>
<tr><td colspan="3">2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.

[Provide a results here]</td></tr>
<tr><td>3a. Is the 36-hour demand greater than or equal to the DCV?
Yes / No ⇨
⇩</td><td>3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?
Yes / No ⇨
⇩</td><td>3c. Is the 36-hour demand less than 0.25DCV?
Yes
⇩</td></tr>
<tr><td>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</td><td>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</td><td>Harvest and use is considered to be infeasible.</td></tr>
</table>

B.3.2 Harvested Water Demand Calculation

The following sections provide technical references and guidance for estimating the harvested water demand of a project. These references are intended to be used for the planning phase of a project for feasibility screening purposes.

B.3.2.1 Toilet and Urinal Flushing Demand Calculations

The following guidelines should be followed for computing harvested water demand from toilet and urinal flushing:

- If reclaimed water is planned for use for toilet and urinal flushing, then the demand for harvested storm water is equivalent to the total demand minus the reclaimed water supplied, and should be reduced by the amount of reclaimed water that is available during the wet season.
- Demand calculations for toilet and urinal flushing should be based on the average rate of use during the wet season for a typical year.
- Demand calculations should include changes in occupancy over weekends and around holidays and changes in attendance/enrollment over school vacation periods.
- For facilities with generally high demand, but periodic shut downs (e.g., for vacations, maintenance, or other reasons), a project specific analysis should be conducted to determine whether the long term storm water capture performance of the system can be maintained despite shut downs.
- Such an analysis should consider the statistical distributions of precipitation and demand, most importantly the relationship of demand to the wet seasons of the year.

Table B.3-1 provides planning level demand estimates for toilet and urinal flushing per resident, or employee, for a variety of project types. The per capita use per day is based on daily employee or resident usage. For non-residential types of development, the "visitor factor" should be multiplied by the employee use to account for toilet and urinal usage for non-employees using facilities. Project proponents may suggest an alternate per capita use for airport employees and passengers, with approval from EAD and FDD.

Table B.3-1. Toilet and Urinal Water Usage per Employee and Visitor

Land Use Type[6]	Toilet User Unit of Normalization	Per Capita Use per Day		Visitor Factor[4]	Water Efficiency Factor	Total Use per Employee[6]
		Toilet Flushing[1,2]	Urinals[3]			
Office	Employee (non-visitor)	9.0	2.27	1.1	0.5	7 (avg)
Retail	Employee (non-visitor)	9.0	2.11	1.4	0.5	
Various Industrial Uses (excludes process water)	Employee (non-visitor)	9.0	2	1	0.5	5.5

1- Based on American Waterworks Association Research Foundation,1999. Residential End Uses of Water. Denver, CO: AWWARF
2 - Based on use of 3.45 gallons per flush and average number of per employee flushes per subsector, Table D-1 for MWD (Pacific Institute, 2003)
3 - Based on use of 1.6 gallons per flush, Table D-4 and average number of per employee flushes per subsector, Appendix D (Pacific Institute, 2003)
4 - Multiplied by the demand for toilet and urinal flushing for the project to account for visitors. Based on proportion of annual use allocated to visitors and others (includes students for schools; about 5 students per employee) for each subsector in Table D-1 and D-4 (Pacific Institute, 2003)
5 – Accounts for requirements to use ultra low flush toilets in new development projects; assumed that requirements will reduce toilet and urinal flushing demand by half on average compared to literature estimates. Ultra low flush toilets are required in all new construction in California as of January 1, 1992. Ultra low flush toilets must use no more than 1.6 gallons per flush and Ultra low flush urinals must use no more than 1 gallon per flush. Note: If zero flush urinals are being used, adjust accordingly.
6 – Project proponents may suggest an alternate usage rate for airport employees and passengers, with approval from EAD.

B.3.2.2 General Requirements for Irrigation Demand Calculations

The following guidelines should be followed for computing harvested water demand from landscape irrigation:

- If reclaimed water is planned for use for landscape irrigation, then the demand for harvested storm water should be reduced by the amount of reclaimed water that is available during the wet season.
- Irrigation rates should be based on the irrigation demand exerted by the types of landscaping that are proposed for the project, with consideration for water conservation requirements.
- Irrigation rates should be estimated to reflect the average wet season rates (defined as October through April) accounting for the effect of storm events in offsetting harvested water demand. In the absence of a detailed demand study, it should be assumed that irrigation demand is not present during days with greater than 0.1 inches of rain and the subsequent 3-day period. This irrigation shutdown period is consistent with standard practice in land application of wastewater and is applicable to storm water to prevent irrigation from resulting in dry weather runoff. Based on a statistical analysis of San Diego County rainfall patterns, approximately 30 percent of wet season days would not have a demand for irrigation.

- If land application of storm water is proposed (irrigation in excess of agronomic demand), then this BMP must be considered to be an infiltration BMP and feasibility screening for infiltration must be conducted. In addition, it must be demonstrated that land application would not result in greater quantities of runoff as a result of saturated soils at the beginning of storm events. Agronomic demand refers to the rate at which plants use water.

The following sections describe methods that should be used to calculate harvested water irrigation demand. While these methods are simplified, they provide a reasonable estimate of potential harvested water demand that is appropriate for feasibility analysis and project planning. These methods may be replaced by a more rigorous project-specific analysis that meets the intent of the criteria above.

B.3.2.2.1 Demand Calculation Method

This method is based on the San Diego Municipal Code Land Development Code Landscape Standards Appendix E which includes a formula for estimating a project's annual estimated total water use based on reference evaporation, plant factor, and irrigation efficiency.

For the purpose of calculating harvested water irrigation demand applicable to the sizing of harvest and use systems, the estimated total water use has been modified to reflect typical wet-season irrigation demand. This method assumes that the wet season is defined as October through April. This method further assumes that no irrigation water will be applied during days with precipitation totals greater than 0.1 inches or within the 3 days following such an event. Based on these assumptions and an analysis of Lake Wohlford, Lindbergh and Oceanside precipitation patterns, irrigation would not be applied during approximately 30 percent of days from October through April.

The following equation is used to calculate the Modified Estimated Total Water Usage:

$$\text{Modified ETWU} = ETo_{Wet} \times [[\Sigma(PF \times HA)/IE] + SLA] \times 0.015$$

Where:

Modified ETWU = Estimated daily average water usage during wet season
ETo_{Wet} = Average reference evapotranspiration from October through April (use 2.8 inches per month, using CIMS Zone 4 from Table G.1-1)
PF = Plant Factor

Table B.3-2. Planning Level Plant Factor Recommendations

Plant Water Use	Plant Factor	Also Includes
Low	< 0.1 – 0.2	Artificial Turf
Moderate	0.3 – 0.7	
High	0.8 and greater	Water features
Special Landscape Area	1.0	

HA = Hydrozone Area (sq-ft); A section or zone of the landscaped area having plants with similar water needs.
Σ(PF x HA) = The sum of PF x HA for each individual Hydrozone (accounts for different landscaping zones).
IE = Irrigation Efficiency (assume 90 percent for demand calculations)
SLA = Special Landscape Area (sq-ft); Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

In this equation, the coefficient (0.015) accounts for unit conversions and shut down of irrigation during and for the three days following a significant precipitation event:

0.015 = (1 mo/30 days)×(1 ft/12 in)×(7.48 gal/cu-ft)×(approximately 7 out of 10 days with irrigation demand from October through April)

B.3.2.2.2 Planning Level Irrigation Demands

To simplify the planning process, the method described above has been used to develop daily average wet season demands for a one-acre irrigated area based on the plant/landscape type. These demand estimates can be used to calculate the drawdown of harvest and use systems for the purpose of LID BMP sizing calculations.

Table B.3-3. Planning Level Irrigation Demand by Plant Factor and Landscape Type

General Landscape Type	36-Hour Planning Level Irrigation Demand (gallons per irrigated acre per 36 hour period)
Hydrozone – Low Plant Water Use	390
Hydrozone – Moderate Plant Water Use	1,470
Hydrozone – High Plant Water Use	2,640
Special Landscape Area	2,640

B.3.2.3 Calculating Other Harvested Water Demands

Calculations of other harvested water demands should be based on the knowledge of land uses, industrial processes, and other factors that are project-specific. Demand should be calculated based on the following guidelines:

- Demand calculations should represent actual demand that is anticipated during the wet season (October through April).
- Sources of demand should only be included if they are reliably and consistently present during the wet season.
- Where demands are substantial but irregular, a more detailed analysis should be conducted based on a statistical analysis of anticipated demand and precipitation patterns.

B.3.3 Sizing Harvest and Use BMPs

Sizing calculations shall demonstrate that one of two equivalent performance standards is met:

1. Harvest and use BMPs are sized to drain the tank in 36 hours following the end of rainfall. The size of the BMP is dependent on the demand (Section B.3.2) at the site; OR
2. Harvest and use BMP is designed to capture at least 80 percent of average annual (long term) runoff volume.

It is rare cisterns can be sized to capture the full DCV and use this volume in 36 hours. So when using Worksheet B.3-1 if it is determined that harvest and use BMP is feasible then the BMP should be sized to the estimated 36-hour demand. The applicant has an option to design the harvest and use BMP for greater demand, but the BMP must then be made larger to account for back to back storms. This increase in sizing can be estimated using the nomograph presented in Figure B.4-1.

According to the California Department of Health, structural BMPs that retain standing water for over 96 hours are particularly concerning for facilitating mosquito breeding. Cisterns designed for the 96-hour demand or greater should incorporate appropriate vector controls, and a vector control plan be submitted to EAD.

B.4 Infiltration BMPs

Sizing calculations shall demonstrate that one of two equivalent performance standards is met:

1. The BMP or series of BMPs captures the DCV and infiltrates this volume fully within 36 hours following the end of precipitation. This can be demonstrated through the Simple Method (Section B.4.1).

2. The BMP or series of BMPs infiltrates at least 80 percent of average annual (long term) runoff volume. This can be demonstrated using the percent capture method (Section B.4.2), through reporting of output from the San Diego Hydrology Model, or through other continuous simulation modeling meeting the criteria in Appendix G, as acceptable to the EAD and FDD. This method is **not** applicable for sizing biofiltration BMPs.

The methods to show compliance with these standards are provided in the following sections.

B.4.1 Simple Method

Stepwise Instructions:

1. Compute DCV using Worksheet B.4-1
2. Estimate design infiltration rate using Worksheet D.5-1
3. Design BMP(s) to ensure that the DCV is fully retained (i.e., no surface discharge during the design event) and the stored effective depth draws down in no longer than 36 hours.

Worksheet B.4-1: Simple Sizing Method for Infiltration BMPs

Simple Sizing Method for Infiltration BMPs		Worksheet B.4-1		
1	DCV (Worksheet B-2.1)	DCV=		cubic-feet
2	Estimated design infiltration rate (Worksheet D.5-1)	K_{design}=		in/hr
3	Available BMP surface area	A_{BMP}=		sq-ft
4	Average effective depth in the BMP footprint (DCV/A_{BMP})	D_{avg}=		feet
5	Drawdown time, T (D_{avg} *12/K_{design})	T=		hours
6	Provide alternative calculation of drawdown time, if needed.			

Notes:

- Drawdown time must be less than 36 hours. This criterion was set to achieve average annual capture of 80% to account for back to back storms (See rationale in Section B.4.3). In order to use a different drawdown time, BMPs should be sized using the percent capture method (Section B.4.2).
- The average effective depth calculation should account for any aggregate/media in the BMP. For example, 4 feet of stone at a porosity of 0.4 would equate to 1.6 feet of effective depth.
- This method may overestimate drawdown time for BMPs that drain through both the bottom and walls of the system. BMP specific calculations of drawdown time may be provided that account for BMP-specific geometry.

B.4.2 Percent Capture Method

This section describes the recommended method of sizing volume-based BMPs to achieve the 80 percent capture performance criterion. This method has a number of potential applications for sizing BMPs, including:

- Use this method when a BMP can draw down in less than 36 hours and it is desired to demonstrate that 80 percent capture can be achieved using a BMP volume smaller than the DCV.
- Use this method to determine how much volume (greater than the DCV) must be provided to achieve 80 percent capture when the drawdown time of the BMP exceeds 36 hours. Note: if the drawdown time exceeds 96 hours, appropriate vector control should be incorporated.
- Use this method to determine how much volume should be provided to achieve 80 percent capture when upstream BMP(s) have achieved some capture, but have not achieved 80 percent capture.

By nature, the percent capture method is an iterative process that requires some initial assumptions about BMP design parameters and subsequent confirmation that these assumptions are valid. For example, sizing calculations depend on the assumed drawdown time, which depends on BMP depth, which may in turn need to be adjusted to provide the required volume within the allowable footprint. In general, the selection of reasonable BMP design parameters in the first iteration will result in minimal required additional iterations. Figure B.4-1 presents the nomograph for use in sizing retention BMPs in San Diego County.

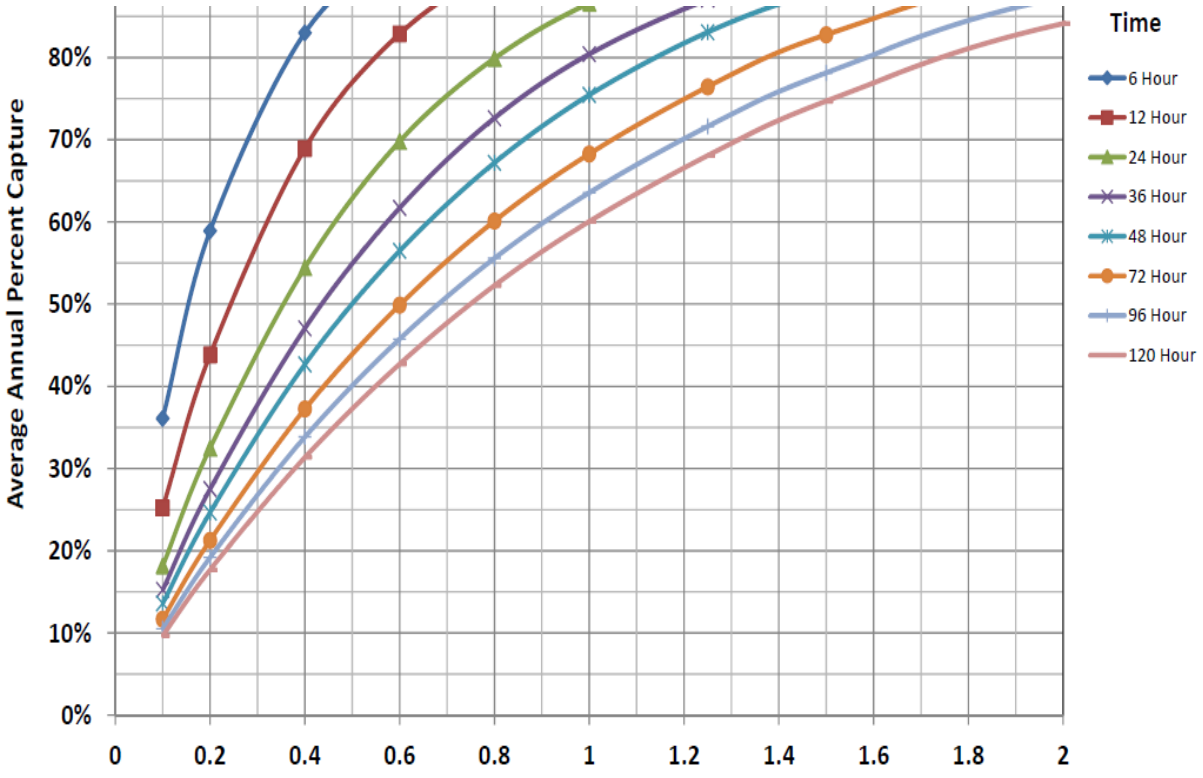


Figure B.4-1: Percent Capture Nomograph

B.4.2.1 Stepwise Instructions for sizing a single BMP:

1. Estimate the drawdown time of the proposed BMP by estimating the design infiltration rate (Worksheet D.5-1) and accounting for BMP dimensions/geometry. See the applicable BMP Fact Sheet for specific guidance on how to convert BMP geometry to estimated drawdown time.
2. Using the estimated drawdown time and the nomograph from Figure B.4-1 locate where the line corresponding to the estimated drawdown time intersects with 80 percent capture. Pivot to the X axis and read the fraction of the DCV that needs to be provided in the BMP to achieve this level of capture.
3. Calculate the DCV using Worksheet B.2-1.
4. Multiply the result of Step 2 by the DCV (Step 3). This is the required BMP design volume.
5. Design the BMP to retain the required volume, and confirm that the drawdown time is no more than 25 percent greater than estimated in Step 1. If the computed drawdown time is greater than 125 percent of the estimated drawdown, then return to Step 1 and revise the initial drawdown time assumption.

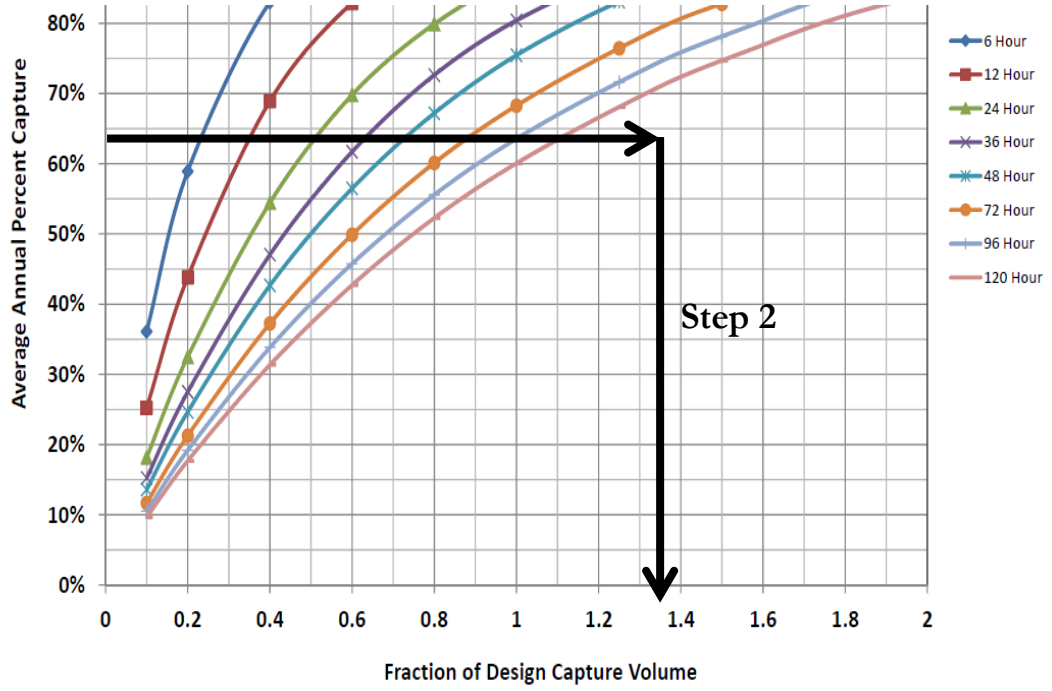
See the respective BMP facts sheets for BMP-specific instructions for the calculation of volume and drawdown time. The above method can also be used to size and/or evaluate the performance of other retention BMPs (evapotranspiration, harvest and use) that have a drawdown rate that can be approximated as constant throughout the year or over the wet season. In order to use this method for other retention BMPs, drawdown time in Step 1 will need to be evaluated using an applicable method for the type of BMP selected. After completing Step 1 continue to Step 2 listed above.

Example B.4.2.1 Percent Capture Method for Sizing a Single BMP:

Given:
• Estimated drawdown time: 72 Hours • DCV: 3000 ft^3
Required:
• Determine the volume required to achieve 80 percent capture.
Solution:
1. Estimated drawdown time = 72 Hours 2. Fraction of DCV required = 1.35 3. DCV = 3000 ft^3 (Given for this example; To be estimated using Worksheet B.2-1) 4. Required BMP volume = 1.35 x 3000 = 4050 ft^3 5. Design BMP and confirm drawdown Time is $\leq$ 90 Hours (72 Hours +25%)

Example B.4.2.1 Continued:

Graphical Operations Supporting Solution:



Percent Capture Nomograph

B.4.2.2 Stepwise Instructions for sizing BMPs in series:

For projects where BMPs in series have to be implemented to meet the performance standard the following stepwise procedure shall be used to size the downstream BMP to achieve the 80 percent capture performance criterion:

1. Using the upstream BMP parameters (volume and drawdown time) estimate the average annual capture efficiency achieved by the upstream BMP using the nomograph.
2. Estimate the drawdown time of the proposed downstream BMP by estimating the design infiltration rate (Worksheet D.5-1) and accounting for BMP dimensions/geometry. See the applicable BMP Fact Sheet for specific guidance on how to convert BMP geometry to estimated drawdown time. Use the nomograph and locate where the line corresponding to the estimated drawdown time intersects with 80 percent capture. Pivot to the horizontal axis and read the fraction of the DCV that needs to be provided in the BMP. This is referred to as X_1.
3. Trace a horizontal line on the nomograph using the capture efficiency of the upstream BMP estimated in Step 1. Find where the line traced intersects with the drawdown time of the downstream BMP (Step 2). Pivot and read down to the horizontal axis to yield the fraction of the DCV already provided by the upstream BMP. This is referred to as X_2.

4. Subtract X_2 (Step 3) from X_1 (Step 2) to determine the fraction of the design volume that must be provided in the downstream BMP to achieve 80 percent capture to meet the performance standard.
5. Multiply the result of Step 4 by the DCV. This is the required downstream BMP design volume.
6. Design the BMP to retain the required volume, and confirm that the drawdown time is no more than 25 percent greater than estimated in Step 2. If the computed drawdown time is greater than 125 percent of the estimated drawdown, then return to Step 2 and revise the initial drawdown time assumption.

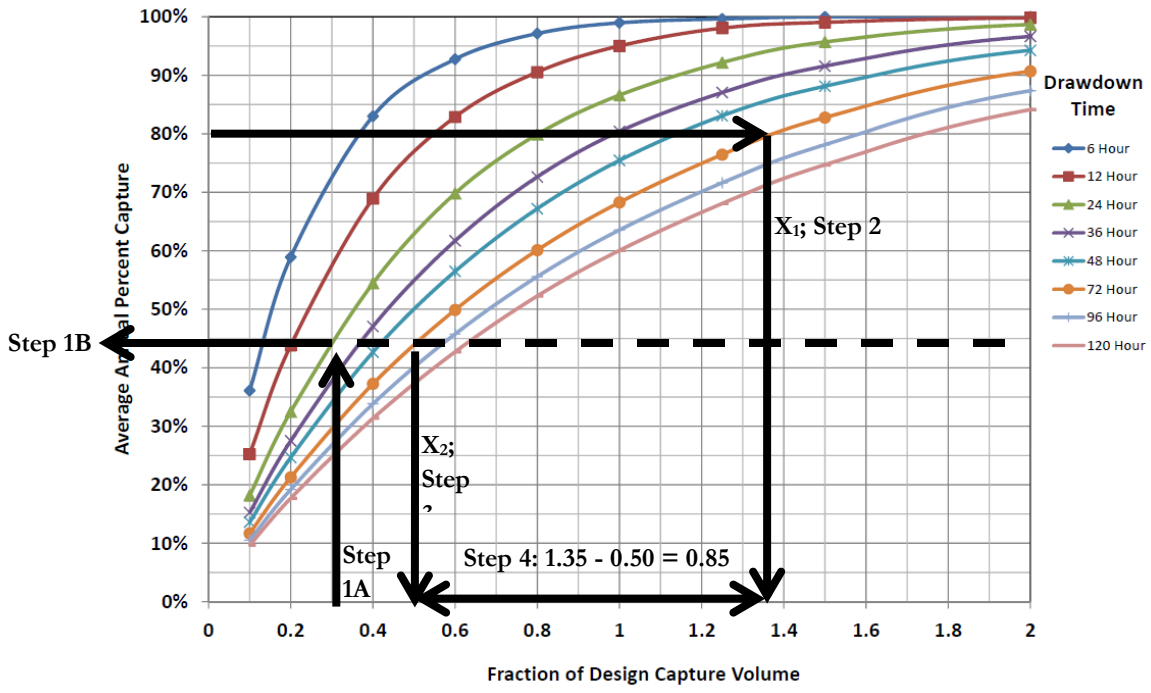
See the respective BMP facts sheets for BMP-specific instructions for the calculation of volume and drawdown time.

Example B.4.2.2 Percent Capture Method for Sizing BMPs in Series:

Given:
• Estimated drawdown time for downstream BMP: 72 Hours • DCV for the area draining to the BMP: 3000 ft^3 • Upstream BMP volume: 900 ft^3 • Upstream BMP drawdown time: 24 Hours
Required:
• Determine the volume required in the downstream BMP to achieve 80 percent capture.
Solution:
1. Step 1A: Upstream BMP Capture Ratio = 900/3000 = 0.3; Step 1B: Average annual capture efficiency achieved by upstream BMP = 44% 2. Downstream BMP drawdown = 72 hours; Fraction of DCV required to achieve 80% capture = 1.35 3. Locate intersection of design capture efficiency and drawdown time for upstream BMP (See Graph); Fraction of DCV already provided (X_2) = 0.50 (See Graph) 4. Fraction of DCV Required by downstream BMP = 1.35-0.50 = 0.85 5. DCV (given) = 3000 ft^3 ; Required downstream BMP volume = 3000 ft^3 x 0.85 = 2,550 ft^3 6. Design BMP and confirm drawdown Time is $\leq$ 90 Hours (72 Hours +25%)

Example B.4.2.2 Continued:

Graphical Operations Supporting Solution:



Percent Capture Nomograph

B.4.3 Technical Basis for Equivalent Sizing Methods

Storm water BMPs can be conceptualized as having a storage volume and a treatment rate, in various proportions. Both are important in the long-term performance of the BMP under a range of actual storm patterns, depths, and inter-event times. Long-term performance is measured by the operation of a BMP over the course of multiple years, and provides a more complete metric than the performance of a BMP during a single event, which does not take into account antecedent conditions, including multiple storms arriving in short timeframes. A BMP that draws down more quickly would be expected to capture a greater fraction of overall runoff (i.e., long-term runoff) than an identically sized BMP that draws down more slowly. This is because storage is made available more quickly, so subsequent storms are more likely to be captured by the BMP. In contrast a BMP with a long drawdown time would stay mostly full, after initial filling, during periods of sequential storms. The volume in the BMP that draws down more quickly is more "valuable" in terms of long term performance than the volume in the one that draws down more slowly. The MS4 permit definition of the DCV does not specify a drawdown time, therefore the definition is not a complete

indicator of a BMP's level of performance. An accompanying performance-based expression of the BMP sizing standard is essential to ensure uniformity of performance across a broad range of BMPs and helps prevents BMP designs from being used that would not be effective.

An evaluation of the relationships between BMP design parameters and expected long term capture efficiency has been conducted to address the needs identified above. Relationships have been developed through a simplified continuous simulation analysis of precipitation, runoff, and routing, that relate BMP design volume and storage recovery rate (i.e., drawdown time) to an estimated long term level of performance using United States Environmental Protection Agency (USEPA) SWMM and parameters listed in Appendix G for Lake Wohlford, Lindbergh, and Oceanside rain gages. Comparison of the relationships developed using the three gages indicated that the differences in relative capture estimates are within the uncertainties in factors used to develop the relationships. For example, the estimated average annual capture for the BMP sized for the DCV and 36 hour drawdown using Lake Wohlford, Lindbergh, and Oceanside are 80%, 76% and 83% respectively. In an effort to reduce the number of curves that are made available, relationships developed using Lake Wohlford are included in this manual for use in the whole San Diego County region.

Figure B.4-1 demonstrated that a BMP sized for the runoff volume from the 85th percentile, 24-hour storm event (i.e., the DCV), which draws down in 36 hours is capable of managing approximately 80 percent of the average annual. There is long precedent for 80 percent capture of average annual runoff as approximately the point at which larger BMPs provide decreasing capture efficiency benefit (also known as the "knee of the curve") for BMP sizing. The characteristic shape of the plot of capture efficiency versus storage volume in Figure B.4-1 illustrates this concept.

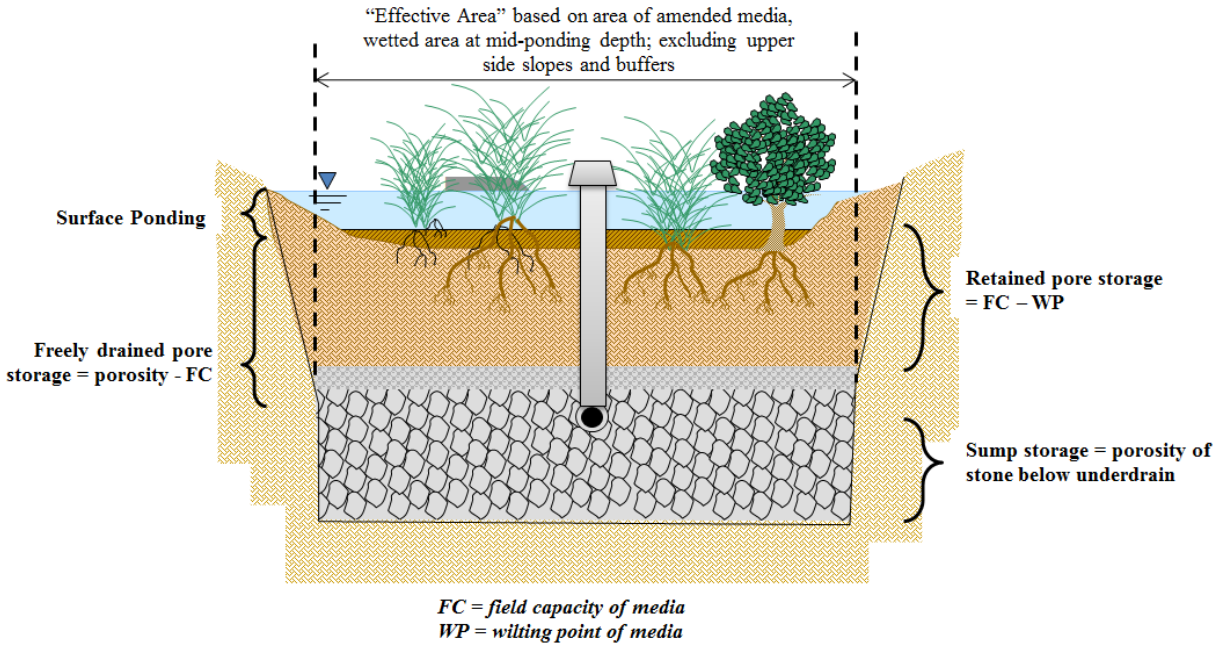
As such, this equivalency (between DCV draw down in 36-hours and 80 percent capture) has been utilized to provide a common currency between volume-based BMPs with a wide range of drawdown rates. This approach allows flexibility in the design of BMPs while ensuring consistent performance.

B.5 Biofiltration BMPs

Biofiltration BMPs shall be sized by one of the following sizing methods:

Option 1: Treat 1.5 times the portion of the DCV not reliably retained onsite, OR

Option 2: Treat 1.0 times the portion of the DCV not reliably retained onsite; and additionally check that the system has a total static (i.e., non-routed) storage volume, including pore spaces and pre-filter detention volume, equal to at least 0.75 times the portion of the DCV not reliably retained onsite.



Explanation of Biofiltration Volume Compartments for Sizing Purposes

Worksheet B.5-1 provides a simple sizing method for sizing biofiltration BMP with partial retention and biofiltration BMP.

When using sizing option 1 a routing period of 6 hours is allowed. The routing period was estimated based on 50th percentile storm duration for storms similar to 85th percentile rainfall depth. It was estimated based on inspection of continuous rainfall data from Lake Wohlford, Lindbergh and Oceanside rain gages.

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs		cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible		in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]		inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]		inches
7	Assumed surface area of the biofiltration BMP		sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7		cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]		cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]		inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations		inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area		inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]		inches
19	Total Depth Treated [Line 17 + Line 18]		inches

Worksheet Error! No text of specified style in document.**-1: Simple Sizing Method for Biofiltration BMPs (continued)**

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 2 of 2)	
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]		cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12		sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]		cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12		sq-ft
Footprint of the BMP			
24	Area draining to the BMP		sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)		
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)		unitless
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]		sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)		sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of the DCV retained by the BMP [Line 9/ Line 1]		unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV > 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☐ Yes ☐ No	

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.
4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the EAD and FDD, if it meets the requirements in Appendix F.

B.5.1 Basis for Minimum Sizing Factor for Biofiltration BMPs

B.5.1.1 Introduction

MS4 Permit Provision E.3.c.(1)(a)(i)

The MS4 Permit describes conceptual performance goals for biofiltration BMPs and specifies numeric criteria for sizing biofiltration BMPs (See Section 2.2.1 of this Manual).

However, the MS4 Permit does not define a specific footprint sizing factor or design profile that must be provided for the BMP to be considered "biofiltration." Rather, the MS4 Permit specifies (Footnote 25):

> **As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.**

To meet this provision, this manual includes specific criteria for design of biofiltration BMPs. Among other criteria, a minimum footprint sizing factor of 3 percent (BMP footprint area as percent of contributing area times adjusted runoff factor) is specified. The purpose of this section is to provide the technical rationale for this 3 percent minimum sizing factor.

B.5.1.2 Conceptual Need for Minimum Sizing Factor

Under the 2011 Model SUSMP, a sizing factor of 4 percent was used for sizing biofiltration BMPs. This value was derived based on the goal of treating the runoff from a 0.2 inch per hour uniform precipitation intensity at a constant media flow rate of 5 inches per hour. While this method was simple, it was considered to be conservative as it did not account for significant transient storage present in biofiltration BMPs (i.e., volume in surface storage and subsurface storage that would need to fill before overflow occurred). Under this manual, biofiltration BMPs will typically provide subsurface storage to promote infiltration losses; therefore typical BMP profiles will tend to be somewhat deeper than those provided under the 2011 Model SUSMP. A deeper profile will tend to provide more transient storage and allow smaller footprint sizing factors while still providing similar or better treatment capacity and pollutant removal. Therefore a reduction in the minimum sizing factor from the factor used in the 2011 Model SUSMP is supportable. However, as footprint decreases, issues related to potential performance, operations, and/or maintenance can increase for a number of reasons:

1) As the surface area of the media bed decreases, the sediment loading per unit area increases, increasing the risk of clogging. While vigorous plant growth can help maintain permeability of soil, there is a conceptual limit above which plants may not be able to mitigate for the sediment loading. Scientific knowledge is not conclusive in this area.
2) With smaller surface areas and greater potential for clogging, water may be more likely to bypass the system via overflow before filling up the profile of the BMP.
3) As the footprint of the system decreases, the amount of water that can be infiltrated from subsurface storage layers and evapotranspire from plants and soils tends to decrease.
4) With smaller sizing factors, the hydraulic loading per unit area increases, potentially reducing the average contact time of water in the soil media and diminishing treatment performance.

The MS4 Permit requires that volume and pollutant retention be maximized. Therefore, a minimum sizing factor was determined to be needed. This minimum sizing factor does not replace the need to conduct sizing calculations as described in this manual; rather it establishes a lower limit on required size of biofiltration BMPs as the last step in these calculations. Additionally, it does not apply to alternative biofiltration designs that utilize the checklist in Appendix F (Biofiltration Standard and Checklist). Acceptable alternative designs (such as proprietary systems meeting Appendix F criteria) typically include design features intended to allow acceptable performance with a smaller footprint and have undergone field scale testing to evaluate performance and required O&M frequency.

B.5.1.3 Lines of Evidence to Select Minimum Sizing Factor

Three primary lines of evidence were used to select the minimum sizing factor of 3 percent (BMP footprint area as percent of contributing area times adjusted runoff factor) in this manual:

1. Typical design calculations.
2. Volume reduction performance.
3. Sediment clogging calculations.

These lines of evidence and associated findings are explained below.

Typical Design Calculations

A range of BMP profiles were evaluated for different design rainfall depths and soil conditions. Worksheet B.5-1 was used for each case to compute the required footprint sizing factor. For these calculations, the amount of water filtered during the storm event was determined based on a media filtration rate of 5 inches per hour and a routing time of 6 hours. These input assumptions are considered to be well-supported and consistent with the intent of the MS4 Permit. These calculations generally yielded footprint factors between 1.5 and 4.9 percent. In the interest of establishing a uniform County-wide minimum sizing factor, a 3 percent sizing factor was selected from this range, consistent with other lines of evidence.

Volume Reduction Performance

Consistent with guidance in Fact Sheet PR-1, the amount of retention storage (in gravel sump below underdrain) that would drain in 36 hours was calculated for a range of soil types. This was used to estimate the volume reduction that would be expected to be achieved. For a sizing factor of 3 percent and a soil filtration rate of 0.20 inches per hour, the average annual volume reduction was estimated to be approximately 40 percent (via percent capture method; see Appendix B.4.2).

In describing the basis for equivalency between retention and biofiltration (1.5 multiplier), the MS4 Permit Fact Sheet referred to analysis prepared in the Ventura County Technical Guidance Manual. The Ventura County analysis considered the pollutant treatment as well as the volume reduction provided by biofiltration in considering equivalency to retention. This analysis assumed an average long term volume reduction of 40 percent based on analysis of data from the International Stormwater BMP Database. The calculations of estimated volume reduction at a 3 percent sizing factor is (previous paragraph) consistent with this value. While estimated volume reduction is sensitive to site-specific factors, this analysis suggests that a sizing factor of approximately 3 percent provides levels of volume reduction that are reasonably consistent with the intent of the MS4 Permit.

Sediment Clogging Calculations

As sediment accumulates in a filter, the permeability of the filter tends to decline. The lifespan of the filter bed can be estimated by determining the rate of sediment loading per unit area of the filter bed. To determine the media bed surface area sizing factor needed to provide a target lifespan, simple sediment loading calculations were conducted based on typical urban conditions. The inputs and results of this calculation are summarized in Table B.5-1.

Table B.5-1: Inputs and Results of Clogging Calculation

Parameter	Value	Source
Representative TSS Event Mean Concentration, mg/L	100	Approximate average of San Diego Land Use Event Mean Concentrations from San Diego River and San Luis Rey River WQIP
Runoff Coefficient of Impervious Surface	0.90	Table B.1-1
Runoff Coefficient of Pervious Surface	0.10	Table B.1-1 for landscape areas
Imperviousness	40% to 90%	Planning level assumption, covers typical range of single family to commercial land uses
Average Annual Precipitation, inches	11 to 13	Typical range for much of urbanized San Diego County
Load to Initial Maintenance, kg/m^2	10	Pitt, R. and S. Clark, 2010. Evaluation of Biofiltration Media for Engineered Natural Treatment Systems.
Allowable period to initial clogging, yr	10	Planning-level assumption
Estimated BMP Footprint Needed for 10-Year Design Life	2.8 to 3.3%	Calculated

This analysis suggests that a 3 percent sizing factor, coupled with sediment source controls and careful system design, should provide reasonable protection against premature clogging. However, there is substantial uncertainty in sediment loading and the actual load to clog that will be observed under field conditions in the San Diego climate. Additionally this analysis did not account for the effect of plants on maintaining soil permeability. Therefore this line of evidence should be considered provisional, subject to refinement based on field scale experience. As field scale experience is gained about the lifespan of biofiltration BMPs in San Diego and the mitigating effects of plants on long term clogging, it may be possible to justify lower factors of safety and therefore smaller design sizes in some cases. If a longer lifespan is desired and/or greater sediment load is expected, then a larger sizing factor may be justified.

B.5.1.4 Discussion

Generally, the purpose of a minimum sizing factor is to help improve the performance and reliability of standard biofiltration systems and limit the use of sizing methods and assumptions that may lead to designs that are less consistent with the intent of the MS4 Permit.

Ultimately, this factor is a surrogate for a variety of design considerations, including clogging and associated hydraulic capacity, volume reduction potential, and treatment contact time. A prudent design approach should consider each of these factors on a project-specific basis and identify whether site conditions warrant a larger or smaller factor. For example a system treating only rooftop runoff in an area without any allowable infiltration may have negligible clogging risk and negligible volume reduction potential – a smaller sizing factor may not substantially reduce performance in either of these areas. Alternatively, for a site with high sediment load and limited pre-treatment potential, a larger sizing factor may be warranted to help mitigate potential clogging risks. EAD and FDD have discretion to accept alternative sizing factor(s) based on project-specific or jurisdiction-specific considerations. Additionally, the recommended minimum sizing factor may change over time as more experience with biofiltration is obtained.

The worksheet B.5-2 below shall be used to support a request for an alternative minimum footprint sizing factor. Based on a review of the submitted worksheet and supporting documentation, the use of a smaller footprint sizing factor may be approved at the discretion of the EAD and FDD. If approved, the estimated footprint from the worksheet below can be used in line 26 of worksheet B.5-1 in lieu of the 3 percent minimum footprint value.

This worksheet includes the following general steps to calculate the minimum footprint sizing factor:

- Select a "load to clog" that is representative of the type of BMP proposed
- Select a target life span (i.e., frequency of major maintenance) that is acceptable to the EAD and FDD. A default value of 10 years is recommended.
- Compile information about the DMA from other parts of the SWQMP development process.
- Determine the event mean concentration (EMC) of TSS that is appropriate for the DMA
- Perform calculations to determine the minimum footprint to provide the target lifespan.

Worksheet B.5-2: Calculation of Alternative Minimum Footprint Sizing Factor

Alternative Minimum Footprint Sizing Factor			Worksheet B.5-2 (Page 1 of 2)
1	Area draining to the BMP		sq-ft
2	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)		
3	Load to Clog[1] (See Table B.5-2 for guidance; L_c)	2.0	lb/sq-ft
4	Allowable Period to Accumulate Clogging Load (T_L)	10	years

Volume Weighted EMC Calculation			
Land Use	**Fraction of Total DCV**	**TSS EMC (mg/L)**	**Product**
Single Family Residential		123	
Commercial		128	
Industrial		125	
Education (Municipal)		132	
Transportation		78	
Multi-family Residential		40	
Roof Runoff		14	
Low Traffic Areas		50	
Open Space		216	
Other, specify:			
Other, specify:			
Other, specify:			

5	Volume Weighted EMC (sum of all products)		mg/L
BMP Parameters			
6	If pretreatment measures are included in the design, apply an adjustment of 25%[2] [Line 5 x (1-0.25)]		mg/L
7	Average Annual Precipitation		inches
8	Calculate the Average Annual Runoff (Line 7 x 43,560/12) x Line2		cu-ft/yr
9	Calculate the Average Annual TSS Load (Line 8 x 62.4 x Line 6)/10^6		lb/yr
10	Calculate the BMP Footprint Needed (Line 9 x Line 4)/Line 3		sq-ft
11	Calculate the Alternative Minimum Footprint Sizing Factor [Line 10/ (Line 1 x Line 2)]		

[1] Load to clog value should be in the range of 2 – 5 lb/sq-ft per Pitt and Clark (2010). If selecting a value other than 2, a justification for the value selected is required. See guidance in Table B.5-2.

[2] A value of 25 percent is supported by Maniquiz-Redillas et al. (2014) study, which found a pretreatment sediment capture range of 15% - 35%. If using a value outside of this range, documentation of the selected value is required. A value of 50 percent can be claimed for a system with an active Washington State TAPE approval rating for "pre-treatment."

Table B.5-2: Typical land use total suspended solids (TSS) event mean concentration (EMC) values.

Land Use	TSS EMC[1], mg/L
Single Family Residential	123
Commercial	128
Industrial	125
Education (Municipal)	132
Transportation[2]	78
Multi-family Residential	40
Roof Runoff[3]	14
Low Traffic Areas[4]	50
Open Space	216

Table B.5-3: Guidance for Selecting Load to Clog (LC)

BMP Configuration	Load to Clog, L_c, lb/sq-ft
Baseline: Approximately 50 percent vegetative cover; typical fine sand and compost blend	2
Baseline + increase vegetative cover to at least 75 percent	3
Baseline + include coarser sand to increase initial permeability to 20 to 30 in/hr; control flowrate with outlet control	3
Baseline + increase vegetative cover and include more permeable media with outlet control, per above	4

References

Charters, F.J., Cochrane, T.A., and O'Sullivan, A.D., (2015). Particle Size Distribution Variance in Untreated Urban Runoff and its implication on treatment selection. Water Research, 85 (2015), pg. 337-345.

Davis, A.P. and McCuen, R.H., (2005). Stormwater Management for Smart Growth. Springer Science & Business Media, pg. 155.

Maniquiz-Redillas, M.C., Geronimo, F.K.F, and Kim, L-H. Investigation on the Effectiveness of Pretreatment in Stormwater Management Technologies. Journal of Environmental Sciences, 26 (2014), pg. 1824-1830.

Pitt, R. and Clark, S.E., (2010). Evaluation of Biofiltration Media for Engineered Natural Treatment Systems. Geosyntec Consultants and The Boeing Company.

[1] EMCs are from SBPAT datasets for SLR and SDR Watersheds – Arithmetic Estimates of the Lognormal Summary Statistics for San Diego, unless otherwise noted.

[2] EMCs are based on Los Angeles region default SBPAT datasets due to lack of available San Diego data.

[3] Value represents the average first flush concentration for roof runoff (Charters et al., 2015).

[4] Davis and McCuen (2005)

B.5.2 Sizing Biofiltration BMPs Downstream of a Storage Unit

B.5.2.1 Introduction

In scenarios, where the BMP footprint is governed based on Option 1 (Line 21 of Worksheet B.5-1) or the required volume reduction of 40% average annual (long term) runoff capture for partial infiltration conditions (Line 31 of Worksheet B.5.1) the footprint of the biofiltration BMP can be optimized using the sizing calculations in this Appendix B.5.2 when there is an upstream storage unit (e.g. cistern) that can be used to regulate the flows through the biofiltration BMP.

This methodology is **not** applicable when the minimum footprint factor is governed based on the alternative minimum footprint sizing factor calculated using Worksheet B.5-2 (Line 11). Biofiltration BMP smaller than the alternative minimum footprint sizing factor is considered compact biofiltration BMP and may be allowed at the discretion of the EAD and FDD if the BMP meets the requirements in Appendix F **and** Option 1 or Option 2 sizing in Worksheet B.5-1.

B.5.2.2 Sizing Calculations

Sizing calculations for the biofiltration footprint shall demonstrate that one of two equivalent performance standards is met:

1. Use continuous simulation and demonstrate one of the following is met based on the infiltration condition identified in Chapter 5.4.2:
    a. **No infiltration condition**: The BMP or series of BMPs biofilters at least 92 percent of average annual (long term) runoff volume. This can be demonstrated through reporting of output from the San Diego Hydrology Model, or through other continuous simulation modeling meeting the criteria in Appendix G, as acceptable to the EAD and FDD. The 92 percent of average annual runoff treatment corresponds to the average capture achieved by implementing a BMP with 1.5 times the DCV and a drawdown time of 36 hours (Appendix B.4.2).
    b. **Partial infiltration condition**: The BMP or series of BMPs biofilters at least 92 percent of average annual (long term) runoff volume and achieves a volume reduction of at least 40 percent of average annual (long term) runoff volume. This can be demonstrated through reporting of output from the San Diego Hydrology Model, or through other continuous simulation modeling meeting the criteria in Appendix G, as acceptable to the EAD and FDD.
2. Use the simple sizing method in Worksheet B.5-3. The applicant is also required to complete Worksheet B.5-1 and B.5-2 when the applicant elects to use Worksheet B.5-3 to optimize the biofiltration BMP footprint. Worksheet B.5-3 was developed to satisfy the following two criteria as applicable:
    a. Greater than 92 percent of the average annual runoff volume from the storage unit is routed to the biofiltration BMP through the low flow orifice and the peak flow from the low flow orifice can instantaneously be filtered through the biofiltration media. If the outlet design includes orifices at different elevations and an overflow structure,

only flows from the overflow structure should be excluded from the calculation (both for 92 percent capture and for peak flow to the biofiltration BMP that needs to be instantaneously filtered), unless the flows from other orifices also bypass the biofiltration BMP, in which case flows from the orifices that bypass should also be excluded.

b. The retention losses from the optimized biofiltration BMP is equal to or greater than the retention losses from the conventional biofiltration BMP. This second criterion is only applicable for partial infiltration condition.

Table B.5-4 Storage required for different drawdown times

Drawdown Time (hours)	Storage requirement (below the overflow elevation, or below outlet elevation that bypass the biofiltration BMP)
12	0.85 DCV
24	1.25 DCV
36	1.50 DCV
48	1.80 DCV
72	2.20 DCV
96	2.60 DCV
120	2.80 DCV

For drawdown times that are outside the range of values presented in Table B.5-4 above the storage unit should be designed to discharge greater than 92% average annual capture to the downstream Biofiltration BMP.

Worksheet B.5-3: Optimized Biofiltration BMP Footprint when Downstream of a Storage Unit

Optimized Biofiltration BMP Footprint when Downstream of a Storage Unit		Worksheet B.5-3	
1	Area draining to the storage unit and biofiltration BMP		sq-ft
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		
3	Effective impervious area draining to the storage unit and biofiltration BMP [Line 1 x Line 2]		sq-ft
4	Remaining DCV after implementing retention BMPs		cubic-feet
5	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible		ft/hr.
6	Media Thickness [1.5 feet minimum], also add mulch layer thickness to this line for sizing calculations		ft
7	Media filtration rate to be used for sizing (0.42 ft/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)		ft/hr
8	Media retained pore storage	0.1	ft/ft
Storage Unit Requirement			
9	Drawdown time of the storage unit, minimum(from the elevation that bypasses the biofiltration BMP, overflow elevation)		hours
10	Storage required to achieve greater than 92 percent capture (see Table B.5-4)		fraction
11	Storage required in cubic feet (Line 4 x Line 10)		cubic-feet
12	Storage provided in the design, minimum(from the elevation that bypasses the biofiltration BMP, overflow elevation)		cubic-feet
13	Is Line 12 ≥ Line 11. If no increase storage provided until this criteria is met	☐ Yes	☐ No
Criteria 1: BMP Footprint Biofiltration Capacity			
14	Peak flow from the storage unit to the biofiltration BMP (using the elevation used to evaluate the percent capture)		cfs
15	Required biofiltration footprint [(3,600 x Line 14)/Line 7]		sq-ft
Criteria 2: Alternative Minimum Sizing Factor (Clogging)			
16	Alternative Minimum Footprint Sizing Factor [Line 11 of Worksheet B.5-2]		Fraction
17	Required biofiltration footprint [Line 3 x Line 16]		sq-ft
Criteria 3: Retention requirement [Not applicable for No Infiltration Condition]			
18	Conventional biofiltration footprint Line 28 of Worksheet B.5-1		sq-ft
19	Retention Losses from the conventional footprint (36 x Line 5 + Line 6 x Line 8) x Line 18		cubic-feet
20	Average discharge rate from the storage unit to the biofiltration BMP		cfs
21	Depth retained in the optimized biofiltration BMP {Line 6 x Line 8} + {[(Line 4)/(2400 x Line 20)] x Line 5}		ft
22	Required optimized biofiltration footprint (Line 19/Line 21)		sq-ft
Optimized Biofiltration Footprint			
23	Optimized biofiltration footprint, maximum(Line 15, Line 17, Line 22)		sq-ft

Note: Biofiltration BMP smaller than the alternative minimum footprint sizing (Line 17) is considered compact biofiltration BMP and may be allowed at the discretion of the EAD and FDD if the BMP meets the requirements in Appendix F and Option 1 or Option 2 sizing in Worksheet B.5-1.

B.6 Flow-Through Treatment Control BMPs (for use with Alternative Compliance)

The following methodology shall be used for selecting and sizing onsite flow-through treatment control BMPs. These BMPs are to be used only when the project is participating in an alternative compliance program. This methodology consists of three steps:

(1) Determine the PDP most significant pollutants of concern (Appendix B.6.1).

(2) Select a flow-through treatment control BMP that treats the PDP most significant pollutants of concern and meets the pollutant control BMP treatment performance standard (Appendix B.6.2).

(3) Size the selected flow-through treatment control BMP (Appendix B.6.3).

B.6.1 PDP Most Significant Pollutants of Concern

The following steps shall be followed to identify the PDP most significant pollutants of concern:

1) Compile the following information for the PDP and receiving water:
    a. Receiving water quality (including pollutants for which receiving waters are listed as impaired under the Clean Water Act section 303(d) List; refer to Appendix A);
    b. Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the WQIP (refer to Section 1.9);
    c. Land use type(s) proposed by the PDP and the storm water pollutants associated with the PDP land use(s) (see Table B.6–1);
    d. For tenant projects, the potential pollutants listed in Appendix E of the SAN SWMP.
2) From the list of pollutants identified in Step 1 identify the most significant PDP pollutants of concern. A PDP could have multiple most significant pollutants of concerns and shall include the highest priority water quality condition identified in the watershed WQIP and pollutants anticipated to be present onsite/generated from land use.

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TABLE B.6-1. Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories	General Pollutant Categories								
	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Commercial Development	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists onsite.

(2) A potential pollutant if the project includes uncovered parking areas.

(3) A potential pollutant if land use involves food or animal waste products.

(4) Including petroleum hydrocarbons.

(5) Including solvents.

B.6.2 Selection of Flow-Through Treatment Control BMPs

The following steps shall be followed to select the appropriate flow-through treatment control BMPs for the PDP:

1) For each PDP most significant pollutant of concern identify the grouping using Table B.6-2. Table B.6-2 is adopted from the Model SUSMP.

2) Select the flow-through treatment control BMP based on the grouping of pollutants of concern that are identified to be most significant in Step 1. This section establishes the pollutant control BMP treatment performance standard to be met for each grouping of pollutants in order to meet the standards required by the MS4 permit and how an applicant can select a non-proprietary or a proprietary BMP that meets the established performance standard. The grouping of pollutants of concern are:

    a. Coarse Sediment and Trash (Appendix B.6.2.1)
    b. Pollutants that tend to associate with fine particles during treatment (Appendix B.6.2.2)
    c. Pollutants that tend to be dissolved following treatment (Appendix B.6.2.3)

TABLE B.6-2: Grouping of Potential Pollutants of Concern

Pollutant	Coarse Sediment and Trash	Suspended Sediment and Particulate-bound Pollutants[1]	Soluble-form Dominated Pollutants[2]
Sediment	X	X	
Nutrients			X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

[1] Pollutants in this category can be addressed to Medium or High effectiveness by effectively removing suspended sediments and associated particulate-bound pollutants. Some soluble forms of these pollutants will exist, however treatment mechanisms to address soluble pollutants are not necessary to remove these pollutants to a Medium or High effectiveness.

[2] Pollutants in this category are not typically addressed to a Medium or High level of effectiveness with particle and particulate-bound pollutant removal alone.

One flow-through BMP can be used to satisfy the required pollutant control BMP treatment performance standard for the PDP most significant pollutants of concern. In some situations it

might be necessary to implement multiple flow-through BMPs to satisfy the pollutant control BMP treatment performance standards. For example, a PDP has trash, nutrients and bacteria as the most significant pollutants of concern. If a vegetated filter strip is selected as a flow-through BMP then it is anticipated to meet the performance standard in Appendix B.6.2.2 and B.6.2.3 but would need a trash removal BMP to meet the pollutant control BMP treatment performance standard in Appendix B.6.2.1 upstream of the vegetated filter strip. This could be achieved by fitting the inlets and/or outlets with racks or screens on to address trash.

B.6.2.1 Coarse Sediment and Trash

If coarse sediment and/or trash and debris are identified as a pollutant of concern for the PDP, then BMPs must be selected to capture and remove these pollutants from runoff. The BMPs described below can be effective in removing coarse sediment and/or trash. These devices must be sized to treat the flow rate estimated using Worksheet B.6-1. Applicant can only select BMPs that have High or Medium effectiveness.

Trash Racks and Screens [Coarse Sediment: Low effectiveness; Trash: Medium to High effectiveness] are simple devices that can prevent large debris and trash from entering storm drain infrastructure and/or ensure that trash and debris are retained with downstream BMPs. Trash racks and screens can be installed at inlets to the storm drain system, at the inflow line to a BMP, and/or on the outflow structure from the BMP. Trash racks and screens are commercially available in many sizes and configurations or can be designed and fabricated to meet specific project needs.

Hydrodynamic Separation Devices [Coarse Sediment: Medium to High effectiveness; Trash: Medium to High effectiveness] are devices that remove coarse sediment, trash, and other debris from incoming flows through a combination of screening, settlement, and centrifugal forces. The design of hydrodynamic devises varies widely, more specific information can be found by contacting individual vendors. A list of hydrodynamic separator products approved by the Washington State Technology Acceptance Protocol-Ecology protocol can be found at:

http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html.

Systems should be rated for "pretreatment" with a General Use Level Designation or provide results of field-scale testing indicating an equivalent level of performance.

Catch Basin Insert Baskets [Coarse Sediment: Low effectiveness; Trash: Medium effectiveness, if appropriately maintained] are manufactured filters, fabrics, or screens that are placed in inlets to remove trash and debris. The shape and configuration of catch basin inserts varies based on inlet type and configuration. Inserts are prone to clogging and bypass if large trash items are accumulated, and therefore require frequent observation and maintenance to remain effective. Systems with screen size small enough to retain coarse sediment will tend to clog rapidly and should be avoided.

Other Manufactured Particle Filtration Devices [Coarse Sediment: Medium to High effectiveness; Trash: Medium to High effectiveness] include a range of products such as cartridge filters, bag filters, and other configurations that address medium to coarse particles. Systems should be rated for "pretreatment" with a General Use Level Designation under the Technology Acceptance Protocol-Ecology program or provide results of field-scale testing indicating an equivalent level of performance.

Note, any BMP that achieves Medium or High performance for suspended solids (See Section B.6.2.2) is also considered to address coarse sediments. However, some BMPs that address suspended solids do not retain trash (for example, swales and detention basins). These types of BMPs could be fitted with racks or screens on inlets or outlets to address trash.

BMP Selection for Pretreatment:

Devices that address both coarse sediment and trash can be used as pretreatment devices for other BMPs, such as infiltration BMPs. However, it is recommended that BMPs that meet the performance standard in Appendix B.6.2.2 be used. A device with a "pretreatment" rating and General Use Level Designation under Technology Acceptance Protocol-Ecology is required for pretreatment upstream of infiltration basins and underground galleries. Pretreatment may also be provided as presettling basins or forebays as part of a pollutant control BMP instead of implementing a specific pretreatment device for systems where maintenance access to the facility surface is possible (to address clogging), expected sediment load is not high, and appropriate factors of safety are included in design.

B.6.2.2 Suspended Sediment and Particulate-Bound Pollutants

Performance Standard

The pollutant treatment performance standard is shown in Table B.6-3. This performance standard is consistent with the Washington State Technology Acceptance Protocol-Ecology Basic Treatment Level, and is also met by technologies receiving Phosphorus Treatment or Enhanced Treatment certification. This standard is based on pollutant removal performance for total suspended solids. Systems that provide effective TSS treatment also typically address trash, debris, and particulate bound pollutants and can serve as pre-treatment for offsite mitigation projects or for onsite infiltration BMPs.

Table B.6-3: Performance Standard for Flow-Through Treatment Control

Influent Range	Criteria
20 – 100 mg/L TSS	Effluent goal ≤ 20 mg/L TSS
100 – 200 mg/L TSS	≥ 80% TSS removal
>200 mg/L TSS	> 80% TSS removal, effluent not to exceed 100 mg/L TSS

Selecting Non-Proprietary BMPs

Table B.6-4 identifies the categories of non-proprietary BMPs that are considered to meet the pollutant treatment performance standard if designed to contemporary design standards[1]. BMP types with an "High" ranking should be considered before those with an "Medium" ranking. Statistical analysis by category from the International Stormwater BMP Database (also presented in Table B.6-4) indicates each of these BMP types (as a categorical group) meets or nearly meets the performance standard. The International Stormwater BMP Database includes historic as well as contemporary BMP studies; contemporary BMP designs in these categories are anticipated to meet or exceed this standard on average.

[1] Contemporary design standards refers to design standards that are reasonably consistent with the current state of practice and are based on desired outcomes that are reasonably consistent with the context of the MS4 Permit and this manual. For example, a detention basin that is designed solely to mitigate peak flow rates would not be considered a contemporary water quality BMP design because it is not consistent with the goal of water quality improvement. Current state of the practice recognizes that a drawdown time of 24 to 72 hours is typically needed to promote settling. For practical purposes, design standards can be considered "contemporary" if they have been published within the last 10 years, preferably in California or Washington State, and are specifically intended for storm water quality management.

Table B.6-4: Flow-Through Treatment Control BMPs Meeting Performance Standard

List of Acceptable Flow-Through Treatment Control BMPs	Statistical Analysis of International Stormwater BMP Database				Evaluation of Conformance to Performance Standard		
	Count In/Out	TSS Mean Influent, mg/L	TSS Mean Effluent[1], mg/L	Average Category Volume Reduct.	Volume-Adjusted Effluent Conc[2], mg/L	Volume-Adjusted Removal Efficiency[2]	Level of Attainment of Performance Standard (with rationale)
Vegetated Filter Strip	361/ 282	69	31	38%	19	72%	Medium, effluent < 20 mg/L after volume adjustment
Vegetated Swale	399/ 346	45	33	48%	17	61%	Medium, effluent < 20 mg/L after volume adjustment
Detention Basin	321/ 346	125	42	33%	28	77%	Medium, percent removal near 80% after volume adjustment
Sand Filter/ Media Bed Filter	381/ 358	95	19	NA[3]	19	80%	High, effluent and % removal meet criteria without adjustment
Lined Porous Pavement[4]	356/ 220	229	46	NA[3,4]	46	80%	High, % removal meets criteria without adjustment
Wet Pond	923/ 933	119	31	NA[3]	31	74%	Medium, percent removal near 80%

Source: 2014 BMP Performance Summaries and Statistical Appendices; 2010 Volume Performance Summary; available at: www.bmpdatabase.org

1 - A statistically significant difference between influent and effluent was detected at a p value of 0.05 for all categories.

2 - Estimates were adjusted to account for category-average volume reduction.

3 - Not Applicable as these BMPs are not designed for volume reduction and are anticipated to have very small incidental volume reduction.

4 - The category presented in this table represents a lined system for flow-through treatment purposes. Porous pavement for retention purposes is an infiltration BMP, not a flow-through BMP. This table should not be consulted for porous pavement for infiltration.

Selecting Proprietary BMPs

Proprietary BMPs can be used if the BMP meets each of the following conditions:

(1) The proposed BMP meets the performance standard in Appendix B.6.2.2 as certified through third-party, field scale evaluation. An active General Use Level Designation for Basic Treatment, Phosphorus Treatment or Enhanced Treatment under the Washington State Technology Acceptance Protocol-Ecology program is the preferred method of demonstrating that the performance standard is met. The list of certified technologies is updated as new technologies are approved (link below). Technologies with Pilot Use Level Designation and Conditional Use Level Designations are not acceptable. Refer to:

http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html. Alternatively, other field scale verification of 80 percent TSS capture, such as through Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing may be acceptable. A list of field-scale verified technologies under Technology Acceptance Reciprocity Partnership Tier II and New Jersey Corporation for Advance Testing can be accessed at: http://www.njcat.org/verification-process/technology-verification-database.html (refer to field verified technologies only).

(2) The proposed BMP is designed and maintained in a manner consistent with its performance certifications (see explanation below). The applicant must demonstrate conclusively that the proposed application of the BMP is consistent with the basis of its certification/verification. Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification. It is common for these approvals to specify the specific model of BMP, design capacity for given unit sizes, type of media that is the basis for approval, and/or other parameters.

(3) The proposed BMP is acceptable at the discretion of the EAD and FDD. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met. In determining the acceptability of a proprietary flow-through treatment control BMP, the EAD and FDD should consider, as applicable, (a) the data submitted; (b) representativeness of the data submitted; (c) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (d) for projects within tenant areas and/or capital projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business; and (e) other relevant factors. If a proposed BMP is not accepted by the EAD or FDD, a written explanation/reason will be provided to the applicant

B.6.2.3 Soluble-form dominated Pollutants (Nutrients)

If nutrients are identified as a most significant pollutant of concern for the PDP, then BMPs must be selected to meet the performance standard described in Appendix B.6.2.2 **and** must be selected to provide medium or high level of effectiveness for nutrient treatment as described in this section. The most common nutrient of concern in the San Diego region is nitrogen, therefore total nitrogen (TN) was used as the primary indicator of nutrient performance in storm water BMPs.

Selection of BMPs to address nutrients consists of two steps:

1) Determine if nutrients can be addressed via source control BMPs as described in Appendix E and Chapter 4. After applying source controls, if there are no remaining source areas for soluble nutrients, then this pollutant can be removed from the list of pollutants of concerns for the purpose of selecting flow-through treatment control BMPs. Particulate nutrients will be addressed by the performance standard in Appendix B.6.2.2.

2) If soluble nutrients cannot be fully addressed with source controls, then select a flow-through treatment control BMPs that meets the performance criteria in Table B.6-5 or select from the nutrient-specific menu of treatment control BMPs in Table B.6-6.

    a. The performance standard for nitrogen removal (Table B.6-5) has been developed based on evaluation of the relative performance of available categories of non-proprietary BMPs.

    b. For proprietary BMPs, submit third party performance data indicating that the criteria in Table B.6-5 are met. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met. In determining the acceptability of a proprietary flow-through treatment control BMP, the EAD and FDD should consider, as applicable, (a) the data submitted; (b) representativeness of the data submitted; (c) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (d) for projects within tenant areas and/or capital projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business; and (e) other relevant factors. If a proposed BMP is not accepted by the EAD or FDD, a written explanation/reason will be provided to the applicant.

Table B.6-5: Performance Standard for Flow-Through Treatment Control BMPs for Nutrient Treatment

Basis	Criteria
Treatment Basis	Comparison of mean influent and effluent indicates significant concentration reduction of TN approximately 40 percent or higher based on studies with representative influent concentrations
Combined Treatment and Volume Reduction Basis	Combination of concentration reduction and volume reduction yields TN mass removal of approximately 40 percent or higher based on studies with representative influent concentrations

Table B.6-6: Flow-Through Treatment Control BMPs Meeting Nutrient Treatment Performance Standard

List of Acceptable Flow-Through Treatment Control BMPs for Nutrients	Statistical Analysis of International Stormwater BMP Database				Evaluation of Conformance to Performance Standard		
	Count In/Out	TN Mean Influent, mg/L	TN Mean Effluent[1], mg/L	Average Category Volume Reduct.	Volume-Adjusted Effluent Conc[2], mg/L	Volume-Adjusted Removal Efficiency[2]	Level of Attainment of Performance Standard (with rationale)
Vegetated Filter Strip	138/ 122	1.53	1.37	38%	0.85	44%	Medium, if designed to include volume reduction processes
Detention Basin	90/ 89	2.34	2.01	33%	1.35	42%	Medium, if designed to include volume reduction processes
Wet Pond	397/ 425	2.12	1.33	NA	1.33	37%	Medium, best concentration reduction among BMP categories, but limited volume reduction

Source: 2014 BMP Performance Summaries and Statistical Appendices; 2010 Volume Performance Summary; available at: www.bmpdatabase.org

1 - A statistically significant difference between influent and effluent was detected at a p value of 0.05 for all categories included.

2 - Estimates were adjusted to account for category-average volume reduction.

B.6.3 Sizing Flow-Through Treatment Control BMPs:

Flow-through treatment control BMPs shall be sized to filter or treat the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of every storm event. The required flow-through treatment rate should be adjusted for the portion of the DCV already retained or biofiltered onsite as described in Worksheet B.6-1. The following hydrologic method shall be used to calculate the flow rate to be filtered or treated:

$$Q = C \times i \times A$$

Where:

Q = Design flow rate in cubic feet per second

C = Runoff factor, area-weighted estimate using Table B.1-1.

i = Rainfall intensity of 0.2 in/hr.

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drain to the BMP. Refer to Section 3.3.3 for additional guidance. Street projects consult Section 1.4.3.

Worksheet B.6-1: Flow-Through Design Flows

Flow-through Design Flows		Worksheet B.6-1		
1	DCV	DCV		cubic-feet
2	DCV retained	$DCV_{retained}$		cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$		cubic-feet
4	DCV requiring flow-through (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow\text{-}through}$		cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=		unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=		acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=		unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=		cfs

1) Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream of flow-through BMPs. That is, if the flow-through BMP is upstream of the project's retention and biofiltration BMPs then the flow-through BMP shall be sized using an adjustment factor of 1.

2) Volume based (e.g., dry extended detention basin) flow-through treatment control BMPs shall be sized to the volume in Line 4 and flow based (e.g., vegetated swales) shall be sized to flow rate in Line 9. Sand filter and media filter can be designed either by volume in Line 4 or flow rate in Line 9.

3) Proprietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated flow rate in Line 9; certified treatment capacity per unit shall be consistent with third party certifications.

Appendix

C

Geotechnical and Groundwater Investigation Requirements

February 2016

Appendix C Geotechnical and Groundwater Investigation Requirements

C.1 Purpose and Phasing

Feasibility of storm water infiltration is dependent on the geotechnical and groundwater conditions at the project site.

This appendix provides guidelines for performing and reporting feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. It provides framework for feasibility analysis at two phases of project development:

- ***Planning Phase***: Simpler methods for conducting preliminary screening for feasibility/infeasibility, and
- ***Design Phase***: When infiltration is considered potentially feasible, more rigorous analysis is needed to confirm feasibility and to develop design considerations and mitigation measures if required

Planning Phase At this stage of the project, information about the site may be limited, the proposed design features may be conceptual, and there may be an opportunity to adjust project plans to incorporate infiltration into the project layout as it is developed. At this phase, project geotechnical engineers are typically responsible for conducting explorations of geologic conditions, performing preliminary analyses, and identifying particular aspects of design that require more detailed investigation at later phases. As part of this process, the role of a planning- level infiltration feasibility assessment is to help planners reach early tentative conclusions regarding where infiltration is likely feasible, possibly feasible if done carefully, or clearly infeasible. This determination can help guide the design process by influencing project layout, selection of infiltration BMPs, and identifying if more detailed studies are necessary. The goal of the planning and feasibility phase is to identify potential geotechnical and groundwater impacts and to determine which impacts may be considered fatal flaws and which impacts may be possible to mitigate with design features. Determination of acceptable risks and/or mitigation measures may involve discussions with adjacent land owners and/or utility operators, as well as coordination with other projects under planning or design in the project vicinity. Early involvement of potentially impacted parties is critical to avoid late-stage design changes and schedule delays and to reduce potential future liabilities.

Design Phase During this phase, potential geotechnical and groundwater impacts must be fully considered and evaluated and mitigation measures should be incorporated in the BMP design, as appropriate. Mitigation measures refer to design features or assumptions intended to reduce risks

associated with storm water infiltration. While rules of thumb may be useful, if applied carefully, for the planning level phase, the analyses conducted in the detailed design phase require the involvement of a geotechnical professional familiar with the local conditions. One of the first steps in the design phase should be determination if additional field and/or laboratory investigations are required (e.g., borings, test pits, laboratory or field testing) to further assess the geotechnical impacts of storm water infiltration. As the design of infiltration systems are highly dependent on the subsurface conditions, coordination with the storm water design team may be beneficial to limit duplicative efforts and costs.

Worksheet C.4-1 is provided to document infiltration feasibility screening. This worksheet is divided into two parts. Part 1 "Full Infiltration Feasibility Screening Criteria" is used to determine if the full design volume can be infiltrated onsite, whereas Part 2 "Partial Infiltration versus No Infiltration Screening Criteria" is used to determine if any amount of volume can be infiltrated.

Note that it is not necessary to investigate each and every criterion in the worksheet, a single "no" answer in Part 1 and Part 2 controls the feasibility and desirability. If all the answers in Part 1 are "yes" then it is not required to complete Part 2. The same worksheet could be used to document both planning-level categorization and design-level categorization. Note that planning-level categorization, are typically based on initial site assessment results; therefore it is not necessarily conclusive. Categorizations should be confirmed or revised, as necessary, based on more detailed design-level investigation and analysis during BMP design.

C.2 Geotechnical Feasibility Criteria

This section is divided into seven factors that should be considered, as applicable, while assessing the feasibility and desirability of infiltration related to geotechnical conditions. Note that during the planning phase, if one or more of these factors precludes infiltration as an approach, it is not necessary to assess every other factor. However, if proposing infiltration BMPs, then every applicable factor in this section must be addressed.

C.2.1 Soil and Geologic Conditions

Site soils and geologic conditions influence the rate at which water can physically enter the soils. Site assessment approaches for soil and geologic conditions may consist of:

- Review of soil survey maps
- Review of available reports on local geology to identify relevant features, such as depth to bedrock, rock type, lithology, faults, and hydrostratigraphic or confining units
- Review of previous geotechnical investigations of the area
- Site-specific geotechnical and/or geologic investigations (e.g., borings, infiltration tests)

Geologic investigations should also seek to provide an assessment of whether soil infiltration properties are likely to be uniform or variable across the project site. Appendix D provides guidance on determining infiltration rates for planning and design phase.

C.2.2 Settlement and Volume Change

Settlement and volume change limits the amount of infiltration that can be allowed without resulting in adverse impacts that cannot be mitigated. Upon considering the impacts of an infiltration design, the designer must identify areas where soil settlement or heave is likely and whether these conditions would be unfavorable to existing or proposed features. Settlement refers to the condition when soils decrease in volume, and heave refers to expansion of soils or increase in volume.

There are several different mechanisms that can induce volume change due to infiltration that the professional must be aware of and consider while completing the feasibility screening including:

- Hydro collapse and calcareous soils;
- Expansive soils;
- Frost heave;
- Consolidation; and
- Liquefaction.

C.2.3 Slope Stability

Infiltration of water has the potential to result in an increased risk of slope failure of nearby slopes. This should be assessed as part of both the feasibility and design stages of a project. The City of San Diego's Guidelines for Geotechnical Reports states that slope steeper than 25% are generally not feasible for use of infiltration BMPs. The County of San Diego LID Handbook recommends a 50 foot setback from steep or sensitive slopes. In general, this consideration will not apply to Authority projects as there are no significant slopes at SAN.

C.2.4 Utility Considerations

Utilities are either public or private infrastructure components that include underground pipelines and vaults (e.g., potable water, sewer, storm water, gas pipelines), underground wires/conduit (e.g., telephone, cable, electrical) and above ground wiring and associated structures (e.g., electrical distribution and transmission lines). Utility considerations are typically within the purview of a geotechnical site assessment and should be considered in assessing the feasibility of storm water infiltration. Infiltration has the potential to damage subsurface utilities and/or underground utilities may pose geotechnical hazards in themselves when infiltrated water is introduced. Impacts related to storm water infiltration in the vicinity of underground utilities are not likely to cause a fatal flaw in

the design, but the designer must be aware of the potential cost impacts to the design during the planning stage.

Utility setbacks should be determined on a project-specific basis, with the approval of the EAD and FDD.

C.2.5 Groundwater Mounding

Storm water infiltration and recharge to the underlying groundwater table may create a groundwater mound beneath the infiltration facility. The height and shape of the mound depends on the infiltration system design, the recharge rate, and the hydrogeologic conditions at the site, especially the horizontal hydraulic conductivity and the saturated thickness. Elevated groundwater levels can lead to a number of problems, including flooding and damage to structures and utilities through buoyancy and moisture intrusion, increase in inflow and infiltration into municipal sanitary sewer systems, and flow of water through existing utility trenches, including sewers, potentially leading to formation of sinkholes (Gobel et al. 2004). Mounding shall be considered by the geotechnical professional while performing the infiltration feasibility screening.

C.2.6 Retaining Walls and Foundations

Development projects may include retaining walls or foundations in close proximity to proposed infiltration BMPs. These structures are designed to withstand the forces of the earth they are retaining and other surface loading conditions such as nearby structures. Foundations include shallow foundations (spread and strip footings, mats) and deep foundations (piles, piers) and are designed to support overburden and design loads. All types of retaining walls and foundations can be impacted by increased water infiltration into the subsurface as a result of potential increases in lateral pressures and potential reductions in soil strength. The geotechnical professional should consider these factors while performing the infiltration feasibility screening.

C.2.7 Other Factors

While completing the feasibility screening, other factors determined by the geotechnical professional to influence the feasibility and desirability of infiltration related to geotechnical conditions shall also be considered.

C.3 Groundwater Quality and Water Balance Feasibility Criteria

This section is divided into eight factors that should be considered, to the extent applicable, while assessing the feasibility and desirability of infiltration related to groundwater quality and water

balance. Note that during the planning phase, if one or more of these factors precludes infiltration as an approach, it is not necessary to assess every other factor. However, if proposing infiltration BMPs, then every applicable factor in this section must be addressed.

C.3.1 Soil and Groundwater Contamination

Infiltration shall be avoided in areas with:

- Physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content and infiltration rate) which are not adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses.

- Groundwater contamination and/or soil pollution, if infiltration could contribute to the movement or dispersion of soil or groundwater contamination or adversely affect ongoing clean-up efforts, either onsite or down-gradient of the project.

If infiltration is under consideration for one of the above conditions, a site-specific analysis should be conducted to determine where infiltration-based BMPs can be used without adverse impacts.

C.3.2 Separation to Seasonal High Groundwater

The depth to seasonally high groundwater tables (normal high depth during the wet season) beneath the base of any infiltration BMP must be greater than 10 feet for infiltration BMPs to be allowed. The depth to groundwater requirement can be reduced from 10 feet at the discretion of the approval agency if the underlying groundwater basin does not support beneficial uses and the groundwater quality is maintained at the proposed depth. Depth to seasonally high groundwater levels can be estimated based on well level measurements or redoximorphic methods. For sites with complex groundwater tables, long term studies may be needed to understand how groundwater levels change in wet and dry years.

It should be noted that groundwater at SAN does not support beneficial uses (Water Quality Control Plan for the San Diego Basin, 1994/1995 with amendments effective prior to February 16, 2016). As such, the vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark at the SAN may be less than 10 feet, provided groundwater quality is maintained and the remaining restrictions of Section 3.3 are met.

C.3.3 Wellhead Protection

Wellheads natural and man-made are water resources that may potentially be adversely impacted by storm water infiltration through the introduction of contaminants or alteration in water supply and

levels. It is recommended that the locations of wells and springs be identified early in the design process and site design be developed to avoid infiltration in the vicinity of these resources. Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply well. Although no wells are located within SAN, the locations of wells in neighboring jurisdictions (i.e., within the City of San Diego and Port of San Diego jurisdictions) should be considered.

C.3.4 Contamination Risks from Land Use Activities

Concentration of storm water pollutants in runoff is highly dependent on the land uses and activities present in the area tributary to an infiltration BMP. Likewise, the potential for groundwater contamination due to the infiltration BMP is a function of pollutant abundance, concentration of pollutants in soluble forms, and the mobility of the pollutant in the subsurface soils. Hence infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration.

Source control BMPs (as outlined in Appendix B of the SWMP) should be used to reduce concentrations of priority pollutants, including copper and zinc, from industrial areas prior to infiltration.

C.3.5 Consultation with Applicable Groundwater Agencies

Infiltration activities should be coordinated with the applicable groundwater management agency, such as groundwater providers and/or resource protection agencies, to ensure groundwater quality is protected. It is recommended that coordination be initiated as early as possible during the planning process to determine whether specific site assessment activities apply or whether these agencies have data available that may support the planning and design process.

C.3.6 Water Balance Impacts on Stream Flow

Use of infiltration systems to reduce surface water discharge volumes may result in additional volume of deeper infiltration compared to natural conditions, which may result in impacts to receiving channels associated with change in dry weather flow regimes. A relatively simple survey of hydrogeologic data (piezometer measurements, boring logs, regional groundwater maps) and downstream receiving water characteristics is generally adequate to determine whether there is potential for impacts and whether a more rigorous assessment is needed.

Where water balance conditions appear to be sensitive to development impacts and there is an elevated risk of impacts, a computational analysis may be warranted to evaluate the

feasibility/desirability of infiltration. Such an analysis should account for precipitation, runoff, irrigation inputs, soil moisture retention, evapotranspiration, baseflow, and change in groundwater recharge on a long term basis. Because water balance calculations are sensitive to the timing of precipitation versus evapotranspiration, it is most appropriate to utilize a continuous model simulation rather than basing calculations on average annual or monthly normal conditions.

C.3.7 Downstream Water Rights

While water rights cases are not believed to be common, there may be cases in which infiltration of water from area that was previously allowed to drain freely to downstream water bodies would not be legal from a water rights perspective. Site-specific evaluation of water rights laws should be conducted if this is believed to be a potential issue in the project location.

C.3.8 Other Factors

While completing the feasibility screening, other factors determined by the geotechnical professional to influence the feasibility and desirability of infiltration related to groundwater quality and water balance shall also be considered.

C.4 Geotechnical and Groundwater Investigation Report Requirements

The geotechnical and groundwater investigation report(s) addressing onsite storm water infiltration shall include the following elements, as applicable. These reports may need to be completed by multiple professional disciplines, depending on the issues that need be addressed for a given site. It may also be necessary to prepare separate report(s) at the planning phase and design phase of a project if the methods and timing of analyses differ.

C.4.1 Site Evaluation

Site evaluation shall identify the following:

- Areas of contaminated soil or contaminated groundwater within the site;
- "Brown fields" adjacent to the site;
- Mapped soil or fill type(s);
- Historic high groundwater level;
- Slopes steeper than 25 percent (not applicable at SAN); and
- Location of septic systems (and expansion area), or underground storage tanks, or permitted gray water systems within 100 feet of a proposed infiltration/ percolation BMP.

C.4.2 Field Investigation

Where the site evaluation indicates potential feasibility for onsite storm water infiltration BMPs, the following field investigations will be necessary to demonstrate suitability and to provide design recommendations.

C.4.2.1 Subsurface Exploration

Subsurface exploration and testing for storm water infiltration BMPs shall include:

- A minimum of two exploratory excavations shall be conducted within 50-feet of each proposed storm water infiltration BMP. The excavations shall extend at least 10 feet below the lowest elevation of the base of the proposed infiltration BMP.
- Soils shall be logged in detail with emphasis on describing the soil profile.
- Identify low permeability or impermeable materials.
- Indicate any evidence of soil contamination.

C.4.2.2 Material Testing and Infiltration/Percolation Testing

Various material testing and in situ infiltration/percolation testing methods and guidance for appropriate factor of safety are discussed in detail in Appendix D. Infiltration testing methods described in Appendix D include surface and shallow excavation methods and deeper subsurface tests.

C.4.2.3 Evaluation of Depth to Groundwater

An evaluation of the depth to groundwater is required to confirm the feasibility of infiltration. Infiltration BMPs may not be feasible in high groundwater conditions (within 10 feet of the base of infiltration/ percolation BMP) unless an exemption is granted by the EAD or FDD. The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark at the SAN may be less than 10 feet, provided groundwater quality is maintained and the remaining restrictions of Section 3.3 are met.

C.4.3 Reporting Requirements by Geotechnical Engineer

The geotechnical and groundwater investigation report shall address the following key elements, and where appropriate, mitigation recommendations shall be provided.

- Identify areas of the project site where infiltration is likely to be feasible and provide justifications for selection of those areas based on soil types, slopes, proximity to existing features, etc. Include completed and signed Worksheet C.4-1.

- Investigate, evaluate and estimate the vertical infiltration rates and capacities in accordance with the guidance provided in Appendix D which describes infiltration testing and appropriate factor of safety to be applied for infiltration testing results. The site may be broken into sub-basins, each of which has different infiltration rates or capacities.
- Describe the infiltration/ percolation test results and correlation with published infiltration/ percolation rates based on soil parameters or classification. Recommend providing design infiltration/percolation rate(s) at the sub-basins. Use Worksheet D.5-1.
- Investigate the subsurface geological conditions and geotechnical conditions that would affect infiltration or migration of water toward structures, slopes, utilities, or other features. Describe the anticipated flow path of infiltrated water. Indicate if the water will flow into pavement sections, utility trench bedding, wall drains, foundation drains, or other permeable improvements.
- Investigate depth to groundwater and the nature of the groundwater. Include an estimate of the high seasonal groundwater elevations.
- Evaluate proposed use of the site (industrial use, commercial use, etc.), soil and groundwater data and provide a concluding opinion whether proposed storm water infiltration could cause adverse impacts to groundwater quality and if it does cause impacts whether the impacts could be reasonably mitigated or not.
- Estimate the maximum allowable infiltration rates and volumes that could occur at the site that would avoid damage to existing and proposed structures, utilities, slopes, or other features. In addition the report must indicate if the recommended infiltration rate is appropriate based on the conditions exposed during construction.
- Provide a concluding opinion regarding whether or not the proposed onsite storm water infiltration/percolation BMP will result in soil piping, daylight water seepage, slope instability, or ground settlement.
- Recommend measures to substantially mitigate or avoid any potentially detrimental effects of the storm water infiltration BMPs or associated soil response on existing or proposed improvements or structures, utilities, slopes or other features within and adjacent to the site. For example, minimize soil compaction.
- Provide guidance for the selection and location of infiltration BMPs, including the minimum separations between such infiltration BMPs and structures, streets, utilities, manufactured and existing slopes, engineered fills, utilities or other features. Include guidance for measures that could be used to reduce the minimum separations or to mitigate the potential impacts of infiltration BMPs.
- Provide a concluding opinion whether or not proposed infiltration BMPs are in conformance with the following design criteria:
    - Runoff will undergo pretreatment such as sedimentation or filtration prior to infiltration;

- Pollution prevention and source control BMPs are implemented at a level appropriate to protect groundwater quality for areas draining to infiltration BMPs;
- The vertical distance from the base of the infiltration BMPs to the seasonal high groundwater mark is greater than 10 feet. As the groundwater basin at SAN does not support beneficial uses, this vertical distance may be reduced provided the groundwater quality is maintained and the remaining restrictions of Section 3.3 are met;
- The soil through which infiltration is to occur has physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses; and
- Infiltration BMPs are not used for areas of industrial or light industrial activity, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove copper, zinc, and other pollutants of concern prior to infiltration.

C.4.4 Reporting Requirements by the Project Design Engineer

Project design engineer has the following responsibilities:

- Complete criteria 4 and 8 in Worksheet C.4-1

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1	
Part 1 - Full Infiltration Feasibility Screening Criteria **Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by EAD or FDD to substantiate findings.

Worksheet C.4-1 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

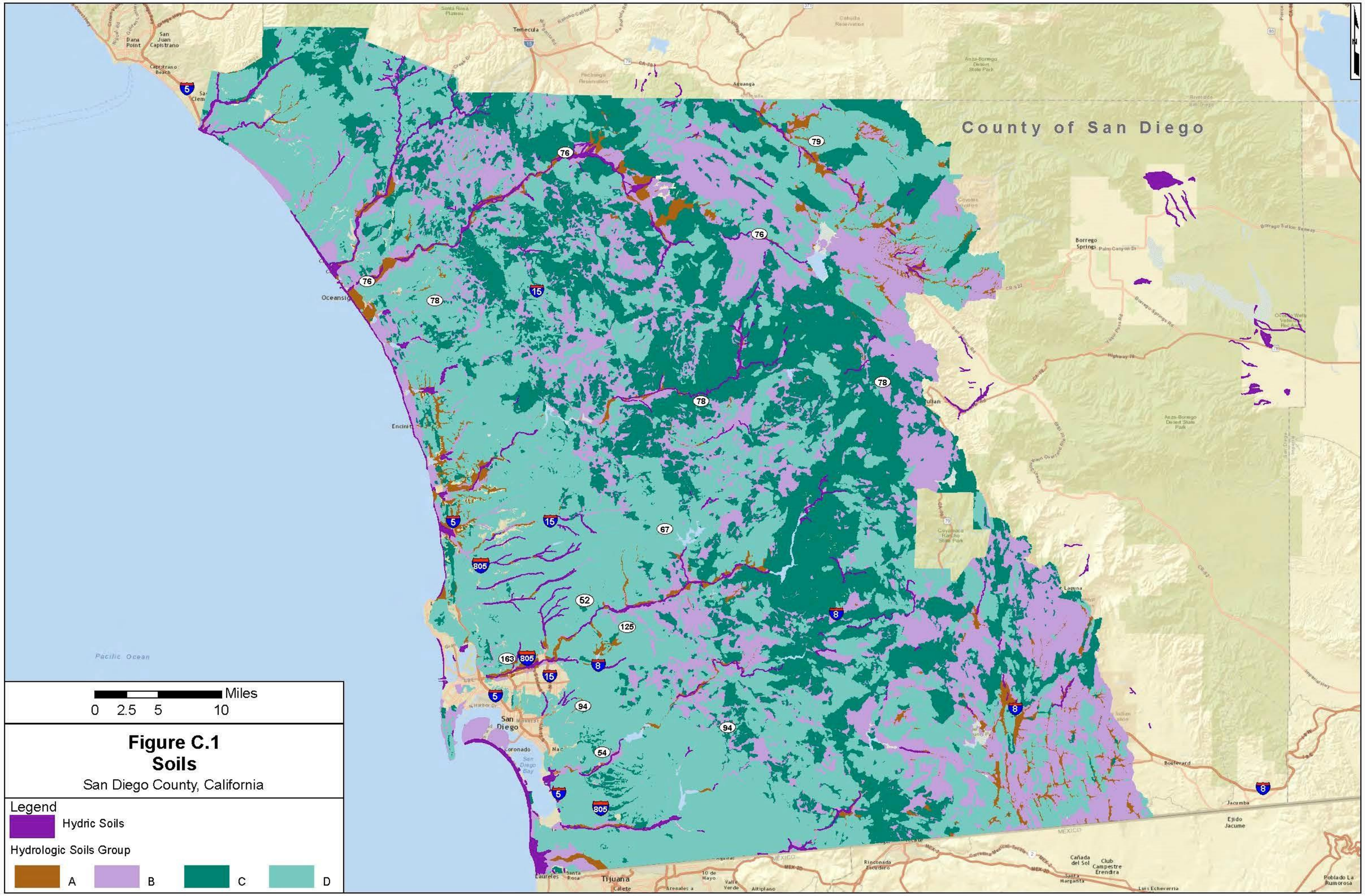
*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

C.5 Feasibility Screening Exhibits

Table C.5-1 lists the feasibility screening exhibits that were generated using readily available GIS data sets to assist the project applicant to screen the project site for feasibility.

Table C.5-1: Feasibility Screening Exhibits

Figures	Layer	Intent/Rationale	Data Sources
C.1 Soils	Hydrologic Soil Group – A, B, C, D	Hydrologic Soil Group will aid in determining areas of potential infiltration	SanGIS http://www.sangis.org/
	Hydric Soils	Hydric soils will indicate layers of intermittent saturation that may function like a D soil and should be avoided for infiltration	USDA Web Soil Survey. Hydric soils, (ratings of 100) were classified as hydric. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
C.2: Slopes and Geologic Hazards	Slopes >25%	BMPs are hard to construct on slopes >25% and can potentially cause slope instability (not applicable at SAN	SanGIS http://www.sangis.org/
	Liquefaction Potential	BMPs (particularly infiltration BMPs) must not be sited in areas with high potential for liquefaction or landslides to minimize earthquake/landslide risks	SanGIS http://www.sangis.org/
	Landslide Potential		SanGIS Geologic Hazards layer. Subset of polygons with hazard codes related to landslides was selected. This data is limited to the City of San Diego Boundary. http://www.sangis.org/
C.3: Groundwater Table Elevations	Groundwater Depths	Infiltration BMPs will need to be sited in areas with adequate distance (>10 ft) from the groundwater table, unless groundwater quality is maintained	GeoTracker. Data downloaded for San Diego county from 2014 and 2013. In cases where there were multiple measurements made at the same well, the average was taken over that year. http://geotracker.waterboards.ca.gov/data_download_by_county.asp
C.4: Contaminated Sites	Contaminated soils and/or groundwater sites	Infiltration must limited in areas of contaminated soil/groundwater	GeoTracker. Data downloaded for San Diego county and limited to active cleanup sites http://geotracker.waterboards.ca.gov/


County of San Diego
Pacific Ocean
Miles
0 2.5 5 10
Figure C.1
Soils
San Diego County, California
Legend
Hydric Soils
Hydrologic Soils Group
A
B
C
D

County of San Diego

Miles
0 2.5 5 10

Figure C.2
Slopes and Geologic Hazards
San Diego County, California

Legend

- Landslide Data Extent
- Potential Landslide Areas
- Slopes >25%
- Potential Liquefaction Areas

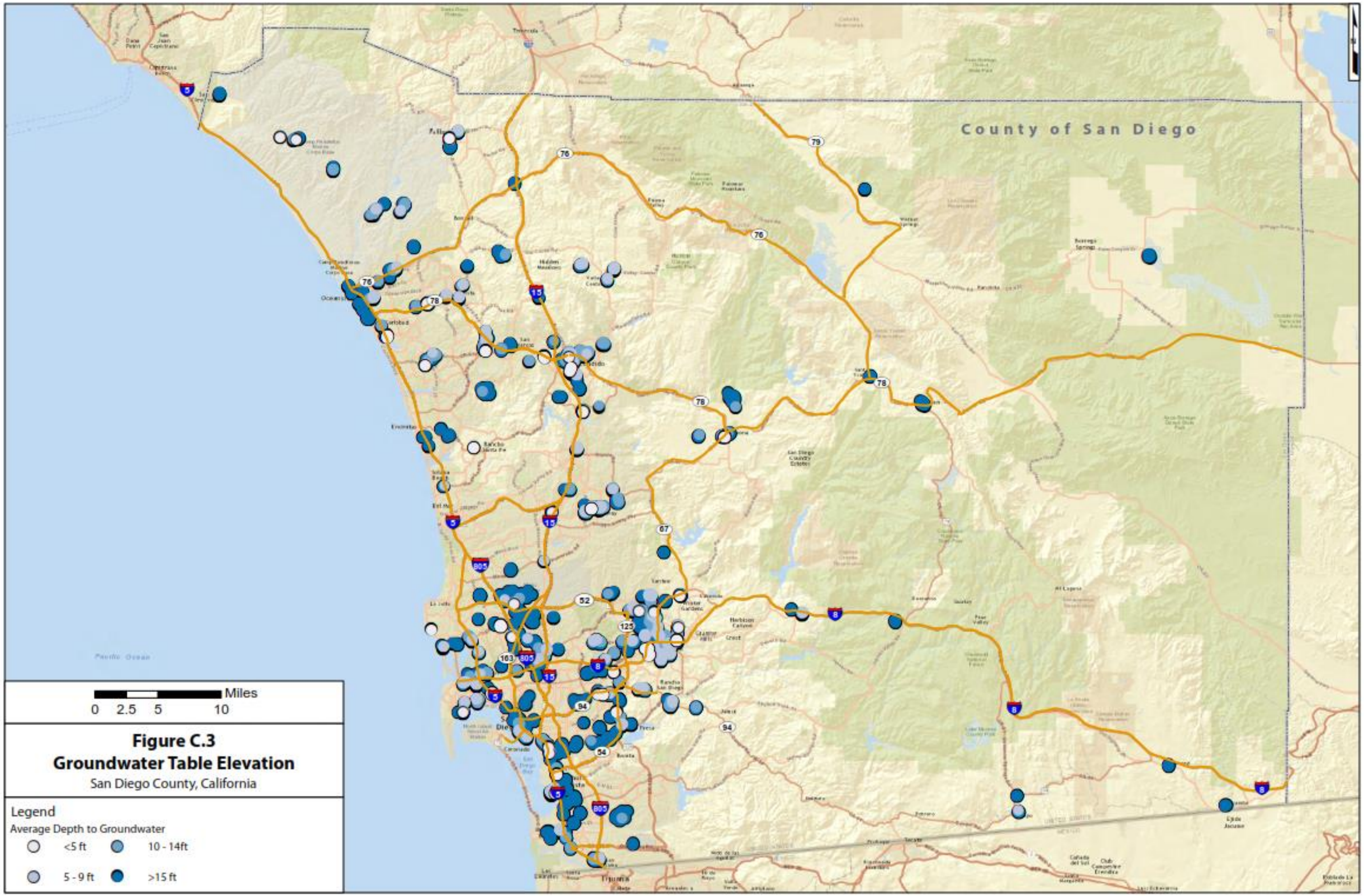


Figure C.3
Groundwater Table Elevation
San Diego County, California

Legend
Average Depth to Groundwater

- <5 ft
- 5 - 9 ft
- 10 - 14ft
- >15 ft

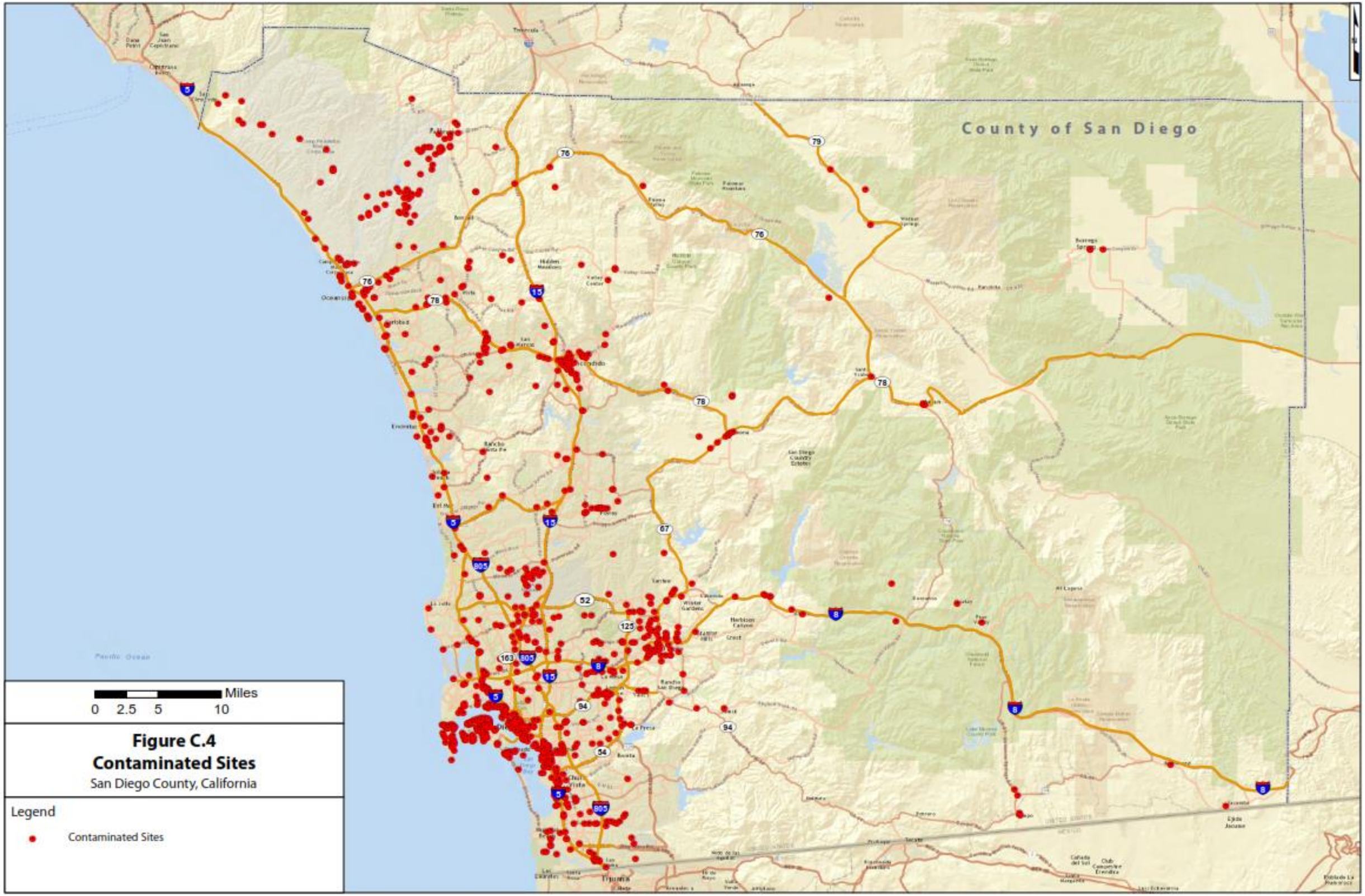


Figure C.4
Contaminated Sites
San Diego County, California

Legend

- Contaminated Sites

Appendix

D

Approved Infiltration Rate Assessment Methods for Selection of Storm Water BMPs

February 2016

Appendix D Approved Infiltration Rate Assessment Methods for Selection and Design of Storm Water BMPs

D.1 Introduction

Characterization of potential infiltration rates is a critical step in evaluating the degree to which infiltration can be used to reduce storm water runoff volume. This appendix is intended to provide guidance to help answer the following questions:

1. *How and where does infiltration testing fit into the project development process?*

   Section D.2 discusses the role of infiltration testing in different stage of project development and how to plan a phased investigation approach.

2. *What infiltration rate assessment methods are acceptable?*

   Section D.3 describes the infiltration rate assessment methods that are acceptable.

3. *What factors should be considered in selecting the most appropriate testing method for a project?*

   Section D.4 provides guidance on site-specific considerations that influence which assessment methods are most appropriate.

4. *How should factors of safety be selected and applied to, for BMP selection and design?*

   Section D.5 provides guidance for selecting a safety factor.

Note, that this appendix does not consider other feasibility criteria that may make infiltration infeasible, such as groundwater contamination and geotechnical considerations (these are covered in Appendix C). In general, infiltration testing should only be conducted after other feasibility criteria specified in this manual have been evaluated and cleared.

D.2 Role of Infiltration Testing in Different Stages of Project Development

In the process of planning and designing infiltration facilities, there are a number of ways that infiltration testing or estimation factors into project development, as summarized in Table D.2-1. As part of selecting infiltration testing methods, the geotechnical engineer shall select methods that are applicable to the phase of the project and the associated burden of proof.

Table D.2-1: Role of Infiltration Testing

Project Phase	Key Questions/Burden of Proof	General Assessment Strategies
Site Planning Phase	• Where within the project area is infiltration potentially feasible? • What volume reduction approaches are potentially suitable for my project?	• Use existing data and maps to the extent possible • Use less expensive methods to allow a broader area to be investigated more rapidly • Reach tentative conclusions that are subject to confirmation/refinement at the design phase
BMP Design Phase	• What infiltration rates should be used to design infiltration and biofiltration facilities? • What factor of safety should be applied?	• Use more rigorous testing methods at specific BMP locations • Support or modify preliminary feasibility findings • Estimate design infiltration rates with appropriate factors of safety

D.3 Guidance for Selecting Infiltration Testing Methods

The geotechnical engineer shall select appropriate testing methods for the site conditions, subject to the engineer's discretion and approval of the EAD and FDD, that are adequate to meet the burden of proof that is applicable at each phase of the project design (See Table D.3-1):

- At the planning phase, testing/evaluation method must be selected to provide a reliable estimate of the locations where infiltration is feasible and allow a reasonably confident determination of infiltration feasibilility to support the selection between full infiltration, partial infiltration, and no infiltration BMPs.

- At the design phase, the testing method must be selected to provide a reliable infiltration rate to be used in design. The degree of certainty provided by the selected test should be considered

Table D.3-1 provides a matrix comparison of these methods. Sections D.3.1 to D.3.3 provide a summary of each method. This appendix is not intended to be an exhaustive reference on infiltration testing at this time. It does not attempt to discuss every method for testing, nor is it intended to provide step-by-step procedures for each method. The user is directed to supplemental resources (referenced in this appendix) or other appropriate references for more specific information. **Alternative testing methods are allowed with appropriate rationales, subject to**

the discretion of the FDD and EAD.

In order to select an infiltration testing method, it is important to understand how each test is applied and what specific physical properties the test is designed to measure. Infiltration testing methods vary considerably in these regards. For example, a borehole percolation test is conducted by drilling a borehole, filling a portion of the hole with water, and monitoring the rate of fall of the water. This test directly measures the three dimensional flux of water into the walls and bottom of the borehole. An approximate correction is applied to indirectly estimate the vertical hydraulic conductivity from the results of the borehole test. In contrast, a double-ring infiltrometer test is conducted from the ground surface and is intended to provide a direct estimate of vertical (one-dimensional) infiltration rate at this point. Both of these methods are applicable under different conditions.

Table D.3-1: Comparision of Infiltration Rate Estimation and Testing Methods

Test	Suitability at Planning Level Screening Phase	Suitability at BMP Design Phase
NRCS Soil Survey Maps	Yes, but mapped soil types must be confirmed with site observations. Regional soil maps are known to contain inaccuracies at the scale of typical development sites.	No, unless a strong correlation is developed between soil types and infiltration rates in the direct vicinity of the site and an elevated factor of safety is used.
Grain Size Analysis	Not preferred. Should only be used if a strong correlation has been developed between grain size analysis and measured infiltration rates testing results of site soils.	No
Cone Penetrometer Testing	Not preferred. Should only be used if a strong correlation has been developed between CPT results and measured infiltration rates testing results of site soils.	No
Simple Open Pit Test	Yes	Yes, with appropriate correction for infiltration into side walls and elevated factor of safety.
Open Pit Falling Head Test	Yes	Yes, with appropriate correction for infiltration into side walls and elevated factor of safety.
Double Ring Infiltrometer Test (ASTM 3385)	Yes	Yes
Single Ring Infiltrometer Test	Yes	Yes

Test	Suitability at Planning Level Screening Phase	Suitability at BMP Design Phase
Large-scale Pilot Infiltration Test	Yes, but generally cost prohibitive and too water-intensive for preliminary screening of a large area.	Yes, but should consider relatively large water demand associated with this test.
Smaller-scale Pilot Infiltration Test	Yes	Yes
Well Permeameter Method (USBR 7300-89)	Yes; reliability of this test can be improved by obtaining a continuous core where tests are conducted.	Yes in areas of proposed cut where other tests are not possible; a continuous boring log should be recorded and used to interpret test; should be confirmed with a more direct measurement following excavation.
Borehole Percolation Tests (various methods)	Yes; reliability of this test can be improved by obtaining a continuous core where tests are conducted.	Yes in areas of proposed cut where other tests are not possible; a continuous boring log should be recorded and used to interpret test; should be confirmed with a more direct measurement following excavation.
Laboratory Permeability Tests (e.g., ASTM D2434)	Yes, only suitable for evaluating potential infiltration rates in proposed fill areas. For sites with proposed cut, it is preferred to do a borehole percolation test at the proposed grade instead of analyzing samples in the lab. A combination of both tests may improve reliability.	No. However, may be part of a line of evidence for estimating the design infiltration of partial infiltration BMPs constructed in future compacted fill.

D.3.1 Desktop Approaches and Data Correlation Methods

This section reviews common methods used to evaluate infiltration characteristics based on desktop-available information, such as GIS data. This section also introduces methods for estimating infiltration properties via correlations with other measurements.

D.3.1.1 NRCS Soil Survey Maps

NRCS Soil Survey maps (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm) can be used to estimate preliminary feasibility conditions, specifically by mapping hydrologic soil groups, soil texture classes, and presence of hydric soils relative to the site layout. For feasibility determinations, mapped conditions must be supplemented with available data from the site (e.g., soil borings, observed soil textures, biological indicators), especially at SAN since the underlying soils are generally undifferentiated bay deposits and hydraulic fill material from San Diego Bay. The presence of D soils, if confirmed by available data, provides a reasonable basis to determine that full infiltration is not feasible for a given DMA.

D.3.1.2 Grain Size Analysis Testing and Correlations to Infiltration Rate

Hydraulic conductivity can be estimated indirectly from correlations with soil grain-size distributions. While this method is approximate, correlations have been relatively well established for some soil conditions. One of the most commonly used correlations between grain size parameters and hydraulic conductivity is the Hazen (1892, 1911) empirical formula (Philips and Kitch, 2011), but a variety of others have been developed. Correlations must be developed based on testing of site-specific soils.

D.3.1.3 Cone Penetrometer Testing and Correlations to Infiltration Rate

Hydraulic conductivity can also be estimated indirectly from cone penetrometer testing (CPT). A cone penetrometer test involves advancing a small probe into the soil and measuring the relative resistance encountered by the probe as it is advanced. The signal returned from this test can be interpreted to yield estimated soil types and the location of key transitions between soil layers. If this method is used, correlations must be developed based on testing of site-specific soils.

D.3.2 Surface and Shallow Excavation Methods

This section describes tests that are conducted at the ground surface or within shallow excavations close to the ground surface. These tests are generally applicable for cases where the bottom of the infiltration system will be near the existing ground surface. They can also be conducted to confirm the results of borehole methods after excavation/site grading has been completed.

D.3.2.1 Simple Open Pit Test

The Simple Open Pit Test is most appropriate for planning level screening of infiltration feasibility. Although it is similar to Open Pit Falling Head tests used for establishing a design infiltration rate (see below), the Simple Open Pit Test is less rigorous and is generally conducted to a lower standard of care. This test can be conducted by a nonprofessional as part of planning level screening phase.

The Simple Open Pit Test is a falling head test in which a hole at least two feet in diameter is filled with water to a level of 6" above the bottom. Water level is checked and recorded regularly until either an hour has passed or the entire volume has infiltrated. The test is repeated two more times in succession and the rate at which the water level falls in the third test is used as the infiltration rate.

This test has the advantage of being inexpensive to conduct. Yet it is believed to be fairly reliable for screening as the dimensions of the test are similar, proportionally, to the dimensions of a typical BMP. The key limitations of this test are that it measures a relatively small area, does not necessarily result in a precise measurement, and may not be uniformly implemented.

Source: City of Portland, 2008. Storm water Management Manual

D.3.2.2 Open Pit Falling Head Test

This test is similar to the Simple Open Pit Test, but covers a larger footprint, includes more specific instructions, returns more precise measurements, and generally should be overseen by a geotechnical professional. Nonetheless, it remains a relatively simple test.

To perform this test, a hole is excavated at least 2 feet wide by 4 feet long (larger is preferred) and to a depth of at least 12 inches. The bottom of the hole should be approximately at the depth of the proposed infiltrating surface of the BMP. The hole is pre-soaked by filling it with water at least a foot above the soil to be tested and leaving it at least 4 hours (or overnight if clays are present). After pre-soaking, the hole is refilled to a depth of 12 inches and allow it to drain for one hour (2 hours for slower soils), measuring the rate at which the water level drops. The test is then repeated until successive trials yield a result with less than 10 percent change.

In comparison to a double-ring infiltrometer, this test has the advantage of measuring infiltration over a larger area and better resembles the dimensionality of a typical small scale BMP. Because it includes both vertical and lateral infiltration, it should be adjusted to estimate design rates for larger scale BMPs.

D.3.2.3 Double Ring Infiltrometer Test (ASTM 3385)

The Double Ring Infiltrometer was originally developed to estimate the saturated hydraulic conductivity of low permeability materials, such as clay liners for ponds, but has seen significant use in storm water applications. The most recent revision of this method from 2009 is known as ASTM 3385-09. The testing apparatus is designed with concentric rings that form an inner ring and an annulus between the inner and outer rings. Infiltration from the annulus between the two rings is intended to saturate the soil outside of the inner ring such that infiltration from the inner ring is restricted primarily to the vertical direction.

To conduct this test, both the center ring and annulus between the rings are filled with water. There is no pre-wetting of the soil in this test. However, a constant head of 1 to 6 inches is maintained for 6 hours, or until a constant flow rate is established. Both the inner flow rate and annular flow rate are recorded, but if they are different, the inner flow rate should be used. There are a variety of approaches that are used to maintain a constant head on the system, including use of a Mariotte tube, constant level float valves, or manual observation and filling. This test must be conducted at the elevation of the proposed infiltrating surface; therefore application of this test is limited in cases where the infiltration surface is a significant distance below existing grade at the time of testing.

This test is generally considered to provide a direct estimate of vertical infiltration rate for the specific point tested and is highly replicable. However, given the small diameter of the inner ring (standard diameter is 12 inches, but it can be larger), this test only measures infiltration rate in a small area. Additionally, given the small quantity of water used in this test compared to larger scale

tests, this test may be biased high in cases where the long term infiltration rate is governed by groundwater mounding and the rate at which mounding dissipates (i.e., the capacity of the infiltration receptor). Finally, the added effort and cost of isolating vertical infiltration rate may not necessarily be warranted considering that BMPs typically have a lateral component of infiltration as well. Therefore, while this method has the advantages of being technical rigorous and well standardized, it should not necessarily be assumed to be the most representative test for estimating full-scale infiltration rates. Source: American Society for Testing and Materials (ASTM) International (2009)

D.3.2.4 Single Ring Infiltrometer Test

The single ring infiltrometer test is not a standardized ASTM test, however it is a relatively well-controlled test and shares many similarities with the ASTM standard double ring infiltrometer test (ASTM 3385-09). This test is a constant head test using a large ring (preferably greater than 40 inches in diameter) usually driven 12 inches into the soil. Water is ponded above the surface. The rate of water addition is recorded and infiltration rate is determined after the flow rate has stabilized. Water can be added either manually or automatically.

The single ring used in this test tends to be larger than the inner ring used in the double ring test. Driving the ring into the ground limits lateral infiltration; however some lateral infiltration is generally considered to occur. Experience in Riverside County (CA) has shown that this test gives results that are close to full-scale infiltration facilities. The primary advantages of this test are that it is relatively simple to conduct and has a larger footprint (compared to the double-ring method) and restricts horizontal infiltration and is more standardized (compared to open pit methods). However, it is still a relatively small scale test and can only be reasonably conducted near the existing ground surface.

D.3.2.5 Large-scale Pilot Infiltration Test

As its name implies, this test is closer in scale to a full-scale infiltration facility. This test was developed by Washington State Department of Ecology specifically for storm water applications.

To perform this test, a test pit is excavated with a horizontal surface area of roughly 100 square feet to a depth that allows 3 to 4 feet of ponding above the expected bottom of the infiltration facility. Water is continually pumped into the system to maintain a constant water level (between 3 and 4 feet about the bottom of the pit, but not more than the estimated water depth in the proposed facility) and the flow rate is recorded. The test is continued until the flow rate stabilizes. Infiltration rate is calculated by dividing the flow rate by the surface area of the pit. Similar to other open pit test, this test is known to result in a slight bias high because infiltration also moves laterally through the walls of the pit during the test. Washington State Department of Ecology requires a correction factor of 0.75 (factor of safety of 1.33) be applied to results.

This test has the advantage of being more resistant to bias from localized soil variability and being more similar to the dimensionality and scale of full scale BMPs. It is also more likely to detect long term decline in infiltration rates associated with groundwater mounding. As such, it remains the preferred test for establishing design infiltration rates in Western Washington (Washington State Department of Ecology, 2012). In a comparative evaluation of test methods, this method was found to provide a more reliable estimate of full-scale infiltration rate than double ring infiltrometer and borehole percolation tests (Philips and Kitch 2011).

The difficulty encountered in this method is that it requires a larger area be excavated than the other methods, and this in turn requires larger equipment for excavation and a greater supply of water. However, this method should be strongly considered when less information is known about spatial variability of soils and/or a higher degree of certainty in estimated infiltration rates is desired.

Source: Washington State Department of Ecology, 2012.

D.3.2.6 Smaller-scale Pilot Infiltration Test

The smaller-scale PIT is conducted similarly to the large-scale PIT but involves a smaller excavation, ranging from 20 to 32 square feet instead of 100 square feet for the large-scale PIT, with similar depths. The primary advantage of this test compared to the full-scale PIT is that it requires less excavation volume and less water. It may be more suitable for small-scale distributed infiltration controls where the need to conduct a greater number of tests outweighs the accuracy that must be obtained in each test, and where groundwater mounding is not as likely to be an issue. Washington State Department of Ecology establishes a correction factor of 0.5 (factor of safety of 2.0) for this test in comparison to 0.75 (factor of safety of 1.33) for the large-scale PIT to account for a greater fraction of water infiltrating through the walls of the excavation and lower degree of certainty related to spatial variability of soils.

D.3.3 Deeper Subsurface Tests

D.3.3.1 Well Permeameter Method (USBR 7300-89)

Well permeameter methods were originally developed for purposes of assessing aquifer permeability and associated yield of drinking water wells. This family of tests is most applicable in situations in which infiltration facilities will be placed substantially below existing grade, which limits the use of surface testing methods.

In general, this test involves drilling a 6 inch to 8 inch test well to the depth of interest and maintaining a constant head until a constant flow rate has been achieved. Water level is maintained with down-hole floats. The Porchet method or the nomographs provided in the USBR Drainage Manual (United States Department of the Interior, Bureau of Reclamation, 1993) are used to convert

the measured rate of percolation to an estimate of vertical hydraulic conductivity. A smaller diameter boring may be adequate, however this then requires a different correction factor to account for the increased variability expected.

While these tests have applicability in screening level analysis, considerable uncertainty is introduced in the step of converting direct percolation measurements to estimates of vertical infiltration. Additionally, this testing method is prone to yielding erroneous results cases where the vertical horizon of the test intersects with minor lenses of sandy soils that allow water to dissipate laterally at a much greater rate than would be expected in a full-scale facility. To improve the interpretation of this test method, a continuous bore log should be inspected to determine whether thin lenses of material may be biasing results at the strata where testing is conducted. Consult USBR procedure 7300-89 for more details.

Source: (United States Department of the Interior, Bureau of Reclamation, 1990, 1993)

D.3.3.2 Borehole Percolation Tests (various methods)

Borehole percolation tests were originally developed as empirical tests to estimate the capacity of onsite sewage disposal systems (septic system leach fields), but have more recently been adopted into use for evaluating storm water infiltration. Similar to the well permeameter method, borehole percolation methods primarily measure lateral infiltration into the walls of the boring and are designed for situations in which infiltration facilities will be placed well below current grade. The percolation rate obtained in this test should be converted to an infiltration rate using a technique such as the Porchet method.

This test is generally implemented similarly to the USBR Well Permeameter Method. Per the Riverside County Borehole Percolation method, a hole is bored to a depth at least 5 times the borehole radius. The hole is presoaked for 24 hours (or at least 2 hours if sandy soils with no clay). The hole is filled to approximately the anticipated top of the proposed infiltration basin. Rates of fall are measured for six hours, refilling each half hour (or 10 minutes for sand). Tests are generally repeated until consistent results are obtained.

The same limitations described for the well permeameter method apply to borehole percolation tests, and their applicability is generally limited to initial screening. To improve the interpretation of this test method, a continuous soil core can be extracted from the hole and below the test depth, following testing, to determine whether thin lenses of material may be biasing results at the strata where testing is conducted.

Sources: Riverside County Percolation Test (2011), California Test 750 (Caltrans, 1986), San Bernardino County Percolation Test (1992); USEPA Falling Head Test (USEPA, 1980).

D.4 Specific Considerations for Infiltration Testing

The following subsections are intended to address specific topics that commonly arise in characterizing infiltration rates.

D.4.1 Hydraulic Conductivity versus Infiltration Rate versus Percolation Rate

A common misunderstanding is that the "percolation rate" obtained from a percolation test is equivalent to the "infiltration rate" obtained from tests such as a single or double ring infiltrometer test which is equivalent to the "saturated hydraulic conductivity". In fact, these terms have different meanings. Saturated hydraulic conductivity is an intrinsic property of a specific soil sample under a given degree of compaction. It is a coefficient in Darcy's equation (Darcy 1856) that characterizes the flux of water that will occur under a given gradient. The measurement of saturated hydraulic conductivity in a laboratory test is typically referred to as "permeability", which is a function of the density, structure, stratification, fines, and discontinuities of a given sample under given controlled conditions. In contrast, infiltration rate is an empirical observation of the rate of flux of water into a given soil structure under long term ponding conditions. Similarly to permeability, infiltration rate can be limited by a number of factors including the layering of soil, density, discontinuities, and initial moisture content. These factors control how quickly water can move through a soil. However, infiltration rate can also be influenced by mounding of groundwater, and the rate at which water dissipates horizontally below a BMP – both of which describe the "capacity" of the "infiltration receptor" to accept this water over an extended period. For this reason, an infiltration test should ideally be conducted for a relatively long duration resembling a series of storm events so that the capacity of the infiltration receptor is evaluated as well as the rate at which water can enter the system. Infiltration rates are generally tested with larger diameter holes, pits, or apparatuses intended to enforce a primarily vertical direction of flux.

In contrast, percolation is tested with small diameter holes, and it is mostly a lateral phenomenon. The direct measurement yielded by a percolation test tends to overestimate the infiltration rate, except perhaps in cases in which a BMP has similar dimensionality to the borehole, such as a dry well. Adjustment of percolation rates may be made to an infiltration rate using a technique such as the Porchet Method.

D.4.2 Cut and Fill Conditions

Cut Conditions: Where the proposed infiltration BMP is to be located in a cut condition, the infiltration surface level at the bottom of the BMP might be far below the existing grade. For example, if the infiltration surface of a proposed BMP is to be located at an elevation that is currently beneath 15 feet of planned cut, *how can the proposed infiltration surface be tested to establish a design*

infiltration rate prior to beginning excavation? The question can be addressed in two ways: First, one of the deeper subsurface tests described above can be used to provide a planning level screening of potential rates at the elevation of the proposed infiltrating surface. These tests can be conducted at depths exceeding 100 feet, therefore are applicable in most cut conditions. Second, the project can commit to further testing using more reliable methods following bulk excavation to refine or adjust infiltration rates, and/or apply higher factors of safety to borehole methods to account for the inherent uncertainty in these measurements and conversions.

Fill Conditions: There are two types of fills – those that are engineered or documented, and those that are undocumented. Undocumented fills are fills placed without engineering controls or construction quality assurance and are subject to great uncertainty. Engineered fills are generally placed using construction quality assurance procedures and may have criteria for grain-size and fines content, and the properties can be very well understood. However, for engineered fills, infiltration rates may still be quite uncertain due to layering and heterogeneities introduced as part of construction that cannot be precisely controlled.

If the bottom of a BMP (infiltration surface) is proposed to be located in a fill location, the infiltration surface may not exist prior to grading. How then can the infiltration rate be determined? For example, if a proposed infiltration BMP is to be located with its bottom elevation in 10 feet of fill, how could one reasonably establish an infiltration rate prior to the fill being placed?

Where possible, infiltration BMPs on fill material should be designed such that their infiltrating surface extends into native soils. Additionally, for shallow fill depths, fill material can be selectively graded (i.e., high permeability granular material placed below proposed BMPs) to provide reliable infiltration properties until the infiltrating water reaches native soils. In some cases, due to considerable fill depth, the extension of the BMP down to natural soil and/or selective grading of fill material may prove infeasible. In additional, fill material will result in some compaction of now buried native soils potentially reducing their ability to infiltrate. In these cases, because of the uncertainty of fill parameters as described above as well as potential compaction of the native soils, an infiltration BMP may not be feasible.

If the source of fill material is defined and this material is known to be of a granular nature and that the native soils below is permeable and will not be highly compacted, infiltration through compacted fill materials may still be feasible. In this case, a project phasing approach could be used including the following general steps, (1) collect samples from areas expected to be used as borrow sites for fill activities, (2) remold samples to approximately the proposed degree of compaction and measure the saturated hydraulic conductivity of remolded samples using laboratory methods, (3) if infiltration rates appear adequate for infiltration, then apply an appropriate factor of safety and use the initial rates for preliminary design, (4) following placement of fill, conduct in-situ testing to refine design infiltration rates and adjust the design as needed; the infiltration rate of native soil below the fill should also be tested at this time to determine if compaction as a result of fill placement has

significantly reduced its infiltration rate. The project geotechnical engineer should be involved in decision making whenever infiltration is proposed in the vicinity of engineered fill structures so that potential impacts of infiltration on the strength and stability of fills and pavement structures can be evaluated.

D.4.3 Effects of Direct and Incidental Compaction

It is widely recognized that compaction of soil has a major influence on infiltration rates (Pitt et al. 2008). However, direct (intentional) compaction is an essential aspect of project construction and indirect compaction (such as by movement of machinery, placement of fill, stockpiling of materials, and foot traffic) can be difficult to avoid in some parts of the project site. Infiltration testing strategies should attempt to measure soils at a degree of compaction that resembles anticipated post-construction conditions.

Ideally, infiltration systems should be located outside of areas where direct compaction will be required and should be staked off to minimize incidental compaction from vehicles and stockpiling. For these conditions, no adjustment of test results is needed.

However, in some cases, infiltration BMPs will be constructed in areas to be compacted. For these areas, it may be appropriate to include field compaction tests or prepare laboratory samples and conducting infiltration testing to approximate the degree of compaction that will occur in post-construction conditions. Alternatively, testing could be conducted on undisturbed soil, and an additional factor of safety could be applied to account for anticipated infiltration after compaction. To develop a factor of safety associated with incidental compaction, samples could compacted to various degrees of compaction, their hydraulic conductivity measured, and a "response curve" developed to relate the degree of compaction to the hydraulic conductivity of the material.

D.4.4 Temperature Effects on Infiltration Rate

The rate of infiltration through soil is affected by the viscosity of water, which in turn is affected by the temperature of water. As such, infiltration rate is strongly dependent on the temperature of the infiltrating water (Cedergren, 1997). For example, Emerson (2008) found that wintertime infiltration rates below a BMP in Pennsylvania were approximately half their peak summertime rates. As such, it is important to consider the effects of temperature when planning tests and interpreting results.

If possible, testing should be conducted at a temperature that approximates the typical runoff temperatures for the site during the times when rainfall occurs. If this is not possible, then the results of infiltration tests should be adjusted to account for the difference between the temperature at the time of testing and the typical temperature of runoff when rainfall occurs. The measured infiltration can be adjusted by the ratio of the viscosity at the test temperature versus the typical temperature when rainfall occurs (Cedergren, 1997), per the following formula:

$$K_{Typical} = K_{Test} \times \left(\frac{\mu_{Test}}{\mu_{Typical}} \right)$$

Where:

$K_{Typical}$ = the typical infiltration rate expected at typical temperatures when rainfall occurs

K_{Test} = the infiltration rate measured or estimated under the conditions of the test

$\mu_{Typical}$ = the viscosity of water at the typical temperature expected when rainfall occurs

μ_{Test} = the viscosity of water at the temperature at which the test was conducted

D.4.5 Number of Infiltration Tests Needed

The heterogeneity inherent in soils implies that all but the smallest proposed infiltration facilities would benefit from infiltration tests in multiple locations. The following requirements apply for in situ infiltration/percolation testing:

- In situ infiltration/ percolation testing shall be conducted at a minimum of two locations within 50-feet of each proposed storm water infiltration/ percolation BMP.
- In situ infiltration/percolation testing shall be conducted using an approved method listed in Table D.3-1
- Testing shall be conducted at approximately the same depth and in the same material as the base of the proposed storm water BMP.

D.5 Selecting a Safety Factor

Should I use a factor of safety for design infiltration rate?

Monitoring of actual facility performance has shown that the full-scale infiltration rate can be much lower than the rate measured by small-scale testing (King County Department of Natural Resources and Parks, 2009). Factors such as soil variability and groundwater mounding may be responsible for much of this difference. Additionally, the infiltration rate of BMPs naturally declines between maintenance cycles as the BMP surface becomes occluded and particulates accumulate in the infiltrative layer.

In the past, infiltration structures have been shown to have a relatively short lifespan. Over 50 percent of infiltration systems either partially or completely failed within the first 5 years of operation (United States EPA. 1999). In a Maryland study on infiltration trenches (Lindsey et al. 1991), 53 percent were not operating as designed, 36 percent were clogged, and 22 percent showed reduced filtration. In a study of 12 infiltration basins (Galli 1992), none of which had built-in pretreatment systems, all had failed within the first two years of operation.

Given the known potential for infiltration BMPs to degrade or fail over time, an appropriate factor of safety applied to infiltration testing results is strongly recommended. This section presents a recommended thought process for selecting a safety factor. This method considers factor of safety

to be a function of:

- Site suitability considerations, and
- Design-related considerations.

These factors and the method for using them to compute a safety factor are discussed below. Importantly, this method encourages rigorous site investigation, good pretreatment, and commitments to routine maintenance to provide technically-sound justification for using a lower factor of safety.

D.5.1 Determining Factor of Safety

Worksheet D.5-1, at the end of this section can be used in conjunction with Tables D.5-1 and D.5-2 to determine an appropriate safety factor. Tables D.5-1 and D.5-2 assign point values to design considerations; the values are entered into Worksheet D.5-1, which assign a weighting factor for each design consideration.

The following procedure can be used to estimate an appropriate factor of safety to be applied to the infiltration testing results. When assigning a factor of safety, care should be taken to understand what other factors of safety are implicit in other aspects of the design to avoid incorporating compounding factors of safety that may result in significant over-design.

1. For each consideration shown above, determine whether the consideration is a high, medium, or low concern.
2. For all high concerns in Table D.5-1, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
3. Multiply each of the factors in Table D.5-1 by 0.25 and then add them together. This should yield a number between 1 and 3.
4. For all high concerns in Table D.5-2, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
5. Multiply each of the factors in Table D.5-2 by 0.5 and then add them together. This should yield a number between 1 and 3.
6. Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then 2 should be used as the safety factor.
7. Divide the tested infiltration rate by the combined safety factor to obtain the adjusted design infiltration rate for use in sizing the infiltration facility.

Note: The minimum combined adjustment factor should not be less than 2.0 and the maximum combined adjustment factor should not exceed 9.0.

D.5.2 Site Suitability Considerations for Selection of an Infiltration Factor of Safety

Considerations related to site suitability include:

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can influence the potential for clogging. Finer grained soils may be more susceptible to clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties for resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.
- These considerations are summarized in Table D.5-1 below, in addition to presenting classification of concern.

Table D.5-1: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern – 3 points	Medium Concern – 2 points	Low Concern – 1 point
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates Use of well permeameter or borehole methods without accompanying continuous boring log Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log Direct measurement of infiltration area with localized infiltration measurement methods (e.g., infiltrometer) Moderate spatial resolution	Direct measurement with localized (i.e., small-scale) infiltration testing methods at relatively high resolution[1] or Use of extensive test pit infiltration measurement methods[2]
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment, or Unknown variability	Soil borings/test pits indicate moderately homogeneous soils	Soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-15 ft below facility bottom	>15 below facility bottom

1 - Localized (i.e., small scale) testing refers to methods such as the double-ring infiltrometer and borehole tests)

2 - Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. The excavation should be to the depth of the proposed infiltration surface and ideally be at least 30 to 100 square feet.

D.5.3 Design Related Considerations for Selection of an Infiltration Factor of Safety

Design related considerations include:

- Level of pretreatment and expected influent sediment loads – credit should be given for good pretreatment to account for the reduced probability of clogging from high sediment loading. Appendix B.6 describes performance criteria for "flow-through treatment" based 80 percent capture of total suspended solids, which provides excellent levels of pretreatment. Additionally, the Washington State Technology Acceptance Protocol-Ecology provides a certification for "pre-treatment" based on 50 percent removal of TSS, which provides moderate levels of treatment. Current approved technologies are listed at:

- http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html. Use of certified technologies can allow a lower factor of safety. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore may be designed with lower safety factors. Finally, the amount of landscaped area and its vegetation coverage characteristics should be considered. For example in arid areas with more soils exposed, open areas draining to infiltration systems may contribute excessive sediments.
- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not impacted by significant incidental compaction. Facilities that use proper construction practices and oversight need less restrictive safety factors.

Table D.5-2: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern – 3 points	Medium Concern – 2 points	Low Concern – 1 point
Level of pretreatment/ expected influent sediment loads	Limited pretreatment using gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, road sanding, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be moderate (e.g., low traffic, mild slopes, stabilized pervious areas, etc.). Performance of pretreatment consistent with "pretreatment BMP performance criteria" (50% TSS removal) in Appendix B.6	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops/non-sanded road surfaces. Performance of pretreatment consistent with "flow-through treatment control BMP performance criteria" (i.e., 80% TSS removal) in Appendix B.6
Redundancy/ resiliency	No "backup" system is provided; the system design does not allow infiltration rates to be restored relatively easily with maintenance	The system has a backup pathway for treated water to discharge if clogging occurs or infiltration rates can be restored via maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs and infiltration rates can be relatively easily restored via maintenance.
Compaction during construction	Construction of facility on a compacted site or increased probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Equipment traffic is effectively restricted from infiltration areas during construction and there is low probability of unintended/ indirect compaction.

D.5.4 Implications of a Factor of Safety in BMP Feasibility and Design

The above method will provide safety factors in the range of 2 to 9. From a simplified practical perspective, this means that the size of the facility will need to increase in area from 2 to 9 times relative to that which might be used without a safety factor. Clearly, numbers toward the upper end of this range will make all but the best locations prohibitive in land area and cost.

In order to make BMPs more feasible and cost effective, steps should be taken to plan and execute the implementation of infiltration BMPs in a way that will reduce the safety factors needed for those projects. A commitment to effective site design and source control thorough site investigation, use of effective pretreatment controls, good construction practices, and restoration of the infiltration rates of soils that are damaged by prior compaction should lower the safety factor that should be applied, to help improve the long term reliability of the system and reduce BMP construction cost. While these practices decrease the recommended safety factor, they do not totally mitigate the need to apply a factor of safety. The minimum recommended safety factor of 2.0 is intended to account for the remaining uncertainty and long-term deterioration that cannot be technically mitigated.

Because there is potential for an applicant to "exaggerate" factor of safety to artificially prove infeasibility, an upper cap on the factor of safety is proposed for feasibility screening. A maximum factor of safety of 2.0 is recommended for infiltration feasibility screening such that an artificially high factor of safety cannot be used to inappropriately rule out infiltration, unless justified. If the site passes the feasibility analysis at a factor of safety of 2.0, then infiltration must investigated, but a higher factor of safety may be selected at the discretion of the design engineer.

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

Appendix

E

BMP Design Fact Sheets

Appendix E BMP Design Fact Sheets

The following fact sheets were developed to assist the project applicants with designing BMPs to meet the storm water obligations:

MS4 Category	Manual Category	Design Fact Sheet
Source Control	Source Control	SC: Source Control BMP Requirements
Site Design	Site Design	SD-1: Street Trees SD-5: Impervious Area Dispersion SD-6A: Green Roofs SD-6B: Permeable Pavement (Site Design BMP) SD-8: Rain Barrels
Retention	Harvest and Use	HU-1: Cistern
	Infiltration	INF-1: Infiltration Basins INF-2: Bioretention INF-3: Permeable Pavement (Pollutant Control)
	Partial Retention	PR-1: Biofiltration with Partial Retention
Biofiltration	Biofiltration	BF-1: Biofiltration BF-2: Nutrient Sensitive Media Design BF-3: Proprietary Biofiltration
Flow-through Treatment Control	Flow-through Treatment Control with Alternative Compliance	FT-1: Vegetated Swales FT-2: Media Filters FT-3: Sand Filters FT-4: Dry Extended Detention Basin FT-5: Proprietary Flow-through Treatment Control
		PL: Plant List

E.1 Source Control BMP Requirements

Worksheet E.1-1: Source Control BMP Requirements

How to comply: Projects shall comply with this requirement by implementing all source control BMPs listed in this section that are applicable to their project. Applicability shall be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E.1 provides guidance for identifying source control BMPs applicable to a project. Form H-4 in Appendix A shall be used to document compliance with source control BMP requirements.

How to use this worksheet:

1. Review Column 1 and identify which of these potential sources of storm water pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your project site plan.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your project-specific storm water management report. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.
4. Review Column 5 and incorporate all of the corresponding applicable Authority Source Control BMPs in a table in your project-specific storm water management report. Describe any special conditions that require omitting BMPs or substituting alternatives. Detailed descriptions of BMPs are found in Appendix B of the SAN SWMP (www.san.org/green). Note that all BMPs listed in Appendix B of the SAN SWMP, as applicable, apply to all areas of the Authority jurisdiction.

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If These Sources Will Be on the Project Site …	… Then Your SWQMP Shall Consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **A.** Onsite storm drain inlets ❑ Not Applicable	❑ Locations of inlets.	❑ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	❑ Maintain and periodically repaint or replace inlet markings. ❑ Provide storm water pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."	❑ BMP SC17 – Storm Drain Maintenance
❑ **B.** Interior floor drains and elevator shaft sump pumps ❑ Not Applicable		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC17 – Storm Drain Maintenance
❑ **C.** Interior parking garages ❑ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC17 – Storm Drain Maintenance
❑ **D1.** Need for future indoor & structural pest control ❑ Not Applicable		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.	❑ BMP SC09 – Building and Grounds Maintenance

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **D2.** Landscape/ Outdoor Pesticide Use ❑ Not Applicable	❑ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show storm water treatment facilities.	State that final landscape plans will accomplish all of the following. ❑ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ❑ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. ❑ Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ❑ Provide IPM information to new owners, lessees and operators.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC09 – Building and Grounds Maintenance
❑ **E.** Ponds, decorative fountains, and other water features. ❑ Not Applicable	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If EAD requires the water feature to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **F.** Food service ❑ Not Applicable	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.		❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC04 – Aircraft, Ground Vehicle, and Equipment Cleaning
❑ **G.** Refuse areas ❑ Not Applicable	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on- site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC08 – Waste Handling and Disposal

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **H.** Industrial processes. ❑ Not Applicable	❑ Show process area.	❑ If industrial processes are to be located onsite, state: "All process activities to be performed indoors where possible. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non- Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC02A – Outdoor Equipment Operations and Maintenance Areas ❑ BMP SC02B – Aircraft, Ground Vehicle, and Equipment Maintenance ❑ BMP SC02C – Electric Vehicle Maintenance and Charging
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ❑ Not Applicable	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials (HazMat) Management Plan for the site. HazMat Management Plans must be on file with EAD.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC07 – Outdoor Material Storage

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **J.** Vehicle and Equipment Cleaning ❑ Not Applicable	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (3) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from aircraft, vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Vehicle maintenance shops and similar shall use dry wash methods, capture all wash water, or wash offsite. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC04 – Aircraft, Ground Vehicle, and Equipment Cleaning

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and**	**4** **Operational BMPs—Include in Table and Narrative**	**5** **Authority Source Control BMPs—Include in Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance ❑ Not Applicable	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the report, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC02A – Outdoor Equipment Operations and Maintenance Areas ❑ BMP SC02B – Aircraft, Ground Vehicle, and Equipment Maintenance ❑ BMP SC02C – Electric Vehicle Maintenance and Charging

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
❑ **L.** Fuel Dispensing Areas ❑ Not Applicable	❑ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of storm water to the MEP. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] shall not drain onto the fueling area.		❑ The tenant or property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC03 – Aircraft, Ground Vehicle, and Equipment Fueling

1. The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**	**5** **Authority Source Control BMPs—Include in Table and Narrative**
M. Loading Docks ❑ Not Applicable	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct storm water away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC06 – Outdoor Loading and Unloading of Materials
❑ **N.** Fire Sprinkler Test Water ❑ Not Applicable		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.	❑ BMP SC13 – Fire Fighting Foam Discharge

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs			
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**	5 **Authority Source Control BMPs—Include in Table and Narrative**
O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim ❑ Not Applicable		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. Consider harvest and use of condensate. ❑ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.		❑ BMP SC01 – Non-Storm Water Management
❑ **P.** Plazas, sidewalks, parking lots, runways, ramp, and taxiways. ❑ Not Applicable			❑ Plazas, sidewalks, parking lots, runways, ramp, and taxiways shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.	❑ BMP SC01 – Non-Storm Water Management ❑ BMP SC12 – Outdoor Wash Down/Sweeping (Apron Washing, Ramp Scrubbing) ❑ BMP SC15 – Runway Rubber Removal ❑ BMP SC16 – Parking Lots

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E.2 SD-1 Street Trees

MS4 Permit Category
Site Design
Manual Category
Site Design
Applicable Performance Standard
Site Design
Primary Benefits
Volume Reduction

Street Trees (Source: County of San Diego LID Manual – EOA, Inc.)

Description

Trees planted to intercept rainfall and runoff can be used as storm water management measures that provide additional benefits beyond those typically associated with trees, including energy conservation, air quality improvement, and aesthetic enhancement. Typical storm water management benefits associated with trees include:

- **Interception of rainfall** – tree surfaces (roots, foliage, bark, and branches) intercept, evaporate, store, or convey precipitation to the soil before it reaches surrounding impervious surfaces
- **Reduced erosion** – trees protect denuded area by intercepting or reducing the velocity of rain drops as they fall through the tree canopy
- **Increased infiltration** – soil conditions created by roots and fallen leaves promote infiltration
- **Treatment of storm water** – trees provide treatment through uptake of nutrients and other storm water pollutants (phytoremediation) and support of other biological processes that break down pollutants

Typical street tree system components include:

- Trees of the appropriate species for site conditions and constraints
- Available growing space based on tree species, soil type, water availability, surrounding land uses, and project goals

- Optional suspended pavement design to provide structural support for adjacent pavement without requiring compaction of underlying layers
- Optional root barrier devices as needed; a root barrier is a device installed in the ground, between a tree and the sidewalk, intended to guide roots down and away from the sidewalk in order to prevent sidewalk lifting from tree roots.
- Optional tree grates; to be considered to maximize available space for pedestrian circulation and to protect tree roots from compaction related to pedestrian circulation; tree grates are typically made up of porous material that will allow the runoff to soak through.
- Optional shallow surface depression for ponding of excess runoff
- Optional planter box drain

Design Adaptations for Project Goals

Site design BMP to provide incidental treatment. Street trees primarily functions as site design BMPs for incidental treatment. Benefits from street trees are accounted for by adjustment factors presented in Appendix B.2. This credit can apply to non-street trees as well (that meet the same criteria). Trees as a site design BMP are only credited up to 0.25 times the DCV from the project footprint (with a maximum single tree credit volume of 400 ft^3).

Storm water pollutant control BMP to provide treatment. Applicants are allowed to design trees as a pollutant control BMP and obtain credit greater than 0.25 times the DCV from the project footprint (or a credit greater than 400 ft^3 from a single tree). For this option to be approved by the EAD, applicant is required to do infiltration feasibility screening (Appendix C and D) and provide calculations supporting the amount of credit claimed from implementing trees within the project footprint. The EAD has the discretion to request additional analysis before approving credits greater than 0.25 times the DCV from the project footprint (or a credit greater than 400 ft^3 from a single tree).

Design Criteria and Considerations

Street Trees must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	**Tree species** is appropriately chosen for the development (private or public). For public rights-of-ways, local planning guidelines and zoning provisions for the permissible species and placement of trees are consulted. A list of trees appropriate for site design that can be used	Proper tree placement and species selection minimizes problems such as pavement damage by surface roots and poor growth.

Siting and Design	*Intent/Rationale*
by all county municipalities are provided in Appendix E.20	
☐ **Location of trees** planted along public streets follows local requirements and guidelines. Vehicle and pedestrian line of sight are considered in tree selection and placement. Unless exemption is granted by the FDD and EAD the following minimum tree separation distance is followed	Roadway safety for both vehicular and pedestrian traffic is a key consideration for placement along public streets.
☐ **Underground utilities and overhead wires** are considered in the design and avoided or circumvented. Underground utilities are routed around or through the planter in suspended pavement applications. All underground utilities are protected from water and root penetration.	Tree growth can damage utilities and overhead wires resulting in service interruptions. Protecting utilities routed through the planter prevents damage and service interruptions.

Improvement	Minimum distance to Street Tree
Traffic Signal, Stop sign	20 feet
Underground Utility lines (except sewer)	5 feet
Sewer Lines	10 feet
Above ground utility structures (Transformers, Hydrants, Utility poles, etc.)	10 feet
Driveways	10 feet
Intersections (intersecting curb lines of two streets)	25 feet

Siting and Design		*Intent/Rationale*
☐	**Suspended pavement** design was developed where appropriate to minimize soil compaction and improve infiltration and filtration capabilities. Suspended pavement was constructed with an approved structural cell.	Suspended pavement designs provide structural support without compaction of the underlying layers, thereby promoting tree growth. Recommended structural cells include poured in place concrete columns, Silva Cells manufactured by Deeproot Green Infrastructures and Stratacell and Stratavault systems manufactured by Citygreen Systems.
☐	A minimum soil volume of 2 cubic feet per square foot of canopy projection volume is provided for each tree. Canopy projection area is the ground area beneath the tree, measured at the drip line.	The minimum soil volume ensures that there is adequate storage volume to allow for unrestricted evapotranspiration. A lower amount of soil volume may be allowed at the discretion of the FDD and EAD if certified by a landscape architect or agronomist. The retention credit from the tree is directly proportional to the soil volume provided for the tree.
☐	DCV from the tributary area draining to the tree is equal to or greater than the tree credit volume	The minimum tributary area ensures that the tree receives enough runoff to fully utilize the infiltration and evapotranspiration potential provided. In cases where the minimum tributary area is not provided, the tree credit volume must be reduced proportionately to the actual tributary area.
☐	Inlet opening to the tree that is at least 18 inches wide. A minimum 2 inch drop in grade from the inlet to the finish grade of the tree. Grated inlets are allowed for pedestrian circulation. Grates need to be ADA compliant and have sufficient slip resistance.	Design requirement to ensure that the runoff from the tributary area is not bypassed. Different inlet openings and drops in grade may be allowed at the discretion of the FDD and EAD if calculations are shown that the diversion flow rate (Appendix B.1.2) from the tributary area can be conveyed to the tree. In cases where the inlet capacity is limiting the amount of runoff draining to the tree, the tree credit volume must be reduced

Siting and Design	*Intent/Rationale*
	proportionately.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where street trees can be used in the site design to achieve incidental treatment. Street trees reduce runoff volumes from the site. Refer to Appendix B.2. Document the proposed tree locations in the SWQMP.

2. When trees are proposed as a storm water pollutant control BMP, applicant must complete feasibility analysis in Appendix C and D and submit detailed calculations for the DCV treated by trees. Document the proposed tree locations, feasibility analysis and sizing calculations in the SWQMP. The following calculations should be performed and the smallest of the three should be used as the volume treated by trees:
    a. Delineate the DMA (tributary area) to the tree and calculate the associated DCV.
    b. Calculate the required diversion flow rate using Appendix B.1.2 and size the inlet required to covey this flow rate to the tree. If the proposed inlet cannot convey the diversion flow rate for the entire tributary area, then the DCV that enters the tree should be proportionally reduced.
        i. For example, 0.5 acre drains to the tree and the associated DCV is 820 ft^3. The required diversion flow rate is 0.10 ft^3/s, but only an inlet that can divert 0.05 ft^3/s could be installed.
        ii. Then the effective DCV draining to the tree = 820 ft^3 * (0.05/0.10) = 420 ft^3
    c. Estimate the amount of storm water treated by the tree by summing the following:
        i. Evapotranspiration credit of 0.1 * amount of soil volume installed; and
        ii. Infiltration credit calculated using sizing procedures in Appendix B.4.

E.3 SD-5 Impervious Area Dispersion

MS4 Permit Category
Site Design
Manual Category
Site Design
Applicable Performance Criteria
Site Design
Primary Benefits
Volume Reduction Peak Flow Attenuation

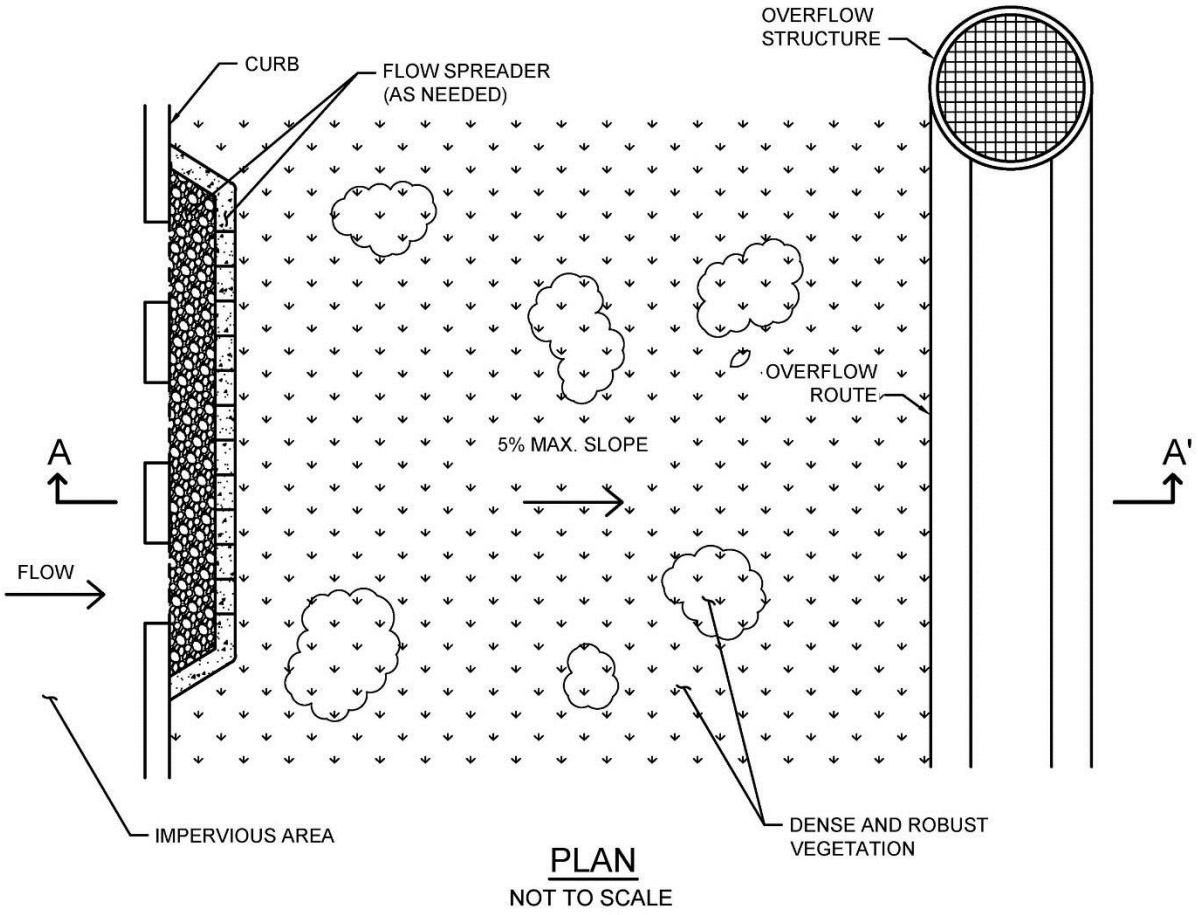
Photo Credit: Orange County Technical Guidance Document

Description

Impervious area dispersion (dispersion) refers to the practice of effectively disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops (through downspout disconnection), walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes. Dispersion with partial or full infiltration results in significant volume reduction by means of infiltration and evapotranspiration.

Typical dispersion components include:

- An impervious surface from which runoff flows will be routed with minimal piping to limit concentrated inflows
- Splash blocks, flow spreaders, or other means of dispersing concentrated flows and providing energy dissipation as needed
- Dedicated pervious area, typically vegetated, with in-situ soil infiltration capacity for partial or full infiltration
- Optional soil amendments to improve vegetation support, maintain infiltration rates and enhance treatment of routed flows
- Overflow route for excess flows to be conveyed from dispersion area to the storm drain system or discharge point



Typical plan and section view of an Impervious Area Dispersion BMP

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. Impervious area dispersion primarily functions as a site design BMP for reducing the effective imperviousness of a site by providing partial or full infiltration of the flows that are routed to pervious dispersion areas and otherwise slowing down excess flows that eventually reach the storm drain system. This can significantly reduce the DCV for the site.

Design Criteria and Considerations

Dispersion must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Dispersion is over areas with soil types capable of supporting or being amended (e.g., with sand or compost) to support vegetation. Media amendments must be tested to verify that they are not a source of pollutants.	Soil must have long-term infiltration capacity for partial or full infiltration and be able to support vegetation to provide runoff treatment. Amendments to improve plant growth must not have negative impact on water quality.
☐	Dispersion has vegetated sheet flow over a relatively large distance (minimum 10 feet) from inflow to overflow route.	Full or partial infiltration requires relatively large areas to be effective depending on the permeability of the underlying soils.
☐	Pervious areas should be flat (with less than 5% slopes) and vegetated.	Flat slopes facilitate sheet flows and minimize velocities, thereby improving treatment and reducing the likelihood of erosion.
	Inflow velocities	
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
	Dedication	
☐	Dispersion areas must be owned by the project owner and be dedicated for the purposes of dispersion to the exclusion of other future uses that might reduce the effectiveness of the dispersion area.	Dedicated dispersion areas prevent future conversion to alternate uses and facilitate continued full and partial infiltration benefits.

Siting and Design		*Intent/Rationale*
Vegetation		
☐	Dispersion typically requires dense and robust vegetation for proper function. Drought tolerant species should be selected to minimize irrigation needs. A plant list to aid in selection can be found in Appendix E.20.	Vegetation improves resistance to erosion and aids in runoff treatment.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where dispersion can be used in the site design to reduce the DCV for pollutant control sizing.
2. Calculate the DCV for storm water pollutant control per Appendix B.2, taking into account reduced runoff from dispersion.
3. Determine if a DMA is considered "Self-retaining" if the impervious to pervious ratio is:
    a. 2:1 when the pervious area is composed of Hydrologic Soil Group A
    b. 1:1 when the pervious area is composed of Hydrologic Soil Group B

E.4 SD-6A: Green Roofs

MS4 Permit Category

Site Design

Manual Category

Site Design

Applicable Performance Standard

Site Design

Primary Benefits

Volume Reduction
Peak Flow Attenuation

Location: County of San Diego Operations Center, San Diego, California

Description

Green roofs are vegetated rooftop systems that reduce runoff volumes and rates, treat storm water pollutants through filtration and plant uptake, provide additional landscape amenity, and create wildlife habitat. Additionally, green roofs reduce the heat island effect and provide acoustical control, air filtration and oxygen production. In terms of building design, they can protect against ultraviolet rays and extend the roof lifetime, as well as increase the building insulation, thereby decreasing heating and cooling costs. There are two primary types of green roofs:

- **Extensive** – lightweight, low maintenance system with low-profile, drought tolerant type groundcover in shallow growing medium (6 inches or less)
- **Intensive** – heavyweight, high maintenance system with a more garden-like configuration and diverse plantings that may include shrubs or trees in a thicker growing medium (greater than 6 inches)

Typical green roof components include, from top to bottom:

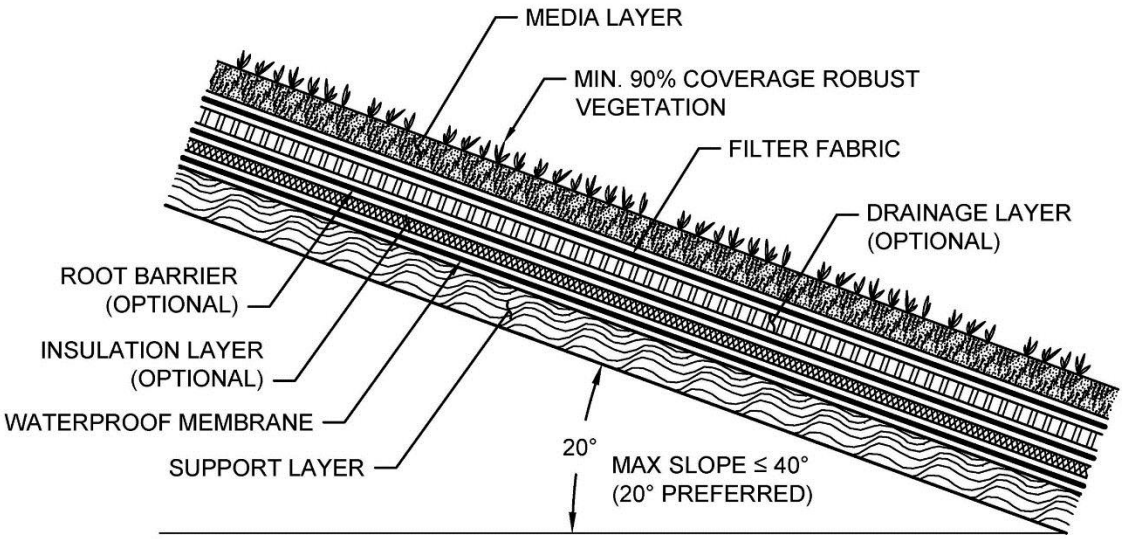
- Vegetation that is appropriate to the type of green roof system, climate, and watering conditions
- Media layer (planting mix or engineered media) capable of supporting vegetation growth

- Filter fabric to prevent migration of fines (soils) into the drainage layer
- Optional drainage layer to convey excess runoff
- Optional root barrier
- Optional insulation layer
- Waterproof membrane
- Structural roof support capable of withstanding the additional weight of a green roof

Because SAN is an active airport, additional design considerations include:

- Minimizing animal attractants to prevent bird strikes
- Maintaining height restrictions
- Preventing the release of organic foreign object debris (FOD)

O'Hare International Airport has successfully installed green roofs on 12 facilities. Additional references for airport-specific installation, including plant species recommendations, can be found at http://www.flychicago.com/OHare/EN/AboutUs/Sustainability/Vegetated-Roofs.aspx. A landscape architect should be consulted to identify climate-specific species that meet the necessary restrictions for airport design.



Typical profile of a Green Roof BMP

Design Adaptations for Project Goals

Site design BMP to provide incidental treatment. Green roofs can be used as a site design feature to reduce the impervious area of the site through replacing conventional roofing. This can reduce the DCV and flow control requirements for the site.

Design Criteria and Considerations

Green roofs must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Roof slope is ≤ 40% (Roofs that are ≤ 20% are preferred).	Steep roof slopes increases project complexity and requires supplemental anchoring.
☐	Structural roof capacity design supports the calculated additional load (lbs/sq. ft) of the vegetation growing medium and additional drainage and barrier layers.	Inadequate structural capacity increases the risk for roof failure and harm to the building and occupants.
☐	Design and construction is planned to be completed by an experienced green roof specialist.	A green roof specialist will minimize complications in implementation and potential structural issues that are critical to green roof success.
☐	Green roof location and extent must meet fire safety provisions.	Green roof design must not negatively impact fire safety.
☐	Maintenance access is included in the green roof design.	Maintenance will facilitate proper functioning of drainage and irrigation components and allow for removal of undesirable vegetation and soil testing, as needed.
☐	Green roof location will not violate airport building height restrictions.	Green roof design must not interfere with airport operation.
	Vegetation	
☐	Vegetation is suitable for the green roof type, climate and expected watering conditions. Perennial, self-sowing plants that are drought-tolerant (e.g., sedums, succulents) and require little to no fertilizer, pesticides or herbicides are recommended. Vegetation pre-grown at grade may allow plants to establish prior to facing harsh roof conditions.	Plants suited to the design and expected growing environment are more likely to survive.

Siting and Design		***Intent/Rationale***
☐	Vegetation is capable of covering ≥ 90% the roof surface.	Benefits of green roofs are greater with more surface vegetation.
☐	Vegetation is robust and erosion-resistant in order to withstand the anticipated rooftop environment (e.g., heat, cold, high winds).	Weak plants will not survive in extreme rooftop environments.
☐	Vegetation is fire resistant.	Vegetation that will not burn easily decreases the chance for fire and harm to the building and occupants.
☐	Vegetation considers roof sun exposure and shaded areas based on roof slope and location.	The amount of sunlight the vegetation receives can inhibit growth therefore the beneficial effects of a vegetated roof.
☐	Vegetation is unattractive for animal food production and species habitat.	Minimizing animal attraction is necessary to avoid bird strikes and maintain safety.
☐	Vegetation is highly durable and wind resistant.	Plant fragility may increase FOD and compromise safety.
☐	An irrigation system (e.g., drip irrigation system) is included as necessary to maintain vegetation.	Proper watering will increase plant survival, especially for new plantings.
☐	Media is well-drained and is the appropriate depth required for the green roof type and vegetation supported.	Unnecessary water retention increases structural loading. An adequate media depth increases plant survival.
☐	A filter fabric is used to prevent migration of media fines through the system.	Migration of media can cause clogging of the drainage layer.
☐	A drainage layer is provided if needed to convey runoff safely from the roof. The drainage layer can be comprised of gravel, perforated sheeting, or other drainage materials.	Inadequate drainage increases structural loading and the risk of harm to the building and occupants.
☐	A root barrier comprised of dense material to inhibit root penetration is used if the waterproof membrane will not provide root penetration protection.	Root penetration can decrease the integrity of the underlying structural roof components and increase the risk of harm to the building and occupants.
☐	An insulation layer is included as needed to protect against the water in the drainage layer from extracting building	Regulating thermal impacts of green roofs will aid in controlling building heating and cooling costs.

Siting and Design		*Intent/Rationale*
	heat in the winter and cool air in the summer.	
☐	A waterproof membrane is used to prevent the roof runoff from vertically migrating and damaging the roofing material. A root barrier may be required to prevent roots from compromising the integrity of the membrane.	Water-damaged roof materials increase the risk of harm to the building and occupants.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where green roofs can be used in the site design to replace conventional roofing to reduce the DCV. These green roof areas can be credited toward reducing runoff generated through representation in storm water calculations as pervious, not impervious, areas but are not credited for storm water pollutant control.
2. Calculate the DCV per Appendix B.2.

E.5 SD-6B Permeable Pavement (Site Design BMP)

Photo Credit: San Diego Low Impact Development Design Manual

Description

Permeable pavement is pavement that allows for percolation through void spaces in the pavement surface into subsurface layers. Permeable pavements reduce runoff volumes and rates and can provide pollutant control via infiltration, filtration, sorption, sedimentation, and biodegradation processes. When used as a site design BMP, the subsurface layers are designed to provide storage of storm water runoff so that outflow rates can be controlled via infiltration into subgrade soils. Varying levels of storm water treatment and flow control can be provided depending on the size of the permeable pavement system relative to its drainage area and the underlying infiltration rates. As a site design BMP permeable pavement areas are designed to be self-retaining and are designed primarily for direct rainfall. Self-retaining permeable pavement areas have a ratio of total drainage area (including permeable pavement) to area of permeable pavement of 1.5:1 or less. Permeable pavement surfaces can be constructed from modular paver units or paver blocks, pervious concrete, porous asphalt, and turf pavers. Sites designed with permeable pavements can significantly reduce the impervious area of the project. Reduction in impervious surfaces decreases the DCV and can reduce the footprint of treatment control and flow control BMPs.

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. Permeable pavement without an underdrain can be used as a site design feature to reduce the impervious area of the site by replacing traditional pavements, including roadways, parking lots, emergency access lanes, sidewalks, trails and driveways.

Typical Permeable Pavement Components (Top to Bottom)
Permeable surface layer
Bedding layer for permeable surface
Aggregate storage layer with optional underdrain(s)
Optional final filter course layer over uncompacted existing subgrade

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where permeable pavements can be used in the site design to replace conventional pavements to reduce the DCV. These areas can be credited toward reducing runoff generated through representation in storm water calculations as pervious, not impervious, areas but are not credited for storm water pollutant control.
2. Calculate the DCV per Appendix B.2, taking into account reduced runoff from permeable pavement areas.

E.6 SD-8 Rain Barrels

Photo Credit: San Diego Low Impact Development Design Manual

Description

Rain barrels are containers that can capture rooftop runoff and store it for future use. With controlled timing and volume release, the captured rainwater can be used for irrigation or alternative grey water between storm events, thereby reducing runoff volumes and associated pollutants to downstream waterbodies. Rain barrels tend to be smaller systems, less than 100 gallons. Treatment can be achieved when rain barrels are used as part of a treatment train along with other BMPs that use captured flows in applications that do not result in discharges into the storm drain system. Rooftops are the ideal tributary areas for rain barrels.

Design Adaptations for Project Goals

Site design BMP to reduce effective impervious area and DCV. Barrels can be used as a site design feature to reduce the effective impervious area of the site by removing roof runoff from the site discharge. This can reduce the DCV and flow control requirements for the site.

Typical Rain Barrel Components
Storage container, barrel or tank for holding captured flows
Inlet and associated valves and piping
Outlet and associated valves and piping
Overflow outlet
Optional pump
Optional first flush diverters
Optional roof, supports, foundation, level indicator, and other accessories

Important Considerations

Maintenance: Rain barrels require regular monitoring and cleaning to ensure that they do not become clogged with leaves or other debris.
Economics: Rain barrels have low installation costs.
Limitations: Due to San Diego's arid climate, some rain barrels may fill only a few times each year.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where rain barrels can be used in the site design to capture roof runoff to reduce the DCV. Rain barrels reduce the effective impervious area of the site by removing roof runoff from the site discharge.
2. Calculate the DCV per Appendix B.2, taking into account reduced runoff from permeable pavement areas.

E.7 HU-1 Cistern

MS4 Permit Category

Retention

Manual Category

Harvest and Use

Applicable Performance Standards

Pollutant Control
Flow Control

Primary Benefits

Volume Reduction
Peak Flow Attenuation

Photo Credit: Water Environment Research Foundation: WERF.org

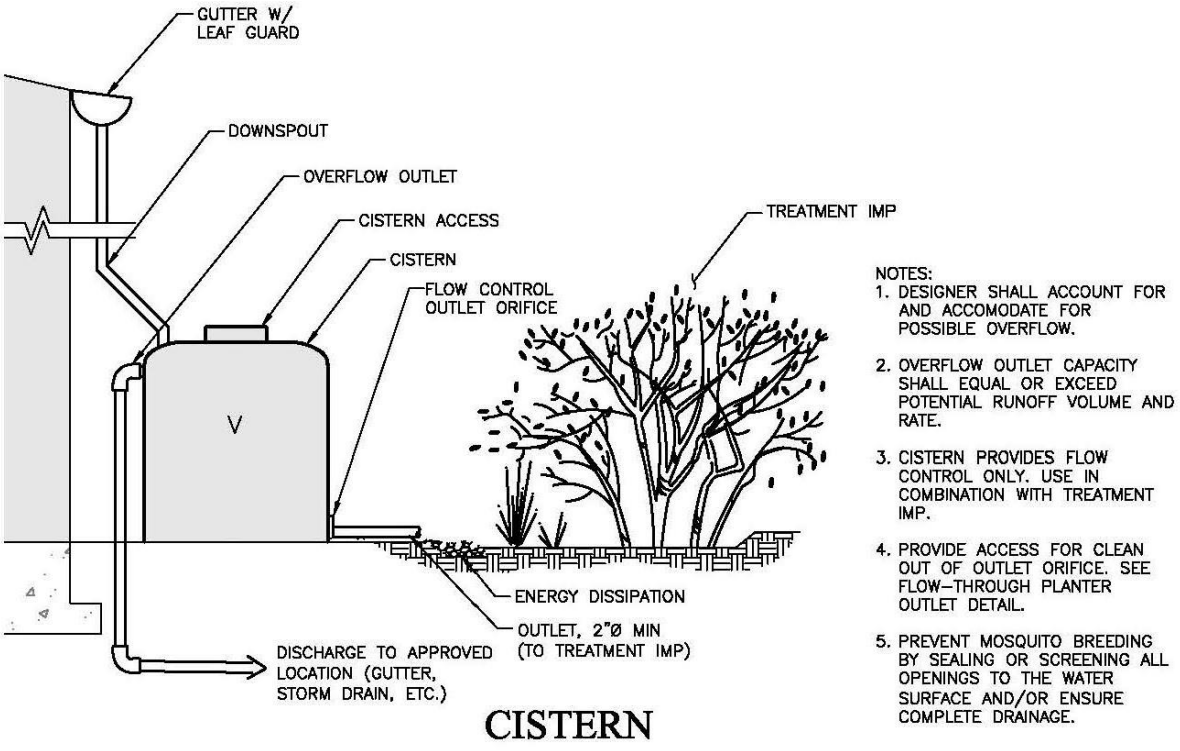
Description

Cisterns are containers that can capture rooftop runoff and store it for future use. With controlled timing and volume release, the captured rainwater can be used for irrigation or alternative grey water between storm events, thereby reducing runoff volumes and associated pollutants to downstream water bodies. Cisterns are larger systems (generally>100 gallons) that can be self-contained aboveground or below ground systems. Treatment can be achieved when cisterns are used as part of a treatment train along with other BMPs that use captured flows in applications that do not result in discharges into the storm drain system. Rooftops are the ideal tributary areas for cisterns.

Typical cistern components include:

- Storage container, barrel or tank for holding captured flows
- Inlet and associated valves and piping
- Outlet and associated valves and piping
- Overflow outlet

- Optional pump
- Optional first flush diverters
- Optional roof, supports, foundation, level indicator, and other accessories



Source: City of San Diego Storm Water Standards

Design Adaptations for Project Goals

Site design BMP to reduce effective impervious area and DCV. Cisterns can be used as a site design feature to reduce the effective impervious area of the site by removing roof runoff from the site discharge. This can reduce the DCV and flow control requirements for the site.

Harvest and use for storm water pollutant control. Typical uses for captured flows include irrigation, toilet flushing, cooling system makeup, and vehicle and equipment washing.

Integrated storm water flow control and pollutant control configuration. Cisterns provide flow control in the form of volume reduction and/or peak flow attenuation and storm water treatment through elimination of discharges of pollutants. Additional flow control can be achieved by sizing

the cistern to include additional detention storage and/or real-time automated flow release controls.

Design Criteria and Considerations

Cisterns must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the EAD if it is determined to be appropriate:

Siting and Design	*Intent/Rationale*
☐ Cisterns are sized to detain the full DCV of contributing area and empty within 36 hours.	Draining the cistern makes the storage volume available to capture the next storm. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method in Appendix B.4.2. If drawdown time is greater than 96 hours, a vector control plan must be submitted to EAD.
☐ Cisterns are fitted with a flow control device such as an orifice or a valve to limit outflow in accordance with drawdown time requirements.	Flow control provides flow attenuation benefits and limits cistern discharge to downstream facilities during storm events.
☐ Cisterns are designed to drain completely, leaving no standing water, and all entry points are fitted with traps or screens, or sealed.	Complete drainage and restricted entry prevents mosquito habitat.
☐ Leaf guards and/or screens are provided to prevent debris from accumulating in the cistern.	Leaves and organic debris can clog the outlet of the cistern.
☐ Access is provided for maintenance and the cistern outlets are accessible and designed to allow easy cleaning.	Properly functioning outlets are needed to maintain proper flow control in accordance with drawdown time requirements.
☐ Cisterns must be designed and sited such that overflow will be conveyed safely overland to the storm drain system or discharge point.	Safe overflow conveyance prevents flooding and damage of property.

Conceptual Design and Sizing Approach for Site Design and Storm Water Pollutant Control

1. Calculate the DCV for site design per Appendix B.
2. Determine the locations on the site where cisterns can be located to capture and detain the DCV from roof areas without subsequent discharge to the storm drain system. Cisterns are best located in close proximity to building and other roofed structures to minimize piping.

Cisterns can also be used as part of a treatment train upstream by increasing pollutant control through delayed runoff to infiltration BMPs such as bioretention without underdrain facilities.

3. Use the sizing worksheet in Appendix B.3 to determine if full or partial capture of the DCV is achievable.
4. The remaining DCV to be treated should be calculated for use in sizing downstream BMP(s).

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or duration is desired on an Authority project, significant cistern volumes will typically be required, and therefore the following steps should be taken prior to determination of site design and storm water pollutant control. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that cistern siting and design criteria have been met. Design for flow control can be achieved using various design configurations, shapes, and quantities of cisterns.
2. Iteratively determine the cistern storage volume required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control valve operation.
3. Verify that the cistern is drawdown within 36 hours. The drawdown time can be estimated by dividing the storage volume by the rate of use of harvested water.
4. If the cistern cannot fully provide the flow rate and duration control required by this manual, a downstream structure with additional storage volume or infiltration capacity such as a biofiltration can be used to provide remaining flow control.

E.8 INF-1 Infiltration Basin

MS4 Permit Category
Retention

Manual Category
Infiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Volume Reduction
Peak Flow Attenuation

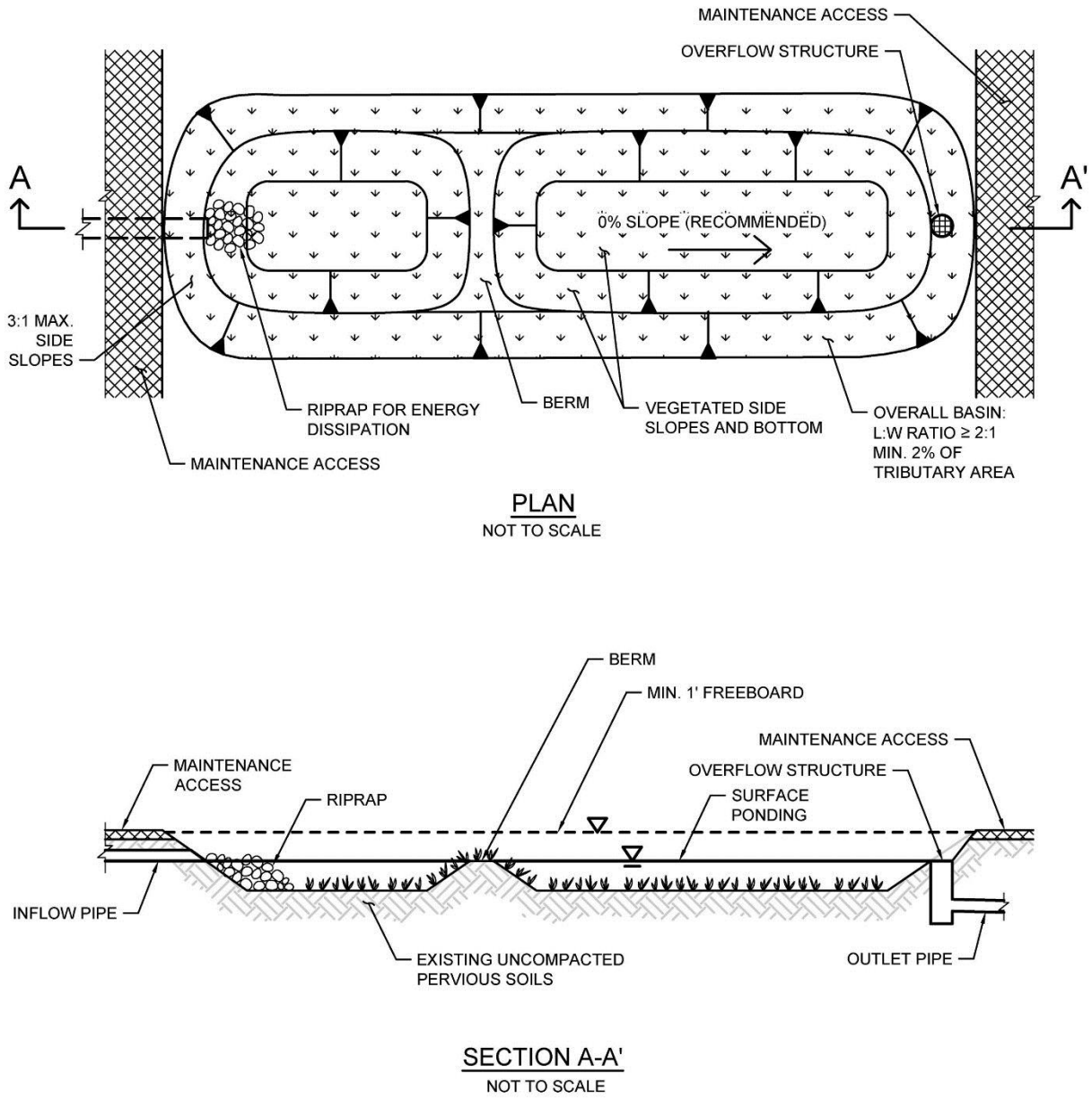
Photo Credit: http://www.stormwaterpartners.com/facilities/basin.html

Description

An infiltration basin typically consists of an earthen basin with a flat bottom constructed in naturally pervious soils. An infiltration basin retains storm water and allows it to evaporate and/or percolate into the underlying soils. The bottom of an infiltration basin is typically vegetated with native grasses or turf grass; however other types of vegetation can be used if they can survive periodic inundation and long inter-event dry periods. Treatment is achieved primarily through infiltration, filtration, sedimentation, biochemical processes and plant uptake. Infiltration basins can be constructed as linear **trenches** or as **underground infiltration galleries**.

Typical infiltration basin components include:

- Inflow distribution mechanisms (e.g., perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Forebay to provide pretreatment surface ponding for captured flows
- Vegetation selected based on basin use, climate, and ponding depth
- Uncompacted native soils at the bottom of the facility
- Overflow structure



Typical plan and section view of an Infiltration BMP

Design Adaptations for Project Goals

Full infiltration BMP for storm water pollutant control. Infiltration basins can be used as a pollutant control BMP, designed to infiltrate runoff from direct rainfall as well as runoff from adjacent areas that are tributary to the BMP. Infiltration basins must be designed with an infiltration storage volume (a function of the surface ponding volume) equal to the full DCV and able to meet drawdown time limitations.

Integrated storm water flow control and pollutant control configuration. Infiltration basins

can also be designed for flow rate and duration control by providing additional infiltration storage through increasing the surface ponding volume.

Design Criteria and Considerations

Infiltration basins must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a full infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Finish grade of the facility is ≤ 2% (0% recommended).	Flatter surfaces reduce erosion and channelization with the facility.
☐	Settling forebay has a volume ≥ 25% of facility volume below the forebay overflow.	A forebay to trap sediment can decrease frequency of required maintenance.
☐	Infiltration of surface ponding is limited to a 36-hour drawdown time.	Prolonged surface ponding reduce volume available to capture subsequent storms. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method in Appendix B.4.2.
☐	Minimum freeboard provided is ≥1 foot.	Freeboard minimizes risk of uncontrolled surface discharge.
☐	Side slopes are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
	Inflow and Overflow Structures	
☐	Inflow and outflow structures are accessible by required equipment (e.g.,	Maintenance will prevent clogging and ensure proper operation of the flow control

Siting and Design		*Intent/Rationale*
	vactor truck) for inspection and maintenance.	structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control

To design infiltration basins for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement and basin area requirements, forebay volume, and maximum slopes for basin sides and bottom.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet (Appendix B.4) to determine if full infiltration of the DCV is achievable based on the infiltration storage volume calculated from the surface ponding area and depth for a maximum 36-hour drawdown time. The drawdown time can be estimated by dividing the average depth of the basin by the design infiltration rate. Appendix D provides guidance on evaluating a site's infiltration rate.

Conceptual Design and Sizing Approach for Storm Water Pollutant Treatment and Flow Control

If control of flow rates and/or durations is desired on an Authority project, significant surface ponding volume will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement and basin area

requirements, forebay volume, and maximum slopes for basin sides and bottom.

2. Iteratively determine the surface ponding required to provide infiltration storage to reduce flow rates and durations to allowable limits while adhering to the maximum 36-hour drawdown time. Flow rates and durations can be controlled using flow splitters that route the appropriate inflow amounts to the infiltration basin and bypass excess flows to the downstream storm drain system or discharge point.
3. If an infiltration basin cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide additional control.
4. After the infiltration basin has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.9 INF-2 Bioretention

MS4 Permit Category
Retention

Manual Category
Infiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Volume Reduction
Treatment
Peak Flow Attenuation

Photo Credit: Ventura County Technical Guidance Document

Description

Bioretention (bioretention without underdrain) facilities are vegetated surface water systems that filter water through vegetation and soil, or engineered media prior to infiltrating into native soils. These facilities are designed to infiltrate the full DCV. Bioretention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed inground or partially aboveground, such as planter boxes with open bottoms (no impermeable liner at the bottom) to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

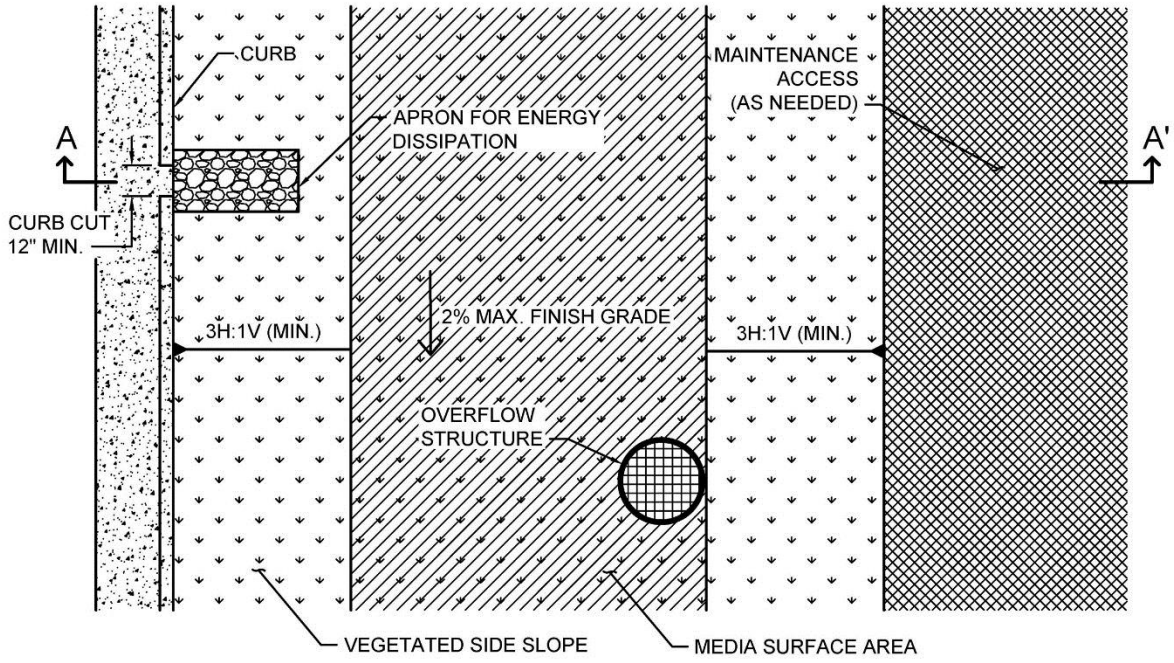
Typical bioretention without underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer (optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth

- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Optional aggregate storage layer for additional infiltration storage
- Uncompacted native soils at the bottom of the facility
- Overflow structure

Design Adaptations for Project Goals

- **Full infiltration BMP for storm water pollutant control.** Bioretention can be used as a pollutant control BMP designed to infiltrate runoff from direct rainfall as well as runoff from adjacent tributary areas. Bioretention facilities must be designed with an infiltration storage volume (a function of the ponding, media and aggregate storage volumes) equal to the full DCV and able to meet drawdown time limitations.
- **Integrated storm water flow control and pollutant control configuration.** Bioretention facilities can be designed to provide flow rate and duration control. This may be accomplished by providing greater infiltration storage with increased surface ponding and/or aggregate storage volume for storm water flow control.



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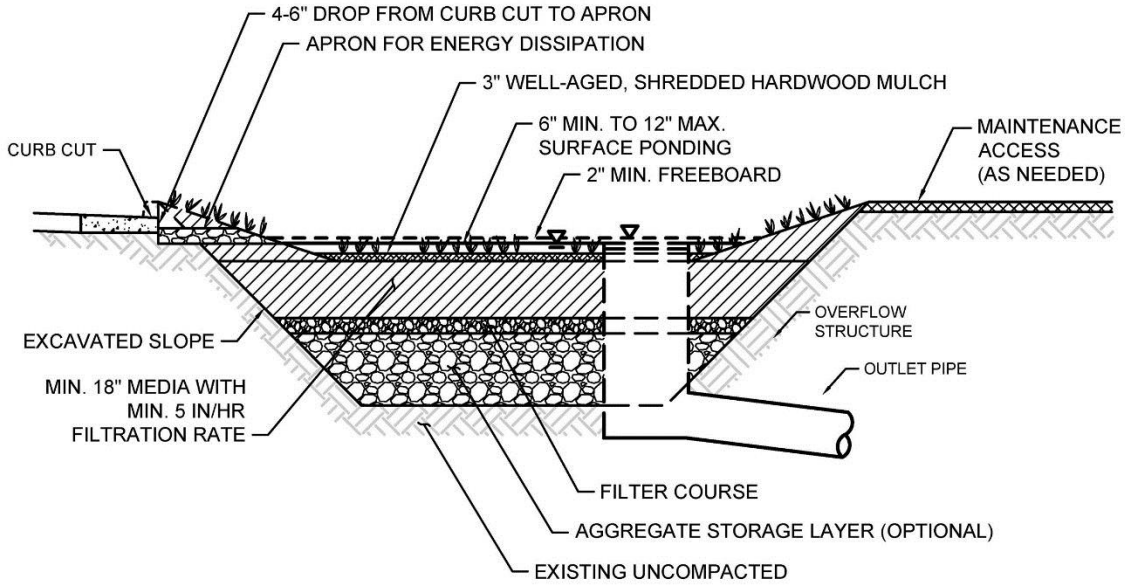

SECTION A-A'
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Typical plan and section view of a Bioretention BMP

Design Criteria and Considerations

Bioretention must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of BMP is based on infiltration feasibility criteria and appropriate design infiltration rate presented in Appendix C and D.	Must operate as a full infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Contributing tributary area is ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the Authority for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%. In long bioretention facilities where the potential for internal erosion and channelization exists, the use of check dams is required.	Flatter surfaces reduce erosion and channelization within the facility. Internal check dams reduce velocity and dissipate energy.
	Surface Ponding	
☐	Surface ponding is limited to a 24-hour drawdown time.	24-hour drawdown time is recommended for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the FDD and EAD if certified by a landscape architect or agronomist.

Siting and Design		*Intent/Rationale*
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 12 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are ≥ 3H: 1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply is provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows beneficial microbes to multiply.
Media Layer		

	Siting and Design	***Intent/Rationale***
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. A minimum initial filtration rate of 10 in/hr is recommended.	A high filtration rate through the soil mix minimizes clogging potential and allows flows to quickly enter the aggregate storage layer, thereby minimizing bypass.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Storm Water Standards, Appendix F (February 2016, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition).	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed.
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2016 City Storm Water Standards or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%	Greater surface area to tributary area ratios decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
	Filter Course Layer (Optional)	
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and

	Siting and Design	*Intent/Rationale*
		impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
	Aggregate Storage Layer (Optional)	
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	Maximum aggregate storage layer depth is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A maximum drawdown time to facilitate provision of adequate storm water storage for the next storm event.
	Inflow and Overflow Structures	
☐	Inflow and overflow structures are accessible for inspection and maintenance. Overflow structures must be connected to downstream storm drain system or appropriate discharge point.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design bioretention for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement and basin area requirements, maximum side and finish grade slope, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine if full infiltration of the DCV is achievable based on the available infiltration storage volume calculated from the bioretention without underdrain footprint area, effective depths for surface ponding, media and aggregate storage layers, and in-situ soil design infiltration rate for a maximum 36-hour drawdown time for the aggregate storage layer, with surface ponding no greater than a maximum 24-hour drawdown. The drawdown time can be estimated by dividing the average depth of the basin by the design infiltration rate of the underlying soil. Appendix D provides guidance on evaluating a site's infiltration rate. A generic sizing worksheet is provided in Appendix B.4.
4. Where the DCV cannot be fully infiltrated based on the site or bioretention constraints, an underdrain can be added to the design (use biofiltration with partial retention factsheet).

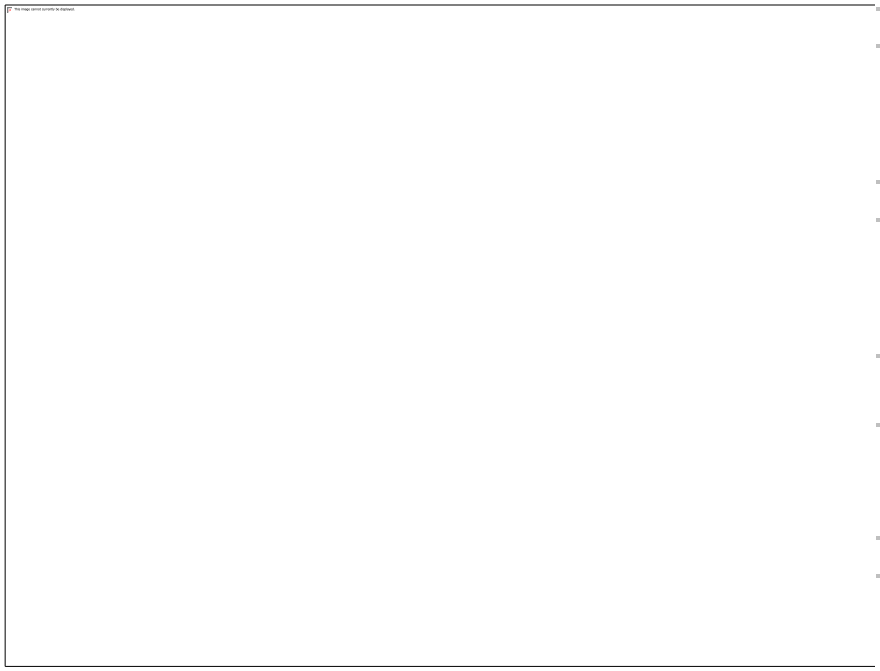
Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant surface ponding and/or aggregate storage volumes will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations shall be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement requirements, maximum side and finish grade slopes, and the recommended media surface area tributary area ratio. Design for flow control can be achieved using various design configurations.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide infiltration storage to reduce flow rates and durations to allowable limits while adhering to the maximum drawdown times for surface ponding and aggregate storage. Flow rates and durations can be controlled using flow splitters that route the appropriate inflow amounts to the bioretention facility and bypass excess flows to the downstream storm drain system or discharge point.
3. If bioretention without underdrain facility cannot fully provide the flow rate and duration control required by the MS4 permit, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide additional control.

4. After bioretention without underdrain BMPs have been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.10 INF-3 Permeable Pavement (Pollutant Control)



MS4 Permit Category

Retention
Flow-through Treatment Control

Manual Category

Infiltration
Flow-through Treatment Control

Applicable Performance Standard

Pollutant Control
Flow Control

Primary Benefits

Volume Reduction
Peak Flow Attenuation

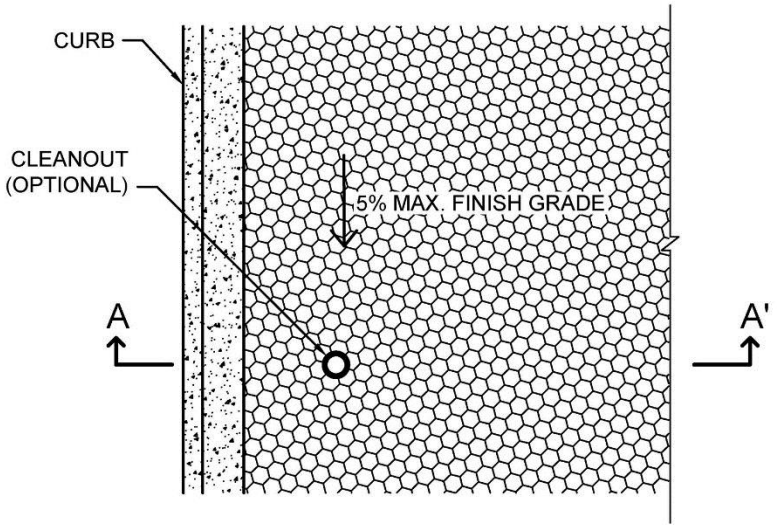
Location: Kellogg Park, San Diego, California

Description

Permeable pavement is pavement that allows for percolation through void spaces in the pavement surface into subsurface layers. The subsurface layers are designed to provide storage of storm water runoff so that outflows, primarily via infiltration into subgrade soils or release to the downstream conveyance system, can be at controlled rates. Varying levels of storm water treatment and flow control can be provided depending on the size of the permeable pavement system relative to its drainage area, the underlying infiltration rates, and the configuration of outflow controls. Pollutant control permeable pavement is designed to receive runoff from a larger tributary area than site design permeable pavement (see SD-6B). Pollutant control is provided via infiltration, filtration, sorption, sedimentation, and biodegradation processes.

Typical permeable pavement components include, from top to bottom:

- Permeable surface layer
- Bedding layer for permeable surface
- Aggregate storage layer with optional underdrain(s)
- Optional final filter course layer over uncompacted existing subgrade



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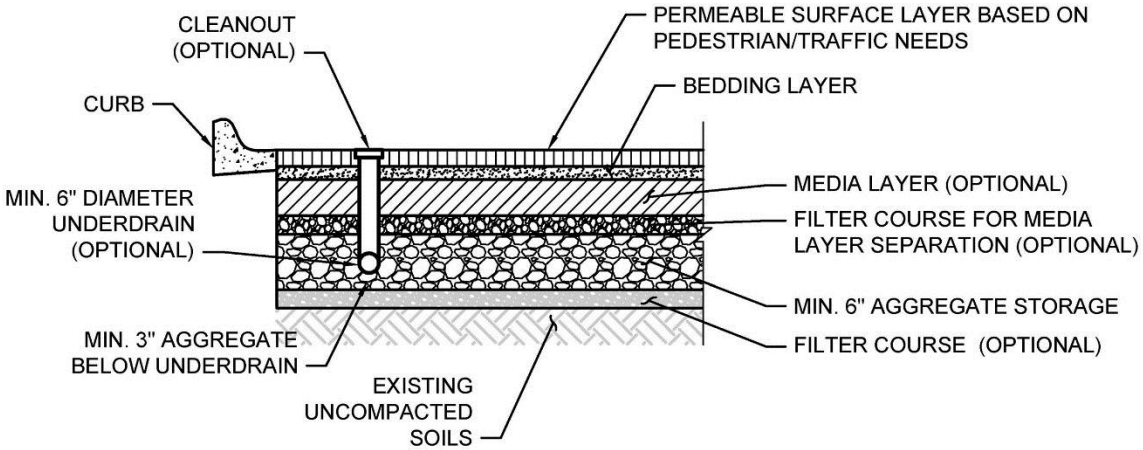

SECTION A-A'
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Typical plan and Section view of a Permeable Pavement BMP

Subcategories of permeable pavement include modular paver units or paver blocks, pervious

concrete, porous asphalt, and turf pavers. These subcategory variations differ in the material used for the permeable surface layer but have similar functions and characteristics below this layer.

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. See site design option SD-6B.

Full infiltration BMP for storm water pollutant control. Permeable pavement without an underdrain and without impermeable liners can be used as a pollutant control BMP, designed to infiltrate runoff from direct rainfall as well as runoff from adjacent areas that are tributary to the pavement. The system must be designed with an infiltration storage volume (a function of the aggregate storage volume) equal to the full DCV and able to meet drawdown time limitations.

Partial infiltration BMP with flow-through treatment for storm water pollutant control. Permeable pavement can be designed so that a portion of the DCV is infiltrated by providing an underdrain with infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered flow-through treatment and is not considered biofiltration treatment. Storage provided above the underdrain invert is included in the flow-through treatment volume.

Flow-through treatment BMP for storm water pollutant control. The system may be lined and/or installed over impermeable native soils with an underdrain provided at the bottom to carry away filtered runoff. Water quality treatment is provided via unit treatment processes other than infiltration. This configuration is considered to provide flow-through treatment, not biofiltration treatment. Significant aggregate storage provided above the underdrain invert can provide detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain. **PDPs have the option to add saturated storage to the flow-through configuration in order to reduce the DCV that the BMP is required to treat.** Saturated storage can be added to this design by including an upturned elbow installed at the downstream end of the underdrain or via an internal weir structure designed to maintain a specific water level elevation. The DCV can be reduced by the amount of saturated storage provided.

Integrated storm water flow control and pollutant control configuration. With any of the above configurations, the system can be designed to provide flow rate and duration control. This may include having a deeper aggregate storage layer that allows for significant detention storage above the underdrain, which can be further controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Permeable pavements must meet the following design criteria. Deviations from the below criteria

may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection must be based on infiltration feasibility criteria.	Full or partial infiltration designs must be supported by drainage area feasibility findings.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Permeable pavement is not placed in an area with significant overhanging trees or other vegetation.	Leaves and organic debris can clog the pavement surface.
☐	For pollutant control permeable pavement, the ratio of the total drainage area (including the permeable pavement) to the permeable pavement should not exceed 4:1.	Higher ratios increase the potential for clogging but may be acceptable for relatively clean tributary areas.
☐	Finish grade of the permeable pavement has a slope ≤ 5%.	Flatter surfaces facilitate increased runoff capture.
☐	Minimum depth to groundwater and bedrock ≥ 10 ft.	A minimum separation facilitates infiltration and lessens the risk of negative groundwater impacts.
☐	Contributing tributary area includes effective sediment source control and/or pretreatment measures such as raised curbed or grass filter strips.	Sediment can clog the pavement surface.
☐	Direct discharges to permeable pavement are only from downspouts carrying "clean" roof runoff that are equipped with filters to remove gross solids.	Roof runoff typically carries less sediment than runoff from other impervious surfaces and is less likely to clog the pavement surface.

Siting and Design		*Intent/Rationale*
Permeable Surface Layer		
☐	Permeable surface layer type is appropriately chosen based on pavement use and expected vehicular loading.	Pavement may wear more quickly if not durable for expected loads or frequencies.
☐	Permeable surface layer type is appropriate for expected pedestrian traffic.	Expected demographic and accessibility needs (e.g., adults, children, seniors, runners, high-heeled shoes, wheelchairs, strollers, bikes) requires selection of appropriate surface layer type that will not impede pedestrian needs.
Bedding Layer for Permeable Surface		
☐	Bedding thickness and material is appropriate for the chosen permeable surface layer type.	Porous asphalt requires a 2- to 4-inch layer of asphalt and a 1- to 2-inch layer of choker course (single-sized crushed aggregate, one-half inch) to stabilize the surface. Pervious concrete also requires an aggregate course of clean gravel or crushed stone with a minimum amount of fines. Permeable Interlocking Concrete Paver requires 1 or 2 inches of sand or No. 8 aggregate to allow for leveling of the paver blocks. Similar to Permeable Interlocking Concrete Paver, plastic grid systems also require a 1- to 2-inch bedding course of either gravel or sand. For Permeable Interlocking Concrete Paver and plastic grid systems, if sand is used, a geotextile should be used between the sand course and the reservoir media to prevent the sand from migrating into the stone media.
☐	Aggregate used for bedding layer is washed prior to placement.	Washing aggregate will help eliminate fines that could clog the permeable pavement system aggregate storage layer

Siting and Design		*Intent/Rationale*
		void spaces or underdrain.
Media Layer (Optional) –used between bedding layer and aggregate storage layer to provide pollutant treatment control		
☐	The pollutant removal performance of the media layer is documented by the applicant.	Media used for BMP design should be shown via research or testing to be appropriate for expected pollutants of concern and flow rates.
☐	A filter course is provided to separate the media layer from the aggregate storage layer.	Migration of media can cause clogging of the aggregate storage layer void spaces or underdrain.
☐	If a filter course is used, calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
☐	Consult permeable pavement manufacturer to verify that media layer provides required structural support.	Media must not compromise the structural integrity or intended uses of the permeable pavement surface.
Aggregate Storage Layer		
☐	Aggregate used for the aggregate storage layer is washed and free of fines.	Washing aggregate will help eliminate fines that could clog aggregate storage layer void spaces or underdrain.
☐	Minimum layer depth is 6 inches and for infiltration designs, the maximum depth is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A minimum depth of aggregate provides structural stability for expected pavement loads.
Underdrain and Outflow Structures		
☐	Underdrains and outflow structures, if used, are accessible for inspection and maintenance.	Maintenance will improve the performance and extend the life of the permeable pavement system.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.

Siting and Design		*Intent/Rationale*
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
Filter Course (Optional)		
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog subgrade and impede infiltration.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where permeable pavement can be used in the site design to replace traditional pavement to reduce the impervious area and DCV. These permeable pavement areas can be credited toward reducing runoff generated through representation in storm water calculations as pervious, not impervious, areas but are not credited for storm water pollutant control. These permeable pavement areas should be designed as self-retaining with the appropriate tributary area ratio identified in the design criteria.
2. Calculate the DCV per Appendix B, taking into account reduced runoff from self-retaining permeable pavement areas.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design permeable pavement for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, maximum finish grade slope, and the recommended tributary area ratio for non-self-retaining permeable pavement. If infiltration is infeasible, the permeable pavement can be designed as flow-through treatment per the sizing worksheet. If infiltration is feasible, calculations should follow the remaining design steps.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine if full or partial infiltration of the DCV is achievable based on the available infiltration storage volume calculated from the permeable pavement footprint, aggregate storage layer depth, and in-situ soil design infiltration rate for a maximum 36-hour drawdown time. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method

in Appendix B.4.2.

4. Where the DCV cannot be fully infiltrated based on the site or permeable pavement constraints, an underdrain must be incorporated above the infiltration storage to carry away runoff that exceeds the infiltration storage capacity.
5. The remaining DCV to be treated should be calculated for use in sizing downstream BMP(s).

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant aggregate storage volumes will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement requirements, maximum finish grade slope, and the recommended tributary area ratio for non-self-retaining permeable pavement. Design for flow control can be achieving using various design configurations, but a flow-thru treatment design will typically require a greater aggregate storage layer volume than designs which allow for full or partial infiltration of the DCV.
2. Iteratively determine the area and aggregate storage layer depth required to provide infiltration and/or detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If the permeable pavement system cannot fully provide the flow rate and duration control required by this manual, a downstream structure with sufficient storage volume such as an underground vault can be used to provide remaining controls.
4. After permeable pavement has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.11 PR-1 Biofiltration with Partial Retention

Location: 805 and Bonita Road, Chula vista, CA.

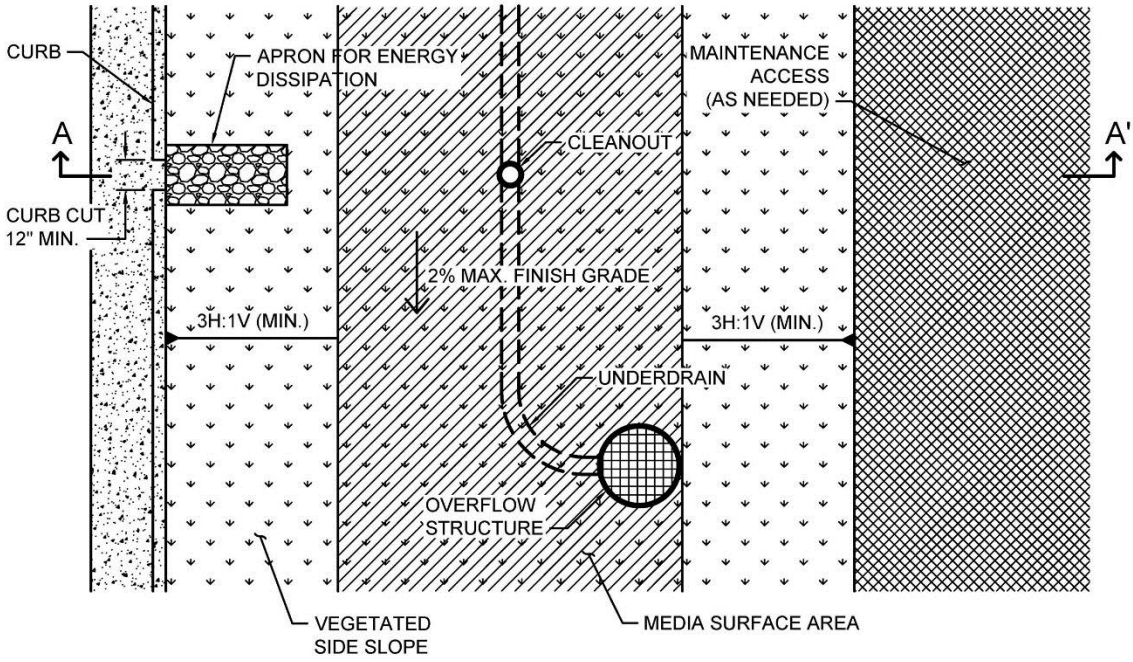
MS4 Permit Category
NA
Manual Category
Partial Retention
Applicable Performance Standard
Pollutant Control
Flow Control
Primary Benefits
Volume Reduction
Treatment
Peak Flow Attenuation

Description

Biofiltration with partial retention (partial infiltration and biofiltration) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. Where feasible, these BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Biofiltration with partial retention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed in ground or partially aboveground, such as planter boxes with open bottoms to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

Typical biofiltration with partial retention components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side Slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Uncompacted native soils at the bottom of the facility
- Overflow structure



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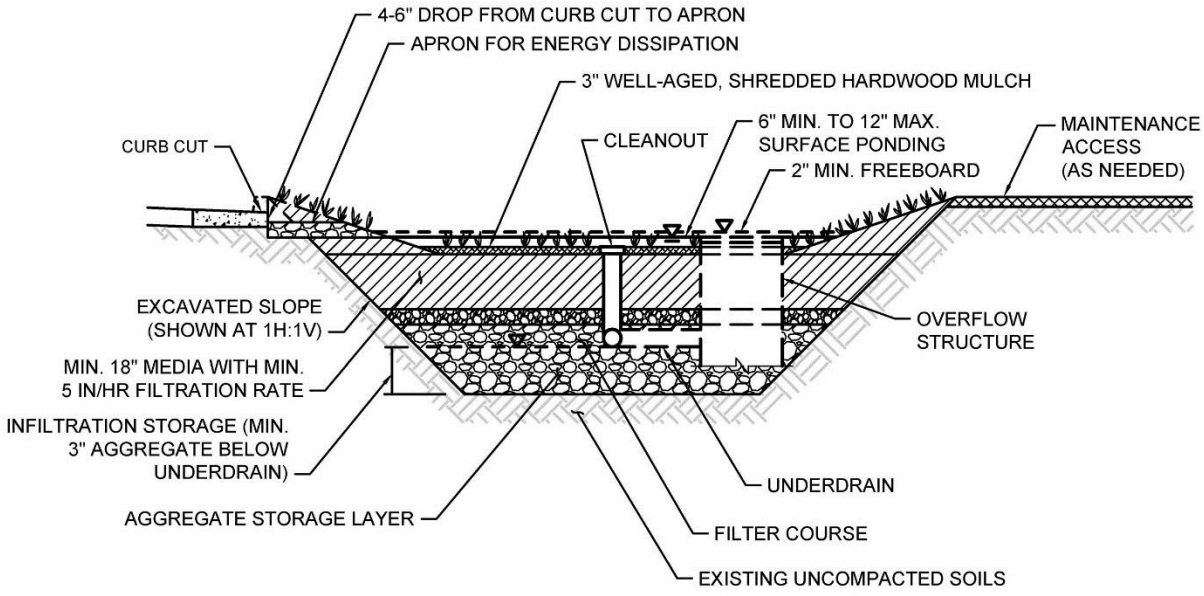

SECTION A-A'
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Typical plan and Section view of a Biofiltration with Partial Retention BMP

Design Adaptations for Project Goals

Partial infiltration BMP with biofiltration treatment for storm water pollutant control. Biofiltration with partial retention can be designed so that a portion of the DCV is infiltrated by providing infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered biofiltration treatment. Storage provided above the underdrain within surface ponding, media, and aggregate storage is included in the biofiltration treatment volume.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer. This will allow for significant detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Biofiltration with partial retention must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a partial infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design

Siting and Design		*Intent/Rationale*
		features requested by the FDD for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the FDD and EAD if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 12 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in	Plants suited to the climate and ponding depth are more likely to survive.

Siting and Design		*Intent/Rationale*
	selection can be found in Appendix E.20	
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events, and allows flows to relatively quickly enter the aggregate storage layer, thereby minimizing bypass. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Storm Water Standards Appendix F (February 2016, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2016 City Storm Water Standards or County LID Manual, the media meets the pollutant treatment	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.

Siting and Design		*Intent/Rationale*
	performance criteria in Section F.1.	
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.

	Siting and Design	*Intent/Rationale*
	is required.	
☐	Maximum aggregate storage layer depth below the underdrain invert is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A maximum drawdown time is needed for vector control and to facilitate providing storm water storage for the next storm event.
	Inflow, Underdrain, and Outflow Structures	
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Nutrient Sensitive Media Design

To design biofiltration with partial retention with underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration with partial retention and an underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Generalized sizing procedure is presented in Appendix B.5. The surface ponding should be verified to have a maximum 24-hour drawdown time.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant surface ponding and/or aggregate storage volumes will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention and/or infiltration storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If biofiltration with partial retention cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After biofiltration with partial retention has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.12 BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

MS4 Permit Category
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

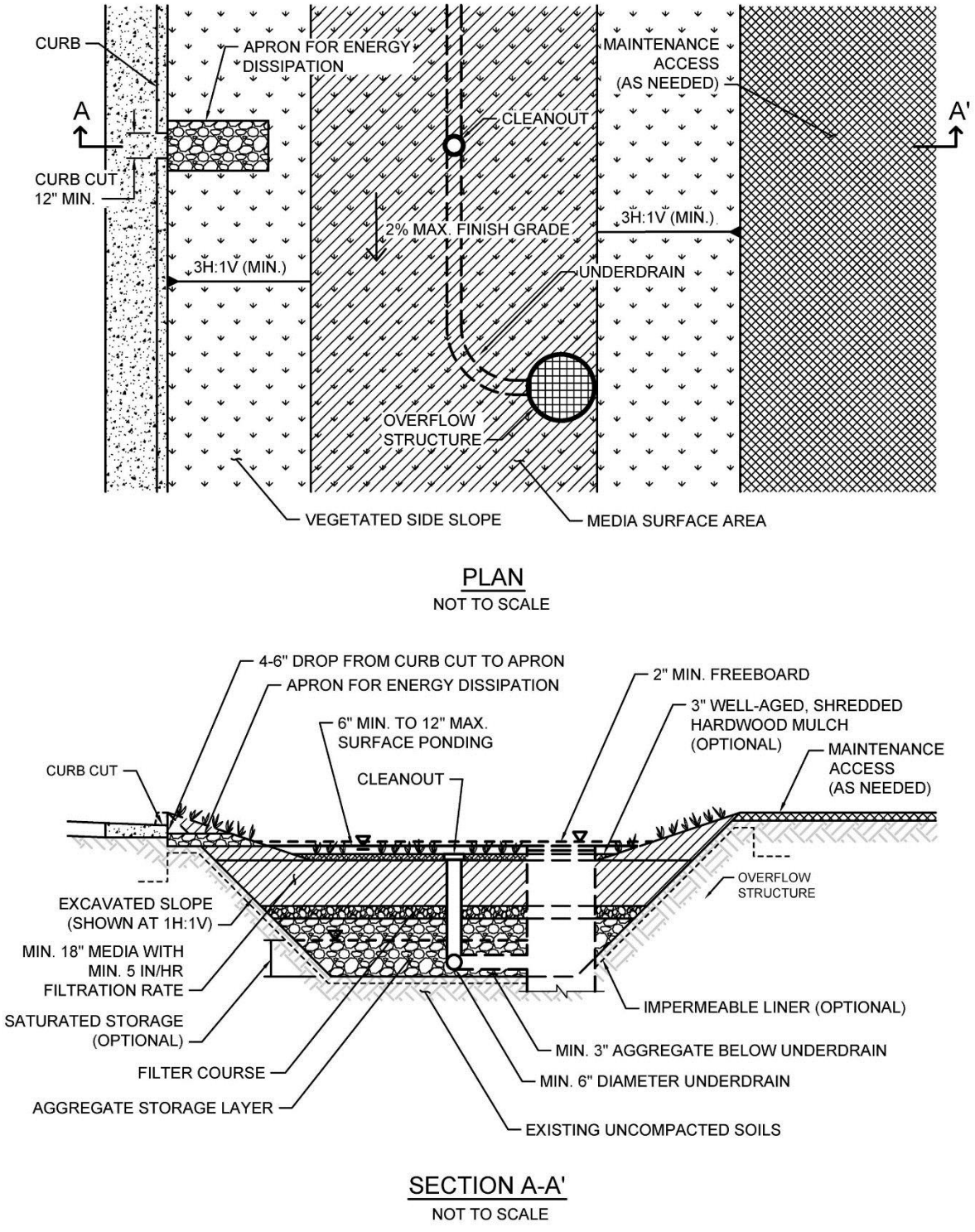
Description

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical bioretention with underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility

- Overflow structure



Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Bioretention with underdrain must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) incorporate design

Siting and Design		*Intent/Rationale*
		features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the FDD for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the EAD if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 12 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		

Siting and Design		*Intent/Rationale*
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Storm Water Standards Appendix F (February 2016, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2016 City Storm Water Standards or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless	Greater surface area to tributary area ratios: a) maximizes volume retention as

Siting and Design		*Intent/Rationale*
	demonstrated that the BMP surface area can be smaller than 3%.	required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.

Siting and Design		*Intent/Rationale*
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design bioretention with underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant surface ponding and/or aggregate storage volumes will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.13 BF-2 Nutrient Sensitive Media Design

Some studies of bioretention with underdrains have observed export of nutrients, particularly inorganic nitrogen (nitrate and nitrite) and dissolved phosphorus. This has been observed to be a short-lived phenomenon in some studies or a long term issue in some studies. The composition of the soil media, including the chemistry of individual elements is believed to be an important factor in the potential for nutrient export. Organic amendments, often compost, have been identified as the most likely source of nutrient export. The quality and stability of organic amendments can vary widely.

The biofiltration media specifications contained in the County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition) and the City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) were developed with consideration of the potential for nutrient export. These specifications include criteria for individual component characteristics and quality in order to control the overall quality of the blended mixes. As of the publication of this manual, the June 2014 County of San Diego specifications provide more detail regarding mix design and quality control.

The City and County specifications noted above were developed for general purposes to meet permeability and treatment goals. In cases where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the biofiltration media should be designed with the specific goal of minimizing the potential for export of nutrients from the media. Therefore, in addition to adhering to the City or County media specifications, the following guidelines should be followed:

1. Select plant palette to minimize plant nutrient needs

A landscape architect or agronomist should be consulted to select a plant palette that minimizes nutrient needs. Utilizing plants with low nutrient needs results in less need to enrich the biofiltration soil mix. If nutrient quantity is then tailored to plants with lower nutrient needs, these plants will generally have less competition from weeds, which typically need higher nutrient content. The following practices are recommended to minimize nutrient needs of the plant palette:

- **Utilize native, drought-tolerant plants and grasses where possible.** Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils.

- **Start plants from smaller starts or seed.** Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Given the lower cost of smaller plants, the project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.

2. Minimize excess nutrients in media mix

Once the low-nutrient plant palette is established (item 1), the landscape architect and/or agronomist should be consulted to assist in the design of a biofiltration media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient export. The following guidelines should be followed:

- **The mix should not exceed the nutrient needs of plants.** In conventional landscape design, the nutrient needs of plants are often exceeded intentionally in order to provide a factor of safety for plant survival. This practice must be avoided in biofiltration media as excess nutrients will increase the chance of export. The mix designer should keep in mind that nutrients can be added later (through mulching, tilling of amendments into the surface), but it is not possible to remove nutrients, once added.

- **The actual nutrient content and organic content of the selected organic amendment source should be determined when specifying mix proportions.** Nutrient content (i.e., C:N ratio; plant extractable nutrients) and organic content (i.e, % organic material) are relatively inexpensive to measure via standard agronomic methods and can provide important information about mix design. If mix design relies on approximate assumption about nutrient/organic content and this is not confirmed with testing (or the results of prior representative testing), it is possible that the mix could contain much more nutrient than intended.

- **Nutrients are better retained in soils with higher cation exchange capacity.** Cation exchange capacity can be increased through selection of organic material with naturally high cation exchange capacity, such as peat or coconut coir pith, and/or selection of inorganic material with high cation exchange capacity such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher cation exchange capacity materials would tend to reduce the net export of nutrients. Natural silty materials also provide cation exchange capacity; however potential impacts to permeability need to be considered.

- **Focus on soil structure as well as nutrient content.** Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of organic amendment, plants survivability should still be provided. While soil structure generally develops with time, biofiltration media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high humus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of organic material with a distribution of particle sizes (i.e., a more heterogeneous mix).

- **Consider alternatives to compost.** Compost, by nature, is a material that is continually evolving and decaying. It can be challenging to determine whether tests previously done on a given compost stock are still representative. It can also be challenging to determine how the properties of the compost will change once placed in the media bed. More stable materials

such as aged coco coir pith, peat, biochar, shredded bark, and/or other amendments should be considered.

With these considerations, it is anticipated that less than 10 percent organic amendment by volume could be used, while still balancing plant survivability and water retention. If compost is used, designers should strongly consider utilizing less than 10 percent by volume.

3. Design with partial retention and/or internal water storage

An internal water storage zone, as described in Fact Sheet PR-1 is believed to improve retention of nutrients. For lined systems, an internal water storage zone worked by providing a zone that fluctuates between aerobic and anaerobic conditions, resulting in nitrification/denitrification. In soils that will allow infiltration, a partial retention design (PR-1) allows significant volume reduction and can also promote nitrification/denitrification.

Acknowledgment: This fact sheet has been adapted from the Orange County Technical Guidance Document (May 2011). It was originally developed based on input from: Deborah Deets, City of Los Angeles Bureau of Sanitation, Drew Ready, Center for Watershed Health, Rick Fisher, ASLA, City of Los Angeles Bureau of Engineering, Dr. Garn Wallace, Wallace Laboratories, Glen Dake, GDML, and Jason Schmidt, Tree People. The guidance provided herein does not reflect the individual opinions of any individual listed above and should not be cited or otherwise attributed to those listed.

E.14 BF-3 Proprietary Biofiltration Systems

The purpose of this fact sheet is to help explain the potential role of proprietary BMPs in meeting biofiltration requirements, when full retention of the DCV is not feasible. The fact sheet does not describe design criteria like the other fact sheets in this appendix because this information varies by BMP product model.

Criteria for Use of a Proprietary BMP as a Biofiltration BMP

A proprietary BMP may be acceptable as a "biofiltration BMP" under the following conditions:

(1) The BMP meets the minimum design criteria listed in Appendix F, including the pollutant treatment performance standard in Appendix F.1;

(2) The BMP is designed and maintained in a manner consistent with its performance certifications (See explanation in Appendix F.2); and

(3) The BMP is acceptable at the discretion of the EAD. In determining the acceptability of a BMP, the EAD should consider, as applicable, (a) the data submitted; (b) representativeness of the data submitted; (c) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (d) for projects within the public right of way and/or capital projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business; and (e) other relevant factors. If a proposed BMP is not accepted by the EAD, a written explanation/reason will be provided to the applicant..

Guidance for Sizing a Proprietary BMP as a Biofiltration BMP

Proprietary biofiltration BMPs must meet the same sizing guidance as non-proprietary BMPs. Sizing is typically based on capturing and treating 1.50 times the DCV not reliably retained. Guidance for sizing biofiltration BMPs to comply with requirements of this manual is provided in Appendix F.2.

E.15 FT-1 Vegetated Swales

MS4 Permit Category
Flow-through Treatment Control

Manual Category
Flow-through Treatment Control

Applicable Performance Standard
Pollutant Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation

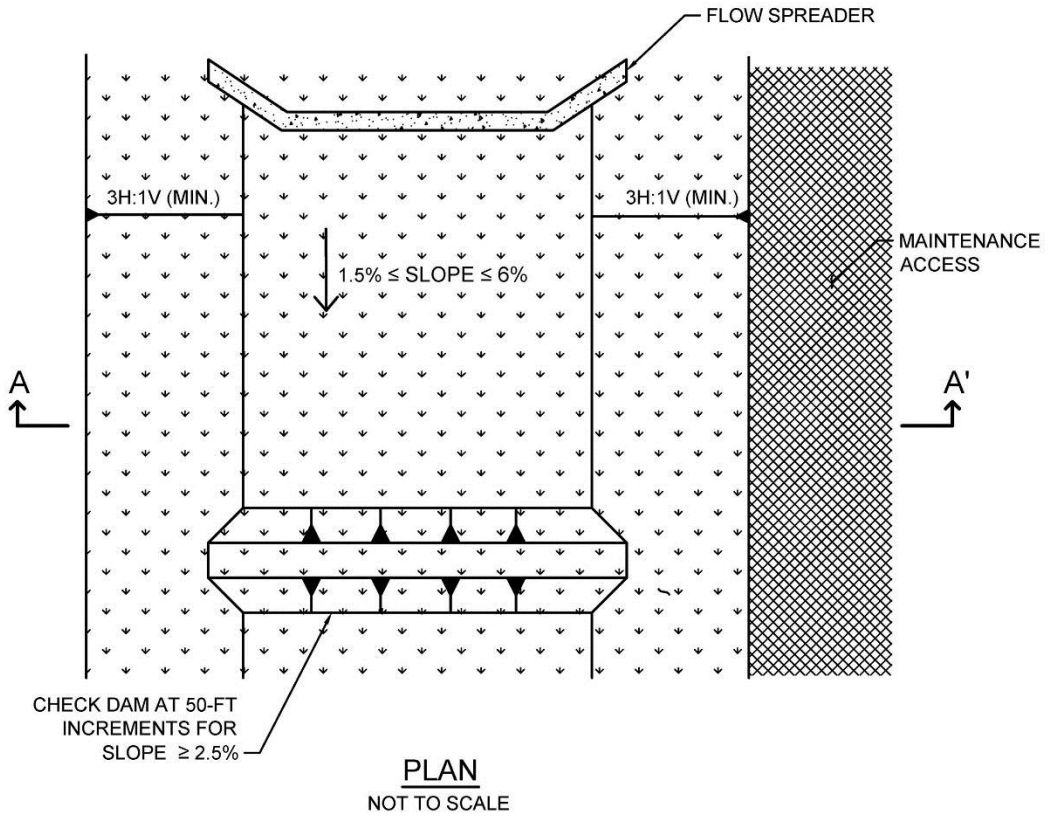
Location: Eastlake Business Center, Chula Vista, California; Photo Credit: Eric Mosolgo

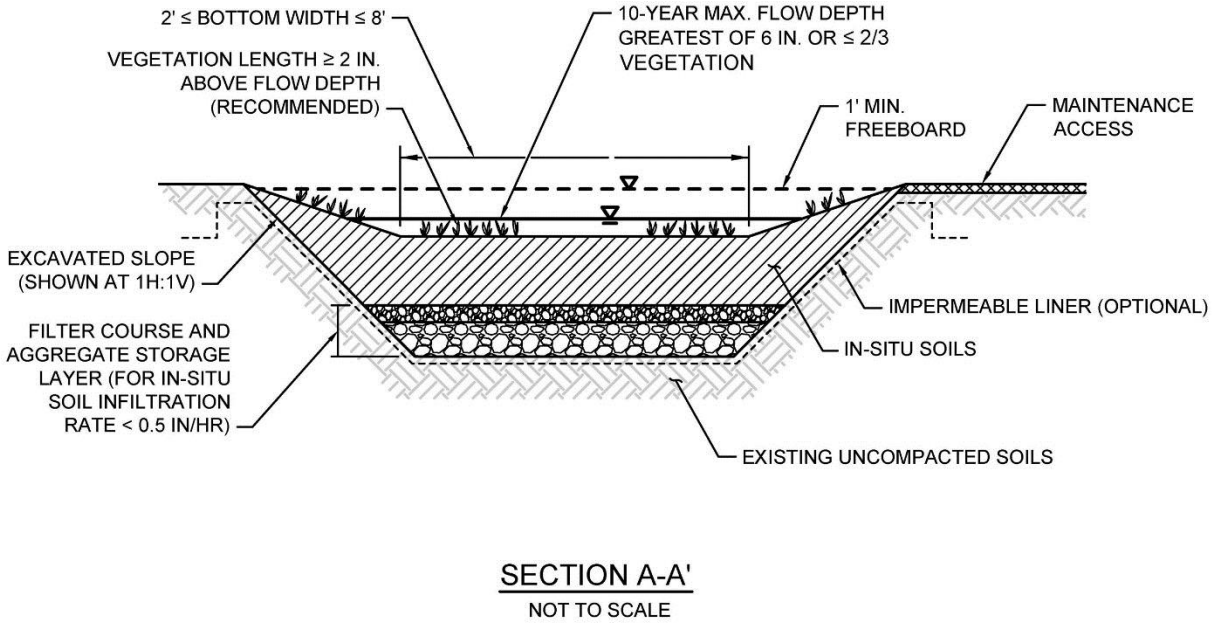
Description

Vegetated swales are shallow, open channels that are designed to remove storm water pollutants by physically straining/filtering runoff through vegetation in the channel. Swales can be used in place of traditional curbs and gutters and are well-suited for use in linear transportation corridors to provide both conveyance and treatment via filtration. An effectively designed vegetated swale achieves uniform sheet flow through densely vegetated areas. When soil conditions allow, infiltration and volume reduction are enhanced by adding a gravel drainage layer underneath the swale. Vegetated swales with a subsurface media layer can provide enhanced infiltration, water retention, and pollutant-removal capabilities. Pollutant removal effectiveness can also be maximized by increasing the hydraulic residence time of water in swale using weirs or check dams.

Typical vegetated swale components include:

- Inflow distribution mechanisms (e.g., flow spreader)
- Surface flow
- Vegetated surface layer
- Check dams (if required)
- Optional aggregate storage layer with underdrain(s)





Typical plan and Section view of a Vegetated Swale BMP

Design Adaptations for Project Goals

Site design BMP to reduce runoff volumes and storm peaks. Swales without underdrains are an alternative to lined channels and pipes and can provide volume reduction through infiltration. Swales can also reduce the peak runoff discharge rate by increasing the time of concentration of the site and decreasing runoff volumes and velocities.

Flow-through treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration with an underdrain and designed to provide pollutant removal through settling and filtration in the channel vegetation (usually grasses). This configuration is considered to provide flow-through treatment via horizontal surface flow through the swale. Sizing for flow-through treatment control is based on the surface flow rate through the swale that meets water quality treatment performance objectives.

Design Criteria and Considerations

Vegetated swales must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area ≤ 2 acres.	Higher ratios increase the potential for clogging but may be acceptable for relatively clean tributary areas.
☐	Longitudinal slope is ≥ 1.5% and ≤ 6%.	Flatter swales facilitate increased water quality treatment while minimum slopes prevent ponding.
☐	For site design goal, in-situ soil infiltration rate ≥ 0.5 in/hr (if < 0.5 in/hr, an underdrain is required and design goal is for pollutant control only).	Well-drained soils provide volume reduction and treatment. An underdrain should only be provided when soil infiltration rates are low or per geotechnical or groundwater concerns.

	Siting and Design	*Intent/Rationale*
Surface Flow		
☐	Maximum flow depth is ≤ 6 inches or ≤ $^2/_3$ the vegetation length, whichever is greater. Ideally, flow depth will be ≥ 2 inches below shortest plant species.	Flow depth must fall within the height range of the vegetation for effective water quality treatment via filtering.
	A minimum of 1 foot of freeboard is provided.	Freeboard minimizes risk of uncontrolled surface discharge.
☐	Cross sectional shape is trapezoidal or parabolic with side slopes ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐	Bottom width is ≥ 2 feet and ≤ 8 feet.	A minimum of 2 feet minimizes erosion. A maximum of 8 feet prevents channel braiding.
☐	Minimum hydraulic residence time ≥ 10 minutes.	Longer hydraulic residence time increases pollutant removal.
☐	Swale is designed to safely convey the 10-yr storm event unless a flow splitter is included to allow only the water quality event.	Planning for larger storm events lessens the risk of property damage due to flooding.
☐	Flow velocity is ≤ 1 ft/s for water quality event. Flow velocity for 10-yr storm event is ≤ 3 ft/s.	Lower flow velocities provide increased pollutant removal via filtration and minimize erosion.
Vegetated Surface Layer (amendment with media is Optional)		
☐	Soil is amended with 2 inches of media mixed into the top 6 inches of in-situ soils, as needed, to promote plant growth (optional). For enhanced pollutant control, 2 feet of media can be used in place of in-situ soils. Media meets either of these two media specifications: City of San Diego Storm Water Standards Appendix F, February 2016); Or County of San Diego Low Impact Development Handbook, June 2014: Appendix G -Bioretention Soil Specification.	Amended soils aid in plant establishment and growth. Media replacement for in-situ soils can improve water quality treatment and site design volume reduction.

Siting and Design		*Intent/Rationale*
☐	Vegetation is appropriately selected low-growing, erosion-resistant plant species that effectively bind the soil, thrive under site-specific climatic conditions and require little or no irrigation.	Plants suited to the climate and expected flow conditions are more likely to survive.
Check Dams		
☐	Check dams are provided at 50-foot increments for slopes ≥ 2.5%.	Check dams prevent erosion and increase the hydraulic residence time by lowering flow velocities and providing ponding opportunities.
Filter Course Layer (For Underdrain Design)		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer (For Underdrain Design)		
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
☐	Aggregate used for the aggregate storage layer is washed and free of fines.	Washing aggregate will help eliminate fines that could clog aggregate storage layer void spaces or underdrain.
Inflow and Underdrain Structures		
☐	Inflow and underdrains are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic

Siting and Design		*Intent/Rationale*
	elevation of the aggregate storage layer.	performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where vegetated swales can be used in the site design to replace traditional curb and gutter facilities and provide volume reduction through infiltration.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design vegetated swales for storm water pollutant control only, the following steps should be taken:

1. Verify that siting and design criteria have been met, including bottom width and longitudinal and side slope requirements.
2. Calculate the design flow rate per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-through treatment sizing of the vegetated swale and if flow velocity, flow depth, and hydraulic residence time meet required criteria. Swale configuration should be adjusted as necessary to meet design requirements.

E.16 FT-2 Media Filters

MS4 Permit Category
Flow-through Treatment Control

Manual Category
Flow-through Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Peak Flow Attenuation (Optional)

Photo Credit: Contech Stormwater Solutions

Description

Media filters are manufactured devices that consist of a series of modular filters packed with engineered media that can be contained in a catch basin, manhole, or vault that provide treatment through filtration and sedimentation. The manhole or vault may be divided into multiple chambers where the first chamber acts as a presettling basin for removal of coarse sediment while the next chamber acts as the filter bay and houses the filter cartridges. A variety of media types are available from various manufacturers that can target pollutants of concern via primarily filtration, sorption, ion exchange, and precipitation. **Specific products must be selected to meet the flow-through BMP selection requirements described in Appendix B.6**. Treatment effectiveness is contingent upon proper maintenance of filter units.

Typical media filter components include:

- Vault for flow storage and media housing
- Inlet and outlet
- Media filters

Design Adaptations for Project Goals

Flow-through treatment BMP for storm water pollutant control. Water quality treatment is provided through filtration. This configuration is considered to provide flow-through treatment, not biofiltration treatment. Storage provided within the vault restricted by an outlet is considered detention storage and is included in calculations for the flow-through treatment volume.

Integrated storm water flow control and pollutant control configuration. Media filters can also be designed for flow rate and duration control via additional detention storage. The vault storage can be designed to accommodate higher volumes than the storm water pollutant control volume and can utilize multi-stage outlets to mitigate both the duration and rate of flows within a prescribed range.

Design Criteria and Considerations

Media filters must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	***Intent/Rationale***
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Recommended for tributary areas with limited available surface area or where surface BMPs would restrict uses.	Maintenance needs may be more labor intensive for media filters than surface BMPs. Lack of surface visibility creates additional risk that maintenance needs may not be completed in a timely manner.
☐	Vault storage drawdown time ≤96 hours.	Provides vector control.
☐	Vault storage drawdown time ≤36 hours if the vault is used for equalization of flows for pollutant treatment.	Provides required capacity to treat back to back storms. Exception to the 36 hour drawdown criteria is allowed if additional vault storage is provided using the curves in Appendix B.4.2.
	Inflow and Outflow Structures	
☐	Inflow and outflow structures are accessible by required equipment (e.g., vactor truck) for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design a media filter for storm water pollutant control only (no flow control required), the following steps should be taken

1. Verify that the selected BMP complies with BMP selection requirements in Appendix B.6.
2. Verify that placement and tributary area requirements have been met.
3. Calculate the required DCV and/or flow rate per Appendix B.6.3 based on expected site design runoff for tributary areas.
4. Media filter can be designed either for DCV or flow rate. To estimate the drawdown time, divide the vault storage by the treatment rate of media filters.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant vault storage volume will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that placement and tributary area requirements have been met.
2. Iteratively determine the vault storage volume required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows to MS4.
3. If a media filter cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide remaining controls.
4. After the media filter has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.
5. Verify that the vault drawdown time is 96 hours or less. To estimate the drawdown time:
    a. Divide the vault volume by the filter surface area.
    b. Divide the result (a) by the design filter rate.

E.17 FT-3 Sand Filters

MS4 Permit Category
Flow-through Treatment Control

Manual Category
Flow-through Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

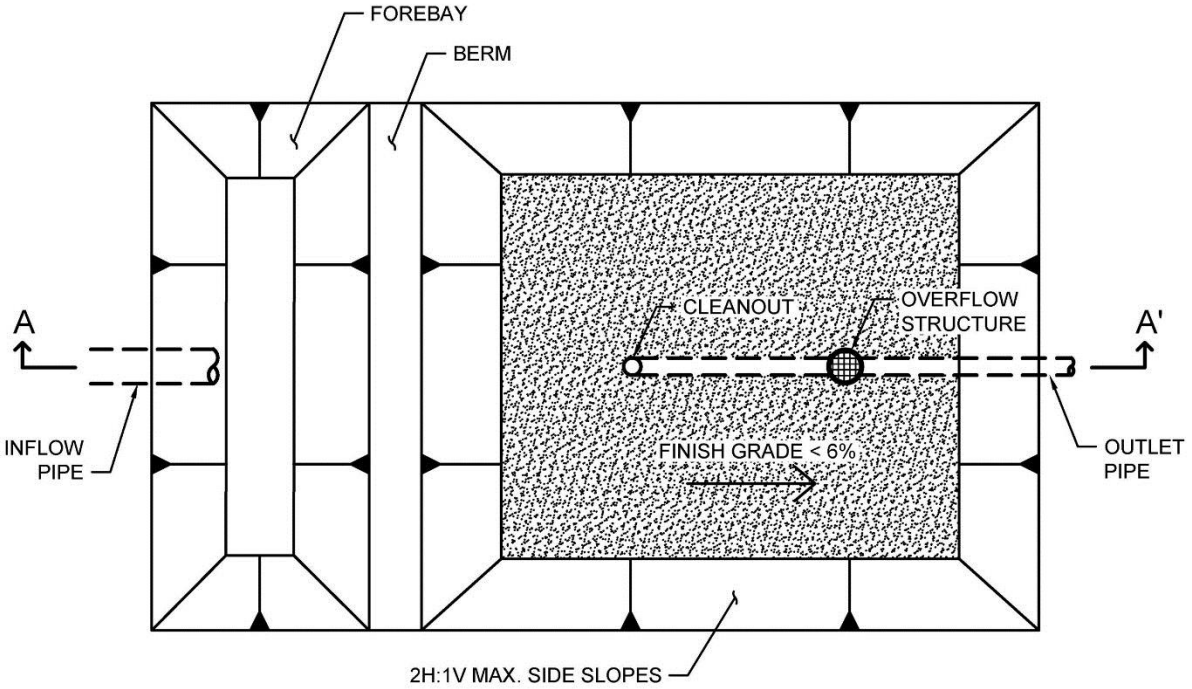
Photo Credit: City of San Diego LID Manual

Description

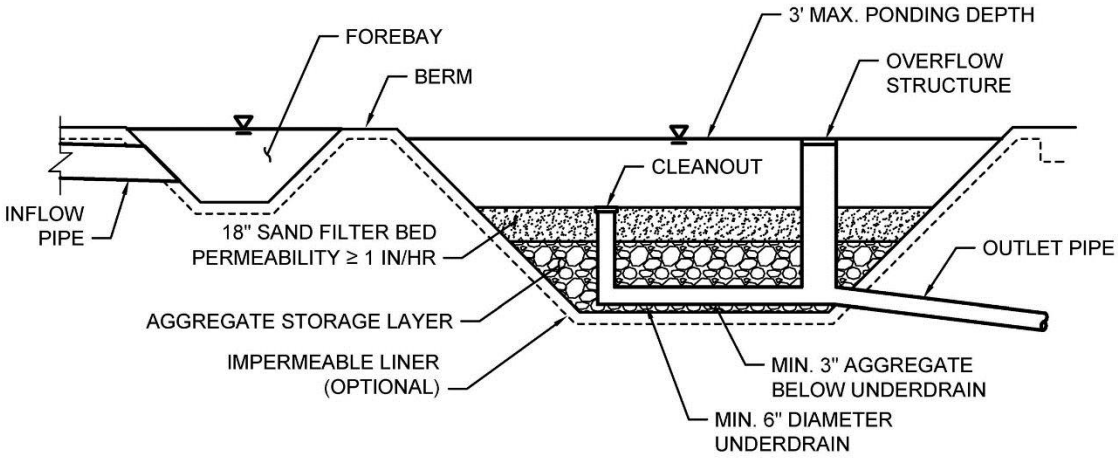
Sand filters operate by filtering storm water through a constructed sand bed with an underdrain system. Runoff enters the filter and spreads over the surface. Sand filter beds can be enclosed within concrete structures or within earthen containment. As flows increase, water backs up on the surface of the filter where it is held until it can percolate through the sand. The treatment pathway is downward (vertical) through the media to an underdrain system that is connected to the downstream storm drain system. As storm water passes through the sand, pollutants are trapped on the surface of the filter, in the small pore spaces between sand grains or are adsorbed to the sand surface. The high filtration rates of sand filters, which allow a large runoff volume to pass through the media in a short amount of time, can provide efficient treatment for storm water runoff.

Typical sand filter components include:

- Forebay for pretreatment/energy dissipation
- Surface ponding for captured flows
- Sand filter bed
- Aggregate storage layer with underdrain(s)
- Overflow structure



PLAN
NOT TO SCALE



SECTION A-A'
NOT TO SCALE

Typical plan and Section view of a Sand Filter BMP

Design Adaptations for Project Goals

Flow-through treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide flow-through treatment via vertical flow through the sand filter bed. Storage provided above the underdrain within surface ponding, the sand filter bed, and aggregate storage is considered included in the flow-through treatment volume. Saturated storage within the aggregate storage layer can be added to this design by including an upturned elbow installed at the downstream end of the underdrain or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Sand filters must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area (≤ 5 acres).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the FDD and EAD if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the

Siting and Design	*Intent/Rationale*
	FDD for proper performance of the regional BMP.
☐ Finish grade of facility is < 6%.	Flatter surfaces reduce erosion and channelization within the facility.
☐ Earthen side slopes are ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐ Surface ponding is limited to a 36-hour drawdown time.	Provides required capacity to treat back to back storms. Exception to the 36 hour drawdown criteria is allowed if additional surface storage is provided using the curves in Appendix B.4.2.
☐ Surface ponding is limited to a 96-hour drawdown time.	Prolonged surface ponding can create a vector hazard.
☐ Maximum ponding depth does not exceed 3 feet.	Surface ponding capacity lowers subsurface storage requirements and results in lower cost facilities. Deep surface ponding raises safety concerns.
☐ Sand filter bed consists of clean washed concrete or masonry sand (passing ¼ inch sieve) or sand similar to the ASTM C33 gradation.	Washing sand will help eliminate fines that could clog the void spaces of the aggregate storage layer.
☐ Sand filter bed permeability is at least 1 in/hr.	A high filtration rate through the media allows flows to quickly enter the aggregate storage layer, thereby minimizing bypass.
☐ Sand filter bed depth is at least 18 inches deep.	Different pollutants are removed in various zones of the media using several mechanisms. Some pollutants bound to sediment, such as metals, are typically removed within 18 inches of the media.
☐ Aggregate storage should be washed, bank-run gravel.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐ The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.

Siting and Design		*Intent/Rationale*
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow must be non-erosive sheet flow (≤ 3 ft/s) unless an energy-dissipation device, flow diversion/splitter or forebay is installed.	Concentrated flow and/or excessive volumes can cause erosion in a sand filter and can be detrimental to the treatment capacity of the system.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains should be made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design a sand filter for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, and maximum finish grade slope.
2. Calculate the required DCV and/or flow rate per Appendix B.6.3 based on expected site design runoff for tributary areas.
3. Sand filter can be designed either for DCV or flow rate. To estimate the drawdown time, divide the average ponding depth by the permeability of the filter sand.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant surface

ponding and/or aggregate storage volumes will typically be required, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, and maximum finish grade slope.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If a sand filter cannot fully provide the flow rate and duration control required by the MS4 permit, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide remaining controls.
4. After the sand filter has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.18 FT-4 Dry Extended Detention Basin

MS4 Permit Category
Flow-through Treatment Control

Manual Category
Flow-through Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation

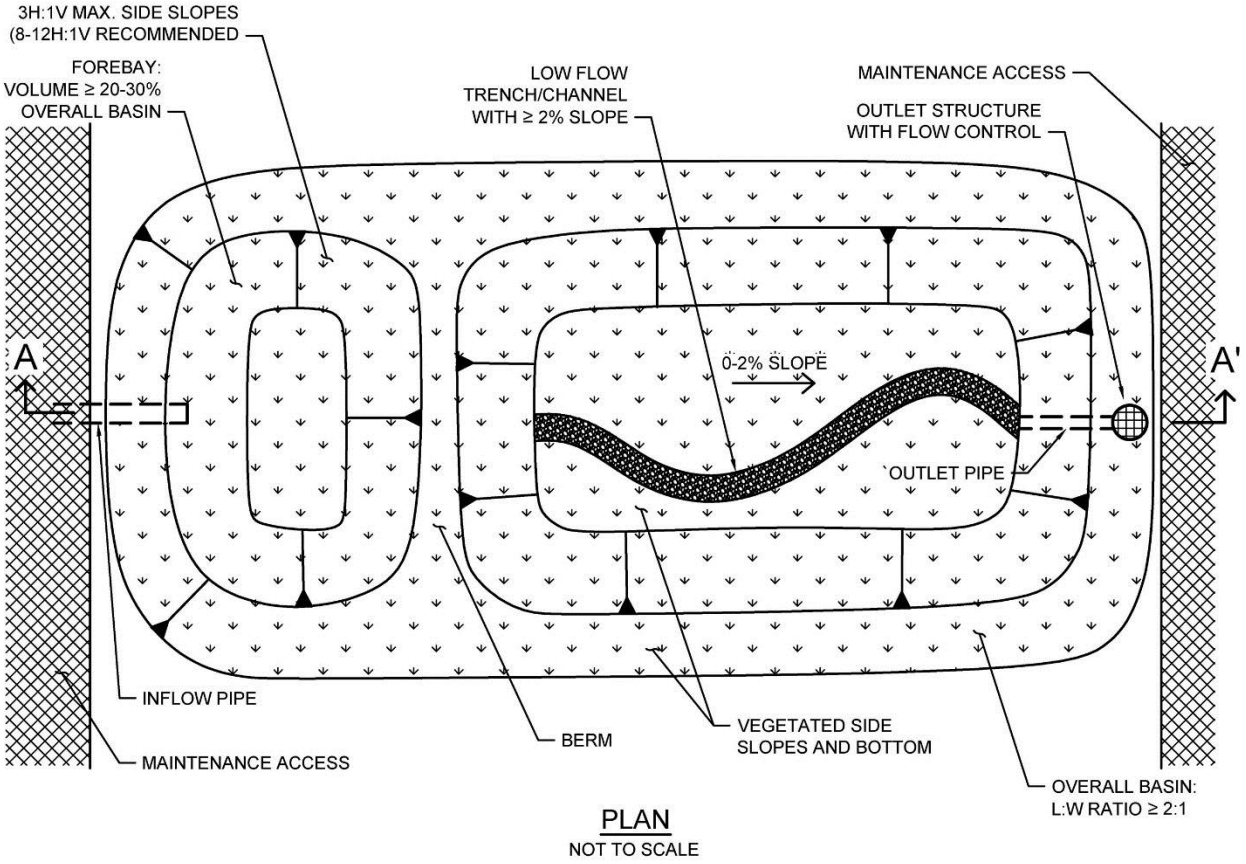
Location: Rolling Hills Ranch, Chula Vista, California; Photo Credit: Eric Mosolgo

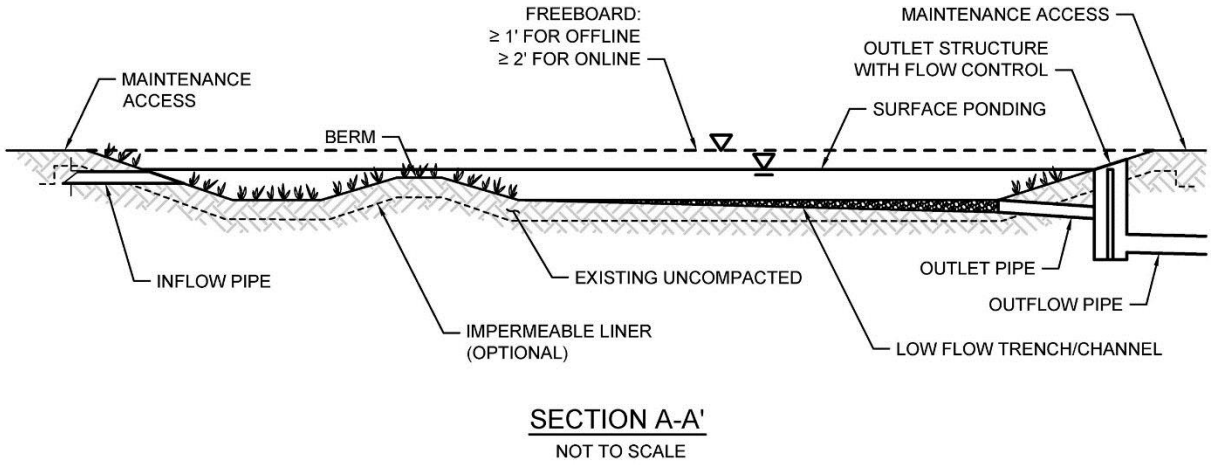
Description

Dry extended detention basins are basins that have been designed to detain storm water for an extended period to allow sedimentation and typically drain completely between storm events. A portion of the dissolved pollutant load may also be removed by filtration, uptake by vegetation, and/or through infiltration. The slopes, bottom, and forebay of dry extended detention basins are typically vegetated. Considerable storm water volume reduction can occur in dry extended detention basins when they are located in permeable soils and are not lined with an impermeable barrier. dry extended detention basins are generally appropriate for developments of ten acres or larger, and have the potential for multiple uses including parks, playing fields, tennis courts, open space, and overflow parking lots. They can also be used to provide flow control by modifying the outlet control structure and providing additional detention storage.

Typical dry extended detention basins components include:

- Forebay for pretreatment
- Surface ponding for captured flows
- Vegetation selected based on basin use, climate, and ponding depth
- Low flow channel, outlet, and overflow device
- Impermeable liner or uncompacted native soils at the bottom of the facility





Typical plan and Section view of a Dry Extended Detention Basin BMP

Design Adaptations for Project Goals

Flow-through treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration and designed to detain storm water to allow particulates and associated pollutants to settle out. This configuration is considered to provide flow-through treatment, not biofiltration treatment. Storage provided as surface ponding above a restricted outlet invert is considered detention storage and is included in calculations for the flow-through treatment volume.

Integrated storm water flow control and pollutant control configuration. Dry extended detention basins can also be designed for flow control. The surface ponding can be designed to accommodate higher volumes than the storm water pollutant control volume and can utilize multi-stage outlets to mitigate both the duration and rate of flows within a prescribed range.

Design Criteria and Considerations

Dry extended detention basins must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the FDD and EAD if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area is large (typically ≥ 10 acres).	Dry extended detention basins require significant space and are more cost-effective for treating larger drainage areas.
☐	Longitudinal basin bottom slope is 0 - 2%.	Flatter slopes promote ponding and settling of particles.
☐	Basin length to width ratio is ≥ 2:1 (L:W).	A larger length to width ratio provides a longer flow path to promote settling.
☐	Forebay is included that encompasses 20 - 30% of the basin volume.	A forebay to trap sediment can decrease frequency of required maintenance.

Siting and Design		*Intent/Rationale*
☐	Side slopes are ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐	Surface ponding drawdown time is between 24 and 96 hours.	Minimum drawdown time of 24 hours allows for adequate settling time and maximizes pollutant removal. Maximum drawdown time of 96 hours provides vector control.
☐	Minimum freeboard provided is ≥1 foot for offline facilities and ≥2 feet for online facilities.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Inflow and outflow structures are accessible by required equipment (e.g., vactor truck) for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	A low flow channel or trench with a ≥ 2% slope is provided. A gravel infiltration trench is provided where infiltration is allowable.	Aids in draining or infiltrating dry weather flows.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow.	Planning for overflow lessens the risk of property damage due to flooding.
☐	The maximum rate at which runoff is discharged is set below the erosive threshold for the site.	Extended low flows can have erosive effects.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design dry extended detention basins for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and criteria have been met, including placement requirements, contributing tributary area, forebay volume, and maximum slopes for basin sides and bottom.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-through treatment sizing of the surface ponding of the dry extended detention basin, which includes calculations for a maximum 96-hour drawdown time.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

If control of flow rates and/or durations is desired on an Authority project, significant surface ponding volume will typically be required, and therefore the following steps should be taken prior to

determination of storm water pollutant control design. Pre-development and post-project flow rates and durations should be determined as discussed in Chapter 6 of the Copermittees' original Model BMP Design Manual. (As previously indicated in this Manual, development within Authority jurisdiction is not subject to hydromodification management requirements, however this sub-section remains as a reference).

1. Verify that siting and criteria have been met, including placement requirements, tributary area, and maximum slopes for basin sides and bottom.
2. Iteratively determine the surface ponding required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If a dry extended detention basin cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an additional basin or underground vault can be used to provide remaining controls.
4. After the dry extended detention basin has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.19 FT-5 Proprietary Flow-Through Treatment Control BMPs

The purpose of this fact sheet is to help explain the potential role of proprietary BMPs in meeting flow thru treatment control BMP requirements. The fact sheet does not describe design criteria like the other fact sheets in this appendix because this information varies by BMP product model.

Criteria for Use of a Proprietary BMP as a Flow-Through Treatment Control BMP

A proprietary BMP may be acceptable as a "flow-through treatment control BMP" under the following conditions:

(1) The BMP is selected and sized consistent with the method and criteria described in Appendix B.6;

(2) The BMP is designed and maintained in a manner consistent with its performance certifications (See explanation in Appendix B.6); and

(3) The BMP is acceptable at the discretion of the EAD. In determining the acceptability of a BMP, the EAD should consider, as applicable, (a) the data submitted; (b) representativeness of the data submitted; (c) consistency of the BMP performance claims with pollutant control objectives; certainty of the BMP performance claims; (d) for projects within the public right of way and/or capital projects: maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business; and (e) other relevant factors. If a proposed BMP is not accepted by the EAD, a written explanation/reason will be provided to the applicant..

Guidance for Sizing Proprietary BMPs

Proprietary flow-through BMPs must meet the same sizing guidance as other flow-through treatment control BMPs. Guidance for sizing flow-through BMPs to comply with requirements of this manual is provided in Appendix B.6.

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E.20 PL Plant List

Plant Name		Irrigation Requirements		Preferred Location in Basin		Applicable Bioretention Sections (Un-Lined Facilities)				Applicability to Flow-Through Planter? (Lined Facility)	
Latin Name	Common Name	Temporary Irrigation during Plant Establishment Period	Permanent Irrigation (Drip / Spray)[1]	Basin Bottom	Basin Side Slopes	Section A Treatment-Only Bioretention in Hydrologic Soil Group A or B Soils	Section B Treatment-Only Bioretention in Hydrologic Soil Group C or D soils	Section C Treatment Plus Flow Control Bioretention in Hydrologic Soil Group A or B Soils	Section D Treatment Plus Flow Control Bioretention in Hydrologic Soil Group C or D Soils	**NO** Applicable to Un-lined Facilities Only (Bioretention Only)	**YES** Can Use in Lined or Un-Lined Facility (Flow-Through Planter OR Bioretention)
TREES[2]											
Alnus rhombifolia	White Alder	X		X	X	X	X	X	X	X	
Platanus racemosa	California Sycamore	X		X	X	X	X	X	X	X	
Salix lasiolepsis	Arroyo Willow	X			X	X	X	X	X	X	
Salix lucida	Lance-Leaf Willow	X			X	X	X	X	X	X	
Sambucus mexicana	Blue Elderberry	X			X	X	X	X	X	X	
SHRUBS / GROUNDCOVER											
Achillea millefolium	Yarrow	X			X	X	X				X
Agrostis palens	Thingrass	X			X	X	X	X	X		X
Anemopsis californica	Yerba Manza	X			X	X	X	X	X		X
Baccharis douglasii	Marsh Baccahris	X	X	X		X	X	X	X		X
Carex praegracillis	California Field Sedge	X	X	X		X	X	X	X		X
Carex spissa	San Diego Sedge	X	X	X		X	X	X	X		X
Carex subfusca	Rusty Sedge	X	X	X	X	X	X	X	X		X
Distichlis spicata	Salt Grass	X	X	X		X	X	X	X		X
Eleocharis macrostachya	Pale Spike Rush	X	X	X		X	X	X	X		X
Festuca rubra	Red Fescue	X	X	X	X	X	X				X
Festuca californica	California Fescue	X	X		X	X	X				X
Iva hayesiana	Hayes Iva	X			X	X	X				X
Juncus Mexicana	Mexican Rush	X	X	X	X	X	X	X	X		X
Jucus patens	California Gray Rush	X	X	X	X	X	X	X	X		X
Leymus condensatus ‘Canyon Prince’	Canyon Prince Wild Rye	X	X	X	X	X	X	X	X		X
Mahonia nevinii	Nevin’s Barberry	X			X	X	X	X	X		X
Muhlenburgia rigens	Deergrass	X	X	X	X	X	X	X	X		X
Mimulus cardinalis	Scarlet Monkeyflower	X		X	X	X	X				X
Ribes speciosum	Fushia Flowering Goose.	X			X	X	X				X
Rosa californica	California Wild Rose	X	X		X	X	X				X
Scirpus cenuus	Low Bullrush	X	X	X		X	X	X	X		X
Sisyrinchium bellum	Blue-eyed Grass	X			X	X	X				X

1. All plants will benefit from some supplemental irrigation during hot dry summer months, particularly those on basin side slopes and further inland.
2. All trees should be planted a min. of 10’ away from any drain pipes or structures.

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Appendix

F

Biofiltration Standard and Checklist

Appendix F Biofiltration Standard and Checklist

Introduction

The MS4 Permit and this manual define a specific category of storm water pollutant treatment BMPs called "biofiltration BMPs." The MS4 Permit (Section E.3.c.1) states:

Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:

a) **Treat 1.5 times the DCV not reliably retained onsite, OR**

b) **Treat the DCV not reliably retained onsite with a flow-through design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite.**

A project applicant must be able to affirmatively demonstrate that a given BMP is designed and sized in a manner consistent with this definition to be considered as a "biofiltration BMP" as part of a compliant storm water management plan. Retention is defined in the MS4 Permit as evapotranspiration, infiltration, and harvest and use of storm water vs. discharge to a surface water system.

Contents and Intended Uses

This appendix contains a checklist of the key underlying criteria that must be met for a BMP to be considered a biofiltration BMP. The purpose of this checklist is to facilitate consistent review and approval of biofiltration BMPs that meet the "biofiltration standard" defined by the MS4 Permit.

This checklist includes specific design criteria that are essential to defining a system as a biofiltration BMP; however it does not present a complete design basis. This checklist was used to develop BMP Fact Sheets for PR-1 biofiltration with partial retention and BF-1 biofiltration, which do present a complete design basis. Therefore, biofiltration BMPs that substantially meet all aspects of the Fact sheets PR-1 or BF-1 should be able to complete this checklist without additional documentation beyond what would already be required for a project submittal.

Other biofiltration BMP designs[1] (including both non-proprietary and proprietary designs) may also meet the underlying MS4 Permit requirements to be considered biofiltration BMPs. These BMPs may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in this appendix, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with their performance certifications (See explanation in Appendix F.2), if applicable, and (3) are acceptable at the discretion of the EAD. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met.

Organization

The checklist in this appendix is organized into the seven (7) main objectives associated with biofiltration BMP design. It describes the associated minimum criteria that must be met in order to qualify a biofiltration BMP as meeting the biofiltration standard. The seven main objectives are listed below. Specific design criteria and associated manual references associated with each of these objectives is provided in the checklist in the following section.

1. Biofiltration BMPs shall be allowed only as described in the BMP selection process in this manual (i.e., retention feasibility hierarchy).

2. Biofiltration BMPs must be sized using acceptable sizing methods described in this manual.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control/sequestration processes, and minimize potential for pollutant washout.

5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.

6. Biofiltration BMPs must be designed to prevent erosion, scour, and channeling within the BMP.

7. Biofiltration BMP must include operations and maintenance design features and planning

[1] Defined as biofiltration designs that do not conform to the specific design criteria described in Fact Sheets PR-1 or BF-1. This category includes proprietary BMPs that are sold by a vendor as well as non-proprietary BMPs that are designed and constructed of primarily of more elementary construction materials.

considerations to provide for continued effectiveness of pollutant and flow control functions.

Biofiltration Criteria Checklist

The applicant shall provide documentation of compliance with each criterion in this checklist as part of the project submittal. The right column of this checklist identifies the submittal information that is recommended to document compliance with each criterion. Biofiltration BMPs that substantially meet all aspects of Fact Sheets PR-1 or BF-1 should still use this checklist; however additional documentation (beyond what is already required for project submittal) should not be required.

1. Biofiltration BMPs shall be allowed to be used only as described in the BMP selection process based on a documented feasibility analysis.

Intent: This manual defines a specific prioritization of pollutant treatment BMPs, where BMPs that retain water (retained includes evapotranspired, infiltrated, and/or harvested and used) must be used before considering BMPs that have a biofiltered discharge to the MS4 or surface waters. Use of a biofiltration BMP in a manner in conflict with this prioritization (i.e., without a feasibility analysis justifying its use) is not permitted, regardless of the adequacy of the sizing and design of the system.

☐	The project applicant has demonstrated that it is not technically feasible to retain the full DCV onsite.	Document feasibility analysis and findings in SWQMP per Appendix C.

2. Biofiltration BMPs must be sized using acceptable sizing methods.

Intent: The MS4 Permit and this manual defines specific sizing methods that must be used to size biofiltration BMPs. Sizing of biofiltration BMPs is a fundamental factor in the amount of storm water that can be treated and also influences volume and pollutant retention processes.

☐	The project applicant has demonstrated that biofiltration BMPs are sized to meet one of the biofiltration sizing options available (Appendix B.5).	Submit sizing worksheets (Appendix B.5) or other equivalent documentation with the SWQMP.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

Intent: Various decisions about BMP placement and design influence how much water is retained via infiltration and evapotranspiration. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention (evapotranspiration and infiltration) of storm water volume.

☐	The biofiltration BMP is sited to allow for maximum infiltration of runoff volume based on the feasibility factors considered in site planning efforts. It is also designed to maximize evapotranspiration through the use of amended media and plants (biofiltration designs without amended media and plants may be permissible; see Item 5).	Document site planning and feasibility analyses in SWQMP per Section 5.4.
☐	For biofiltration BMPs categorized as "Partial Infiltration Condition" the infiltration storage depth in the biofiltration design has been selected to drain in 36 hours (+/-25%) or an alternative value shown to maximize infiltration on the site.	Included documentation of estimated infiltration rate per Appendix D; provide calculations using Appendix B.4 and B.5 to show that the infiltration storage depth meets this criterion. Note, depths that are too shallow or too deep may not be acceptable.
☐	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the infiltration storage is over the entire bottom of the biofiltration BMP footprint.	Document on plans that the infiltration storage covers the entire bottom of the BMP (i.e., not just underdrain trenches); or an equivalent footprint elsewhere on the site.
☐	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the sizing factor used for the infiltration storage area is not less than the minimum biofiltration BMP sizing factors calculated using Worksheet B.5.1 to achieve 40% average annual percent capture within the BMP or downstream of the BMP. .	Provide a table that compares the minimum sizing factor per Appendix B.5 to the provided sizing factor. Note: The infiltration storage area could be a separate storage feature located downstream of the biofiltration BMP, not necessarily within the same footprint.
☐	An impermeable liner or other hydraulic restriction layer is only used when needed to avoid geotechnical and/or subsurface contamination issues in locations identified as "No Infiltration Condition."	If using an impermeable liner or hydraulic restriction layer, provide documentation of feasibility findings per Appendix C that recommend the use of this feature.

☐	The use of "compact" biofiltration BMP design[2] is permitted only in conditions identified as "No Infiltration Condition" and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible.	Provide documentation of feasibility findings that recommend no infiltration is feasible. Provide site-specific information to demonstrate that a larger footprint biofiltration BMP would not be feasible.
	4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control processes, and minimize potential for pollutant washout. Intent: Various decisions about biofiltration BMP design influence the degree to which pollutants are retained. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention of storm water pollutants.	
☐	Media selected for the biofiltration BMP meets minimum quality and material specifications per 2016 City Storm Water Standards or County LID Manual, including the maximum allowable design filtration rate and minimum thickness of media.	Provide documentation that media meets the specifications in 2016 City Storm Water Standards or County LID Manual.
	OR	
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2016 City Storm Water Standards or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below.	Provide documentation of performance information as described in Section F.1.
☐	To the extent practicable, filtration rates are outlet controlled (e.g., via an underdrain and orifice/weir) instead of controlled by the infiltration rate of the media.	Include outlet control in designs or provide documentation of why outlet control is not practicable.

[2] Compact biofiltration BMPs are defined as features with infiltration storage footprint less than the minimum sizing factors required to achieve 40% volume retention. Note that if a biofiltration BMP is accompanied by an infiltrating area downstream that has a footprint equal to at least the minimum sizing factors calculated using Worksheet B.5.1 assuming a partial infiltration condition, then it is not considered to be a compact biofiltration BMP for the purpose of Item 4 of the checklist. For potential configurations with a higher rate biofiltration BMP upstream of an larger footprint infiltration area, the BMP would still need to comply with Item 5 of this checklist for pollutant treatment effectiveness.

☐	The water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure.	Include calculations to demonstrate that drawdown rate is adequate. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the EAD and FDD if certified by a landscape architect or agronomist.
☐	If nutrients are a pollutant of concern, design of the biofiltration BMP follows nutrient-sensitive design criteria.	Follow specifications for nutrient sensitive design in Fact Sheet BF-2. Or provide alternative documentation that nutrient treatment is addressed and potential for nutrient release is minimized.
☐	Media gradation calculations or geotextile selection calculations demonstrate that migration of media between layers will be prevented and permeability will be preserved.	Follow specification for choking layer or geotextile in Fact Sheet PR-1 or BF-1. Or include calculations to demonstrate that choking layer is appropriately specified.

5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.

Intent: Biological processes are an important element of biofiltration performance and longevity.

☐	Plants have been selected to be tolerant of project climate, design ponding depths and the treatment media composition.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	Plants have been selected to minimize irrigation requirements.	Provide documentation describing irrigation requirements for establishment and long term operation.
☐	Plant location and growth will not impede expected long-term media filtration rates and will enhance long term infiltration rates to the extent possible.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	If plants are not part of the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland).	For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained.

6. Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP.

Intent: Erosion, scour, and/or channeling can disrupt treatment processes and reduce biofiltration effectiveness.

☐	Scour protection has been provided for both sheet flow and pipe inflows to the BMP, where needed.	Provide documentation of scour protection as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities.	Provide documentation of design checks for erosive velocities as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	For proprietary BMPs, the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification[3] (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).	Provide copy of manufacturer recommendations and conditions of third-party certification.
	7. Biofiltration BMP must include operations and maintenance design features and planning considerations for continued effectiveness of pollutant and flow control functions. Intent: Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore plans must be in place to correct issues if they arise.	
☐	The biofiltration BMP O&M plan describes specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures.	Include O&M plan with project submittal as described in Chapter 7.
☐	Adequate site area and features have been provided for BMP inspection and maintenance access.	Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans.
☐	For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies).	Provide copy of manufacturer recommendations and conditions of third-party certification.

[3] Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the New Jersey Corporation for Advanced Technology programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification

F.1 Pollutant Treatment Performance Standard

Standard biofiltration BMPs that are designed following the criteria in Fact Sheets PR-1 and BF-1 are presumed to the meet the pollutant treatment performance standard associated with biofiltration BMPs. This presumption is based on the MS4 Permit Fact Sheet which cites analyses of standard biofiltration BMPs conducted in the Ventura County Technical Guidance Manual (July 2011).

For BMPs that do not meet the biofiltration media specification and/or the range of acceptable media filtration rates described in Fact Sheet, PR-1 and BF-1, additional documentation must be provided to demonstrate that adequate pollutant treatment performance is provided to be considered a biofiltration BMP. Project applicants have three options for documenting compliance:

1) Project applicants may provide documentation to substantiate that the minor modifications to the design is expected to provide equal or better pollutant removal performance for the project pollutants of concern than would be provided by a biofiltration design that complies with the criteria in Fact Sheets PR-1 and BF-1. Minor modifications are design elements that deviate only slightly from standard design criteria and are expected to either not impact performance or to improve performance compared to standard biofiltration designs. The reviewing agency has the discretion to accept or reject this documentation and/or request additional documentation to substantiate equivalent or better performance to BF-1 or PR-1, as applicable. Examples of minor deviations include:

    - Different particle size distribution of aggregate, with documentation that system filtration rate will meet specifications.

    - Alternative source of organic components, with documentation of material suitability and stability from appropriate testing agency.

    - Specialized amendments to provide additional treatment mechanisms, and which have negligible potential to upset other treatment mechanisms or otherwise deteriorate performances.

2) For proprietary BMPs, project applicants may provide evidence that the BMP has been certified for use as part of the Washington State Technology Assessment Protocol-Ecology certification program and meets each of the following requirements:

    a. The applicant must demonstrate (using the checklist in this Appendix) that the BMP meets all other conditions to be considered as a biofiltration BMP. For example, a cartridge media filter or hydrodynamic separator would not meet biofiltration BMP design criteria regardless of Technology Acceptance Protocol-Ecology certification because they do not support effective biological processes.

b. The applicant must select BMPs that have an active Technology Acceptance Protocol-Ecology certification, with General Use Level Designation for the appropriate project pollutants of concern as identified in Table F.1-1. The list of certified technologies is updated as new technologies are approved (link below). Technologies with Pilot Use Level Designation and Conditional Use Level Designations are not acceptable. Refer to: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html.

c. The applicant must demonstrate that BMP is being used in a manner consistent with all conditions of the Technology Acceptance Protocol-Ecology certification while meeting the flow rate or volume design criteria that is required for biofiltration BMPs under this manual. Conditions of Technology Acceptance Protocol-Ecology certification are available by clicking on the technology name at the website listed in bullet b. Additional discussion about sizing of proprietary biofiltration BMPs to comply with applicable sizing standards is provided below in Section F.2.

d. For projects within the public right of way and/or capital projects: the product must be acceptable to the EAD and FDD with respect to maintainability and long term operation of the product. In determining the acceptability of a product the EAD and FDD should consider, as applicable, maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business, and other relevant factors. If a proposed BMP is not accepted by the EAD and/or FDD, a written explanation/reason will be provided to the applicant.

3) For BMPs that do not fall into options 1 or 2 above, the EAD and FDD may allow the applicant to submit alternative third-party documentation that the pollutant treatment performance of the system is consistent with the performance levels associated with the necessary Technology Acceptance Protocol-Ecology certifications. Table F.1-1 describes the required levels of certification and Table F.l-2 describes the pollutant treatment performance levels associated with each level of certification. Acceptance of this approach is at the sole discretion of the EAD and FDD. If a proposed BMP is not accepted by the EAD and/or FDD, a written explanation/reason will be provided to the applicant. If Technology Acceptance Protocol-Ecology certifications are not available, preference shall be given to:

a. Verified third-party, field-scale testing performance under the Technology Acceptance Reciprocity Partnership Tier II Protocol. This protocol is no longer operated, however this is considered to be a valid protocol and historic verifications are considered to be representative provided that product models being proposed are

consistent with those that were tested. Technology Acceptance Reciprocity Partnership verifications were conducted under New Jersey Corporation for Advance Testing and are archived at the website linked below. Note that Technology Acceptance Reciprocity Partnership verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol-Ecology certification in Table F.1-1.

b. Verified third-party, field-scale testing performance under the New Jersey Corporation for Advance Testing protocol. Note that New Jersey Corporation for Advance Testing verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol-Ecology certification in Table F.1-1.

A list of field-scale verified technologies under Technology Acceptance Reciprocity Partnership Tier II and New Jersey Corporation for Advance Testing can be accessed at: http://www.njcat.org/verification-process/technology-verification-database.html (refer to field verified technologies only).

Table F.1-1: Required Technology Acceptance Protocol-Ecology Certifications for Polltuants of Concern for Biofiltration Performance Standard

Project Pollutant of Concern	Required Technology Acceptance Protocol-Ecology Certification for Biofiltration Performance Standard
Trash	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Sediments	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Oil and Grease	Basic Treatment OR Phosphorus Treatment OR Enhanced Treatment
Nutrients	Phosphorus Treatment[1]
Metals	Enhanced Treatment
Pesticides	Basic Treatment (including filtration)[2] OR Phosphorus Treatment OR Enhanced Treatment
Organics	Basic Treatment (including filtration)[2] OR Phosphorus Treatment OR Enhanced Treatment
Bacteria and Viruses	Basic Treatment (including bacteria removal processes)[3] OR Phosphorus Treatment OR Enhanced Treatment

1 – There is no Technology Acceptance Protocol-Ecology equivalent for nitrogen compounds; however systems that are designed to retain phosphorus (as well as meet basic treatment designation), generally also provide treatment of nitrogen compounds. Where nitrogen is a pollutant of concern, relative performance of available certified systems for nitrogen removal should be considered in BMP selection.

2 – Pesticides, organics, and oxygen demanding substances are typically addressed by particle filtration consistent with the level of treatment required to achieve Basic treatment certification; if a system with Basic treatment certification does not provide filtration, it is not acceptable for pesticides, organics or oxygen demanding substances.

3 – There is no Technology Acceptance Protocol-Ecology equivalent for pathogens (viruses and bacteria), and testing data are limited because of typical sample hold times. Systems with Technology Acceptance Protocol-Ecology Basic Treatment must be include one or more significant bacteria removal process such as media filtration, physical sorption, predation, reduced redox conditions, and/or solar inactivation. Where design options are available to enhance pathogen removal (i.e., pathogen-specific media mix offered by vendor), this design variation should be used.

Table F.1-2: Performance Standards for Technology Acceptance Protocol-Ecology Certification

Performance Goal	Influent Range	Criteria
Basic Treatment	20 – 100 mg/L TSS	Effluent goal ≤ 20 mg/L TSS
	100 – 200 mg/L TSS	≥ 80% TSS removal
	>200 mg/L TSS	> 80% TSS removal, effluent not to exceed 100 mg/L TSS
Enhanced (Dissolved Metals) Treatment	Dissolved copper 0.005 – 0.02 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >30% dissolved copper removal
	Dissolved zinc 0.02 – 0.3 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >60% dissolved zinc removal
Phosphorous Treatment	Total phosphorous 0.1 – 0.5 mg/L	Must meet basic treatment goal and exhibit ≥50% total phosphorous removal
Oil Treatment	Total petroleum hydrocarbon > 10 mg/L	No ongoing or recurring visible sheen in effluent Daily average effluent Total petroleum hydrocarbon concentration < 10 mg/L Maximum effluent Total petroleum hydrocarbon concentration for a 15 mg/L for a discrete (grab) sample
Pretreatment	50 – 100 mg/L TSS	≤ 50 mg/L TSS
	≥ 200 mg/L TSS	≥ 50% TSS removal

F.2 Guidance on Sizing and Design of Non-Standard Biofiltration BMPs

This section explains the general process for design and sizing of non-standard biofiltration BMPs. This section assumes that the BMPs have been selected based on the criteria in Section F.1.

F.2.1 Guidance on Design per Conditions of Certification/Verification

The biofiltration standard and checklist in this appendix requires that "the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification." Practically, what this means is that the BMP is used in the same way in which it was tested and certified. For example, it is not acceptable for a BMP of a given size to be certified/verified with a 100 gallon per minute treatment rate and be applied at a 150 gallon per minute treatment rate in a design.
Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification. It is common for these approvals to specify the specific model of BMP, design capacity for given unit sizes, type of media that is the basis for approval, and/or other parameter. The applicant must demonstrate conclusively that the proposed application of the BMP is consistent with these criteria.

For alternate non-proprietary systems that do not have a Technology Acceptance Protocol-Ecology / Technology Acceptance Reciprocity Partnership / New Jersey Corporation for Advance Testing certification (but which still must provide quantitative data per Appendix F.1), it must be demonstrate that the configuration and design proposed for the project is reasonably consistent with the configuration and design under which the BMP was tested to demonstrate compliance with Appendix F.1.

F.2.2 Sizing of Flow-Based Biofiltration BMP

This sizing method is <u>only</u> available when the BMP meets the pollutant treatment performance standard in Appendix F.1.

Proprietary biofiltration BMPs are typically designed as a flow-based BMPs (i.e., a constant treatment capacity with negligible storage volume). Additionally, proprietary biofiltration is only acceptable if no infiltration is feasible and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible or if the proprietary biofiltration BMP is supplemented with a downstream retention BMP that achieves volume reduction equivalent to a non-proprietary BMP sized in accordance with Worksheet B.5-1. The applicable sizing method for biofiltration is therefore reduced to: <u>Treat 1.5 times the DCV</u>.

The following steps should be followed to demonstrate that the system is sized to treat 1.5 times the

DCV.

1. Calculate the flow rate required to meet the pollutant treatment performance standard without scaling for the 1.5 factor. Options include either:
    - Calculate the runoff flow rate from a 0.2 inch per hour uniform intensity precipitation event (See methodology Appendix B.6.3), or
    - Conduct a continuous simulation analysis to compute the size required to capture and treat 80 percent of average annual runoff; for small catchments, 5-minute precipitation data should be used to account for short time of concentration. Nearest rain gage with 5-minute precipitation data is allowed for this analysis.
2. Multiply the flow rate from Step 1 by 1.5 to compute the design flow rate for the biofiltration system.
3. Based on the conditions of certification/verification (discussed above), establish the design capacity, as a flow rate, of a given sized unit.
4. Demonstrates that an appropriate unit size and number of units is provided to provide a flow rate that meets the required flow rate from Step 2.
5. Provide a downstream retention BMP that achieves volume reduction equivalent to a non-proprietary BMP sized in accordance with Worksheet B.5-1.

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Appendix

G

Guidance for Continuous Simulation and Hydromodification Management Sizing Factors

February 2016

Appendix G Guidance for Continuous Simulation and Hydromodification Management Sizing Factors

G.1 Guidance for Continuous Simulation Hydrologic Modeling for Hydromodification Management Studies in San Diego County Region 9

G.1.1 Introduction

Continuous simulation hydrologic modeling is used to demonstrate compliance with the performance standards for hydromodification management in San Diego. Although hydromodification management requirements do not apply at SAN, per Section 2 of this manual, this Appendix is included as reference for the design of structural BMPs where appropriate and required, as noted throughout Appendix B.

There are several available hydrologic models that can perform continuous simulation analyses. Each has different methods and parameters for determining the amount of rainfall that becomes runoff, and for representing the hydraulic operations of certain structural BMPs such as biofiltration with partial retention or biofiltration. This Appendix is intended to:

- Identify acceptable models for continuous simulation hydrologic analyses for hydromodification management;
- Provide guidance for selecting climatology input to the models;
- Provide standards for rainfall loss parameters to be used in the models;
- Provide standards for defining physical characteristics of LID components; and
- Provide guidance for demonstrating compliance with performance standards for hydromodification management.

This Appendix is not a user's manual for any of the acceptable models, nor a comprehensive manual for preparing a hydrologic model. This Appendix provides guidance for selecting model input parameters for the specific purpose of hydromodification management studies. The model preparer must be familiar with the user's manual for the selected software to determine how the parameters are entered to the model.

G.1.2 Software for Continuous Simulation Hydrologic Modeling

The following software models may be used for hydromodification management studies in San Diego:

- HSPF – Hydrologic Simulation Program-FORTRAN, distributed by USEPA, public domain.
- SDHM – San Diego Hydrology Model, distributed by Clear Creek Solutions, Inc. This is an HSPF-based model with a proprietary interface that has been customized for use in San Diego for hydromodification management studies.
- SWMM – Storm Water Management Model, distributed by USEPA, public domain.

Third-party and proprietary software, such as XPSWMM or PCSWMM, may be used for hydromodification management studies in San Diego, provided that:

- Input and output data from the software can interface with public domain software such as SWMM. In other words, input files from the third party software should have sufficient functionality to allow export to public domain software for independent validation.
- The software's hydromodification control processes are substantiated.

G.1.3 Climatology Parameters

G.1.3.1 Rainfall

In all software applications for preparation of hydromodification management studies in San Diego, rainfall data must be selected from approved data sets that have been prepared for this purpose. As part of the development of the March 2011 Final HMP, long-term hourly rainfall records were prepared for public use. The rainfall record files are provided on the Project Clean Water website. The rainfall station map is provided in the March 2011 Final HMP and is included in this Appendix as Figure G.1-1.

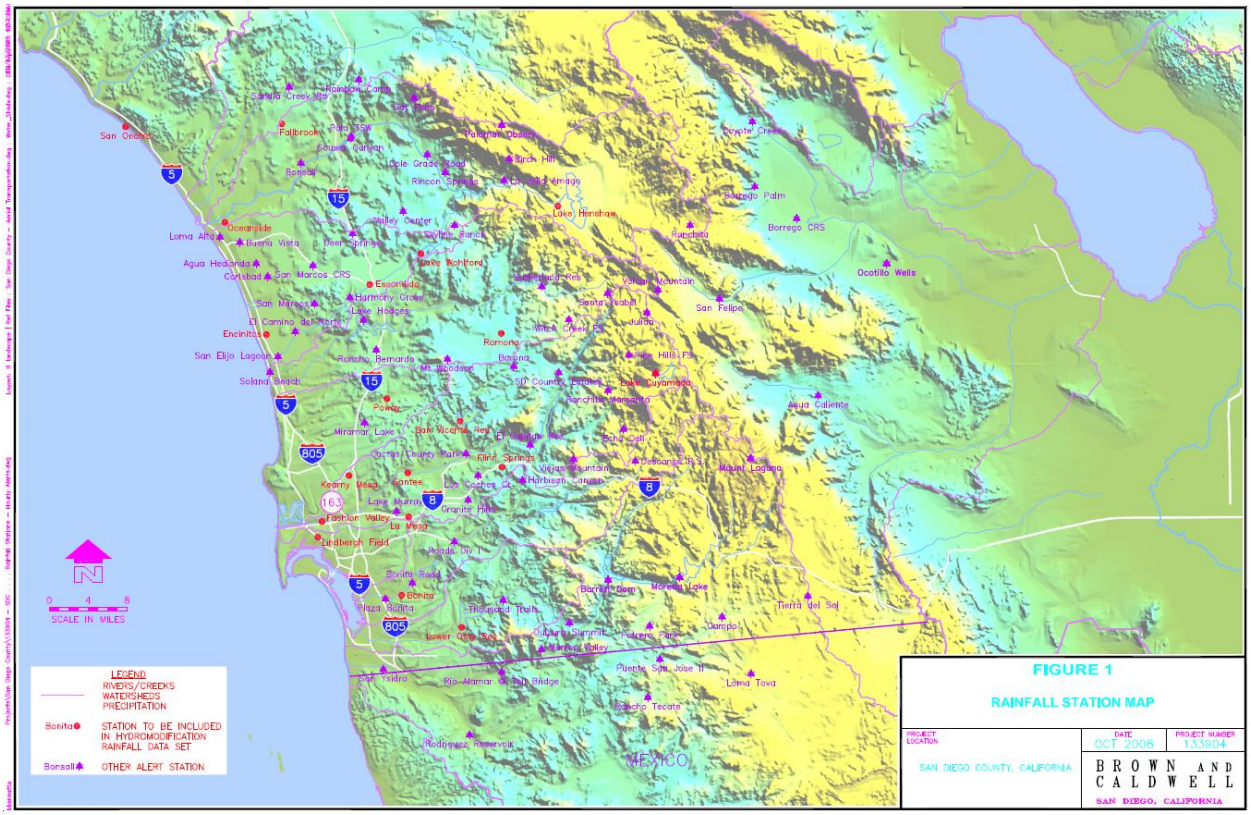


Figure G.1-1: Rainfall Station Map

Project applicants preparing continuous simulation models shall select the most appropriate rainfall data set from the rainfall record files provided on the Project Clean Water website. For a given project location, the following factors should be considered in the selection of the appropriate rainfall data set:

- In most cases, the rainfall data set in closest proximity to the project site will be the appropriate choice (refer to the rainfall station map).
- In some cases, the rainfall data set in closest proximity to the project site may not be the most applicable data set. Such a scenario could involve a data set with an elevation significantly different from the project site. In addition to a simple elevation comparison, the project proponent may also consult with the San Diego County's average annual precipitation isopluvial map, which is provided in the San Diego County Hydrology Manual (2003). Review of this map could provide an initial estimate as to whether the project site is in a similar rainfall zone as compared to the rainfall stations. Generally, precipitation totals in San Diego County increase with increasing elevation.
- Where possible, rainfall data sets should be chosen so that the data set and the project location are both located in the same topographic zone (coastal, foothill, mountain) and

major watershed unit (Upper San Luis Rey, Lower San Luis Rey, Upper San Diego River, Lower San Diego River, etc.).

For SDHM users, the approved rainfall data sets are pre-loaded into the software package. SDHM users may select the appropriate rainfall gage within the SDHM program. HSPF or SWMM users shall download the appropriate rainfall record from the Project Clean Water website and load it into the software program.

Both the pre-development and post-project model simulation period shall encompass the entire rainfall record provided in the approved rainfall data set. Scaling the rainfall data is not permitted.

G.1.3.2 Potential Evapotranspiration

Project applicants preparing continuous simulation models shall select a data set from the sources described below to represent potential evapotranspiration.

For HSPF users, this parameter may be entered as an hourly time series. The hourly time series that was used to develop the BMP Sizing Calculator parameters is provided on the project clean water website and may be used for hydromodification management studies in San Diego. For SDHM users, the hourly evaporation data set is pre-loaded into the program. HSPF users may download the evaporation record from the Project Clean Water website and load it into the software program.

For HSPF or SWMM users, this parameter may be entered as monthly values in inches per month or inches per day. Monthly values may be obtained from the California Irrigation Management Information System "Reference Evapotranspiration Zones" brochure and map (herein "CIMIS ETo Zone Map"), prepared by California Department of Water Resources, dated January 2012. The CIMIS ETo Zone Map is available from www.cimis.gov, and is provided in this Appendix as Figure G.1-2. Determine the appropriate reference evapotranspiration zone for the project from the CIMIS ETo Zone Map. The monthly average reference evapotranspiration values are provided below in Table G.1-1.

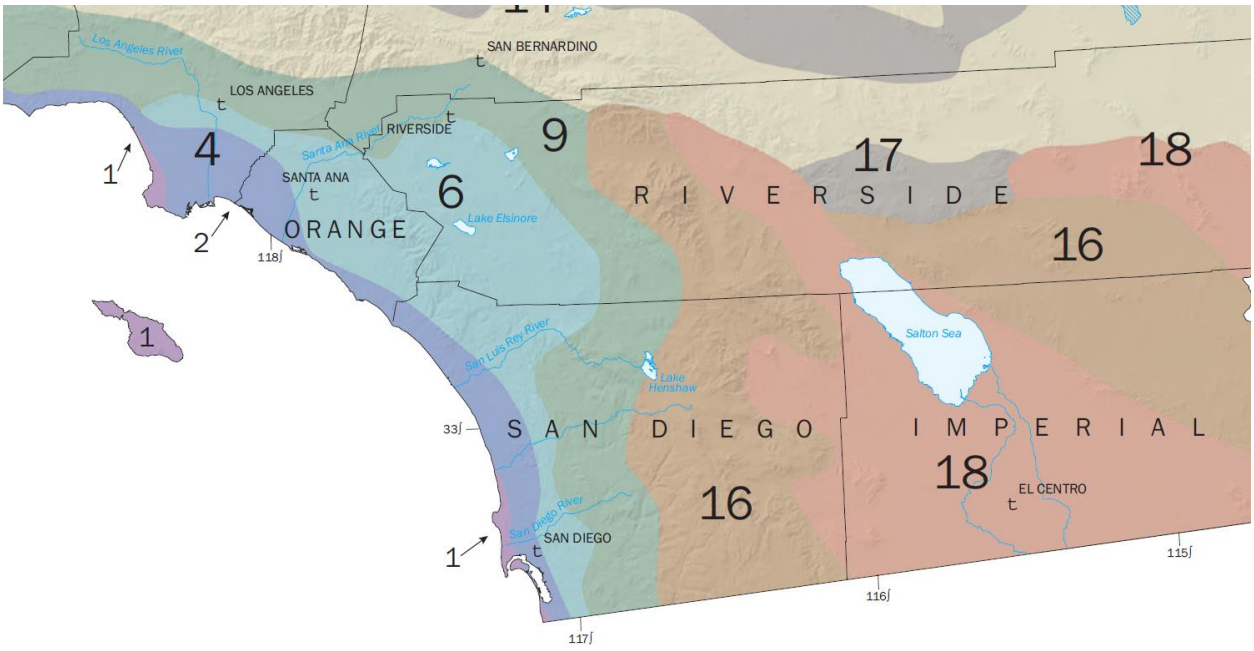


Figure G.1-2: California Irrigation Management Information System "Reference Evapotranspiration Zones"

Table G.1-1: Monthly Average Reference Evapotranspiration by ETo Zone (inches/month and inches/day) for use in SWMM Models for Hydromodification Management Studies in San Diego County CIMIS Zones 1, 4, 6, 9, and 16 (See CIMIS ETo Zone Map)

	January	February	March	April	May	June	July	August	September	October	November	December
Zone	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month
1	0.93	1.4	2.48	3.3	4.03	4.5	4.65	4.03	3.3	2.48	1.2	0.62
4	1.86	2.24	3.41	4.5	5.27	5.7	5.89	5.58	4.5	3.41	2.4	1.86
6	1.86	2.24	3.41	4.8	5.58	6.3	6.51	6.2	4.8	3.72	2.4	1.86
9	2.17	2.8	4.03	5.1	5.89	6.6	7.44	6.82	5.7	4.03	2.7	1.86
16	1.55	2.52	4.03	5.7	7.75	8.7	9.3	8.37	6.3	4.34	2.4	1.55
	January	February	March	April	May	June	July	August	September	October	November	December
Days	31	28	31	30	31	30	31	31	30	31	30	31
Zone	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day
1	0.030	0.050	0.080	0.110	0.130	0.150	0.150	0.130	0.110	0.080	0.040	0.020
4	0.060	0.080	0.110	0.150	0.170	0.190	0.190	0.180	0.150	0.110	0.080	0.060
6	0.060	0.080	0.110	0.160	0.180	0.210	0.210	0.200	0.160	0.120	0.080	0.060
9	0.070	0.100	0.130	0.170	0.190	0.220	0.240	0.220	0.190	0.130	0.090	0.060
16	0.050	0.090	0.130	0.190	0.250	0.290	0.300	0.270	0.210	0.140	0.080	0.050

G.1.4 LAND CHARACTERISTICS AND LOSS PARAMETERS

In all software applications for preparation of hydromodification management studies in San Diego, rainfall loss parameters must be consistent with this Appendix unless the preparer can provide documentation to substantiate use of other parameters, subject to local jurisdiction approval. HSPF and SWMM use different processes and different sets of parameters. SDHM is based on HSPF, therefore parameters for SDHM and HSPF are presented together in Section G.1.4.1. Parameters that have been pre-loaded into SDHM may be used for other HSPF hydromodification management studies outside of SDHM. Parameters for SWMM are presented separately in Section G.1.4.2.

G.1.4.1 Rainfall Loss Parameters for HSPF and SDHM

Rainfall losses in HSPF are characterized by PERLND/PWATER parameters and IMPLND parameters, which describe processes occurring when rainfall lands on pervious lands and impervious lands, respectively. "BASINS Technical Notice 6, Estimating Hydrology and Hydraulic Parameters for HSPF," prepared by the USEPA, dated July 2000, provides details regarding these parameters and summary tables of possible ranges of these parameters. Table G.1-2, excerpted from the above-mentioned document, presents the ranges of these parameters.

For HSPF studies for hydromodification management in San Diego, PERLND/PWATER parameters and IMPLND parameters shall fall within the "possible" range provided in EPA Technical Note 6. To select specific parameters, HSPF users may use the parameters established for development of the San Diego BMP Sizing Calculator, and/or the parameters that have been established for SDHM. Parameters for the San Diego BMP Sizing Calculator and SDHM are based on research conducted specifically for HSPF modeling in San Diego.

Documentation of parameters selected for the San Diego BMP Sizing Calculator is presented in the document titled, San Diego BMP Sizing Calculator Methodology, prepared by Brown and Caldwell, dated January 2012 (herein "BMP Sizing Calculator Methodology"). The PERLND/PWATER parameters selected for development of the San Diego BMP Sizing Calculator represent a single composite pervious land cover that is representative of most pre-development conditions for sites that would commonly be managed by the BMP Sizing Calculator. The parameters shown below in Table G.1-3 are excerpted from the BMP Sizing Calculator Methodology.

Table G.1-2: HSPF PERLND/PWATER and IMPLND Parameters from EPA Technical Note 6

			Range of Values					
Name	**Definition**	**Units**	**Typical**		**Possible**		**Function of ...**	**Comment**
			Min	**Max**	**Min**	**Max**		
PWAT – PARM2								
FOREST	Fraction forest cover	none	0.0	0.50	0.0	0.95	Forest cover	Only impact when SNOW is active
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	2.0	15.0	Soils, climate	**Calibration**
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.001	0.50	Soils, land use	**Calibration**, divides surface and subsurface flow
LSUR	Length of overland flow	feet	200	500	100	700	Topography	Estimate from high resolution topo maps or GIS
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.15	0.001	0.30	Topography	Estimate from high resolution topo maps or GIS
KVARY	Variable groundwater recession	1/inches	0.0	3.0	0.0	5.0	Baseflow recession variation	Used when recession rate varies with GW levels
AGWRC	Base groundwater recession	none	0.92	0.99	0.85	0.999	Baseflow recession	**Calibration**
PWAT – PARM3								
PETMAX	Temp below which ET is reduced	deg. F	35.0	45.0	32.0	48.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
PETMIN	Temp below which ET is set to zero	deg. F	30.0	35.0	30.0	40.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
INFEXP	Exponent in infiltration equation	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
INFILD	Ratio of max/mean infiltration capacities	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
DEEPFR	Fraction of GW inflow to deep recharge	none	0.0	0.20	0.0	0.50	Geology, GW recharge	Accounts for subsurface losses
BASETP	Fraction of remaining ET from baseflow	none	0.0	0.05	0.0	0.20	Riparian vegetation	Direct ET from riparian vegetation
AGWETP	Fraction of remaining ET from active GW	none	0.0	0.05	0.0	0.20	Marsh/wetlands extent	Direct ET from shallow GW
PWAT – PARM4								
CEPSC	Interception storage capacity	inches	0.03	0.20	0.01	0.40	Vegetation type/density, land use	Monthly values usually used
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.05	2.0	Surface soil conditions, land use	Accounts for near surface retention
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.05	0.50	Surface conditions, residue, etc.	Monthly values often used for croplands
INTFW	Interflow inflow parameter	none	1.0	3.0	1.0	10.0	Soils, topography, land use	**Calibration**, based on hydrograph separation
IRC	Interflow recession parameter	none	0.5	0.70	0.30	0.85	Soils, topography, land use	Often start with a value of 0.7, and then adjust
LZETP	Lower zone ET parameter	none	0.2	0.70	0.1	0.9	Vegetation type/density, root depth	**Calibration**
IWAT – PARM2								
LSUR	Length of overland flow	feet	50	150	50	250	Topography, drainage system	Estimate from maps, GIS, or field survey
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.05	0.001	0.15	Topography, drainage	Estimate from maps, GIS, or field survey
NSUR	Manning's n (roughness) for overland flow	none	0.03	0.10	0.01	0.15	Impervious surface conditions	Typical range is 0.05 to 0.10 for roads/parking lots
RETSC	Retention storage capacity	inches	0.03	0.10	0.01	0.30	Impervious surface conditions	Typical range is 0.03 to 0.10 for roads/parking lots
IWAT – PARM3 (PETMAX and PETMIN, same values as shown for PWAT – PARM3)								

Table G.1-3: HSPF PERLND/PWATER Parameters from BMP Sizing Calculator Methodology

		Hydrologic Soil Group A			Hydrologic Soil Group B			Hydrologic Soil Group C			Hydrologic Soil Group D		
	Slope	5%	10%	15%	5%	10%	15%	5%	10%	15%	5%	10%	15%
PWAT_PARM2	Units												
FOREST	None	0	0	0	0	0	0	0	0	0	0	0	0
LZSN	inches	5.2	4.8	4.5	5.0	4.7	4.4	4.8	4.5	4.2	4.8	4.5	4.2
INFILT	in/hr	0.090	0.070	0.045	0.070	0.055	0.040	0.050	0.040	0.032	0.040	0.030	0.020
LSUR	Feet	200	200	200	200	200	200	200	200	200	200	200	200
SLSUR	ft/ft	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15
KVARY	1/inches	3	3	3	3	3	3	3	3	3	3	3	3
AGWRC	None	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PWAT_PARM3													
PETMAX (F)	F	35	35	35	35	35	35	35	35	35	35	35	35
PETMIN (F)	F	30	30	30	30	30	30	30	30	30	30	30	30
INFEXP	None	2	2	2	2	2	2	2	2	2	2	2	2
INFILD	None	2	2	2	2	2	2	2	2	2	2	2	2
DEEPFR	None	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
BASETP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
AGEWTP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PWAT_PARM4													
CEPSC	inches	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UZSN	inches	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
NSUR	None	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTFW	None	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
IRC	None	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
LZETP	None	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Parameters within SDHM are documented in "San Diego Hydrology Model User Manual," prepared by Clear Creek Solutions, Inc. (as of the development of the Manual, the current version of the SDHM User Manual is dated January 2012). Parameters established for SDHM represent "grass" (non-turf grasslands), "dirt," "gravel," and "urban" cover. The documented PERLND and IMPLND parameters for the various land covers and soil types have been pre-loaded into SDHM. SDHM users shall use the parameters that have been pre-loaded into the program without modification unless the preparer can provide documentation to substantiate use of other parameters.

G.1.4.2 Rainfall Loss Parameters for SWMM

In SWMM, rainfall loss parameters (parameters that describe processes occurring when rainfall lands on pervious lands and impervious lands) are entered in the "subcatchment" module. In addition to specifying parameters, the SWMM user must also select an infiltration model.

The SWMM Manual provides details regarding the subcatchment parameters and summary tables of possible ranges of these parameters. For SWMM studies for hydromodification management in San Diego, subcatchment parameters shall fall within the range provided in the SWMM Manual. Some of the parameters depend on the selection of the infiltration model. For consistency across the San Diego region, SWMM users shall use the Green-Ampt infiltration model for hydromodification management studies. Table G.1-4 presents SWMM subcatchment parameters for use in hydromodification management studies in the San Diego region.

Table G.1-4: Subcatchment Parameters for SWMM Studies for Hydromodification Management in San Diego

SWMM Parameter Name	Unit	Range	Use in San Diego
Name X-Coordinate Y-Coordinate Description Tag Rain Gage Outlet	N/A	N/A – project-specific	Project-specific
Area	acres (ac)	Project-specific	Project-specific
Width	feet (ft)	Project-specific	Project-specific
% Slope	percent (%)	Project-specific	Project-specific
% Imperv	percent (%)	Project-specific	Project-specific
N-imperv	--	0.011 – 0.024 presented in Table A.6 of SWMM Manual	default use 0.012 for smooth concrete, otherwise provide documentation of other surface consistent with Table A.6 of SWMM Manual
N-Perv	--	0.05 – 0.80 presented in Table A.6 of SWMM Manual	default use 0.15 for short prairie grass, otherwise provide documentation of other surface consistent with Table A.6 of SWMM Manual
Dstore-Imperv	inches	0.05 – 0.10 inches presented in Table A.5 of SWMM Manual	0.05
Dstore-Perv	inches	0.10 – 0.30 inches presented in Table A.5 of SWMM Manual	0.10
%ZeroImperv	percent (%)	0% – 100%	25%
Subarea routing	--	OUTLET IMPERVIOUS PERVIOUS	Project-specific, typically OUTLET
Percent Routed	%	0% – 100%	Project-specific, typically 100%
Infiltration	Method	HORTON GREEN_AMPT CURVE_NUMBER	GREEN_AMPT

SWMM Parameter Name	Unit	Range	Use in San Diego
Suction Head (Green-Ampt)	Inches	1.93 – 12.60 presented in Table A.2 of SWMM Manual	Hydrologic Soil Group A: 1.5 Hydrologic Soil Group B: 3.0 Hydrologic Soil Group C: 6.0 Hydrologic Soil Group D: 9.0
Conductivity (Green-Ampt)	Inches per hour	0.01 – 4.74 presented in Table A.2 of SWMM Manual by soil texture class 0.00 – ≥0.45 presented in Table A.3 of SWMM Manual by hydrologic soil group	Hydrologic Soil Group A: 0.3 Hydrologic Soil Group B: 0.2 Hydrologic Soil Group C: 0.1 Hydrologic Soil Group D: 0.025 Note: reduce conductivity by 25% in the post-project condition when native soils will be compacted. Conductivity may also be reduced by 25% in the pre-development condition model for redevelopment areas that are currently concrete or asphalt but must be modeled according to their underlying soil characteristics. For fill soils in post-project condition, see Section G.1.4.3.
Initial Deficit (Green-Ampt)		The difference between soil porosity and initial moisture content. Based on the values provided in Table A.2 of SWMM Manual, the range for completely dry soil would be 0.097 to 0.375	Hydrologic Soil Group A: 0.30 Hydrologic Soil Group B: 0.31 Hydrologic Soil Group C: 0.32 Hydrologic Soil Group D: 0.33 Note: in long-term continuous simulation, this value is not important as the soil will reach equilibrium after a few storm events regardless of the initial moisture content specified.
Groundwater	yes/no	yes/no	NO
LID Controls			Project Specific
Snow Pack Land Uses Initial Buildup Curb Length			Not applicable to hydromodification management studies

G.1.4.3 Pervious Area Rainfall Loss Parameters in Post-Project Condition (HSPF, SDHM, and SWMM)

The following guidance applies to HSPF, SDHM, and SWMM. When modeling pervious areas in the post-project condition, fill soils shall be modeled as hydrologic soil group Type D soils, or the project applicant may provide an actual expected infiltration rate for the fill soil based on testing (must be approved by the FDD and EAD for use in the model). Where landscaped areas on fill soils will be re-tilled and/or amended in the post-project condition, the landscaped areas may be modeled as Type C soils. Areas to be re-tilled and/or amended in the post-project condition must be shown on the project plans. For undisturbed pervious areas (i.e., native soils, no fill), use the actual hydrologic soil group, the same as in the pre-development condition.

G.1.5 MODELING STRUCTURAL BMPS (PONDS AND LID FEATURES)

There are many ways to model structural BMPs. There are standard modules for several pond or LID elements included in SDHM and SWMM. Users may also set up project-specific stage-storage-discharge relationships representing structural BMPs. Regardless of the modeling method, certain characteristics of the structural BMP, including infiltration of water from the bottom of the structural BMP into native soils, porosity of bioretention soils and/or gravel sublayers, and other program-specific parameters must be consistent with those presented below, unless the preparer can provide documentation to substantiate use of other parameters, subject to local jurisdiction approval. The geometry of structural BMPs is project-specific and shall match the project plans.

G.1.5.1 Infiltration into Native Soils Below Structural BMPs

Infiltration into native soils below structural BMPs may be modeled as a constant outflow rate equal to the project site-specific design infiltration rate (Worksheet D.5-1) multiplied by the area of the infiltrating surface (and converted to cubic feet per second). This infiltration rate is not the same as an infiltration parameter used in the calculation of rainfall losses, such as the HSPF INFILT parameter or the Green-Ampt conductivity parameter in the SWMM subcatchment module. It must be site-specific and must be determined based on the methods presented in Appendix D of this manual.

For preliminary analysis when site-specific geotechnical investigation has not been completed, project applicants proposing infiltration into native soils as part of the structural BMP design shall prepare a sensitivity analysis to determine a potential range for the structural BMP size based on a range of potential infiltration rates. As shown in Appendices C and D of this manual, many factors influence the ability to infiltrate storm water. Therefore even when soils types A and B are present, which are generally expected to infiltrate storm water, the possibility that a very low infiltration rate could be determined at design level must be considered. The range of potential infiltration rates for

preliminary analysis is shown below in Table G.1-5.

Table G.1-5: Range of Potential Infiltration Rates to be Studied for Sensitivity Analysis when Native Infiltration is Proposed but Site-Specific Geotechnical Investigation has not been Completed

Hydrologic Soil Group at Location of Proposed Structural BMP	Low Infiltration Rate for Preliminary Study (inches/hour)	High Infiltration Rate for Preliminary Study (inches/hour)
A	0.02	2.4
B	0.02	0.52
C	0	0.08
D	0	0.02

The infiltration rates shown above are for preliminary investigation only. Final design of a structural BMP must be based on the project site-specific design infiltration rate (Worksheet D.5-1).

G.1.5.2 Structural BMPs That Do Not Include Sub-Layers (Ponds)

To model a pond, basin, or other depressed area that does not include processing runoff through sublayers of amended soil and/or gravel, create a stage storage discharge relationship for the pond, and supply the information to the model according to the program requirements. For HSPF users, the stage-storage-discharge relationship is provided in FTABLES. SDHM users may use the TRAPEZOIDAL POND element for a trapezoidal pond or IRREGULAR POND element to request the program to create the stage-storage-discharge relationship, use the SSD TABLE element to supply a user-created stage-storage-discharge relationship, or use other available modules such as TANK or VAULT. For SWMM users, the stage-storage relationship is supplied in the storage unit module, and the stage-discharge relationship may be represented by various other modules such as the orifice, weir, or outlet modules. Stage-storage and stage-discharge curves for structural BMPs must be fully documented in the project-specific HMP report and must be consistent with the structural BMP(s) shown on project plans.

For user-created stage-discharge relationships, refer to local drainage manual criteria for equations representing hydraulic behavior of outlet structures. Users relying on the software to develop the stage-discharge relationship may use the equations built into the program. This manual does not recommend that all program modules calculating stage-discharge relationships must be uniform because the flows to be controlled for hydromodification management are low flows, calculated differently from the single-storm event peak flows studied for flood control purposes, and hydromodification management performance standards do not represent any performance standard for flood control drainage design. Note that for design of emergency outlet structures, and any calculations related to single-storm event routing for flood control drainage design, stage-discharge

calculations must be consistent with the local drainage design requirements. This may require separate calculations for stage-discharge relationship pursuant to local manuals. The HMP flow rates shall not be used for flood control calculations.

G.1.5.3 Structural BMPs That Include Sub-Layers (Bioretention and Other LID)

G.1.5.3.1 Characteristics of Engineered Soil Media

The engineered soil media used in bioretention, biofiltration with partial retention, and biofiltration structural BMPs is a sandy loam. The following parameters presented in Table G.1-6 are characteristics of a sandy loam for use in continuous simulation models.

Table G.1-6: Characteristics of Sandy Loam to Represent Engineered Soil Media in Continuous Simulation for Hydromodification Management Studies in San Diego

Soil Texture	Porosity	Field Capacity	Wilting Point	Conductivity	Suction Head
Sandy Loam	0.4	0.2	0.1	5 inches/hour	1.5 inches

- Porosity is the volume of pore space (voids) relative to the total volume of soil (as a fraction).
- Field Capacity is the volume of pore water relative to total volume after the soil has been allowed to drain fully (as a fraction). Below this level, vertical drainage of water through the soil layer does not occur.
- Wilting point is the volume of pore water relative to total volume for a well dried soil where only bound water remains (as a fraction). The moisture content of the soil cannot fall below this limit.
- Conductivity is the hydraulic conductivity for the fully saturated soil (in/hr or mm/hr).
- Suction head is the average value of soil capillary suction along the wetting front (inches or mm).

Figures G.1-3 and G.1-4, from http://www.stevenswater.com/articles/irrigationscheduling.aspx, illustrate unsaturated soil and soil saturation, field capacity, and wilting point.

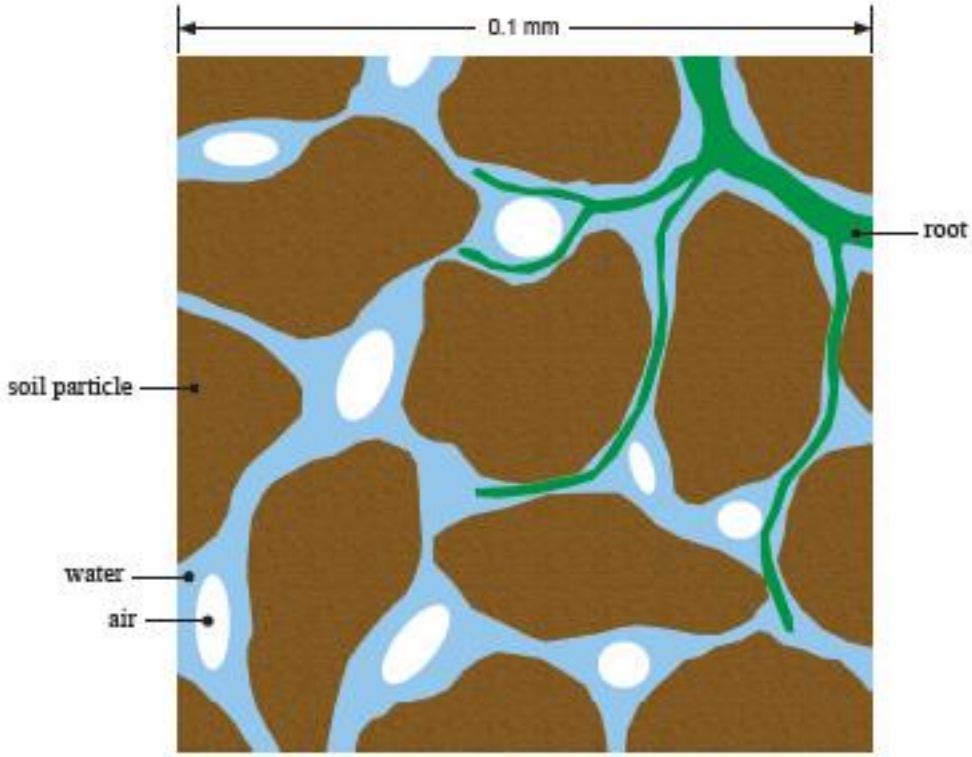


Figure G.1-3: Unsaturated Soil Composition

Unsaturated soil is composed of solid particles, organic material and pores. The pore space will contain air and water.

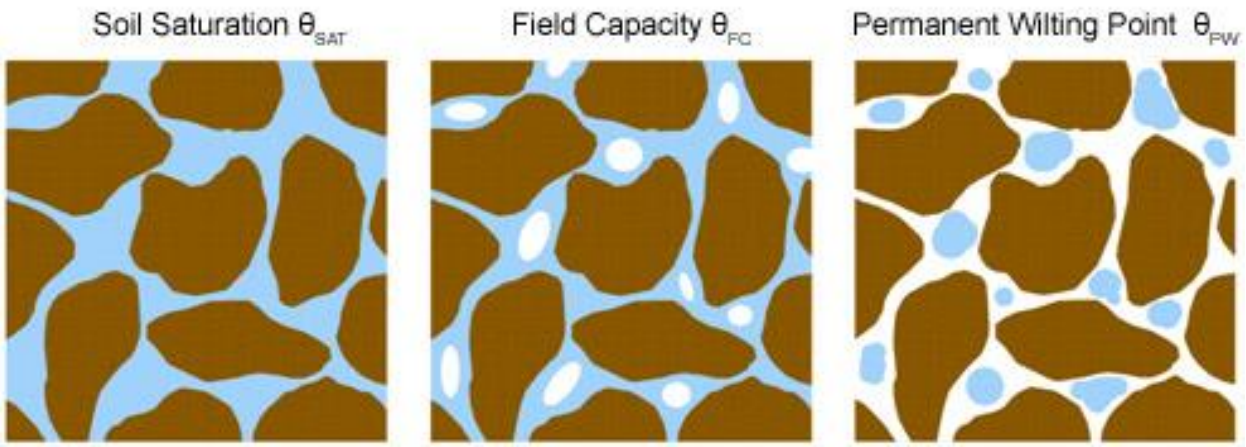


Figure G.1-4: Soil saturation, field capacity, and wilting point

G.1.5.3.2 Characteristics of Gravel

For the purpose of hydromodification management studies, it may be assumed that water moves freely through gravel, not limited by hydraulic properties of the gravel. For the purpose of calculating available volume, use porosity of 0.4, or void ratio of 0.67. Porosity is equal to void ratio divided by (1 + void ratio).

G.1.5.3.3 Additional Guidance for SDHM Users

The module titled "bioretention/rain garden element" may be used to represent bioretention or biofiltration BMPs. SDHM users using the available "bioretention/rain garden element" shall customize the soil media characteristics to use the parameters from Table G.1-6 above, and select "gravel" for gravel sublayers. All other input variables are project-specific. "Native infiltration" refers to infiltration from the bottom of the structural BMP into the native soil. This variable is project-specific, see Section G.1.5.1.

G.1.5.3.4 Additional Guidance for SWMM Users

The "bio-retention cell" LID control may be used to represent bioretention or biofiltration BMPs. Table G.1-7 provides parameters required for the standard "bio-retention cell" available in SWMM. The parameters are entered in the LID Control Editor.

Table G.1-7: Parameters for SWMM "Bio-Retention Cell" Module for Hydromodification Management Studies in San Diego

SWMM Parameter Name	Unit	Use in San Diego
Surface		
Berm Height also known as Storage Depth	inches	Project-specific
Vegetative Volume Fraction also known as Vegetative Cover Fraction	---	0
Surface Roughness	---	0 (this parameter is not applicable to bio-retention cell)
Surface Slope	---	0 (this parameter is not applicable to bio-retention cell)
Soil		
Thickness	inches	project-specific
Porosity	---	0.40
Field Capacity	---	0.2

SWMM Parameter Name	Unit	Use in San Diego
Wilting Point	---	0.1
Conductivity	Inches/hour	5
Conductivity Slope	---	5
Suction Head	inches	1.5
Storage		
Thickness also known as Height	inches	Project-specific
Void Ratio	---	0.67
Seepage Rate also known as Conductivity	Inches/hour	Conductivity from the storage layer refers to infiltration from the bottom of the structural BMP into the native soil. This variable is project-specific, see Section G.5.1. Use 0 if the bio-retention cell includes an impermeable liner
Clogging Factor	---	0
Underdrain		
Flow Coefficient Also known as Drain Coefficient	---	Project-specific
Flow Exponent Also known as Drain Exponent	---	Project-specific, typically 0.5
Offset Height Also known as Drain Offset Height	Inches	Project-specific

G.1.6 FLOW FREQUENCY AND DURATION

The continuous simulation model will generate a flow record corresponding to the frequency of the rainfall data input as its output. This flow record must then be processed to determine pre-development and post-project flow rates and durations. Compliance with hydromodification management requirements of this manual is achieved when results for flow duration meet the performance standards. The performance standard is as follows (also presented in Chapter 6 of this manual):

1. For flow rates ranging from 10 percent, 30 percent or 50 percent of the pre-development 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) to the pre-development 10-year runoff event (Q_{10}), the post-project discharge rates and durations must not exceed the pre-development

rates and durations by more than 10 percent. The specific lower flow threshold will depend on the erosion susceptibility of the receiving stream for the project site (see Section 6.3.4).

To demonstrate that a flow control facility meets the hydromodification management performance standard, a flow duration summary must be generated and compared for pre-development and post-project conditions. The following guidelines shall be used for determining flow rates and durations.

G.1.6.1 Determining Flow Rates from Continuous Hourly Flow Output

Flow rates for hydromodification management studies in San Diego must be based on partial duration series analysis of the continuous hourly flow output. Partial duration series frequency calculations consider multiple storm events in a given year. To construct the partial duration series:

1. Parse the continuous hourly flow data into discrete runoff events. The following separation criteria may be used for separation of flow events: a new discrete event is designated when the flow falls below an artificially low flow value based on a fraction of the contributing watershed area (e.g., 0.002 to 0.005 cfs/acre) for a time period of 24 hours. Project applicants may consider other separation criteria provided the separation interval is not more than 24 hours and the criteria is clearly described in the submittal document.
2. Rank the peak flows from each discrete flow event, and compute the return interval or plotting position for each event.

Readers who are unfamiliar with how to compute the partial-duration series should consult reference books or online resources for additional information. For example, Hydrology for Engineers, by Linsley et all, 1982, discusses partial-duration series on pages 373-374 and computing recurrence intervals or plotting positions on page 359. Handbook of Applied Hydrology, by Chow, 1964, contains a detailed discussion of flow frequency analysis, including Annual Exceedance, Partial-Duration and Extreme Value series methods, in Chapter 8. The US Geological Survey (USGS) has several hydrologic study reports available online that use partial duration series statistics (see http://water.usgs.gov/ and http://water.usgs.gov/osw/bulletin17b/AGU_Langbein_1949.pdf).

Pre-development Q_2 and Q_{10} shall be determined from the partial duration analysis for the pre-development hourly flow record. Pre-development Q_{10} is the upper threshold of flow rates to be controlled in the post-project condition. The lower flow threshold is a fraction of the pre-development Q_2 determined based on the erosion susceptibility of the receiving stream. Simply multiply the pre-development Q_2 by the appropriate fraction (e.g., $0.1Q_2$) to determine the lower flow threshold.

G.1.6.2 Determining Flow Durations from Continuous Hourly Flow Output

Flow durations must be summarized within the range of flows to control. Flow duration statistics

provide a simple summary of how often a particular flow rate is exceeded. To prepare this summary:

1. Rank the entire hourly runoff time series output.
2. Extract the portion of the ranked hourly time series output from the lower flow threshold to the upper flow threshold – this is the portion of the record to be summarized.
3. Divide the applicable portion of the record into 100 equal flow bins (compute the difference between the upper flow threshold (cfs) and lower flow threshold (cfs) and divide this value by 99 to establish the flow bin size).
4. Count the number of hours of flow that fall into each flow bin.

Both pre-development and post-project flow duration summary must be based on the entire length of the flow record. Compare the post-project flow duration summary to the pre-development flow duration summary to determine if it meets performance criteria for post-project flow rates and durations (criteria presented under Section G.1.6).

G.2 Sizing Factors for Hydromodification Management BMPs

Jurisdictional Update:

1. Due to the changes to the flow control performance standard (removal of flow frequency criteria and revision to flow duration criteria), sizing factors, which were developed under the 2007 MS4 Permit, may be retired from use. Designs based on sizing factors would be conservative compared to designs based on the revised flow control performance standard. Use of sizing factors is at the discretion of the FDD and EAD.

This section presents sizing factors for design of flow control structural BMPs based on the sizing factor method identified in Chapter 6.3.5.1. The sizing factors are re-printed from the "San Diego BMP Sizing Calculator Methodology," dated January 2012, prepared by Brown and Caldwell (herein "BMP Sizing Calculator Methodology"). The sizing factors are linked to the specific details and descriptions that were presented in the BMP Sizing Calculator Methodology, with limited options for modifications. The sizing factors were developed based on the 2007 MS4 Permit. Although the sizing factors were developed under the 2007 MS4 Permit, the unit runoff ratios and some sizing factors developed for flow control facility sizing may still be applied at the discretion of the FDD and EAD. Some of the original sizing factors developed based on the 2007 MS4 Permit and presented in the BMP Sizing Calculator Methodology are not compatible with new requirements of the 2013 MS4 Permit, and therefore are not included in this manual. The sizing factor method is intended for simple studies that do not include diversion, do not include significant offsite area draining through the project from upstream, and do not include offsite area downstream of the project area. Use of the sizing factors is limited to the specific structural BMPs described in this Appendix. Sizing factors are available for the following specific structural BMPs:

- Full infiltration condition:
    - **Infiltration**: sizing factors available for A and B soils represent a below-ground structure (dry well)
    - **Bioretention**: sizing factors available for A and B soils represent a bioretention area with engineered soil media and gravel storage layer, with no underdrain and no impermeable liner
- Partial infiltration condition:
    - **Biofiltration with partial retention**: sizing factors available for C and D soils represent a bioretention area with engineered soil media and gravel storage layer, with an underdrain, with gravel storage below the underdrain, with no impermeable liner

- No infiltration condition:
    - **Biofiltration**: sizing factors available for C and D soils represent a bioretention area with engineered soil media and gravel storage layer, with an underdrain, without gravel storage below the underdrain, with no impermeable liner
    - **Biofiltration (formerly known as "flow-through planter") with impermeable liner**: sizing factors available for C and D soils represent a biofiltration system with engineered soil media and gravel storage layer, with an underdrain, with or without gravel storage below the underdrain, with an impermeable liner
- Other:
    - **Cistern**: sizing factors available for A, B, C, or D soils represent a vessel with a low flow orifice outlet to meet the hydromodification management performance standard.

Sizing factors were created based on three rainfall basins: Lindbergh Field, Oceanside, and Lake Wohlford.

The following information is needed to use the sizing factors:

- Determine the appropriate rainfall basin for the project site from Figure G.2-1, Rainfall Basin Map
- Hydrologic soil group at the project site (use available information pertaining to existing underlying soil type such as soil maps published by the Natural Resources Conservation Service)
- Pre-development and post-project slope categories (low = 0% – 5%, moderate = 5% – 15%, steep = >15%)
- Area tributary to the structural BMP
- Area weighted runoff factor (C) for the area draining to the BMP from Table G.2-1. Note: runoff coefficients and adjustments presented in Appendices B.1 and B.2 are for pollutant control only and are not applicable for hydromodification management studies
- Fraction of Q2 to control (see Chapter 6.3.4)

When using the sizing factor method, Worksheet G.2-1 may be used to present the calculations of the required minimum areas and/or volumes of BMPs as applicable.

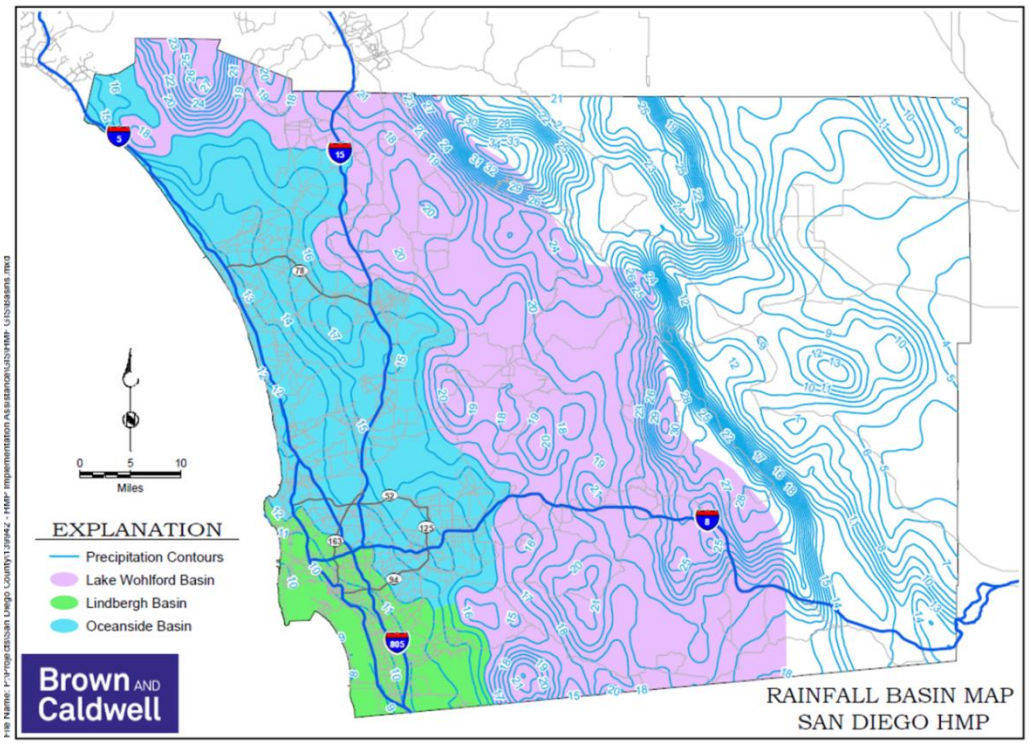


Figure G.2-1: Appropriate Rain Gauge for Project Sites

Table G.2-1: Runoff factors for surfaces draining to BMPs for Hydromodification Sizing Factor Method

Surface	Runoff Factor
Roofs	1.0
Concrete	1.0
Pervious Concrete	0.10
Porous Asphalt	0.10
Grouted Unit Pavers	1.0
Solid Unit Pavers on granular base, min. 3/16 inch joint space	0.20
Crushed Aggregate	0.10
Turf block	0.10
Amended, mulched soils	0.10
Landscape	0.10

Worksheet G.2-1: Sizing Factor Worksheet

Site Information			
Project Name:		Hydrologic Unit	
Project Applicant:		Rain: Gauge:	
Jurisdiction:		Total Project Area:	
Assessor's Parcel Number :		Low Flow Threshold:	
BMP Name:		BMP Type:	

Areas Draining to BMP						Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Pre-Project Slope	Post Project Surface Type	Runoff Factor (From Table G.2-1)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
Total DMA Area								Minimum BMP Size*			
								Proposed BMP Size*			

*Minimum BMP Size = Total of rows above.

*Proposed BMP Size ≥ Minimum BMP size.

G.2.1 Unit Runoff Ratios

Table G.2-2 presents unit runoff ratios for calculating pre-development Q_2, to be used when applicable to determine the lower flow threshold for low flow orifice sizing for biofiltration with partial retention, biofiltration, biofiltration with impermeable liner, or cistern BMPs. There is no low flow orifice in the infiltration BMP or bioretention BMP. The unit runoff ratios are re-printed from the BMP Sizing Calculator methodology. Unit runoff ratios for "urban" and "impervious" cover categories were not transferred to this manual due to the requirement to control runoff to pre-development condition (see Chapter 6.3.3).

How to use the unit runoff ratios:

Obtain unit runoff ratio from Table G.2-2 based on the project's rainfall basin, hydrologic soil group, and pre-development slope (for redevelopment projects, pre-development slope may be considered if historic topographic information is available, otherwise use pre-project slope). Multiply the area tributary to the structural BMP (A, acres) by the unit runoff ratio (Q2, cfs/acre) to determine the pre-development Q2 to determine the lower flow threshold, to use for low flow orifice sizing.

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

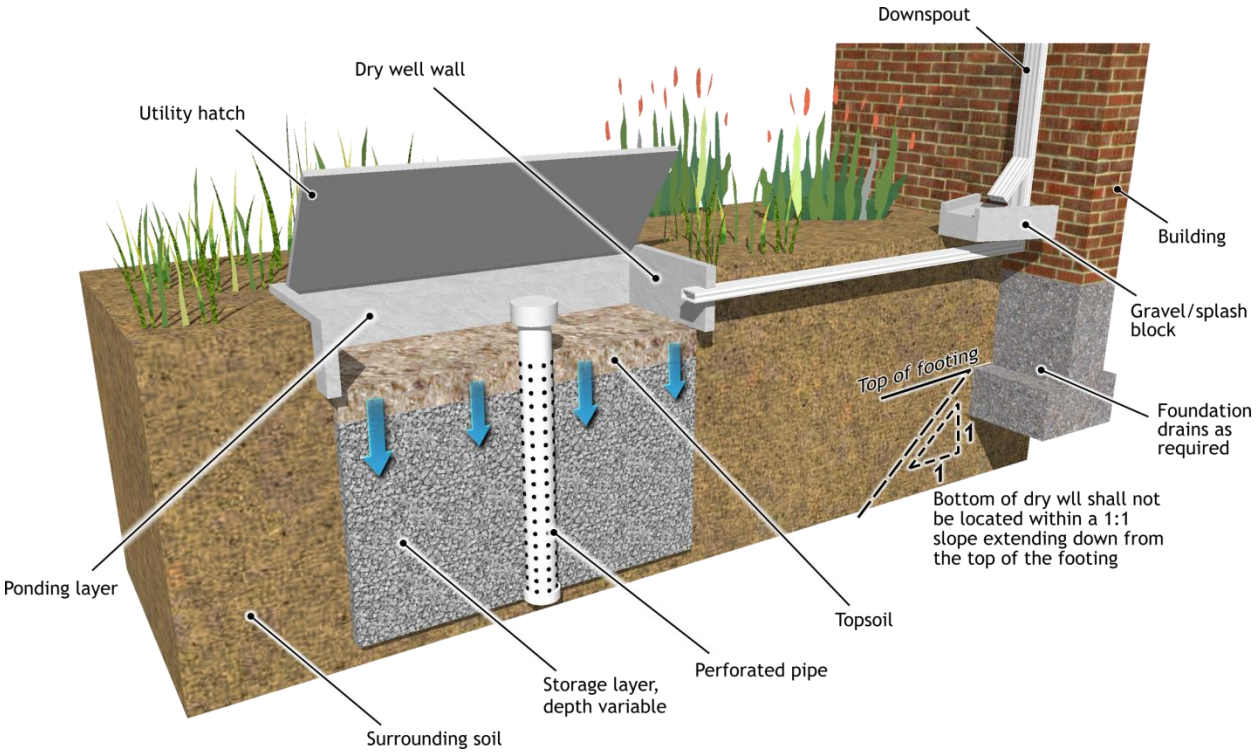
Unit Runoff Ratios for Sizing Factor Method					
Rain Gauge	**Soil**	**Cover**	**Slope**	**Q_2 (cfs/acre)**	**Q_{10} (cfs/ac)**
Lake Wohlford	A	Scrub	Low	0.136	0.369
Lake Wohlford	A	Scrub	Moderate	0.207	0.416
Lake Wohlford	A	Scrub	Steep	0.244	0.47
Lake Wohlford	B	Scrub	Low	0.208	0.414
Lake Wohlford	B	Scrub	Moderate	0.227	0.448
Lake Wohlford	B	Scrub	Steep	0.253	0.482
Lake Wohlford	C	Scrub	Low	0.245	0.458
Lake Wohlford	C	Scrub	Moderate	0.253	0.481
Lake Wohlford	C	Scrub	Steep	0.302	0.517
Lake Wohlford	D	Scrub	Low	0.253	0.48
Lake Wohlford	D	Scrub	Moderate	0.292	0.516

Unit Runoff Ratios for Sizing Factor Method					
Rain Gauge	Soil	Cover	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Lake Wohlford	D	Scrub	Steep	0.351	0.538
Oceanside	A	Scrub	Low	0.035	0.32
Oceanside	A	Scrub	Moderate	0.093	0.367
Oceanside	A	Scrub	Steep	0.163	0.42
Oceanside	B	Scrub	Low	0.08	0.365
Oceanside	B	Scrub	Moderate	0.134	0.4
Oceanside	B	Scrub	Steep	0.181	0.433
Oceanside	C	Scrub	Low	0.146	0.411
Oceanside	C	Scrub	Moderate	0.185	0.433
Oceanside	C	Scrub	Steep	0.217	0.458
Oceanside	D	Scrub	Low	0.175	0.434
Oceanside	D	Scrub	Moderate	0.212	0.455
Oceanside	D	Scrub	Steep	0.244	0.571
Lindbergh	A	Scrub	Low	0.003	0.081
Lindbergh	A	Scrub	Moderate	0.018	0.137
Lindbergh	A	Scrub	Steep	0.061	0.211
Lindbergh	B	Scrub	Low	0.011	0.134
Lindbergh	B	Scrub	Moderate	0.033	0.174
Lindbergh	B	Scrub	Steep	0.077	0.23
Lindbergh	C	Scrub	Low	0.028	0.19
Lindbergh	C	Scrub	Moderate	0.075	0.232
Lindbergh	C	Scrub	Steep	0.108	0.274
Lindbergh	D	Scrub	Low	0.05	0.228
Lindbergh	D	Scrub	Moderate	0.104	0.266
Lindbergh	D	Scrub	Steep	0.143	0.319

G.2.2 Sizing Factors for "Infiltration" BMP

Table G.2-3 presents sizing factors for calculating the required surface area (A) and volume (V1) for an infiltration BMP. There is no underdrain and therefore no low flow orifice in the infiltration BMP. Sizing factors were developed for hydrologic soil groups A and B only. This BMP is not applicable in hydrologic soil groups C and D. The infiltration BMP is a below-ground structure (dry well) that consists of three layers:

- Ponding layer: a nominal 6-inch ponding layer should be included below the access hatch to allow for water spreading and infiltration during intense storms.
- Soil layer [topsoil layer]: 12 inches of soil should be included to remove pollutants.
- Free draining layer [storage layer]: The drywell is sized assuming a 6-foot deep free draining layer. However, designers could use shallower facility depths [provided the minimum volume and surface area are met].



Infiltration Facility BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-3 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, pre-development slope, and rain gauge (rainfall basin). Multiply the area

tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet) and volume (V1, cubic feet) for the infiltration BMP. The civil engineer shall provide the necessary volume and surface area of the BMP on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors, then refer to Appendix B.4 to check whether the BMP meets performance standards for infiltration for pollutant control. If necessary, increase the surface area to meet the drawdown requirement for pollutant control.

Table G.2-3: Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	0.040	0.1040	N/A
$0.5Q_2$	A	Moderate	Lindbergh	0.040	0.1040	N/A
$0.5Q_2$	A	Steep	Lindbergh	0.035	0.0910	N/A
$0.5Q_2$	B	Flat	Lindbergh	0.058	0.1495	N/A
$0.5Q_2$	B	Moderate	Lindbergh	0.055	0.1430	N/A
$0.5Q_2$	B	Steep	Lindbergh	0.050	0.1300	N/A
$0.5Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.5Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.5Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.5Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Flat	L Wohlford	0.050	0.1300	N/A
$0.5Q_2$	A	Moderate	L Wohlford	0.050	0.1300	N/A
$0.5Q_2$	A	Steep	L Wohlford	0.040	0.1040	N/A
$0.5Q_2$	B	Flat	L Wohlford	0.078	0.2015	N/A
$0.5Q_2$	B	Moderate	L Wohlford	0.075	0.1950	N/A
$0.5Q_2$	B	Steep	L Wohlford	0.065	0.1690	N/A
$0.5Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Flat	Lindbergh	0.040	0.1040	N/A
$0.3Q_2$	A	Moderate	Lindbergh	0.040	0.1040	N/A
$0.3Q_2$	A	Steep	Lindbergh	0.035	0.0910	N/A
$0.3Q_2$	B	Flat	Lindbergh	0.058	0.1495	N/A
$0.3Q_2$	B	Moderate	Lindbergh	0.055	0.1430	N/A
$0.3Q_2$	B	Steep	Lindbergh	0.050	0.1300	N/A
$0.3Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.3Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.3Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.3Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Flat	L Wohlford	0.050	0.1300	N/A
$0.3Q_2$	A	Moderate	L Wohlford	0.050	0.1300	N/A
$0.3Q_2$	A	Steep	L Wohlford	0.040	0.1040	N/A
$0.3Q_2$	B	Flat	L Wohlford	0.078	0.2015	N/A
$0.3Q_2$	B	Moderate	L Wohlford	0.075	0.1950	N/A
$0.3Q_2$	B	Steep	L Wohlford	0.065	0.1690	N/A
$0.3Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Lindbergh	0.040	0.1040	N/A
$0.1Q_2$	A	Moderate	Lindbergh	0.040	0.1040	N/A
$0.1Q_2$	A	Steep	Lindbergh	0.035	0.0910	N/A
$0.1Q_2$	B	Flat	Lindbergh	0.058	0.1495	N/A
$0.1Q_2$	B	Moderate	Lindbergh	0.055	0.1430	N/A
$0.1Q_2$	B	Steep	Lindbergh	0.050	0.1300	N/A
$0.1Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.1Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.1Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.1Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Flat	L Wohlford	0.050	0.1300	N/A
$0.1Q_2$	A	Moderate	L Wohlford	0.050	0.1300	N/A
$0.1Q_2$	A	Steep	L Wohlford	0.040	0.1040	N/A
$0.1Q_2$	B	Flat	L Wohlford	0.078	0.2015	N/A
$0.1Q_2$	B	Moderate	L Wohlford	0.075	0.1950	N/A
$0.1Q_2$	B	Steep	L Wohlford	0.065	0.1690	N/A
$0.1Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Infiltration volume sizing factor for flow control

Definitions for "N/A"

- Soil groups A and B: N/A in column V2 means there is no V2 element in this infiltration BMP for soil groups A and B
- Soil groups C and D: N/A across all elements (A, V1, V2) means sizing factors were not developed for an infiltration BMP for soil groups C and D

G.2.3 Sizing Factors for Bioretention

Table G.2-4 presents sizing factors for calculating the required surface area (A) and surface volume (V1) for the bioretention BMP. The bioretention BMP consists of two layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]

This BMP is applicable in soil groups A and B. This BMP does not include an underdrain or a low flow orifice. This BMP does not include an impermeable layer at the bottom of the facility to prevent infiltration into underlying soils, regardless of hydrologic soil group. If a facility is to be lined, the designer must use the sizing factors for biofiltration with impermeable layer (formerly known as "flow-through planter").

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-4 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, pre-development slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet) and surface volume (V1, cubic feet). Note the surface volume is the ponding layer. The BMP must also include 18 inches of bioretention soil media which does not contribute to V1. The civil engineer shall provide the necessary volume and surface area of the BMP on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors, then refer to Appendix B.4 to check whether the BMP meets performance standards for infiltration for pollutant control. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards.

Table G.2-4: Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.5Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.5Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	B	Flat	Lindbergh	0.093	0.0771	N/A
$0.5Q_2$	B	Moderate	Lindbergh	0.085	0.0708	N/A
$0.5Q_2$	B	Steep	Lindbergh	0.065	0.0542	N/A
$0.5Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.5Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.5Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.5Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.5Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.5Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.5Q_2$	B	Flat	L Wohlford	0.048	0.0396	N/A
$0.5Q_2$	B	Moderate	L Wohlford	0.045	0.0375	N/A
$0.5Q_2$	B	Steep	L Wohlford	0.040	0.0333	N/A
$0.5Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.3Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.3Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A
$0.3Q_2$	B	Flat	Lindbergh	0.098	0.0813	N/A
$0.3Q_2$	B	Moderate	Lindbergh	0.090	0.0750	N/A
$0.3Q_2$	B	Steep	Lindbergh	0.070	0.0583	N/A
$0.3Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.3Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.3Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.3Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.3Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.3Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.3Q_2$	B	Flat	L Wohlford	0.060	0.0500	N/A
$0.3Q_2$	B	Moderate	L Wohlford	0.055	0.0458	N/A
$0.3Q_2$	B	Steep	L Wohlford	0.045	0.0375	N/A
$0.3Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.1Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.1Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A
$0.1Q_2$	B	Flat	Lindbergh	0.100	0.0833	N/A
$0.1Q_2$	B	Moderate	Lindbergh	0.095	0.0792	N/A
$0.1Q_2$	B	Steep	Lindbergh	0.080	0.0667	N/A
$0.1Q_2$	C	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.1Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.1Q_2$	B	Flat	Oceanside	0.103	0.0854	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.1Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.1Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.1Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.1Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.1Q_2$	B	Flat	L Wohlford	0.090	0.0750	N/A
$0.1Q_2$	B	Moderate	L Wohlford	0.085	0.0708	N/A
$0.1Q_2$	B	Steep	L Wohlford	0.065	0.0542	N/A

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	C	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	D	Steep	L Wohlford	N/A	N/A	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Surface volume sizing factor for flow control

Definitions for "N/A"

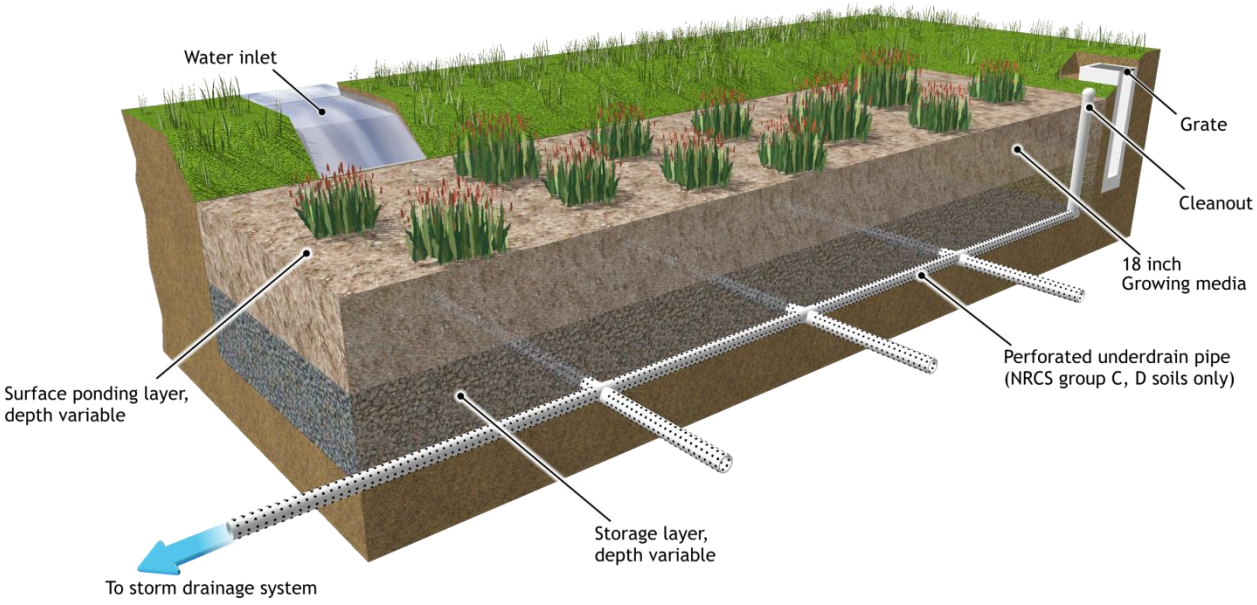
- Soil groups A and B: N/A in column V2 means there is no V2 element in this bioretention BMP for soil groups A and B
- Soil groups C and D: N/A in all elements (A, V1, V2) for soil groups C and D means sizing factors developed for "bioretention" in soil groups C and D under the 2007 MS4 Permit are not applicable in the "bioretention" category under the 2013 MS4 Permit because they were developed with the assumption that an underdrain is operating. Refer to Appendix G.2.4, Sizing Factors for Biofiltration with Partial Retention and Biofiltration

G.2.4 Sizing Factors for Biofiltration with Partial Retention and Biofiltration

Table G.2-5 presents sizing factors for calculating the required surface area (A), surface volume (V1), and sub-surface volume (V2) for a biofiltration with partial retention and biofiltration BMP. The BMPs consist of three layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]
- Storage layer: 30-inches of gravel at 40 percent porosity [18 inches active storage above underdrain is required, additional dead storage depth below underdrain is optional and can vary]

This BMP is applicable in soil groups C and D. This BMP includes an underdrain with a low flow orifice 18 inches (1.5 feet) below the bottom of the growing medium. This BMP can include additional dead storage below the underdrain. This BMP does not include an impermeable layer at the bottom of the facility to prevent infiltration into underlying soils, regardless of hydrologic soil group. If a facility is to be lined, the designer must use the sizing factors for biofiltration with impermeable liner (formerly known as "flow-through planter").



Biofiltration BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-5 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, pre-development slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet), surface volume (V1, cubic feet), and sub-surface volume (V2, cubic feet). Select a low flow orifice for the underdrain that will discharge the lower flow threshold flow when there is 1.5 feet of head over the underdrain orifice. The civil engineer shall provide the necessary volume and surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors. For BMPs without dead storage below the underdrain, then refer to Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards. For BMPs with dead storage below the underdrain, refer to Appendix B.4 to determine the portion of the DCV to be infiltrated for pollutant control, then Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control for the balance of the DCV. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards.

Table G.2-5: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.100	0.0833	0.0600
$0.5Q_2$	C	Moderate	Lindbergh	0.100	0.0833	0.0600
$0.5Q_2$	C	Steep	Lindbergh	0.075	0.0625	0.0450
$0.5Q_2$	D	Flat	Lindbergh	0.080	0.0667	0.0480

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	D	Moderate	Lindbergh	0.080	0.0667	0.0480
$0.5Q_2$	D	Steep	Lindbergh	0.060	0.0500	0.0360
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.060	0.0500	0.0360
$0.5Q_2$	D	Flat	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Moderate	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.5Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Flat	L Wohlford	0.065	0.0542	0.0390
$0.5Q_2$	C	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.5Q_2$	C	Steep	L Wohlford	0.050	0.0417	0.0300
$0.5Q_2$	D	Flat	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Moderate	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Steep	L Wohlford	0.045	0.0375	0.0270
$0.3Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.110	0.0917	0.0660

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	C	Moderate	Lindbergh	0.110	0.0917	0.0660
$0.3Q_2$	C	Steep	Lindbergh	0.085	0.0708	0.0510
$0.3Q_2$	D	Flat	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Moderate	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Steep	Lindbergh	0.070	0.0583	0.0420
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Moderate	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Steep	Oceanside	0.080	0.0667	0.0480
$0.3Q_2$	D	Flat	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Moderate	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390
$0.3Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.075	0.0625	0.0450
$0.3Q_2$	C	Moderate	L Wohlford	0.075	0.0625	0.0450
$0.3Q_2$	C	Steep	L Wohlford	0.060	0.0500	0.0360
$0.3Q_2$	D	Flat	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Steep	L Wohlford	0.050	0.0417	0.0300
$0.1Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.145	0.1208	0.0870
$0.1Q_2$	C	Moderate	Lindbergh	0.145	0.1208	0.0870
$0.1Q_2$	C	Steep	Lindbergh	0.120	0.1000	0.0720
$0.1Q_2$	D	Flat	Lindbergh	0.160	0.1333	0.0960
$0.1Q_2$	D	Moderate	Lindbergh	0.160	0.1333	0.0960
$0.1Q_2$	D	Steep	Lindbergh	0.115	0.0958	0.0690
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Steep	Oceanside	0.110	0.0917	0.0660
$0.1Q_2$	D	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390
$0.1Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	C	Moderate	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	C	Steep	L Wohlford	0.090	0.0750	0.0540
$0.1Q_2$	D	Flat	L Wohlford	0.100	0.0833	0.0600
$0.1Q_2$	D	Moderate	L Wohlford	0.100	0.0833	0.0600
$0.1Q_2$	D	Steep	L Wohlford	0.075	0.0625	0.0450

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Surface volume sizing factor for flow control

V_2 = Subsurface volume sizing factor for flow control

Definitions for "N/A"

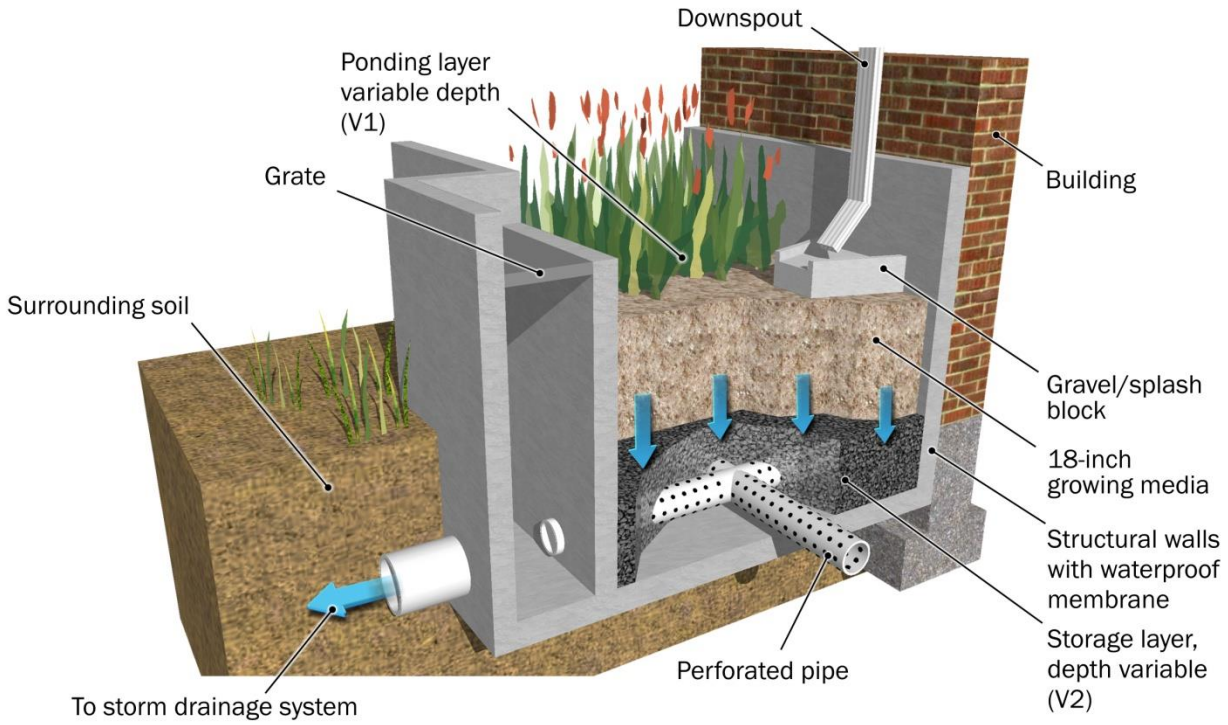
- Soil groups A and B: N/A in all elements (A, V1, V2) for soil groups A and B means sizing factors were not developed for biofiltration (i.e., with an underdrain) for soil groups A and B. If no underdrain is proposed, refer to Appendix G.2.3, Sizing Factors for Bioretention. If an underdrain is proposed, use project-specific continuous simulation modeling.

G.2.5 Sizing Factors for Biofiltration with Impermeable Liner

Table G.2-6 presents sizing factors for calculating the required surface area (A), surface volume (V1), and sub-surface volume (V2) for a biofiltration BMP with impermeable liner (formerly known as flow-through planter). The BMP consists of three layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]
- Storage layer: 30-inches of gravel at 40 percent porosity [18 inches active storage above underdrain is required, additional dead storage depth below underdrain is optional and can vary]

This BMP includes an underdrain with a low flow orifice 18 inches (1.5 feet) below the bottom of the growing medium. This BMP includes an impermeable liner to prevent infiltration into underlying soils.



Biofiltration with impermeable liner BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-6 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, pre-development slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet), surface volume (V1, cubic feet), and sub-surface volume (V2, cubic feet). Select a low flow orifice for the underdrain that will discharge the lower flow threshold flow when there is 1.5 feet of head over the underdrain orifice. The civil engineer shall provide the necessary volume and surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size using the sizing factors, then refer to Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control. If necessary, adjust the surface area, depth of growing medium, or depth of storage layer as needed to meet pollutant control standards.

Table G.2-6: Sizing Factors for Hydromodification Flow Control Biofiltration BMPs (formerly known as Flow-Through Planters) Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.115	0.0958	0.0690
$0.5Q_2$	C	Moderate	Lindbergh	0.115	0.0958	0.0690
$0.5Q_2$	C	Steep	Lindbergh	0.080	0.0667	0.0480
$0.5Q_2$	D	Flat	Lindbergh	0.085	0.0708	0.0510
$0.5Q_2$	D	Moderate	Lindbergh	0.085	0.0708	0.0510
$0.5Q_2$	D	Steep	Lindbergh	0.065	0.0542	0.0390
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Flat	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Moderate	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.5Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Flat	L Wohlford	0.070	0.0583	0.0420
$0.5Q_2$	C	Moderate	L Wohlford	0.070	0.0583	0.0420
$0.5Q_2$	C	Steep	L Wohlford	0.050	0.0417	0.0300
$0.5Q_2$	D	Flat	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Moderate	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Steep	L Wohlford	0.045	0.0375	0.0270
$0.3Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.130	0.1083	0.0780
$0.3Q_2$	C	Moderate	Lindbergh	0.130	0.1083	0.0780
$0.3Q_2$	C	Steep	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Flat	Lindbergh	0.105	0.0875	0.0630
$0.3Q_2$	D	Moderate	Lindbergh	0.105	0.0875	0.0630
$0.3Q_2$	D	Steep	Lindbergh	0.075	0.0625	0.0450

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Moderate	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Steep	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Flat	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Moderate	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Steep	Oceanside	0.070	0.0583	0.0420
$0.3Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.085	0.0708	0.0510
$0.3Q_2$	C	Moderate	L Wohlford	0.085	0.0708	0.0510
$0.3Q_2$	C	Steep	L Wohlford	0.060	0.0500	0.0360
$0.3Q_2$	D	Flat	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Steep	L Wohlford	0.050	0.0417	0.0300
$0.1Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.250	0.2083	0.1500
$0.1Q_2$	C	Moderate	Lindbergh	0.250	0.2083	0.1500
$0.1Q_2$	C	Steep	Lindbergh	0.185	0.1542	0.1110

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	D	Flat	Lindbergh	0.200	0.1667	0.1200
$0.1Q_2$	D	Moderate	Lindbergh	0.200	0.1667	0.1200
$0.1Q_2$	D	Steep	Lindbergh	0.130	0.1083	0.0780
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Moderate	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Steep	Oceanside	0.140	0.1167	0.0840
$0.1Q_2$	D	Flat	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Moderate	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Steep	Oceanside	0.105	0.0875	0.0630
$0.1Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.135	0.1125	0.0810
$0.1Q_2$	C	Moderate	L Wohlford	0.135	0.1125	0.0810
$0.1Q_2$	C	Steep	L Wohlford	0.105	0.0875	0.0630
$0.1Q_2$	D	Flat	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	D	Moderate	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	D	Steep	L Wohlford	0.080	0.0667	0.0480

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Surface area sizing factor for flow control
V_1 = Surface volume sizing factor for flow control
V_2 = Subsurface volume sizing factor for flow control

Definitions for "N/A"

- Soil groups A and B: N/A in all elements (A, V1, V2) for soil groups A and B means sizing factors were not developed for biofiltration (i.e., with an underdrain) for soil groups A and B. If no underdrain is proposed, refer to Appendix G.2.3, Sizing Factors for Bioretention. If an underdrain is proposed, use project-specific continuous simulation modeling.

G.2.6 Sizing Factors for "Cistern" BMP

Table G.2-7 presents sizing factors for calculating the required volume (V1) for a cistern BMP. In this context, a "cistern" is a detention facility that stores runoff and releases it at a controlled rate. A cistern can be a component of a harvest and use system, however the sizing factor method will not account for any retention occurring in the system. The sizing factors were developed assuming runoff is released from the cistern. The sizing factors presented in this section are to meet the hydromodification management performance standard only. The cistern BMP is based on the following assumptions:

- Cistern configuration: The cistern is modeled as a 4-foot tall vessel. However, designers could use other configurations (different cistern heights), as long as the lower outlet orifice is sized to properly restrict outflows and the minimum required volume is provided.
- Cistern upper outlet: The upper outlet from the cistern would consist of a weir or other flow control structure with the overflow invert set at an elevation of 7/8 of the water height associated with the required volume of the cistern – V1. For the assumed 4-foot water depth in the cistern associated with the sizing factor analysis, the overflow invert is assumed to be located at an elevation of 3.5 feet above the bottom of the cistern. The overflow weir would be sized to pass the peak design flow based on the tributary drainage area.

How to use the sizing factors:

Obtain sizing factors from Table G.2-7 based on the project's lower flow threshold fraction of Q_2, hydrologic soil group, pre-development slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required volume (V_1, cubic feet). Select a low flow orifice that will discharge the lower flow threshold flow when there is 4 feet of head over the lower outlet orifice (or adjusted head as appropriate if the cistern configuration is not 4 feet tall). The civil engineer shall provide the necessary volume of the BMP and the lower outlet orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

A cistern could be a component of a full retention, partial retention, or no retention BMP depending on how the outflow is disposed. However use of the sizing factor method for design of the cistern in a combined pollutant control and flow control system is not recommended. The sizing factor method for designing a cistern does not account for any retention or storage occurring in BMPs combined with the cistern (i.e., cistern sized using sizing factors may be larger than necessary because sizing factor method does not recognize volume losses occurring in other elements of a combined system). Furthermore when the cistern is designed using the sizing factor method, the cistern outflow must be set to the low flow threshold flow for the drainage area, which may be inconsistent with requirements for other elements of a combined system. To optimize a system in

which a cistern provides temporary storage for runoff to be either used onsite (harvest and use), infiltrated, or biofiltered, project-specific continuous simulation modeling is recommended. Refer to Sections 5.6 and 6.3.6.

Table G.2-7: Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	N/A	0.1200	N/A
$0.5Q_2$	A	Moderate	Lindbergh	N/A	0.1000	N/A
$0.5Q_2$	A	Steep	Lindbergh	N/A	0.1000	N/A
$0.5Q_2$	B	Flat	Lindbergh	N/A	0.3900	N/A
$0.5Q_2$	B	Moderate	Lindbergh	N/A	0.2000	N/A
$0.5Q_2$	B	Steep	Lindbergh	N/A	0.1200	N/A
$0.5Q_2$	C	Flat	Lindbergh	N/A	0.1200	N/A
$0.5Q_2$	C	Moderate	Lindbergh	N/A	0.1200	N/A
$0.5Q_2$	C	Steep	Lindbergh	N/A	0.1000	N/A
$0.5Q_2$	D	Flat	Lindbergh	N/A	0.1000	N/A
$0.5Q_2$	D	Moderate	Lindbergh	N/A	0.1000	N/A
$0.5Q_2$	D	Steep	Lindbergh	N/A	0.0800	N/A
$0.5Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	B	Flat	Oceanside	N/A	0.1900	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	0.1600	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Moderate	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	0.1000	N/A
$0.5Q_2$	A	Flat	L Wohlford	N/A	0.1800	N/A
$0.5Q_2$	A	Moderate	L Wohlford	N/A	0.1400	N/A
$0.5Q_2$	A	Steep	L Wohlford	N/A	0.0800	N/A
$0.5Q_2$	B	Flat	L Wohlford	N/A	0.2100	N/A
$0.5Q_2$	B	Moderate	L Wohlford	N/A	0.2000	N/A

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	B	Steep	L Wohlford	N/A	0.1400	N/A
$0.5Q_2$	C	Flat	L Wohlford	N/A	0.1400	N/A
$0.5Q_2$	C	Moderate	L Wohlford	N/A	0.1400	N/A
$0.5Q_2$	C	Steep	L Wohlford	N/A	0.1000	N/A
$0.5Q_2$	D	Flat	L Wohlford	N/A	0.1000	N/A
$0.5Q_2$	D	Moderate	L Wohlford	N/A	0.1000	N/A
$0.5Q_2$	D	Steep	L Wohlford	N/A	0.0800	N/A
$0.3Q_2$	A	Flat	Lindbergh	N/A	0.1200	N/A
$0.3Q_2$	A	Moderate	Lindbergh	N/A	0.1000	N/A
$0.3Q_2$	A	Steep	Lindbergh	N/A	0.1000	N/A
$0.3Q_2$	B	Flat	Lindbergh	N/A	0.5900	N/A
$0.3Q_2$	B	Moderate	Lindbergh	N/A	0.3600	N/A
$0.3Q_2$	B	Steep	Lindbergh	N/A	0.1800	N/A
$0.3Q_2$	C	Flat	Lindbergh	N/A	0.1800	N/A
$0.3Q_2$	C	Moderate	Lindbergh	N/A	0.1800	N/A
$0.3Q_2$	C	Steep	Lindbergh	N/A	0.1400	N/A
$0.3Q_2$	D	Flat	Lindbergh	N/A	0.1400	N/A
$0.3Q_2$	D	Moderate	Lindbergh	N/A	0.1400	N/A
$0.3Q_2$	D	Steep	Lindbergh	N/A	0.0800	N/A
$0.3Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	0.2200	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	0.1800	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Steep	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	0.1200	N/A
$0.3Q_2$	A	Flat	L Wohlford	N/A	0.1800	N/A
$0.3Q_2$	A	Moderate	L Wohlford	N/A	0.1400	N/A
$0.3Q_2$	A	Steep	L Wohlford	N/A	0.0800	N/A

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	B	Flat	L Wohlford	N/A	0.2600	N/A
$0.3Q_2$	B	Moderate	L Wohlford	N/A	0.2400	N/A
$0.3Q_2$	B	Steep	L Wohlford	N/A	0.1800	N/A
$0.3Q_2$	C	Flat	L Wohlford	N/A	0.1800	N/A
$0.3Q_2$	C	Moderate	L Wohlford	N/A	0.1800	N/A
$0.3Q_2$	C	Steep	L Wohlford	N/A	0.1400	N/A
$0.3Q_2$	D	Flat	L Wohlford	N/A	0.1400	N/A
$0.3Q_2$	D	Moderate	L Wohlford	N/A	0.1400	N/A
$0.3Q_2$	D	Steep	L Wohlford	N/A	0.1000	N/A
$0.1Q_2$	A	Flat	Lindbergh	N/A	0.1200	N/A
$0.1Q_2$	A	Moderate	Lindbergh	N/A	0.1000	N/A
$0.1Q_2$	A	Steep	Lindbergh	N/A	0.1000	N/A
$0.1Q_2$	B	Flat	Lindbergh	N/A	0.5400	N/A
$0.1Q_2$	B	Moderate	Lindbergh	N/A	0.7800	N/A
$0.1Q_2$	B	Steep	Lindbergh	N/A	0.3400	N/A
$0.1Q_2$	C	Flat	Lindbergh	N/A	0.3600	N/A
$0.1Q_2$	C	Moderate	Lindbergh	N/A	0.3600	N/A
$0.1Q_2$	C	Steep	Lindbergh	N/A	0.2400	N/A
$0.1Q_2$	D	Flat	Lindbergh	N/A	0.2600	N/A
$0.1Q_2$	D	Moderate	Lindbergh	N/A	0.2600	N/A
$0.1Q_2$	D	Steep	Lindbergh	N/A	0.1600	N/A
$0.1Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	0.5100	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	0.3400	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	0.2400	N/A
$0.1Q_2$	C	Flat	Oceanside	N/A	0.2600	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	0.2600	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	0.1800	N/A
$0.1Q_2$	A	Flat	L Wohlford	N/A	0.1800	N/A

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	A	Moderate	L Wohlford	N/A	0.1400	N/A
$0.1Q_2$	A	Steep	L Wohlford	N/A	0.0800	N/A
$0.1Q_2$	B	Flat	L Wohlford	N/A	0.4400	N/A
$0.1Q_2$	B	Moderate	L Wohlford	N/A	0.4000	N/A
$0.1Q_2$	B	Steep	L Wohlford	N/A	0.3200	N/A
$0.1Q_2$	C	Flat	L Wohlford	N/A	0.3200	N/A
$0.1Q_2$	C	Moderate	L Wohlford	N/A	0.3200	N/A
$0.1Q_2$	C	Steep	L Wohlford	N/A	0.2200	N/A
$0.1Q_2$	D	Flat	L Wohlford	N/A	0.2400	N/A
$0.1Q_2$	D	Moderate	L Wohlford	N/A	0.2400	N/A
$0.1Q_2$	D	Steep	L Wohlford	N/A	0.1800	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Bioretention surface area sizing factor (not applicable under this manual standards – use methods presented in Chapter 5 and Appendix B or Appendix F to size bioretention or biofiltration facility for pollutant control)
V_1 = Cistern volume sizing factor

Definitions for "N/A"

- Column V2: N/A in column V2 means there is no V2 element in the cistern BMP
- Column A: N/A in column A means there is no A element in the cistern BMP. Note sizing factors previously created for sizing a bioretention or biofiltration facility downstream of a cistern under the 2007 MS4 Permit are not applicable under the MS4 Permit.

Appendix

H

Forms and Checklists

Appendix H Forms and Checklists

The following Forms/Checklists/Worksheets were developed for use by the project applicant to document the storm water management design. These forms represent the forms not included as part of the Standard and PDP SWQMP Templates in Appendix A:

- I-7: Harvest and Use Feasibility Screening Checklist
- I-8: Categorization of Infiltration Feasibility Condition
- I-9: Factor of Safety and Design Infiltration Rate

<table>
<tr><th colspan="2">Harvest and Use Feasibility Checklist</th><th>Form H-7</th></tr>
<tr><td colspan="3">1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:_____</td></tr>
<tr><td colspan="3">2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.

DCV = _____ (cubic feet)</td></tr>
<tr><td>3a. Is the 36 hour demand greater than or equal to the DCV?
☐ Yes / ☐ No ⇨
⇩</td><td>3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?
☐ Yes / ☐ No ⇨
⇩</td><td>3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes
⇩</td></tr>
<tr><td>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</td><td>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</td><td>Harvest and use is considered to be infeasible.</td></tr>
<tr><td colspan="3">Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.

☐ No, select alternate BMPs.</td></tr>
</table>

Categorization of Infiltration Feasibility Condition	Form H-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form H-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form H-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form H-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form H-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

Appendix

I

USEPA Green Streets Handbook

Appendix I USEPA Green Streets Handbook

The following handbook is attached to provide guidance on green streets design. New or retrofit sidewalks, and retrofit or redeveloped existing paved alleys, streets, and roads, may qualify for PDP exemption if they are designed in accordance with the following handbook. The project proponent should consult with the EAD and FDD for additional restrictions on PDP exemption.

Appendix

J

Alternative Compliance Program

Appendix J Alternative Compliance Program

The MS4 Permit allows the Authority the discretion to develop an alternative compliance program for PDPs. Participation in this program would allow a PDP to implement flow-through BMPs onsite without completely fulfilling the pollutant control requirement in Chapter 5 of the Manual (retention and/or biofiltration to mitigate the full DCV). The portion of the DCV not retained onsite would then be mitigated via an offsite project.

J.1 Prerequisites to Program Development

Prior to the development of an alternative compliance program, the Watershed Management Area Analysis (WMAA) must be incorporated into the San Diego Bay WQIP, and the RWQCB must accept Water Quality Equivalency guidelines that provide a currency basis for demonstrating water quality benefit for offsite projects. These requirements are discussed below.

J.1.1 Watershed Management Area Analysis

A WMAA, as described in MS4 Permit Provision B.3.b(4)(a), was performed by the Copermittees and included in the San Diego Bay WQIP. As part of the WMAA, some Copermittees identified and compiled lists of candidate projects that could potentially be used as alternative compliance options for PDPs. These lists include opportunities such as:

(1) Stream or riparian area rehabilitation;
(2) Retrofitting existing infrastructure to incorporate storm water retention or treatment;
(3) Regional BMPs;
(4) Groundwater recharge projects;
(5) Water supply augmentation projects; and
(6) Land purchases to preserve floodplain functions.

At this time, the Authority has not developed a candidate project list for opportunities within the Authority's jurisdiction. A list may be developed as opportunities are identified, in which case the list will be included in the subsequent WQIP update. A PDP may independently propose a project for alternative compliance that is not on the candidate project list, as discussed in Section J.2.2.

J.1.2 Water Quality Equivalency

A Water Quality Equivalency Guidance Document was developed by the Copermittees and accepted by the RWQCB on December 17, 2015. This document provides the standards and

guidance for PDPs to demonstrate that an alternative compliance project will provide a greater overall water quality benefit than the quantifiable water quality impact from the PDP. PDPs must utilize this document to show that the volume of storm water treated through an offsite project is equal to or greater than the deficit of treated storm water from the PDP. The steps to perform these water quality equivalency calculations include:

1) Quantifying the PDP storm water pollutant control impacts;
2) Determining the alternative compliance project storm water pollutant control benefits; and
3) Determining the storm water pollutant control credits (i.e., subtracting the PDP impacts from the alternative compliance project benefits and ensuring that the result is greater than or equal to zero).

The WQE Guidance Document is located on the Project Clean Water website (www.projectcleanwater.org) and provides detailed instructions for calculating water quality equivalency for the six project types listed in Section J.1.1.

J.2 Alternative Compliance Options

The details of the alternative compliance program options are not available at this time. However, the general framework of the program is described below. Section J.2.1 describes the requirements that apply to all alternative compliance projects. Section J.2.2 describes the process for applicant-initiated alternative compliance projects. Section J.2.3 describes an in-lieu fee and/or credit program for alternative compliance.

J.2.1 General Requirements

The alternative compliance program is available to a PDP only if the PDP applicant enters into a voluntary agreement with the Authority authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Authority under the following conditions:

(1) The Authority must determine that implementation of the candidate project will have a greater overall water quality benefit for the WMA than fully complying with the onsite storm water pollutant control requirements;
(2) If a PDP applicant chooses to fully or partially fund a candidate project as described in Section J.2.2, then the in-lieu fee structure described in Provision E.3.c.(3)(d) must be followed;
(3) If the PDP applicant chooses to fully or partially fund a candidate project, then the Authority will ensure that the funds to be obtained from the PDP applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite,

pursuant to the performance requirements described in Section 5 of the Manual;

(4) If the PDP applicant chooses to implement a candidate project, then the Authority will ensure that pollutant control management within the candidate project is sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Section 5 of the Manual;

(5) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(6) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(7) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first PDP that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the RWQCB Executive Officer; and

(8) If the candidate project is constructed after the PDP is constructed, the Authority will require temporal mitigation for pollutant loads and altered flows that are discharged from the PDP.

J.2.2 Phase I

Under Phase I of the alternative compliance program, the Authority may allow a PDP applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the WMAA included in the San Diego Bay WQIP. The PDP applicant must demonstrate to the satisfaction of the EAD and FDD that implementation of the alternative compliance project will have a greater overall water quality benefit than fully complying with the performance requirements outlined in Section 5 of the Manual. This option is available to PDP applicants as of February 16, 2016.

J.2.3 Phase II

Under Phase II of the alternative compliance program, a PDP may be allowed to participate in alternative compliance through either an in-lieu fee or through compliance with a water quality credit system. Both options are currently under development and are not available to PDP applicants at this time. This Manual will be updated as the option for in-lieu fee or the credit system become available.

The Authority may allow a PDP applicant to fund, or partially fund a candidate project or an alternative compliance project through paying an in-lieu fee. The in-lieu fee structure may be

developed by the Authority individually or with other Copermittees and/or entities, and will provide a framework for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Authority (for capital projects) or an escrow account (for tenant projects) prior to the construction of the PDP.

The Authority may also develop and implement an alternative compliance water quality credit system option. A regional crediting system is currently under development; whether the Authority will participate in this regional effort or develop a jurisdiction-specific crediting system is still to be determined. Any credit system that is implemented will be submitted to the RWQCB for review and acceptance prior to its adoption by the Authority. The credit system will clearly exhibit that it will not allow discharges from the PDP to cause or contribute to a net impact over and above the impact provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements in Section 5 of the Manual.

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Glossary of Key Terms

50% Rule	Refers to an MS4 Permit standard for redevelopment PDPs (PDPs on previously developed sites) that defines whether the redevelopment PDP must meet storm water management requirements for the entire development or only for the newly created or replaced impervious surface. Refer to **Section 1.7**.
Aggregate	Hard, durable material of mineral origin typically consisting of gravel, crushed stone, crushed quarry or mine rock. Gradation varies depending on application within a BMP as bedding, filter course, or storage.
Aggregate Storage Layer	Layer within a BMP that serves to provide a conduit for conveyance, detention storage, infiltration storage, saturated storage, or a combination thereof.
Alternative Compliance Programs	A program that allows PDPs to participate in an offsite mitigation project in lieu of implementing the onsite structural BMP performance requirements required under the MS4 Permit. Refer to **Section 1.8** for more information on alternative compliance programs.
Bed Sediment	The part of the sediment load in channel flow that moves along the bed by sliding or saltation, and part of the suspended sediment load, that principally constitutes the channel bed.
Bedding	Aggregate used to establish a foundation for structures such as pipes, manholes, and pavement.
Biodegradation	Decomposition of pollutants by biological means.
Biofiltration BMPs	Biofiltration BMPs are shallow basins filled with treatment media and drainage rock that treat storm water runoff by capturing and detaining inflows prior to controlled release through minimal incidental infiltration, evapotranspiration, or discharge via underdrain or surface outlet structure. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and/or vegetative uptake. These BMPs must be sized to:[a] Treat 1.5 times the DCV not reliably retained onsite, OR[b] Treat the DCV not reliably retained

	onsite with a flow-through design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite. (See **Section 5.5.3** and **Appendix B.5** for illustration and additional information).
Biofiltration Treatment	Treatment from a BMP meeting the biofiltration standard.
Biofiltration with Partial Retention BMPs	Biofiltration with partial retention BMPs are shallow basins filled with treatment media and drainage rock that manage storm water runoff through infiltration, evapotranspiration, and biofiltration. Partial retention is characterized by a subsurface stone infiltration storage zone in the bottom of the BMP below the elevation of the discharge from the underdrains. The discharge of biofiltered water from the underdrain occurs when the water level in the infiltration storage zone exceeds the elevation of the underdrain outlet. (See **Section 5.5.2.1** for illustration and additional information).
Bioretention BMPs	Vegetated surface water systems that filter water through vegetation and soil, or engineered media prior to infiltrating into native soils. Bioretention BMPs in this manual retain the entire DCV prior to overflow to the downstream conveyance system. (See **Section 5.5.1.2** for illustration and additional information).
BMP	A procedure or device designed to minimize the quantity of runoff pollutants and / or volumes that flow to downstream receiving water bodies. Refer to **Section 2.2.2.1**.
BMP Sizing Calculator	An on-line tool that was developed under the 2007 MS4 Permit to facilitate the sizing factor method for designing flow control BMPs for hydromodification management. The BMP Sizing Calculator has been discontinued as of June 30, 2014.
Cistern	A vessel for storing water. In this manual, a cistern is typically a rain barrel, tank, vault, or other artificial reservoir.
Coarse Sediment Yield Area	A GLU with coarse-grained geologic material (material that is expected to produce greater than 50% sand when weathered). See the following terms modifying coarse sediment yield area: critical, potential critical.
Compact Biofiltration BMP	A biofiltration BMP, either proprietary or non-proprietary in origin, that is designed to provide storm water pollutant control within a smaller footprint than a typical biofiltration BMP, usually through use

of specialized media that is able to efficiently treat high storm water inflow rates.

Conditions of Approval

Requirements a jurisdiction may adopt for a project in connection with a discretionary action (e.g., issuance of a use permit). COAs may include features to be incorporated into the final plans for the project and may also specify uses, activities, and operational measures that must be observed over the life of the project.

Contemporary Design Standards

This term refers to design standards that are reasonably consistent with the current state of practice and are based on desired outcomes that are reasonably consistent with the context of the MS4 Permit and Model BMP Design Manual. For example, a detention basin that is designed solely to mitigate peak flow rates would not be considered a contemporary water quality BMP design because it is not consistent with the goal of water quality improvement. Current state of the practice recognizes that a drawdown time of 24 to 72 hour is typically needed to promote settling. For practical purposes, design standards can be considered "contemporary" if they have been published within the last 10 years, preferably in California or Washington State, and are specifically intended for storm water quality management.

Continuous Simulation Modeling

A method of hydrological analysis in which a set of rainfall data (typically hourly for 30 years or more) is used as input, and a continuous runoff hydrograph is calculated over the same time period. Continuous simulation models typical track dynamic soil and storage conditions during and between storm events. The output is then analyzed statistically for the purposes of comparing runoff patterns under different conditions (for example, pre- and post-development-project).

Copermittees

See Jurisdiction.

Critical Channel Flow (Qc)

The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Critical Coarse Sediment Yield Areas

A GLU with coarse-grained geologic material and high relative sediment production, where the sediment produced is critical to the receiving stream (a source of bed material to the receiving stream). See

	also: potential critical coarse sediment yield area.
Critical Shear Stress	The shear stress that initiates channel bed movement or that erodes the toe of channel banks. See also critical channel flow.
DCV	A volume of storm water runoff produced from the 85th percentile, 24-hour storm event. See **Section 2.2.2.2**.
De Minimis DMA	De minimis DMAs are very small areas that are not considered to be significant contributors of pollutants, and are considered not practicable to drain to a BMP. See **Section 5.2.2**.
Depth	The distance from the top, or surface, to the bottom of a BMP component.
Detention	Temporarily holding back storm water runoff via a designed outlet (e.g., underdrain, orifice) to provide flow rate and duration control.
Detention Storage	Storage that provides detention as the outflow mechanism.
Development Footprint	The limits of all grading and ground disturbance, including landscaping, associated with a project.
Development Project	Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects. Includes both new development and redevelopment. Also includes whole of the action as defined by CEQA. See **Section 1.3.**
Direct Discharge	The connection of project site runoff to an exempt receiving water body, which could include an exempt river reach, reservoir or lagoon. To qualify as a direct discharge, the discharge elevation from the project site outfall must be at or below either the normal operating water surface elevation or the reservoir spillway elevation, and properly designed energy dissipation must be provided. "Direct discharge" may be more specifically defined by each municipality.
Direct Infiltration	Infiltration via methods or devices, such as dry wells or infiltration trenches, designed to bypass the mantle of surface soils that is unsaturated and more organically active and transmit runoff directly to deeper subsurface soils.
DMAs	See **Section 3.3.3**.

Drawdown Time	The time required for a storm water detention or infiltration facility to drain and return to the dry-weather condition. For detention facilities, drawdown time is a function of basin volume and outlet orifice size. For infiltration facilities, drawdown time is a function of basin volume and infiltration rate.
Enclosed Embayments (Enclosed Bays)	Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters. In San Diego: Mission Bay and San Diego Bay.
Environmentally Sensitive Areas (ESAs)	Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.
Filter Course	Aggregate used to prevent particle migration between two different materials when storm water runoff passes through.
Filter Fabric	A permeable textile material, also termed a non-woven geotextile, that prevents particle migration between two different materials when storm water runoff passes through.
Filtration	Controlled seepage of storm water runoff through media, vegetation, or aggregate to reduce pollutants via physical separation.
Flow Control	Control of runoff rates and durations as required by the HMP.
Flow Control BMP	A structural BMP designed to provide control of post-project runoff flow rates and durations for the purpose of hydromodification management.
Flow-through Treatment	Treatment from a BMP meeting the flow-through treatment control standard.
Flow-Through	Flow-through treatment control BMPs are structural, engineered

Treatment BMPs	facilities that are designed to remove pollutants from storm water runoff using treatment processes that do not incorporate significant biological methods. Flow-through BMPs include vegetated swales, media filters, sand filters, and dry extended detention basins. (See **Section 5.5.4** for illustration and additional information).
Forebay	An initial storage area at the entrance to a structural BMP designed to trap and settle out solid pollutants such as sediment in a concentrated location, to provide pre-treatment within the structural BMP and facilitate removal of solid pollutants during maintenance operations.
Full Infiltration	Infiltration of a storm water runoff volume equal to the DCV.
Geomorphic Assessment	A quantification or measure of the changing properties of a stream channel.
Geomorphically Significant Flows	Flows that have the potential to cause, or accelerate, stream channel erosion or other adverse impacts to beneficial stream uses. The range of geomorphically significant flows was determined as part of the development of the March 2011 Final HMP, and has not changed under the 2013 MS4 Permit. However, under the 2013 MS4 Permit, Q2 and Q10 must be based on the pre-development condition rather than the pre-project condition, meaning that no pre-project impervious area may be considered in the computation of pre-development Q2 and Q10.
GLUs	Classifications that provide an estimate of sediment yield based upon three factors: geology, hillslope, and land cover. GLUs are developed based on the methodology presented in the SCCWRP Technical Report 605 titled "Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge" (SCCWRP, 2010).
Gross Pollutants	In storm water, generally litter (trash), organic debris (leaves, branches, seeds, twigs, grass clippings), and coarse sediments (inorganic breakdown products from soils, pavement, or building materials).
Harvest and Use BMP	Harvest and use (aka rainwater harvesting) BMPs capture and store storm water runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. (See **Section 5.5.1.1** for illustration and

	additional information).
HMP	A plan implemented by the Copermittees so that post-project runoff shall not exceed estimated pre-development rates and/or durations by more than 10%, where increased runoff would result in increased potential for erosion or other adverse impacts to beneficial uses. The March 2011 Final HMP and the updated MS4 Permit are the basis of the flow control requirements of this manual.
Hungry Water	Also known as "sediment-starved" water, "hungry" water refers to channel flow that is hungry for sediment from the channel bed or banks because it currently contains less bed material sediment than it is capable of conveying. The "hungry water" phenomenon occurs when the natural sediment load decreases and the erosive force of the runoff increases as a natural counterbalance, as described by Lane's Equation.
Hydraulic Head	Energy represented as a difference in elevation, typically as the difference between the inlet and outlet water surface elevation for a BMP.
Hydraulic Residence Time	The length of time between inflow and outflow that runoff remains in a BMP.
Hydrologic Soil Group	Classification of soils by the Natural Resources Conservation Service (NRCS) into A, B, C, and D groups according to infiltration capacity.
Hydromodification	The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive stream-bank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.
Hydromodification Management BMP	A structural BMP for the purpose of hydromodification management, either for protection of critical coarse sediment yield areas or for flow control. See also flow control BMP.
Impervious Surface	Any material that prevents or substantially reduces infiltration of water into the soil.

Infeasible	As applied to BMPs, refers to condition in which a BMP approach is not practicable based on technical constraints specific to the site, including by not limited to physical constraints, risks of impacts to environmental resources, risks of harm to human health, or risk of loss or damage to property. Feasibility criteria are provided in this manual.
Infiltration	In the context of LID, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].
Infiltration BMP	Infiltration BMPs are structural measures that capture, store and infiltrate storm water runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. These types of BMPs may also support evapotranspiration processes, but are characterized by having their most dominant volume losses due to infiltration. (See **Section 5.5.1.2** for illustration and additional information).
Jurisdiction	The term "jurisdiction" is used in this manual to refer to individual copermittees who have independent responsibility for implementing the requirements of the MS4 Permit.
LID	A storm water management and land development strategy that emphasizes conservation and the use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. See **Site Design**.
Lower Flow Threshold	The lower limit of the range of flows to be controlled for hydromodification management. The lower flow threshold is the flow at which erosion of sediment from the stream bed or banks begins to occur. See also critical channel flow. For the San Diego region, the lower flow threshold shall be a fraction (0.1, 0.3, or 0.5) of the pre-development 2-year flow rate based on continuous simulation modeling (0.1Q2, 0.3Q2, or 0.5Q2).

Media	Storm water runoff pollutant treatment material, typically included as a permeable constructed bed or container (cartridge) within a BMP.
MEP	Refer to the definition in the MS4 Permit. [Appendix C, Definitions, Page C-6]
National Pollutant Discharge Elimination System	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.
New Development	Land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.
O&M	Requirements in the MS4 Permit to inspect structural BMPs and verify the implementation of operational practices and preventative and corrective maintenance in perpetuity.
Partial Infiltration	Infiltration of a storm water runoff volume less than the DCV.
Partial Retention	Partial retention category is defined by structural measures that incorporate both infiltration (in the lower treatment zone) and biofiltration (in the upper treatment zone).
PDPs	As defined by the MS4 Permit provision E.3.b, land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements in addition to those required of Standard Projects. Refer to **Section 1.4** to determine if your project is a PDP.
PDPs with only Pollutant Control Requirements	PDPs that need to meet Source Control, Site Design and Pollutant Control Requirements (but are exempt from Hydromodification Management Requirements).
PDPs with Pollutant Control and Hydromodification Management Requirements	PDPs that need to meet Source Control, Site Design, Pollutant Control and Hydromodification Management Requirements.

Point of Compliance	1. For channel screening and determination of low flow threshold: the point at which collected storm water from a development is delivered from a constructed or modified drainage system into a natural or un-lined channel. POC for channel screening may be located onsite or offsite, depending on where runoff from the project meets a natural or un-lined channel. 2. For flow control: the point at which pre-development and post-development flow rates and durations will be compared. POC for flow control is typically onsite. A project may have a different POC for channel screening vs. POC for flow control if runoff from the project site is conveyed in hardened systems from the project site boundary to the natural or un-lined channel.
Pollutant Control	Control of pollutants via physical, chemical or biological processes
Pollution Prevention	Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.
Post-Project Hydrology Flows, Volumes	The peak runoff flows and runoff volume anticipated after the project has been constructed taking into account all permeable and impermeable surfaces, soil and vegetation types and conditions after landscaping is complete, detention or retention basins or other water storage elements incorporated into the site design, and any other site features that would affect runoff volumes and peak flows.
Potential Critical Coarse Sediment Yield Area	A GLU with coarse-grained geologic material and high relative sediment production, as defined in the Regional WMAA. The Regional WMAA identified GLUs as potential critical coarse sediment yield areas based on slope, geology, and land cover. GLU analysis does not determine whether the sediment produced is critical to the receiving stream (a source of bed material to the receiving stream) therefore the areas are designated as potential.
Pre-Development Runoff Conditions	Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before any new project disturbance or grading. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment PDP must use available information pertaining to existing underlying

	soil type and onsite existing grade to estimate pre-development runoff conditions.
Pre-Project Condition	The condition prior to any project work or the existing condition. Note that pre-project condition and pre-development condition will not be the same for redevelopment projects.
Pretreatment	Removal of gross solids, including organic debris and coarse sediment, from runoff to minimize clogging and increase the effectiveness of BMPs.
Project Area	All areas proposed by an applicant to be altered or developed, plus any additional areas that drain on to areas to be altered or developed. Also see **Section 1.3**.
Project Submittal	Documents submitted to a jurisdiction or Copermittee in connection with an application for development approval and demonstrating compliance with MS4 Permit requirements for the project. Specific requirements vary from municipality to municipality.
Proprietary BMP	BMP designed and marketed by private business for treatment of storm water. Check with EAD prior to proposing to use a proprietary BMP.
Receiving Waters	See **Waters of the United States**.
Redevelopment	The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.
Retrofitting	Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but

	is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.
Regional Water Quality Control Board (SDRWQCB)	California RWQCBs are responsible for implementing pollution control provisions of the Clean Water Act and California Water Code within their jurisdiction. There are nine California RWQCBs.
Retention (Retention BMPs)	A category of BMP that does not have any service outlets that discharge to surface water or to a conveyance system that drains to surface waters for the design event (i.e. 85th percentile 24-hour). Mechanisms used for storm water retention include infiltration, evapotranspiration, and use of retained water for non-potable or potable purposes.
Saturated Storage	Storage that provides a permanent volume of water at the bottom of the BMP as an anaerobic zone to promote denitrification and/or thermal pollution control. Also known as internal water storage or a saturation zone.
Self-mitigating Areas	A natural, landscaped, or turf area that does not generate significant pollutants and drains directly offsite or to the public storm drain system without being treated by a structural BMP. See **Section 5.2.1**.
Self-retaining DMA via Qualifying Site Design BMPs	An area designed to retain runoff to fully eliminate storm water runoff from the 85th percentile 24 hours storm event; See **Section 5.2.3**.
SIC	A Federal government system for classifying industries by 4-digit code. It is being supplanted by the North American Industrial Classification System but SIC codes are still referenced by the Regional Water Board in identifying development sites subject to regulation under the National Pollutant Discharge Elimination System permit. Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html
Significant Redevelopment	Redevelopment that meets the definition of a "PDP" in this manual. See **Section 1.4**.
Site Design	A storm water management and land development strategy that emphasizes conservation of natural features and the use of onsite

	natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.
Sizing Factor Method	A method for designing flow control BMPs for hydromodification management using sizing factors developed from unit area continuous simulation models.
Sorption	Physical and/or chemical process where pollutants are taken out of runoff through attachment to another substance.
Source Control	Land use or site planning practices, or structures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimizes the contact between pollutants and storm water runoff. Examples include roof structures over trash or material storage areas, and berms around fuel dispensing areas. Source control BMPs are described within this manual.
Standard Project	Any development project that is not defined as a PDP by the MS4 Permit.
Storm Water Conveyance System	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the Clean Water Act that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works as defined at 40 CFR 122.26.
Storm Water Pollutant Control BMP	A category of storm water management requirements that includes treatment of storm water to remove pollutants by measures such as retention, biofiltration, and/or flow-through treatment control, as specified in this manual. Also called a Pollutant Control BMP.

Structural BMP	Throughout the manual, the term "structural BMP" is a general term that encompasses the pollutant control BMPs and hydromodification BMPs required for PDPs under the MS4 Permit. A structural BMP may be a pollutant control BMP, a hydromodification management BMP, or an integrated pollutant control and hydromodification management BMP. Structural BMPs as defined in the MS4 Permit are: a subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.
Subgrade	In-situ soil that lies underneath a BMP.
Tributary Area	The total surface area of land or hardscape that contributes runoff to the BMP; including any offsite or onsite areas that comingles with project runoff and drains to the BMP. Refer to **Section 3.3.3** for additional guidance Also termed the drainage area or catchment area.
Unified BMP Design Approach	This term refers to the standardized process for site and watershed investigation, BMP selection, BMP sizing, and BMP design that is outlined and described in this manual with associated appendices and templates. This approach is considered to be "unified" because it represents a pathway for compliance with MS4 Permit requirements that is anticipated to be reasonably consistent across the local jurisdictions in San Diego County. In contrast, applicants may choose to take an alternative approach where they demonstrate to the satisfaction of the Copermittee, in their submittal, compliance with applicable performance standards without necessarily following the process identified in this manual.
Upper Flow Threshold	The upper limit of the range of flows to be controlled for hydromodification management. For the San Diego region, the upper flow threshold shall be the pre-development 10-year flow rate (Q10) based on continuous simulation modeling.
Vactor	Refers to a sewer or storm drain cleaning truck equipped to remove materials from sewer or storm drain pipes or structures, including some storm water BMPs.
Vector	An animal or insect capable of transmitting the causative agent of human disease. An example of a vector in San Diego County that is of concern in storm water management is a mosquito.

Water Quality Improvement Plan

Copermittees are required to develop a Water Quality Improvement Plan for each Watershed Management Area in the San Diego Region. The purpose of the Water Quality Improvement Plans is to guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. WQIPs requirements are defined in the MS4 Permit provision B.

Waters of the United States

Surface bodies of water, including naturally occurring wetlands, streams (perennial, intermittent, and ephemeral (exhibiting bed, bank, and ordinary high water mark)), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean which directly or indirectly receive discharges from storm water conveyance systems. The Copermittee shall determine the definition for wetlands and the limits thereof for the purposes of this definition, which shall be as protective as the Federal definition utilized by the United States Army Corps of Engineers and the United States Environmental Protection Agency. Constructed wetlands are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs are not considered receiving waters under this definition, unless the BMP was originally constructed within the boundaries of the receiving waters. Also see MS4 permit definition.

Watershed Management Area

The ten areas defined by the SDRWQCB in Regional MS4 Permit provision B.1, Table B-1. Each Watershed Management Area is defined by one or more Hydrologic Unit, major surface water body, and responsible Copermittee.

Watershed Management Area Analysis

For each Watershed Management Area, the Copermittees have the option to perform a WMAA for the purpose of developing watershed-specific requirements for structural BMP implementation. Each WMAA includes: GIS layers developed to provide physical characteristics of the watershed management area, a list of potential offsite alternative compliance projects, and areas exempt from hydromodification management requirements.

APPENDIX D-1
INDUSTRIAL MONITORING IMPLEMENTATION PLAN


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

APPENDIX D-1: INDUSTRIAL MONITORING IMPLEMENTATION PLAN

1.0 INTRODUCTION

Section XI of State Water Resources Control Board (State Water Board) Order No. 2014-0057-DWQ (the Industrial Permit) requires wet weather monitoring and assessment of storm water runoff. The major monitoring objectives, as outlined in the Industrial Permit Fact Sheet, are to:

1) Demonstrate compliance with the Industrial Permit, per the monitoring implementation plan requirements.

2) Aid in the implementation of the Storm Water Pollution Prevention Plan (SWPPP) outlined in Section 7.0 of this Storm Water Management Plan (SWMP).

3) Measure the effectiveness of best management practices (BMPs) in reducing or preventing pollutants in storm water discharges and authorized non-storm water discharges.

The Industrial Permit (State Water Board Order No. 2014-0057-DWQ, April 1, 2014) took effect on July 1, 2015. This document leads to modifications in the industrial wet weather monitoring program requirements, including the following:

- Number of events –The number of qualifying storm events (QSEs) required annually will increase from two to four. The Authority previously sampled the first storm event during the wet season (October 1 through May 30), and a second event, to be sampled at any time during the wet season. The new permit requires that samples be collected for two QSEs in the first half of the reporting year (July 1 through December 31) and two QSEs in the second half of the reporting year (January 1 through June 30).

- Timing of events – The previous permit required that samples be collected within the first hour of discharge; the new permit extends this time frame to the first four hours of discharge, or the first four hours of facility operation if the QSE occurs outside of facility operating hours and within the previous 12-hour period.

- Definition of a QSE – The new permit specifies that a qualifying storm event is one that produces discharge from at least one drainage area and is preceded by 48 hours with no discharge from any drainage area.

- Visual observation requirements – The new permit requires storm water discharge visual observations only during sampling, rather than requiring observations for one storm event per month during the wet season, as the previous permit required.

- Analytical parameters – The new permit requires permittees to consider Clean Water Act Section 303(d)-listed (303(d)-list) impairments, total maximum daily loads (TMDLs), October 2012 Ocean Plan modifications, and 40 Code of Federal Regulations (CFR) Subchapter N Effluent Limitation Guidelines (ELGs) when selecting analytical parameters, where applicable.

- Exceedance response – The new permit defines two types of numeric action level exceedances (annual and instantaneous maximum) and requires permittees to develop Exceedance Response Actions (ERAs) for numeric action level (NAL) exceedances.

2.0 SAMPLING LOCATION SELECTION

Seventeen sampling locations, and one alternative location, have been identified at SAN, pursuant to the Industrial Permit. These locations are shown on the SWMP site map (Figure 3) and in Table D1-1.

2.1 MONITORING LOCATIONS

Table D1-1. Sampling Locations for Compliance Monitoring

Sampling Location ID[1]	Drainage Basin	Sampling Method	Location Description
C-B03-1c	3[2]	Grab[3]	Sheet flow at storm drain inlet, over zipper line in oval
C-B03-2	3	Grab[3]	Sheet flow at storm drain inlet by blast fence
C-B05-4	5	Grab[3]	Sheet flow from taxiway near storm drain inlet at generator area
C-B06-5a	6	Grab[4]	Inlet pipe in manhole downstream of Central Receiving and Distribution Center (CRDC) BMPs
C-B07-6	7	Grab[3]	Inlet pipe in manhole collecting effluent of Menzies/American oil-water separator (OWS)
C-B07-7[5]	7	Grab[3]	Effluent downstream of maintenance/cargo area
C-B08-8	8	Grab[4]	Sheet flow from the loading area of Terminal 1
C-B12-9a	12	Grab[6]	Inlet pipe at storm drain inlet near Terminal 2 West
C-B05-13	5	Grab[3]	Sheet flow at storm drain inlet near DHL
C-B06-14	6	Grab[4]	Sheet flow at storm drain inlet near FedEx loading area and material storage
C-B06-15a	6	Grab[3]	Sheet flow at storm drain in front of Airport Rescue and Fire-Fighting Facility (ARFF)
C-B06-16a[7]	6	Grab[4]	Inlet pipe at trench drain draining storage area near Commuter Terminal
C-B06-17	6	Grab[3]	Sheet flow from taxiway and at aircraft parking area
C-B15-18a	15	Grab[3]	Sheet flow at trench drain near Gate 46
C-B06-19	6	Grab[3]	Sheet flow at NE drain in Allied Aviation's operating area
C-B06-20	6	Grab[3]	OWS effluent at Allied Aviation's Remote Fueling Facility. Call Allied to operate.
C-B03-21[8]	3	Grab [3]	StormFilter effluent at west corner of Signature FBO
Alternate Sampling Location			
C-B08-22[9]	8	Grab[1]	Sheet flow from runway area taken south of the perimeter road

Notes:

* Sampling location replaced sites C-B01-11 and C-B03-121. Sampling locations C-B05-3 and C-B09-10b are no longer being sampled for compliance purposes because these sites are non-industrial (i.e. parking lots).

2. Drainage basin has changed from 1 to 3 at this site because of the decommissioning of part of the storm drain line in Taxiway C, linking the site to Outfall 1. It now drains to Outfall 3 and is located in a runway oval.

3. Grab sample will be collected manually.

4. Grab sample will be collected using automated sampling equipment.

5. Sampling site moved back to original location after installation of new MetalZorb BMP in December 2018 (an ERA following the Authority's entry into Level 2 for copper and zinc).

6. Grab sample will be collected using automated sampling equipment. If San Diego Bay MS4 sampling is occurring during the same storm event, the equipment will be set to collect a composite. Manual grab sampling is difficult because of the high volume of traffic.
7. Sampling location moved back to C-B06-16a following completion of construction and closing of construction staging yard.
8. Sampling location replaced sites C-B01-11 and C-B03-12 and drains from basins 1 and 3 via a StormFilter BMP.
9. Alternate sampling location for runway. If site C-B03-1c is inaccessible for safety reasons, site C-B08-22 will be sampled instead.

Currently, Basins 1, 3, 5, 6, 7, 8, 12, and 15 contain industrial activities; because of their volume of flow and types of the activities, these basins are most likely to have illicit discharges and/or illicit connections. Industrial Permit storm water monitoring and visual observation sites are located in these eight drainage areas. In Basins 3, 5, 6, 7, and 8, several locations will be monitored because a single sampling location could not represent all industrial activities in the basins.

A portion of Basin 4 was developed into a parking area as a component of the improvements at the former Teledyne Ryan Aeronautics site. The eastern portion of this basin consists of perimeter road, public transportation, and Least Turn nesting habitat. The small portion of taxiway area contained within this drainage basin is considered inaccessible for sampling because of safety hazards within the blast fence area. Taxiway and ramp activities will alternatively be captured within Basins 3, 5, 6, 8, 12, and 15.

Basins 5a, 9, 10, 11, 13, and 14 are not exposed to industrial activities, and therefore runoff is not required to be collected within these drainage basins, pursuant to Section XI.C.6.c of the Industrial Permit. Drainage Basin 2 has been integrated with Drainage Basin 1, due to the determination that the flows at the far eastern end of the runway (which contains a storm drain inlet and part of the vehicle service road that circles the perimeter of the airfield) were actually draining to the same outfall from Drainage Basin 1.

Detailed descriptions of the drainage basins and associated activities are included in Section 1.4. Sampling locations were selected as far downstream as possible to capture multiple areas with industrial activities within a given drainage basin. Where sampling locations are tidally influenced or access is restricted (e.g., when they are over the zipper line demarcating the edge of the taxiway area surrounding the runway), sheet flow runoff will be collected. Effluent from newly installed treatment control best management practices (BMPs) has been targeted for sampling to reflect the anticipated potential pollutant removal benefit of the BMPs.

2.2 ALTERNATIVE DISCHARGE LOCATIONS

Section XI.C.3 of the Industrial Permit allows Copermittees to choose alternative discharge locations for discharge points if the discharge location is either affected by storm water run-on from surrounding areas that cannot be controlled, or difficult to observe or sample. Sampling of the runway poses both safety and security concerns, as most of the runway discharges at points within the boundaries of aircraft taxiway, takeoff, and landing areas. Downstream storm drain lines cannot be sampled because these underground drains are tidally influenced and therefore their flows are not representative of storm water runoff. Storm water samples representative of runway industrial activities will be collected at site C-B03-1c, as sheet flow runoff is discharged from the eastern end of the runway, near where aircraft generally land. If sampling at this location is not possible because of the high volume of aircraft traffic or limited availability of Authority personnel, site C-B08-22 will be sampled instead. This same exception will be applied to the taxiway activities within Basin 1. Only a small portion of these drainage basins is exposed to aircraft taxiway areas. Sampling of the taxiway within these drainage basins would require field crew access inside of the blast fence area where aircraft take off and land. Sampling within this area poses safety hazards and security concerns for the Authority. Taxiway activities will be captured within Basin 3, which is located adjacent to Basin 4 on the south

side of the runway, and Basin 6, which is located on the north side of the runway, at sites C-B03-2 and C-B06-17, and will capture the same taxiway activities.

3.0 REPRESENTATIVE SAMPLING REDUCTION JUSTIFICATION

Pursuant to Section XI.C.4 of the Industrial Permit, if the industrial activities, BMPs, and physical characteristics within a drainage area are found to be "substantially similar," the Authority may collect samples from a reduced number of sampling locations within that drainage basin. There are numerous storm drain inlets throughout SAN for drainage during storm events. If a downstream location representative of all industrial activities cannot be feasibly sampled within a particular drainage basin with multiple storm drain inlets, substantially similar industrial activities will be represented by one sampling point within that basin.

Representative sampling reduction monitoring locations have been chosen to sample industrial activities within the following drainage basins.

Basin 1: This drainage basin is composed of two adjacent drainage areas. The industrial activities in these areas include aircraft taxiway and runway areas. However, sampling within this drainage basin poses safety hazards and security concerns for the Authority, as explained in Section 2.2 of this Appendix; therefore this area will not be sampled, per Section XI.C.3.a.ii of the Industrial Permit. Two infiltration trenches previously implemented were removed and replaced with a Stormfilter. Sampling sites C-B01-11 and C-B03-12 have been removed and replaced with the site C-B03-21. This new location allows drainage from Basin 1 and Basin 3 to be sampled via the effluent from the recently implemented StormFilter. Treatment of this effluent was not possible from sites C-B01-11 and C-B03-12 and this is the reason for their removal. Runway and taxiway activities (aircraft taxi, takeoff and landing) will be captured at the Alternative Discharge Location C-B08-22, as discussed in Section 2.2 of this Appendix.

Basin 6: FedEx, ARFF, Bradford's Central Receiving and Distribution Center (CRDC), Allied Aviation, and the Authority all operate within this drainage basin. Fuel storage and operations include the Aircraft Fuel Storage Facility (FSF), Remote Fueling Facility (RFF), two 1-million gallon aboveground storage tanks (ASTs) for jet fuel, and gasoline and diesel underground storage tanks (USTs). Taxiways and Authority equipment and materials storage is located at the northern end of the drainage basin. The old Commuter Terminal ramp area is located on the southern end of the drainage basin on the opposite side of the runway, though this terminal is no longer operating as a ramp area, since flights will not be arriving or departing there. The Terminal now contains offices and equipment storage only. Sampling locations have been chosen to capture the various industrial activities within these areas. However, the aircraft taxiway drains to many different storm drain inlets. Therefore, site C-B06-17 is located downstream from operations on the northern end of the drainage basin; this site was chosen to represent taxiway runoff discharges from multiple discharge points within this drainage basin.

Treatment Control BMPs (TCBMPs) in this drainage basin include permeable pavement in the employee and long-term parking lots near the Commuter Terminal, one OWS near the FSF, two OWS units downstream of Northside taxiway runoff discharge points, one OWS at the RFF, and one OWS on the Commuter Terminal ramp. The effluent pipes draining from some of the OWSs are tidally influenced and therefore cannot be sampled. Bio-Clean Trench Drain Filters are located near CRDC to filter pollutants associated with the loading and unloading activities in the area, and sampling location C-B06-5a samples the effluent from these BMPs. All other activities and physical characteristics are considered substantially similar for the taxiway storm drain inlets within this drainage basin, so as stated above, C-B06-17 will sample representative runoff from these areas. Paved surfaces are composed of 16-inch thick concrete on top of an aggregate base.

Basin 8: Terminal 1 industrial activities are contained within this drainage basin, and discharge to multiple storm drain inlets. The ramp and apron areas for Terminal 1 and Terminal 2 East are composed of 16 inches of concrete on top of 12 inches of aggregate base and 4 inches of permeable pavement, constructed during the 1992 East Terminal Apron Rehabilitation project. The pavement materials and coverage is comparable for all ramp and terminal discharge points within Basins 8 and 12.

Industrial activities include:

- Aircraft taxiing, loading, fueling, deicing (Gates 1 through 9, away from storm drains and only as needed), and minor maintenance
- Waste storage
- Materials storage and handling
- Vehicle fueling, washing, and minor maintenance

Sampling will occur at the trench drain that collects runoff from Terminal Gates 7 through 9 and 13 (C-B08-8). These gates are occupied primarily by Southwest and Alaska Airlines. All industrial activities discussed above occur within the area where runoff will be sampled.

Basin 12: Terminal 2 East and the eastern half of Terminal 2 West are located within the boundaries of this drainage basin. Industrial activities include:

- Aircraft taxiing, loading, fueling, and minor maintenance
- Waste storage
- Materials storage and handling
- Vehicle fueling and minor maintenance

Paved surface materials are similar to those in Basin 8. Sampling will occur within a manhole at the storm drain inlet pipe (C-B12-9a). Runoff from Terminal 2 ramp area gates will be collected at this sampling location, and will represent all industrial activities of Terminal 2.

Basin 15: Terminal 2 West and the Remain Over Night (RON) aircraft parking area are located within this new drainage basin developed as part of the Green Build expansion of Terminal 2. Operations within the RON include aircraft overnight parking and fueling. These industrial activities also take place near the Terminal 2 West location. A high-rate media filter and 1.75 acres of permeable artificial turf were constructed on the far western end of the drainage basin. The artificial turf effluent is tidally influenced and cannot be sampled. A single sampling location (C-B15-18, now moved to C-B15-18a due to construction) was chosen at the trench drain downstream of Terminal 2 West location and aircraft operational areas to capture ramp and overnight parking activities.

4.0 SAMPLING VISUAL OBSERVATIONS

Visual observations will be recorded at each monitoring location during all wet weather sampling events at the time of sampling. Observations of floating or suspended materials, oil and grease, discolorations, turbidity, odors, trash and debris, and source(s) of any discharged pollutants will be recorded, as applicable. If visual observations are not recorded for any monitoring location or sampling event, an explanation will be provided in the Industrial Permit Annual Report. Observers will record the following information during storm water monitoring events:

- Date and time
- Name of observer
- Locations observed
- Description of any observed pollutants
- Probable source of the observed pollutant, if applicable
- Applicable response actions or Storm Water Pollution Prevention Plan (SWPPP) revisions necessary

Bypass from volume or flow-based TCBMPs will be sampled when feasible during storm events where visual observations or monitoring occur, unless the bypass is predetermined to be tidally influenced; in this case, samples would not be representative of storm water runoff.

If a discharge location is not observed during a sampling event, the observer will record the unobserved discharge locations or that there was no discharge from the discharge location.

4.1 DRY WEATHER VISUAL OBSERVATIONS

The Authority performs monthly visual observations of each drainage basin during dry weather periods in daylight, during scheduled facility operating hours. Monthly visual observations are conducted to identify and evaluate:

1) The presence or indications of prior, current, or potential unauthorized non-storm water discharges (NSWDs) and their sources

2) Authorized NSWDs, sources, and associated BMPs to ensure that BMPs reduce or eliminate contact of authorized NSWDs with pollutants, reduce their flow or volume, reflect best available technology (BAT)/best conventional technology (BCT), and do not cause or contribute to an exceedance of any water quality standards

3) Outdoor industrial equipment and storage areas, outdoor industrial activity areas, BMPs, and all other potential sources of industrial pollutants

If pollutants are observed during monthly visual observations, their probable source will be recorded in the Authority's Web-based database, along with any corrective actions taken or SWPPP revisions necessary. If observations reveal that BMPs are not sufficient to address the associated pollutant, the implemented BMP(s) will be reconsidered and revised as necessary to address the deficiency.

The Authority will provide an explanation in the Industrial Permit Annual Report for any incomplete monthly visual observations.

4.2 VISUAL OBSERVATION RESPONSE PROCEDURES

If irregularities in storm water color, clarity, or odor are observed during wet weather sampling (i.e., suspended materials, oil and grease, discolorations, turbidity, odors, trash and debris, etc.) or NSWDs are observed during dry weather visual observations, efforts will be made to identify the source of the pollutants. Field teams will then investigate the area surrounding the sample location to identify potential pollutant sources. If no source is observed in the immediate area, the investigation will continue upstream of the sample location. If observers are unable to identify potential sources, the lack of potential sources will be noted on the field sheet. If the source is identified, the field team will record the source on the field sheet and report the location of the pollutant and source to the Environmental Affairs Department (EAD). The EAD will then notify the responsible party and require, through verbal or written communication, that corrective actions be taken to reduce or prevent the pollutants from contacting storm water discharge, or to mitigate or eliminate the NSWD. The observation and corresponding corrective action will be recorded in the Authority's Web-based database. The responsible party will then be required to record in the database when and how the issue has been corrected. A follow-up investigation will be performed if the issue has not been corrected. If the source of the observed pollutant is an unauthorized discharge, immediate action will be taken to stop or control active prohibited discharges, spills, or obvious illicit discharges.

5.0 SAMPLING AND ANALYSIS

5.1 FIELD TEAMS

Visual observations and storm water sampling will be conducted by EAD staff or a contractor for EAD. Staff will follow all procedures specified in this Monitoring Implementation Plan.

5.2 SAMPLING FREQUENCY

As required by Section XI.B.2 of the Industrial Permit, the Authority will sample two QSEs during the first half of the reporting year (July 1 through December 31) and two QSEs during the second half (January 1 through June 30). If no NAL exceedances are identified for four consecutive QSEs, and the Authority is in full compliance with the new permit, the Authority may reduce sampling frequency from four samples within each reporting year to two samples within each reporting year.

The Regional Water Board has the discretion to reject the Sampling Frequency Reduction Certification if enforcement actions have been implemented. If the conditions above are met, the certification will be entered into Storm Water Multiple Application Report Tracking System (SMARTS) and the monitoring plan will be revised to collect and analyze samples from one QSE within the first half of the reporting year and one QSE within the second half of the reporting year.

If at any point an NAL exceedance occurs, monitoring of four QSEs per year will resume and the certification will be removed from SMARTS.

5.2.1 PARAMETERS FOR ANALYSIS

Historical Exceedances

Based on data collected from the previous eight seasons, copper and zinc (total and dissolved) are the primary Pollutants of Concern (POCs) because they had the highest exceedance frequencies of benchmark values evaluated in the 2014 Site Audit at SAN and in annual reporting. Benchmark values were derived from the NALs established in the Industrial Permit. The remaining benchmark values were derived from water quality criteria of the California Toxics Rule (Saltwater and Freshwater Consumption of Aquatic Organisms), United States Environmental Protection Agency (USEPA) Multi-Sector General Permit (MSGP) 2008 Factsheet, and USEPA Recommended Ambient Water Quality Criteria (Saltwater and Freshwater Aquatic Life Protection). Three benchmarks, those for ethylene glycol, Methylene Blue Active Substances (MBAS), and specific conductance, were not listed in the USEPA MSGP, and were derived from various other sources.

During the 2014-2015 wet weather season, median concentrations of eight analytes exceeded benchmark values (in order of descending benchmark exceedance frequency): zinc (total and dissolved), copper (total and dissolved), Chemical Oxygen Demand (COD), total coliform, fecal coliform, and *Enterococcus*. Polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), organochlorine pesticides, total petroleum hydrocarbons (TPHs), glycols, oil and grease, MBAs, and total and dissolved arsenic, cadmium, chromium, trivalent chromium, hexavalent chromium, mercury, nickel, and silver did not exceed benchmark values (Amec Foster Wheeler, 2015b). Additionally, ethylene glycol was not detected in samples from the previous four consecutive monitoring seasons (2011-2012, 2012-2013, 2013-2014, and 2014-2015); therefore the Authority has elected to analyze this parameter only for site C-B08-8, which is the area of Terminal 1 where deicing fluid is used and stored.

Industrial Permit Required Parameters

The 2014 Site Audit identified parameters that correspond with analyses that must be performed per Section XI.B.6. of the Industrial Permit, i.e., total suspended solids (TSS), oil and grease, pH, and additional pollutants identified by the Authority within SAN's operational area that serve as indicators of all industrial pollutants that are likely to be present in storm water discharges. Industrial Permit Section XI.B.6 parameters may be modified for future sampling in accordance with any updated SWPPP pollutant source assessments.

Per Table 1 of the Industrial Permit, analysis of additional parameters is required for SAN drainage areas in accordance with the Air Transportation standard industrial classification (SIC) code. These parameters are NH_3, biological oxygen demand (BOD), and chemical oxygen demand (COD). Where deicing activities are performed and more than 100,000 gallons of glycol-based deicing chemicals and/or 100 tons or more of urea are used on an average annual basis, ethylene glycol will also be sampled. However, an average of only 770 gallons are used annually at SAN. Despite this, as a precaution, SAN intends to sample for ethylene glycol.

40 Code of Federal Regulations, Section I, Subchapter N established Effluent Limitation Guidelines (ELGs) and additional monitoring requirements for existing sources. Subchapter N, Part 449 specifies the standards and ELGs for existing airports conducting airfield pavement deicing activities and additional requirements for new airports conducting aircraft deicing and/or airfield pavement deicing. SAN is an existing airport, as defined under 40 CFR Parts 122.2 and 122.29, and does not perform airfield pavement deicing activities. Therefore, SAN does not meet the threshold for compliance with Subchapter N. Ethylene glycol will continue to be monitored where deicing activities occur, i.e., site C-B08-8.

Pollutants of concern (POCs) that have been previously identified in storm water discharges from SAN are copper (total and dissolved), zinc (total and dissolved), total aluminum, total iron, total lead, and ethylene glycol. Total hardness will be analyzed to calculate toxicity benchmarks for metals. MBAS, which are indicators of surfactants, were also selected because of the aircraft and vehicle washing activities at SAN. TPH, an indicator of petroleum hydrocarbons, was selected because of the fueling and maintenance operations at SAN. TPH has historically been non-detect at most monitoring locations; however, it will continue to be analyzed because of the frequency of fueling activities at SAN.

Additional parameters associated with pollutants identified as contributing to 303(d)-listed impairments in receiving waterbodies must also be analyzed. Table D1-2 provides the POCs and discharging outfalls for 303(d)-listed receiving waterbodies.

Additional Parameters

Based on a review of 303(d)-listed water body impairments, Regional Water Board investigative actions, and the potential pollutants, pollutant sources, and scope of operations within each drainage basin, the Authority has elected to analyze additional parameters that have been named or implicated in association with water quality impairments of receiving waterbodies.

Table D1-2. 303(d)-Listed Receiving Water Bodies[1]

Receiving Waterbody	Pollutant of Concern	Discharging Outfalls
San Diego Bay	Polychlorinated Biphenyls (PCBs)	All
San Diego Bay Shoreline, Downtown Anchorage	Benthic Community Effects, Sediment Toxicity[2]	1, 2, 3, 4
San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper[3]	5, 6, 7
San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper[3]	8, 9, 10, 11
San Diego Bay Shoreline, at Spanish Landing	Total Coliform[3]	8, 9, 10, 11

Notes:
1. Section 303(d) of the Clean Water Act, which lists waters not attaining water quality standards.
2. Benthic community effects and sediment toxicity have been linked to PCBs, polycyclic aromatic hydrocarbons (PAHs), and chlordane in preliminary investigations of the proposed Downtown Anchorage total maximum daily load (TMDL) (Regional Water Board, 2005).
3. These parameters are required to be sampled under the Industrial Permit.

Additionally, the Regional Water Board has issued Investigative Order (IO) No. R9-2014-007, which pertains to the Laurel-Hawthorne Embayment, an area of San Diego Bay that encompasses the Downtown Anchorage. This IO highlights outfalls discharging from Basins 1 through 6 as potential sources of pollutants, including PCBs, PAHs, chlordane (a pesticide), and heavy metals (cadmium, copper, lead, mercury, and zinc). The Authority will analyze samples from these (if the basin is a potential pollutant source) and other drainage basins, as applicable, for these additional parameters.

Industrial Compliance Sampling Analyses Selected

Based on a review of the POCs identified in the site audit, analytes named in the Industrial Permit, and pollutants specified in IOs and the 303(d) list, the parameters in Table D1-3 will be analyzed.

Table D1-3. Sampled Parameters at Industrial Compliance Sites

Parameter	Drainage Basin
Oil and Grease (O&G) pH Temperature Specific Conductance (SC) Total Suspended Solids (TSS) Methylene Blue Active Substances (MBAS) Total Petroleum Hydrocarbon (TPH) Biological Oxygen Demand (BOD) Chemical Oxygen Demand (COD) Ammonia (NH3) Total Hardness Polychlorinated Biphenyls (PCBs) Total metals (aluminum, cadmium, chromium III, chromium VI, copper, iron, lead, nickel and zinc) Dissolved metals (cadmium, chromium III, chromium VI, copper, lead, nickel and zinc) Polycyclic Aromatic Hydrocarbons (PAHs)	All
Total Coliform Fecal Coliform *Enterococcus*	3 (C-B03-21 only), 6 (C-B06-14 and C-B06-5a only), 8 (except for C-B08-22), 12, and 15
Ethylene Glycol[1]	8 (C-B08-8 only)
Chlordane	1, 3, 5, 6, and 8
Total and Dissolved Arsenic	5, 6 (C-B06-14 and C-B06-15a only), 7 (C-B07-7a only), 8 (C-B08-8 only), 12, and 15

Notes:

1. Ethylene glycol will be sampled at site C-B08-8 only. The drainage area for this site includes the Southwest and Seaport operational areas, where ethylene glycol may be used for deicing.

5.3 CALIBRATION PROCEDURES

Prior to every field testing event for temperature, pH and any other required field analyses, field staff must calibrate instruments according to manufacturer's specifications, as follows:

1) Switch the unit on by pressing the On/Off button.

2) Ensure that the device is set to dual display.

3) Dip the electrode 2-3 centimeters into pH standard buffer solution.

4) Press the CAL button to enter calibration mode. The device will display the Cal indicator. The upper display will show the measured reading based on the last calibration, and the lower display will show the pH standard buffer solution.

5) Wait 2 minutes for the tester reading to stabilize. Once the reading has stabilized, press the HOLD/ENT button to confirm the first calibration point. The upper display will be calibrated to the pH standard buffer solution and the lower display will toggle between readings of the next pH standard buffer solution. The calibration mode allows up to three calibration points (for example, pH 4, 7 and 10) to be performed before returning to the measurement mode automatically.

6) Repeat with other buffers if necessary. Rinse the electrode in tap water before dipping into the next buffer.

7) It is possible to skip the remaining two calibration points by exiting to the measurement mode by pressing the CAL button.

5.4 SAMPLING AND ANALYSIS PROCEDURES

Monitoring instruments and equipment (including a facility operator's own field instruments for measuring pH, temperature, and electroconductivity) will be calibrated and maintained in accordance with manufacturers' specifications. Field instrument calibration procedures and calibration intervals are provided in Section 5.3 of this Appendix. Sampling and sample preservation will be in accordance with methods identified in the Industrial Permit, Attachment H, as well as with the requirements of the Municipal Permit. Monitoring and analysis must be conducted according to methods and procedures identified under 40 CFR Part 136. Sampling and laboratory procedures unspecified in the Industrial Permit or Municipal Permit will be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), or updated versions of SWAMP water quality analysis procedures, such as SWAMP 2013 Quality Assurance Program Plan (QAPrP). Laboratory analyses will be conducted at a laboratory certified for such analyses by the California Department of Health Services. Laboratory analysis methods and associated data quality objectives (DQOs) will follow those listed in Table D1-5 unless a comparable method is available. Table D1-5 shows the DQOs, including the analytical methods and corresponding method detection limits used to detect pollutants in storm water discharges. DQOs are derived from 40 CFR Part 136, where available, or SWAMP. Reporting limits specified in the monitoring program are below (and often well below) the NALs (annual and instantaneous). NALs applicable to SAN and required under the Industrial Permit are shown in Table D1-4.

Table D1-4. Industrial Permit NALs

Parameter	Annual NAL	Instantaneous Maximum NAL	Units
pH	N/A	6.0<>9.0	pH units
TSS	100	400	mg/L
O&G	15	25	mg/L
Zinc	0.26	N/A	mg/L
Copper	0.0332	N/A	mg/L
Lead	0.262	N/A	mg/L
COD	120	N/A	mg/L
Aluminum1	0.75	N/A	mg/L
Iron1	1.0	N/A	mg/L
Ammonia (as N)	2.14	N/A	mg/L
Arsenic1	0.15	N/A	mg/L
Cadmium1	0.0053	N/A	mg/L
Nickel1	1.02	N/A	mg/L
Mercury1	0.0014	N/A	mg/L
Silver1	0.0183	N/A	mg/L
BOD	30	N/A	mg/L

On an annual basis, exceedances of these benchmarks will be identified and an appropriate exceedance response action (ERA) will be performed. The results will also be used to assess attainment of Water Quality Improvement Plan (WQIP) goals, as required by the Municipal Permit, and will be comparable with methods used by other San Diego Bay Copermittees.

When collecting grab samples for wet weather monitoring (and any dry weather monitoring the Authority is required to perform or identifies a need for), Attachment H of the Industrial Permit and the procedures below will be followed:

1) Prepare previously cleaned bottles with pre-printed labels from the Authority's Web-based monitoring and tracking database. Labels will identify the sampling parameters required for collection and testing at each site.

2) Put on clean, nitrile gloves and prepare sample collection devices, if necessary. If collecting samples for metals and/or mercury, wear polyethylene gloves as the outer layer.

3) Remove the required sample containers from the cooler (see Table D1-5 for appropriate containers to use) and fill out the remaining information on the label with a waterproof pen: date, time, and sampler's initials.

4) If samples are not collected directly into the sample container (for instance, when a bucket or pump is used to collect the sample), rinse the sample collection device three times with water discharging from the sample location before collecting the sample. Use disposable sampling equipment (e.g., bucket liners) at each sample location. Also, rinse sample containers that DO NOT contain a preservative three times prior to sample collection.

5) Collect representative samples at a point below the surface of the flow (at about half of the water's depth) and midway across the flow as close as possible. Avoid stagnant pools near the edge of flowing water unless the purpose is to sample a stagnant pool.

6) If entering the water is necessary for sampling, enter the flow downstream of the sampling location, disturbing as little of the bottom material as possible. Always collect the sample upstream of your position so that the sample will not be contaminated by you or materials on the bottom of the channel that you may have disturbed.

7) Measure water quality parameters (listed in Section 5.2.1 of this Appendix) at the time of field screening using the appropriate portable meters, field test kits, and the clear, plastic containers used for making observations. Measure pH within 15 minutes of sample collection time for applicable sample locations. Ensure that portable field meters are calibrated appropriately per manufacturers' recommendations, as described in Section 5.3 above. Record all observations and field screening results in the Web-based database for SAN, and describe any unusual or noteworthy conditions or results in detail in the "Notes" section of the form.

   Recording field parameters:

   1. Rinse the field meter thoroughly in sample water.
   2. Submerge the field meter in the sample collection device.
   3. Allow the values to stabilize for at least one minute.
   4. Keep the field meter submerged in the sample water while recording the field parameters to the nearest 0.1 unit.

8) Fill sample containers to be sent to the laboratory to the shoulder unless directed otherwise by the laboratory. Bottles should be rinsed with ambient water before collecting the sample. Do not touch the inside of the sample container or cap or put anything into the sample containers before collecting water samples, as this may contaminate the sample.

9) Some of the sample containers may contain a small amount of acid as a preservative. To prevent any possible harm to sampling personnel, open these containers with the cap turned away from the face and do not inhale the vapor. When filling the containers, be careful not to spill any acid; if some of the acid does get on the skin, rinse it off thoroughly.

10) Cap each container tightly and place it into a cooler. The cooler must have a sufficient amount of ice to maintain a temperature of 4 °C during transport. If samples need to be stored for an extended period prior to delivery to the laboratory, it may be necessary to renew the ice every 24 hours.

11) Complete the pre-filled Chain of Custody (COC) form for each set of samples with the appropriate date and time that each sample was collected. Record the initials of the person(s) who collected the sample. An example COC is included in Appendix G.

12) Transport samples to the laboratory within 48 hours, unless otherwise specified by the laboratory. Sign the COC once the samples are relinquished, and obtain the initials of the laboratory representative who receives the samples.

13) Dispose of all spent reagents, reacted samples, and rinse solutions in the appropriate waste containers. Upon return to the office, decant wastes into the sewer system.

5.5 QUALIFIED COMBINED SAMPLES

The Industrial Permit, Section XI.C.5, allows samples of equal volume from no more than four discharge locations to be combined for laboratory analysis if the industrial activities, BMPs, and physical characteristics of the locations where the samples were taken are substantially similar. The Authority must receive previous approval from the Regional Water Board and document such a determination in the annual industrial storm water report. If combining samples, samplers will label sample bottles to instruct the laboratory on which samples to combine. Samples must always be combined by the laboratory and not by the sampler.

6.0 ASSESSMENTS

Assessments required under the Industrial Permit include comparisons between monitoring data and NALs. These assessments are discussed in detail in Section 7.0 of this SWMP.

7.0 QA/QC

This section addresses Quality Assurance and Quality Control (QA/QC) activities associated with both field sampling and laboratory analyses.

Field QC samples are collected and used to evaluate potential contamination and sampling error introduced into a sample prior to its submittal to the analytical laboratory. Laboratory QC activities provide information needed to assess potential laboratory contamination, and analytical precision and accuracy.

Water quality sampling QA/QC will comply with requirements of 40 CFR Part 136 and the State of California's SWAMP QAPrP. This will provide greater comparability of data among Municipal Permit Copermittees, when results are used to compare to water quality goals required under the Municipal Permit.

Field and Laboratory DQOs for all parameters sampled under both Industrial Permit and Municipal Permit monitoring programs are summarized in Table D1-5.

Table D1-5. Data Quality Objectives

Analyte	Container[1]	Preservative[2]	Holding Time	Analytical Method	Reporting Limits[3]	Accuracy	Precision	
							Matrix Spike	Relative Percent Difference
Specific Conductance	Glass or polyethylene	4˚C, filter if hold time >24 hours	28 days	EPA 120.1	0.1 µmhos/cm	±0.5%	--	--
pH (lab)	Glass or polyethylene	None	15 minutes	EPA 150.1	± 0.01 units	--	--	--
pH (field)	In field (electrode)	None	15 minutes	Field meter	±0.5 units or 10%	--	--	--
Temperature	In field	None	15 minutes	Field meter	± 0.1˚C	±0.15	--	--
Total Suspended Solids (TSS)	Glass	4˚C	7 days	SM 2540-D	0.5 mg/L	75-125%	±20%	±20%
Ethylene Glycol	Glass or polyethylene	4˚C, HCl to pH<2	7 days until extraction, 40 days after extraction	EPA 8015.1	5 mg/L	75-125%	±25%	±25%
Total Hardness	Glass or polyethylene	4˚C, HNO_3 or H_2SO_4 to pH<2	6 months	SM2340B	.4 mg/L	0.15	±20%	±25%
Biological Oxygen Demand (BOD)	Glass or polyethylene	4˚C	48 hours	SM 5210B	2 mg/L	80-120%	±25%	±25%
Chemical Oxygen Demand (COD)	Glass or polyethylene	4˚C, H_2SO_4 to pH<2	28 days	SM 5220 D or C	0.1 mg/L	65-135%	±20%	±20%
Oil and Grease (O&G)	Glass with Teflon-liner inside the cap, rinsed with hexane or methylene chloride	4˚C, HNO_3 or H_2SO_4 to pH<2	28 days	EPA 1664A	1.4 mg/L	40-140%	±25%	±25%
Total Petroleum Hydrocarbons (TPH):	Glass with Teflon-liner inside the cap (jet fuel, diesel, and motor oil)	4˚C	7 days until extraction, 40 days after extraction (diesel, jet fuel, and motor oil)					
Jet Fuel				EPA 8015B	0.05 mg/L	45-130%	±50%	±30%
Diesel				EPA 8015B	0.05 mg/L	45-130%	±50%	±30%
Motor Oil				EPA 8015B	0.05 mg/L	45-130%	±50%	±30%

Table D1-5. Data Quality Objectives (continued)

Analyte	Container[1]	Preservative[2]	Holding Time	Analytical Method	Reporting Limits[3]	Accuracy	Precision	
							Matrix Spike	Relative Percent Difference
Polychlorinated Biphenyls (PCBs)	Glass with Teflon-liner inside the cap	4°C	7 days until extraction, 40 days after extraction	If PM >5%: Solids, EPA 8082	50 µg/L	80-120%	± 30%	± 30%
							± 30%	± 20%
				If PM <5%: Water, EPA 608			± 30%	± 20%
Polycyclic Aromatic Hydrocarbons (PAHs)	Glass with Teflon-liner inside the cap	4°C, 0.008% $Na_2S_2O_3$ if residual chlorine may be present	7 days until extraction, 40 days after extraction	EPA 8310	0.05 – 1.00 µg/L	70-130%	±50%	±30%
Chlordane	Glass	4°C, pH 5-9	7 days until extraction, 40 days after extraction	EPA 608	0.005 µg/L	70-130%	±50%	±30%
Metals (Total and Dissolved):[4]	Polyethylene, pre-cleaned using HNO_3	4°C, HNO_3 to pH<2	Filter for dissolved fraction and preserve within 48 hours; 6 months to analyze; 24 hours for Chromium VI					
Aluminum (Al)				EPA 200.8	5.0 µg/L	80-120%	±20%	±20%
Arsenic (As)				EPA 200.8	0.4 µg/L	80-120%	±20%	±20%
Cadmium (Cd)				EPA 200.8	0.10 µg/L	80-120%	±20%	±20%
Chromium (Cr)				EPA 200.8	0.20 µg/L	80-120%	±20%	±20%
Chromium VI (Cr VI)[5]				EPA 218.6	2 µg/L	80-120%	±20%	±20%
Chromium III (Cr III)				Calculation	NA	NA	NA	NA
Copper (Cu)				EPA 200.8	0.50 µg/L	80-120%	±20%	±20%
Iron (Fe)				EPA 200.7	13 µg/L	80-120%	±20%	±20%
Lead (Pb)				EPA 200.8	0.20 µg/L	80-120%	±20%	±20%
Nickel (Ni)				EPA 200.8	0.80 µg/L	80-120%	±20%	±20%
Silver (Ag)				EPA 200.8	0.20 µg/L	80-120%	±20%	±20%
Zinc (Zn)				EPA 200.8	5.0 µg/L	80-120%	±20%	±20%

Table D1-5. Data Quality Objectives (continued)

Analyte	Container[1]	Preservative[2]	Holding Time	Analytical Method	Reporting Limits[3]	Accuracy	Precision	
							Matrix Spike	Relative Percent Difference
Mercury (Hg) (Total and Dissolved)[4]	Glass or teflon, pre-cleaned using HNO_3	4˚C, HNO_3 to pH<2	48 hours to preserve, 28 days to analyze	EPA 245.1	0.0007 mg/L	75-125%	±25%	±25%
Methylene Blue Active Substances (MBAS)	Glass or polyethylene	4˚C	48 hours	SM 5540C	0.05 mg/L	80-120%	±20%	±20%
Ammonia-N (NH_3-N)	Glass or polyethylene	4˚C, H_2SO_4 to pH<2	28 days	SM 4500-NH3 B+ C or E	0.1 mg/L	80-120%	±20%	±20%
Particle Size Distribution	Glass with tetrafluoroethylene	4˚C, analyze at room temperature	As soon as possible	ASTM D4464M	0.1 µm	80-120%	NA	5% of sample
Total Coliform	Sterile plastic	4˚C, 0.0008% $Na_2S_2O_3$	6 hours	SM 9221 B	2 MPN/100mL	--	--	--
Fecal Coliform	Sterile plastic	4˚C, 0.0008% $Na_2S_2O_3$	6 hours	SM 9221 E	2 MPN/100mL	--	--	--
Enterococcus	Sterile plastic	4˚C, $Na_2S_2O_3$	6 hours	SM 9230 C	1 colonies /100 mL	--	--	--

Notes: Analytical test methods may only be substituted with an equivalent method approved in 40 CFR Part 136.

1. Container volume size to be determined by the laboratory.

2. Analytes with the same preservative can be combined into a single container, if the same laboratory is performing the analyses. Samples volumes to be determined by laboratory.

3. Reporting Limits are derived from SWAMP Quality Assurance Program Plan (2008), but may be adjusted according to lab and project-specific requirements.

4. Dissolved analytes will be filtered in the laboratory prior to acidification.

5. Acidification alters the form of the analyte. Minimum of 500 mL of sample water should be submitted in a separate bottle for analysis.

µg/L = micrograms per liter; °C = degrees Celsius; EPA = U.S. Environmental Protection Agency; H_2SO_4 = sulfuric acid; HCl = hydrochloric acid; $Na_2S_2O_3$ = sodium thiosulfate; mg/L = milligrams per liter; PM = particulate material; SM = Standard Method; TBD = to be determined prior to final document submission

Completeness objective for all analytes is 90%.

7.1 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field QA/QC will consist of sample tracking and handling, and the collection of equipment, travel, bottle and field blanks, and field duplicates.

7.2 SAMPLING TRACKING AND HANDLING

Samples will be kept properly chilled and will be transferred to the analytical laboratory within the holding times specified in Table D1-5. To properly track and handle the samples, COC procedures and documentation will accompany the samples from initial collection to final extraction and analysis. To ensure quality data results, the analytical laboratory must provide confirmation of each analytical test to be conducted (including reporting limits, analytical methods, and costs) before analyses are conducted.

7.3 EQUIPMENT BLANKS

Equipment blanks will be collected for automated sampling equipment exclusively. The purpose of the equipment blank is to test the cleanliness of all sample tubing and sample collection devices prior to sample collection. One equipment blank per automated sampling device will be collected and analyzed prior to each sampling season, or if equipment is replaced or contaminated in some way. Bottle blanks are provided by the laboratory for 19-liter bottles after every sampling event, prior to returning cleaned bottles.

7.4 FIELD BLANKS

Field blanks are used to determine whether contamination has been introduced during field sampling. One field blank will be collected for five percent of field samples collected annually. Field blanks will be prepared by pouring laboratory-grade blank water into sampling containers in the field during the sampling period. Blank water is supplied by the laboratory and certified to be free of contaminants. For grab samples, identical equipment used to collect the grab samples will be rinsed with blank water before the blank water is poured into the sample containers.

7.5 TRAVEL BLANKS

Travel blanks are used to demonstrate that no contamination occurs during sample bottle preparation and sample handling. One travel blank will be prepared for volatile organic analysis (VOA) samples (one 40-milliliter [mL] vial per transportation cooler) for each sample event. Blank water specifically prepared for VOAs will be supplied by the laboratory, and prepared in advance by the field team. Vials will remain unopened during sampling and handling prior to receipt by the laboratory.

7.6 FIELD DUPLICATES

Field duplicates are used to assess variability attributable to sample collection, handling, shipment, and storage, and/or laboratory handling and analysis. As with field blanks, one field duplicate will be collected for every ten field samples. Duplicate samples will be labeled separately and will be submitted "blind" to the laboratory. Duplicate analyses results will be evaluated by calculating the relative percent difference (RPD) between the two sets of results and will be a measure of the reproducibility (precision) of the measured results.

Procedures for collecting the additional sample volume for the duplicate field samples will simulate the normal sampling protocols, except that they require collecting twice as much sample volume. Duplicate grab samples will be collected by filling two grab samples bottles at the same time (simultaneously) or in rapid sequence.

7.7 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Laboratory QA/QC includes the following:

- Employing analytical chemists trained in the procedures to be followed
- Adhering to documented procedures, USEPA methods, SWAMP methods, written standard operating procedures (SOPs), and other approved methods (e.g., Standard Methods for the Examination of Water and Wastewater)
- Routine checking and regular maintenance of analytical laboratory equipment and instrumentation
- Conducting laboratory check samples (see below)
- Properly labeling and dating all sample containers and chemicals
- Employing applicable QAPP, SOPs, analytical method manuals, and safety plans
- Completely documenting sample tracking, analysis, and reporting
- Following additional internal QA/QC procedures outlined in the laboratory Quality Assurance Manual

Laboratory Check Samples

Laboratory check samples will include the use of laboratory duplicates, method blanks (MBs), matrix spike and matrix spike duplicates (MS/MSDs), and laboratory control spikes (LCSs). Certified Reference Materials (CRMs) should be used by the laboratory in QC analyses when comparing samples to a known concentration. If no CRM exists, reference values may be used. Where reference values are not available, a laboratory control sample must be prepared and analyzed as a last resort for assessing accuracy. These laboratory QA/QC activities are discussed below and their applicability to each analyte is summarized in Table D1-5.

Laboratory Duplicates

Laboratory duplicate samples will be generated by the laboratory. As with field duplicates, duplicate analyses results evaluate the relative percent difference (RPD) between the two sets of results, and is a measure of the reproducibility (precision) of the measured results.

Method Blanks

Method blanks will be run by the laboratory to determine the level of contamination associated with laboratory reagents and equipment. One method blank must be prepared and analyzed for each analytical batch. A method blank is a sample of a known matrix that has been subjected to the same complete analytical procedure as the field samples to determine if contamination has been introduced into the samples during processing. The results of the method blank will be checked against reporting limits for analytes. Method blank results should be less than the reporting limits for each analyte.

Equipment Blanks

Laboratory equipment blanks are completed by the laboratory after sample processing has been completed for each sampling event. Blank water is pumped through laboratory processing filter, tube, and bottles, then collected, preserved, and analyzed for contaminants. Analytical results are provided to the monitoring program QC personnel to confirm that the laboratory equipment and materials are free of contamination.

Matrix Spikes and Matrix Spike Duplicates

MS and MSD samples are required for ten percent of samples. Samples will be analyzed for their analytes and then are spiked with a known amount of analyte(s). The results of the analysis of the spiked sample are compared to the unspiked sample results and the "percent recovery" of each spiked analyte is calculated. The MS/MSD results and the calculated RPD allow evaluation of the accuracy and precision of the laboratory analytical method and matrix interferences.

Laboratory Control Spikes

The LCS contains a known (spiked) amount of the analyte(s) of interest in a clean matrix and assesses the matrix effects on spike recoveries. High or low recoveries of the analytes in an MS may be caused by interferences from the sample. The LCS assesses these possible matrix effects because the known (clean) matrix is free from matrix interference.

7.8 CORRECTIVE ACTION

Corrective action is taken when an analytical result is considered to be anomalous. Reasons include exceeding RPD ranges and/or problems with spike recoveries or blanks. If the issue is resolved by the laboratory analysis, the problem should be documented and included in the laboratory report. The corrective action varies somewhat from analysis to analysis, but typically involves the following:

- A check of procedures
- A review of documents and calculations to identify possible errors
- Correction of errors
- Re-performing calculations to improve accuracy
- A re-analysis of the sample extract, if sufficient volume is available, to determine if results can be improved
- A complete reprocessing and re-analysis of additional sample material (if available and if the holding time has not been exceeded

7.9 LABORATORY DATA PACKAGE DELIVERABLES

The laboratory deliverable package will include a hard copy and an electronic data deliverable (EDD). The package will include information on the date analyses were performed, names of analytical staff, analytical techniques and methods used, results of the analyses, and standard narratives identifying any analytical or QA/QC problems and corrective actions. Summaries of the following QA/QC elements will be in the data package:

- Sample extraction and analysis dates
- Results of MBs, MSs, and MSDs
- Analytical accuracy
- Analytical precision
- Reporting limits

The electronic data files will contain all information found in the hard copy reports submitted by the laboratory.

7.10 DATA MANAGEMENT AND REPORTING PROCEDURES

The analytical process will be tracked to make sure that the laboratories are meeting holding times and are providing a complete deliverable package. Monitoring staff will receive the original hard copy from the laboratory, verify its completeness, and log the date of receipt. Upon receipt from the laboratory, each analytical report will be thoroughly reviewed and the data evaluated to determine whether it meets the project objectives.

All data will be screened for the following major items:

- A check between electronic data and the hard copy reports provided by the laboratory
- A conformity check between the chain-of-custody forms, compositing protocol, and laboratory reports
- A check for laboratory data report completeness
- A check for typographical errors in the laboratory reports
- A check for suspect values
- A check for missing values requested on the Chain of Custody

Following the initial screening, a more complete QA/QC review will be performed, including evaluation of holding times, method blank contamination, and analytical accuracy and precision from LCSs, MSs, and MSDs. If blank contamination is present, the data will be evaluated and qualified according to USEPA guidelines for organic and inorganic data review. Accuracy will be evaluated by reviewing MS/MSD and LCS recoveries. Depending on the analytical method, precision will be evaluated by reviewing field duplicate, MSD, and laboratory duplicate sample RPDs. Control limits for spike recoveries (accuracy) and RPDs (precision) are defined by the project DQOs listed in Table D1-5.

7.11 ELECTRONIC DATA TRANSFER

The analytical laboratory will provide data in both hard copy and electronic formats. The format required for electronic submittals will be provided to the laboratory to make sure the files can be imported directly into the Authority's Web-based database. Laboratory data will be in a format compatible with guidelines from the California Environmental Data Exchange Network (CEDEN).

8.0 REPORTING

All data will be submitted to SMARTS, and to the Regional Clearinghouse, called the Project Clean Water website, for data that is used to evaluate attainment of WQIP goals. All sampling results must be submitted to SMARTS within 30 days of receiving results from the laboratory. For details on reporting procedures if results exceed NAL benchmarks, see Section 7.0.

9.0 HEALTH AND SAFETY

Sampling sometimes may be necessary when the sampling location and/or the discharge create hazardous conditions. Safety precautions will be used at all times when conducting wet or dry weather monitoring. Safe practices are not limited to those listed here; all reasonable safety precautions should always be taken, based on site and current conditions.

9.1 SAFETY GUIDELINES

Samplers will follow these guidelines in the field:

- Keep a first aid kit with field equipment.
- Watch out for traffic along the access road when sampling or making observations.
- Do NOT remain in open areas or stand under trees or tall structures if lightning is occurring in the vicinity.
- Always watch your step; the ground may be wet and slippery, steep, or unstable. Do not attempt to climb down unsafe slopes.
- Always wear clean, nitrile or polyethylene gloves when sampling.
- Protect eyes and skin against contact with acids and other preservatives.
- Use common sense when deciding whether to sample during adverse weather conditions. Do not sample during dangerous conditions, such as high winds or lightning.
- Do not enter a confined space (spaces with limited or restricted means for entry or exit, and which are not designed for continuous occupancy).
- Be familiar with Safety Data Sheets (SDSs) for all chemicals used in the field and when calibrating instruments. Know the health hazards and emergency medical treatments, and follow proper disposal instructions.

9.2 SAFETY EQUIPMENT

The following safety equipment is to be used wet and dry weather sampling:

- Safety glasses
- Nitrile gloves
- Work boots or rubber boots
- Safety vest
- Hard hat
- Flash light
- Rain pants and coat

The following safety equipment is in the vehicle and readily available for use during wet and dry weather sampling:

- First aid kit
- Safety rope
- Cellular telephone

APPENDIX D-2
MUNICIPAL AND BMP EFFECTIVENESS MONITORING PLAN


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

APPENDIX D-2: MUNICIPAL AND BMP EFFECTIVENESS MONITORING PLAN

1.0 BACKGROUND

Provisions C.2, D.2, and D.4 of San Diego Regional Water Quality Control Board (Regional Water Board) Order No. R9-2013-0001 (the Municipal Permit) require wet and dry weather monitoring and assessment of storm water and non-storm water discharges. The monitoring program is structured around compliance with the Municipal Permit's monitoring requirements at outfalls of the municipal separate storm sewer system (MS4), as well as elements of ongoing studies of the effectiveness of best management practices (BMPs). The objective of the monitoring program, as outlined in Provision D.2 of the Municipal Permit, is to measure the effectiveness of the Authority's jurisdictional runoff management program in reducing the discharge of pollutants in storm water from the MS4 to the maximum extent practicable (MEP), effectively prohibiting non-storm water discharges, and to guide pollutant source identification efforts. However, MS4 outfall wet weather monitoring will be performed as a part of the San Diego Bay Watershed Management Area (WMA) monitoring program rather than the Authority's program, with dry weather investigations performed by the Authority. The results of the MS4 wet and dry monitoring programs will be used to support Copermittees' efforts to track progress in achieving Water Quality Improvement Plan (WQIP) goals and guide further pollutant source identification. In addition to MS4 outfall monitoring, the Authority will continue to conduct BMP effectiveness sampling. This program began in 2006–2007 under the 2007 Municipal Permit (Regional Water Board Order No. R9-2007-0001), and meets two of the objectives of the Authority's Sampling Plan: (1) to identify and rate sources of pollutants of concern (POCs) at SAN in terms of annual mass loading in storm water, the potential for reduction through BMP implementation, and the best combination of sources to address through BMP implementation to achieve pollutant load reduction objectives, and (2) to monitor the performance and effectiveness of BMPs. The BMP effectiveness sampling data may also be used in effectiveness assessments outlined in Provision D.4 of the Municipal Permit. Details on this sampling program are included in Appendix D-2C.

The Municipal Permit mandates that the Copermittees in each WMA in the San Diego region jointly develop and implement a WQIP. The WQIP's purpose is to identify the highest and focused priority water quality conditions in each WMA and specify numeric goals, strategies, and schedules to (1) achieve water quality standards in receiving waters, (2) protect receiving waters and associated habitats from MS4 discharges, and/or (3) support beneficial uses in receiving waters. The Authority, as one of ten Responsible Copermittees in the San Diego Bay WMA, will facilitate WQIP submittal by June 2015 for Regional Water Board approval (Caltrans is also participating in this process voluntarily). This will be followed by a 30-day public comment period, after which time the Copermittees will have 60 days to make any necessary changes.

APPENDIX D-2A: MUNICIPAL WET WEATHER MONITORING PROGRAM

2.0 INTRODUCTION

Upon approval of the WQIP by the Regional Water Board, the Authority will be subject to new requirements for wet weather monitoring to comply with the goals, strategies, and schedules in the WQIP. This updated section of the Storm Water Monitoring Plan (SWMP) will take effect after the WQIP's acceptance by the Regional Water Board. As stated in the Background Section of Appendix D-2, the San Diego Bay WMA monitoring program will perform the wet weather outfall monitoring described below, and not the Authority. However, the results will be used towards assessing the effectiveness of the Authority's JRMP in attaining WQIP goals. Until the WQIP is accepted, the Authority will continue to implement its Transitional Wet Weather Monitoring Program.

Table D2-1 summarizes the Authority's wet weather monitoring programs under the Municipal Permit. Table D2-2 summarizes the Copermittees' wet weather monitoring programs under the San Diego Bay WQIP.

Table D2-1. Summary of the Authority's Wet Weather Compliance Monitoring Programs

Monitoring Program	Regional or Jurisdictional	Monitoring Agency	Sample Type	Analyses	Station Type	Frequency of Events	Number of Sites	Permit Reference
Focused Priority Condition Monitoring[1]	Jurisdictional	Authority	Grab	Metals (total and dissolved)	MS4	4 qualifying storm events (QSEs) and observations	18	2013 Municipal Permit: B.4, D.2.c.(5).(f)
MS4 Outfall Discharge Monitoring	Regional	Copermittees	Visual observations; in-situ field measurements; grab and composite samples	Chemistry, toxicity, indicator bacteria	MS4 Outfall	Annually	10[2]	2013 Municipal Permit: D.2.c

Notes:

1. Sites for priority condition monitoring correspond with the sites in the Industrial Permit Monitoring Implementation Plan (Appendix D-1).

2. There is one MS4 outfall within the Authority's jurisdiction that will be monitored under the MS4 outfall wet weather monitoring program.

Table D2-2. Summary of Copermittees' Wet Weather Monitoring Programs

Monitoring Program	Regional or Jurisdictional	Monitoring Agency	Sample Type	Analyses	Station Type	Frequency of Events	Number of Sites	Permit Reference
San Diego Reference Streams and Beaches Special Study	Regional	Copermittees	In-situ field measurements; grab (water)	Indicator bacteria, toxicity, flow, precipitation, chemistry	Receiving water	3 QSEs	6	2013 Municipal Permit: D.3.a.(1)
Riparian Area Special Study	WMA	Copermittees	Grab (water)	Metals (selenium)	Receiving water	50 events in 2014	5	2013 Municipal Permit: D.3.a.(1)
TMDL[1] Receiving Water Monitoring of Chollas Creek	Jurisdictional	N/A to SAN	Composite samples; grab samples (for bacteria)	Indicator bacteria, metals, pesticides	Receiving water	3 QSEs	4	2013 Municipal Permit: D.1.d.(3).(f).(iii); Attachment E (Provisions 1, 4, and 6)
TMDL[1] Monitoring of Shelter Island Shoreline Park	Jurisdictional	N/A to SAN	Grab (water)	Indicator bacteria	Receiving water	Weekly	5	2013 Municipal Permit: D.1.d.(3).(f).(iii); Attachment E (Provision 5)
TMDL[1] Monitoring of SIYB	Jurisdictional	N/A to SAN	Composite samples, grab (water); visual observations*; in-situ* field measurements	Dissolved copper	Receiving water and MS4 Outfall	3 QSEs	2	2013 Municipal Permit: D.1.d.(3).(f).(iii); Attachment E (Provision 2)
Hydromodification Monitoring Program (HMP)	Regional	N/A to SAN	Visual observations; in-situ measurements	Rain gauge and stream gauge analysis, channel assessments, flow, sediment transport	Receiving water	NA	NA	2013 Municipal Permit: D.1.c.(6)
Long-term Receiving Water Monitoring	Regional	Copermittees	In-situ field measurements; visual observations; trash assessment; grab; and composite samples	Chemistry, nutrients, indicator bacteria, toxicity, bioassessment, trash	Receiving water	3 QSEs	1	2013 Municipal Permit: D.1.d

Notes:

1. SAN is not named in these TMDLs; TMDLs are included here because they apply to San Diego Bay, a receiving water body of the Authority.

DEH = (San Diego County) Department of Environmental Health

IDDE = illicit discharge detection elimination

TMDL = total maximum daily load

N/A = not applicable

MLS = mass loading station

TWAS = temporary water assessment station

NA = not available

SIYB = Shelter Island Yacht Basin

2.1 MONITORING FREQUENCY

Provision D.2.c.(2) of the Municipal Permit requires sampling at outfall discharge monitoring locations once per year. Collectively, the wet weather events monitored by the Copermittees must represent the range of hydrologic conditions experienced in the San Diego region.

2.2 SITE SELECTION

Outfalls 12 and 15 are the major outfalls currently under the jurisdiction of the Authority. An outfall associated with a non-industrial drainage area is classified as major if it meets one of the following criteria:

A circular pipe having a pipe internal diameter of greater than 36 inches

Discharge from a single conveyance other than a circular pipe that is associated with a drainage area of more than 50 acres

An outfall associated with an industrial drainage area is classified as major if it meets one of the following criteria:

A circular pipe having a pipe internal diameter of greater than 12 inches

Discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 2 acres

The two major outfalls within the Authority's jurisdiction drain industrial areas but are tidally influenced and cannot be safely monitored. Two upstream proxies were originally chosen for monitoring. However, the second alternate upstream monitoring location (in drainage basin 15) was determined to be submerged in tidal water and is therefore not a viable sampling location. Monitoring location site C-B12-9a will be sampled as a representation of SAN's wet weather discharge to the MS4. This meets the Municipal Permit Provision D.2.a.(3)(a)(ii) requirement for the Authority of at least one wet weather MS4 outfall discharge monitoring station for each Copermittee within each WMA.

Table D2-3. Authority MS4 Outfall Discharge Monitoring Station

Drainage Basin	Monitoring Location ID	Latitude	Longitude	Outfall Diameter (inches)	Sampling Method	Location Description	Accessibility
12	C-B12-9a	32.734697	-117.202831	NA	Visual Observations, Grab/Composite	Inlet pipe of Terminal 2 West Oil-Water Separator (OWS) at storm drain inlet	Accessible

2.3 VISUAL OBSERVATIONS

Visual observations will be recorded at site C-B12-9a during each wet weather monitoring event. Visual observations will include a narrative description of the state (location, date, duration of the storm event, rainfall estimates, and duration of the preceding dry period) and the measured storm water flow rates and volumes at the site through the duration of the storm.

2.4 FIELD AND ANALYTICAL MONITORING

The Municipal Permit requires both field and laboratory analytical sampling during wet weather MS4 outfall monitoring. Five field parameters will be analyzed during each wet weather sampling event: pH, temperature, special conductance (SC), dissolved oxygen (DO), and turbidity. Additionally, grab samples will be collected for laboratory analysis of hardness and indicator bacteria.

The laboratory parameters listed in Table D2-4 will be analyzed. Site C-B12-9a will be used to comply with sampling requirements under both the Municipal Permit and Industrial Permit. Therefore, analysis will be conducted for parameters required under both permits as a grab sample for the Industrial Permit (see Appendix D-1) and a composite sample plus grab samples for the Municipal Permit. San Diego Bay, the receiving water of the Authority's wet weather outfall sampling locations, is Clean Water Act Section 303(d) listed for PCBs. Provision D.2.c.5.(f).(ii) of the Municipal Permit requires this parameter to be analyzed. The remaining constituents in Table D2-4 are derived from Table D-6 of the Municipal Permit, which presents a core set of constituents to be monitored at all MS4 outfall discharge monitoring locations.

Apart from the grab samples listed above, all other constituents will be sampled using one of the following methods:

1) Time-weighted composite composed of hourly discrete samples, collected over the course of the storm or for the first 24-hour period, whichever is shorter; this sample may be collected using automated equipment

2) Flow-weighted composite collected using automated sampling equipment over the course of the storm or for the first 24-hour period, whichever is shorter

3) If automated compositing is not feasible, a sample composed from a minimum of four grab samples, collected for the first 24-hour period of a storm, or over the course of the entire storm if it is shorter than 24 hours

Table D2-4. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations[1]

Conventionals and Nutrients	Metals (Total and Dissolved)	Indicator Bacteria	Organics
Total Dissolved Solids	Arsenic	Total Coliform	Polychlorinated Biphenyls (PCBs)[3]
Total Suspended Solids	Cadmium	Fecal Coliform	
Turbidity	Chromium	*Enterococcus*	
Total Hardness Total	Copper		
Organic Carbon Dissolved	Iron		
Organic Carbon Sulfate	Lead		
MBAS	Nickel		
Total Phosphorus	Selenium		
Orthophosphate	Thallium		
Nitrite[2]	Zinc		
Nitrate			
Total Kjeldahl Nitrogen			
Ammonia			

Notes:

1. Source: Municipal Permit, Table D-6.

2. Nitrite and Nitrate may be analyzed as Nitrite+Nitrate.

3. Required per Provision D.2.a.3.(e).(vi).[a] of the Municipal Permit. San Diego Bay is 303(d)-listed for PCBs.

MBAS = Methylene Blue Active Substances

2.5 STORM WATER ACTION LEVELS

The WQIP has incorporated Storm Water Action Levels (SALs) to measure progress toward meeting WQIP strategies and the effectiveness of implementation efforts. The Municipal Permit lists the SALs in Table D2-5 for discharges of storm water to the MS4:

Table D2-5. Storm Water Action Levels for Dischargers from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate+Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Notes:
NTU – Nephelometric Turbidity Units; mg/L – milligrams per liter; µg/L – micrograms per liter

As specified with Table C-5 of the Municipal Permit, storm water samples with total metal concentrations that exceed the corresponding SALs will be compared with the California Toxics Rule criteria and the United States Environmental Protection Agency (USEPA) one-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If the total metals concentration exceeds the SAL but does not exceed the applicable USEPA one-hour maximum concentration criterion for the level of hardness measured with sampling, the sampling result is not considered to be above the numeric SAL. SALs are not considered enforceable effluent limitations, but rather as a tool to support WQIP assessments, goals, and strategies.

Focused Priority Condition Monitoring

As required under Provisions B.2 and D.2.c of the Municipal Permit, parameters identified as priority water quality conditions in the San Diego Bay WQIP as the highest threat to receiving water quality in the Authority's jurisdiction will be sampled and analyzed at the MS4 outfall monitoring location during wet weather events. The Authority will monitor copper and zinc concentrations in wet weather discharges as the priority pollutants contributing to impairments in receiving water quality, as determined in the WQIP. These priority pollutants will be monitored in all wet weather monitoring programs, encompassing the requirements of the Municipal Permit and the Industrial Permit.

3.0 ASSESSMENTS

The assessments used to evaluate the effectiveness of SAN's MS4 monitoring programs are described in detail in Section 11.0. In summary, the following assessments, required per Provision D.4.b.(2) of the Municipal Permit, will be based on data collected during wet weather monitoring, and will be included in the WQIP Annual Reports and the Report of Waste Discharge.

Monitoring Program Effectiveness Assessments:

1) Identify trends and conditions of MS4 outfall discharges and receiving water quality conditions in San Diego Bay.

2) Evaluate progress toward meeting the Authority's WQIP goals for its Focused Priority pollutant concentration and load reductions.

3) Compare water quality sampling data and applicable SALs, and determine whether the analysis and assumptions used to develop WQIP strategies should be updated based on this comparison.

4) Identify progress made towards meeting storm water quality goals and pollutant load reductions from different drainage areas.

5) Identify data gaps in the current wet weather monitoring program and revisions necessary to collect sufficient data for thorough water quality condition analysis.

6) Identify modifications to the wet weather monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s.

Focused Priority Condition Assessments:

1) Identify data gaps and additional monitoring required to assess progress toward meeting water quality goals outlined in the WQIP.

2) Identify changes or additions to the priority water quality conditions.

3) Evaluate progress toward meeting WQIP long-term and short-term goals.

4) Identify necessary updates to WQIP strategies and schedules to meet established goals, as necessary.

5) Provide rationale for updates or changes to priority water quality conditions, strategies, and/or schedules, as applicable.

6) Include results from special studies related to water quality conditions or sources of priority condition pollutants, if applicable to the Authority.

7) Identify new and developing regulations, revised 303(d) listings, Basin Plan amendments, and/or Regional Water Board recommendations related to priority water quality conditions.

8) Identify the amount of resources applied to achieve established goals related to priority water quality conditions.

9) Evaluate the overall effectiveness of strategies implemented to achieve established goals.

APPENDIX D-2B: MUNICIPAL DRY WEATHER MONITORING PROGRAM

4.0 INTRODUCTION

Background. Under the Municipal Permit, the Authority is required to develop and implement a program to detect and eliminate illicit connections and illegal discharges to the Authority's MS4. This program is described in Section 3.0 of the Authority's SWMP, "Non-Storm Water Discharge/Illicit Discharge Detection and Elimination Component."

The dry weather monitoring program has been updated to comply with the goals, strategies, and schedules in the WQIP for detecting and eliminating illicit discharges and to comply with Provision D.2.b of the Municipal Permit. These updates will take effect after WQIP's acceptance by the Regional Water Board. Until the WQIP is accepted, the Authority will continue to implement its Transitional Dry Weather Monitoring Program.

Non-Storm Water Discharges and Illicit Discharges. Non-storm water discharges, as defined by the Municipal Permit, include all discharges to and from an MS4 that do not originate from precipitation events (i.e., all discharges from an MS4 other than storm water). Non-storm water discharges can include discharges that are illicit (unauthorized), or National Pollutant Discharge Elimination System (NPDES)-permitted (authorized). An illicit discharge is any discharge to an MS4 that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from firefighting activities (40 Code of Federal Regulations [CFR] 122.26(b)(2)). An illicit connection is a connection to an MS4 that conveys an illicit discharge. Authorized discharges are those identified in Provisions E.2.a.(1) through E.2.a.(5) of the Municipal Permit and Section IV.A of the Industrial Permit and are not identified as a source of pollutants by the Authority. These are described in Sections 3.0 and 7.0.

Dry Weather Field Screening Monitoring Program. A requirement and critical element of the Illicit Discharge Detection and Elimination program is a Dry Weather Field Screening Monitoring Program, as specified under Provisions D.2 and E.2 of the Municipal Permit. The purpose of the program is to identify non-storm water and illicit discharges, categorize these discharges as transient or persistent flows, and prioritize flows to be investigated and eliminated following implementation of the WQIP. The Authority will use the results of this program to assess the effectiveness of its Jurisdictional Runoff Management Program (JRMP) toward reducing or prohibiting non-storm water discharges (NSWDs) into the MS4. Under the transitional Dry Weather Field Screening Monitoring Program, the two MS4 outfalls solely within the Authority's jurisdiction (i.e., Outfalls 12 and 15) were inventoried and incorporated into the MS4 map. The Authority also performs dry weather monitoring at selected stations where industrial wet weather monitoring occurs. Analytical monitoring may be conducted at any of these locations and serves two important purposes: (1) provide more information to help the Authority detect and eliminate illicit discharges and illicit connections, and (2) provide additional analytical data to help prioritize water quality issues, sources, and stressors during implementation of the WQIP and JRMP. Once the monitoring and assessment programs of the WQIP are adopted, the Authority will continue to conduct dry weather field screening monitoring and visual observations of the MS4 outfalls and other locations twice per year during dry weather conditions.

Table D2-6 summarizes the Authority's dry weather monitoring programs. Table D2-7 summarizes Copermittees' dry weather monitoring programs under the San Diego Bay WQIP.

Table D2-6. Summary of the Authority's Dry Weather Monitoring Programs

Monitoring Program	Regional or Jurisdictional	Monitoring Agency	Sample Type	Analyses	Station Type		Frequency of Events	Number of Sites	Permit Reference
MS4 Outfall NSWD and Field Screening	Jurisdictional	SAN	Visual observations, *in-situ* measurements, grab (water)	As needed for IDDE follow-up	MS4 Outfall		2	2	2013 Municipal Permit: D.2.b.; E.2.c; E.2.d;
Dry Weather Industrial	Jurisdictional	SAN	Visual observations	NA	Drainage Area		Monthly	18	Industrial Permit [1]: XI.A, IGP Factsheet II.C

Notes:

IDDE = Illicit Discharge Detection and Elimination

Table D2-7. Summary of Copermittees' Dry Weather Monitoring Programs

Monitoring Program	Regional or Jurisdictional	Monitoring Agency	Sample Type	Analyses	Station Type	Frequency of Events	Number of Sites	Permit Reference
TMDL[1] Monitoring of Shelter Island Shoreline Park	Jurisdictional	N/A to SAN	Grab (water)	Indicator bacteria	Receiving water	At least 5 per month	4	2013 Municipal Permit: D.1.c.(3).(f).(iii); Attachment E (Provision 5); IO No. R9-2011-0036
TMDL[1] Monitoring of Chollas Creek	Regional	N/A to SAN	Grab, visual observations, *in-situ* measurements	Indicator bacteria	Receiving water	At least 5 per month	3	2013 Municipal Permit: D.1.c.(3).(f).(iii); Attachment E (Provision 6)
TMDL[1] Monitoring of SIYB	Jurisdictional	N/A to SAN	*In situ* field measurement, grab (water column), visual observations	Chemistry, toxicity	Receiving water and MS4 Outfall	1	7	2013 Municipal Permit: D.1.c.(3).(f).(iii); Attachment E (Provision 2)

Table D2-7. Summary of Copermittees' Dry Weather Monitoring Programs (continued)

Monitoring Program	Regional or Jurisdictional	Monitoring Agency	Sample Type	Analyses	Station Type	Frequency of Events	Number of Sites	Permit Reference
Long-Term Receiving Waters Monitoring	Regional	Copermittees	*In situ* field measurement, visual observations, trash assessment, grab, and composite samples	Chemistry, nutrients, bacteria, toxicity, bioassessment, trash	Receiving water	3 events	1	2013 Municipal Permit: D.1.b; D.1.c.(2); D.1.c.(3)
San Diego Reference Streams and Beaches Special Study	Regional	Copermittees	Grab (water)	Indicator bacteria, chemistry, nutrients, bioassessment, flow	Receiving water	Weekly until dry	10	2013 Municipal Permit: D.3.a.(1)
San Diego Bay Debris Study	WMA	Copermittees	Grab, visual observations	Trash assessment	Receiving water	2 events	142	2013 Municipal Permit: D.3.a.(2)
Riparian Area Special Study	WMA	Copermittees	Grab (water)	Metals (selenium)	Receiving water	50 events in 2014	5	2013 Municipal Permit: D.3.a.(1)
Southern California Bight Monitoring	Regional	Copermittees	Grab (sediment)	Chemistry, toxicity, bioassessment	Receiving water	Dependent on program	420	2013 Municipal Permit: D.1.e.(1).(b)
Regional Harbor Monitoring Program	Regional	RHMP Agencies	*In situ* field measurement, grab (water, sediment), visual observation	Water/sediment: chemistry, toxicity, bioassessment, trash, fish trawls; special studies (as needed)	Receiving water	1 event every 5 years	75	2013 Municipal Permit: D.1.e.(1).(b)
SMC Regional Monitoring	Regional	Copermittees	Grab (water, algae, infauna)	Chemistry, nutrients, toxicity and bioassessment	Receiving water	Annually	Approximately 3 sites per WMA, but may be randomly distributed	2013 Municipal Permit: D.1.e.(1).(a)
Beach Water Quality (AB411)	Regional	Copermittees	Grab (water)	Indicator bacteria	Receiving water	Weekly from April 1 through October 31	4	N/A

Notes:
1. SAN is not named in these TMDLs; they are included here because they apply to San Diego Bay, a receiving water body of SAN.
DEH = (San Diego County) Department of Environmental Health; IDDE = illicit discharge detection elimination; MLS = mass loading station; MS4= municipal separate storm sewer system; N/A = not applicable; SMC = Southern California Stormwater Monitoring Coalition; SIYB = Shelter Island Yacht Basin; TBD = to be determined; TMDL = total maximum daily load; TWAS = temporary water assessment station

5.0 STORM DRAIN SYSTEM MAPPING (MS4 MAP)

Pursuant to Provisions D.2 and E.2 of the Municipal Permit, the Authority has updated its MS4 map, provided in Appendix B, Figure for BMP SC-01. As defined by the Municipal Permit, an MS4 consists of all conveyances within the jurisdiction of the Authority that it owns or operates and that collect or convey storm water, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

The map identifies:

All segments of the MS4 owned, operated, and maintained by the Authority

Locations of all known connections with other MS4s not owned by the Authority

Locations of inlets and outfalls that collect and/or discharge runoff within the MS4

Receiving waters to which the Authority's MS4 outfalls discharge. (Note: there are no receiving waters within the Authority's jurisdiction)

Locations of the MS4 outfalls from which the Authority's jurisdiction discharge. (Note: only two outfalls (12 and 15) discharge solely Authority runoff; other outfalls discharge comingled runoff).

There are no MS4 outfalls with known persistent flows. Outfalls 12 and 15 are susceptible to tidal influences.

The map also addresses all requirements of the Site Map under the Industrial Permit Section X.E., as described in Section 7.0. The accuracy of the MS4 map is confirmed during dry weather field screening and the map is updated annually. Some information in the most recent map is provisional, pending receipt of as-built drawings from ongoing construction at SAN.

6.0 STATION INVENTORY

An inventory of major MS4 outfalls in the jurisdiction of the Authority that discharge directly to the receiving water (the Navy Boat Channel, which is part of San Diego Bay) was completed per Municipal Permit Provision D.2.a.(1). As stated previously, only two MS4 outfalls discharge directly to the receiving waters from the Authority's jurisdiction, and therefore these outfalls were selected for dry weather field screening and MS4 outfall discharge monitoring under the Municipal Permit, as shown in Table D2-8.

Table D2-8. Monitoring Stations for Dry Weather Field Screening Outfall Monitoring

Drainage Basin	WMA/HSA	Monitoring Location ID	Latitude	Longitude	Outfall Diameter (inches)	Sampling Method	Location Description	Accessibility	Dry Weather Flow Classification
12	San Diego Bay 908.21	DWO1	32.736435	-117.207825	60	NA	Outfall from runway, ramp, and taxiway area to Navy Boat Channel	Inaccessible – tidally influenced	Unknown
15	San Diego Bay 908.21	DWO2	32.736435	-117.736407	54	NA	Outfall from Terminal 2 ramp and taxiway to Navy Boat Channel	Inaccessible – tidally influenced	Unknown
Alternate Upstream Sampling Sites									
12	San Diego Bay 908.21	C-B12-9a	32.734697	-117.202831	NA	Visual Observations/ Grab	Inlet pipe at storm drain inlet for T2W OWS	Accessible	Transient Flows
15	San Diego Bay 908.21	NA	32.735872	-117.206794	NA	NA	Effluent from the storm filter in the loading, ramp, and Remain Overnight parking area of Terminal 2. Site is submerged and cannot be safely monitored.	Inaccessible – tidally influenced	Unknown

In compliance with Provision E.2.C of the Municipal Permit, the Authority also selected the Industrial Permit wet weather monitoring locations for dry weather field screening, since "MS4 outfalls and other portions of its MS4" are required to be investigated (Table D2-9).

Table D2-9. Additional Sampling Locations for Dry Weather Monitoring

Sampling Location ID[1]	Drainage Basin	Sampling Method	Location Description
C-B03-1c	3[2]	Grab[3]	Sheet flow at storm drain inlet, over zipper line in oval
C-B03-2	3	Grab[3]	Sheet flow at storm drain inlet by blast fence
C-B05-4	5	Grab[13]	Sheet flow from taxiway near generator area/ old bird site
C-B06-5a	6	Grab[4]	Inlet pipe in manhole downstream of Central Receiving and Distribution Center (CRDC) BMPs
C-B07-6	7	Grab[3]	Inlet pipe in manhole collecting effluent of Menzies/American oil-water separator (OWS)
C-B07-7[5]	7	Grab[3]	Effluent downstream of maintenance/cargo area
C-B08-8	8	Grab[4]	Sheet flow from the loading area of Terminal 1
C-B12-9a	12	Grab[6]	Inlet pipe at storm drain inlet near Terminal 2 West
C-B05-13	5	Grab[3]	Sheet flow at storm drain inlet near DHL
C-B06-14	6	Grab[4]	Sheet flow at storm drain inlet near FedEx loading area and material storage
C-B06-15a	6	Grab[3]	Sheet flow at storm drain in front of Airport Rescue and Fire-Fighting Facility (ARFF)
C-B06-16a[7]	6	Grab[4]	Inlet pipe at trench drain draining storage area near Commuter Terminal
C-B06-17	6	Grab[3]	Sheet flow from taxiway at blue mark
C-B15-18a	15	Grab[3]	Sheet flow at trench drain near Gate 46
C-B06-19	6	Grab[3]	Sheet flow at NE drain in Allied Aviation's operating area
C-B06-20	6	Grab[3]	OWS effluent at Allied Aviation's Remote Fueling Facility. Call Allied to operate.
C-B03-21[8]	3	Grab [3]	StormFilter effluent at west corner of Signature FBO
Alternate Sampling Location			
C-B08-22[9]	8	Grab[1]	Sheet flow from runway area taken south of the perimeter road

Notes:

* Sampling location replaced sites C-B01-11 and C-B03-121. Sampling locations C-B05-3 and C-B09-10b are no longer being sampled for compliance purposes because these sites are non-industrial (i.e. parking lots).

2. Drainage basin has changed from 1 to 3 at this site because of the decommissioning of part of the storm drain line in Taxiway C, linking the site to Outfall 1. It now drains to Outfall 3 and is located in a runway oval.

3. Grab sample will be collected manually.

4.Grab sample will be collected using automated sampling equipment.

5. Sampling location replaced site C-B07-7a and effluent is taken from newly installed MetalZorb BMP.

6. Grab sample will be collected using automated sampling equipment. If San Diego Bay MS4 sampling is occurring during the same storm event, the equipment will be set to collect a composite. Manual grab sampling is difficult because of the high volume of traffic in the area.

7. Sampling location moved back to C-B06-16a following completion of construction and closing for construction staging yard.

8. Sampling location replaced sites C-B01-11 and C-B03-12 and drains from basins 1 and 3 via a newly installed StormFilter BMP.

9. Alternate sampling location for runway. If site C-B03-1c is inaccessible for safety reasons, site C-B08-22 will be sampled instead.

7.0 DRY WEATHER FIELD SCREENING

Field screening of dry weather MS4 outfalls and inlet monitoring locations will be scheduled to coincide with two of the monthly visual inspections as required under Section XI.A of the Industrial Permit. Field and laboratory analytical sampling will occur as needed to facilitate IDDE investigations or to gain additional data for WQIP updates. The Authority will retain records of all monitoring information, including calibration and maintenance records of monitoring instrumentation, for at least five years from the date of sample collection or measurement. This period may be extended by request of the Regional Water Board or USEPA at any time and will be extended during the course of any unresolved litigation regarding a discharge.

Field screening visual observations are performed after an antecedent dry period of at least 72 hours following a storm event with precipitation of more than 0.1 inch. Parameters include those required in Table D-5 of the Municipal Permit:

Station identification and location

Presence of flow, or pooled or ponded water

If flow is present:

Flow estimation (i.e., width of water surface, approximate depth of water, approximate flow velocity, flow rate)

Flow characteristics (i.e., presence of floatables, surface scum, sheens, odor, color)

Flow source(s) suspected or identified from non-storm water source investigation

Flow source(s) eliminated during non-storm water source identification

If pooled or ponded water is present:

Characteristics of pooled or ponded water (i.e., presence of floatables, surface scum, sheens, odor, color)

Known or suspected source(s) of pooled or ponded water

Station description (i.e., deposits or stains, vegetation condition, structural condition, observable biology)

Presence and assessment of trash in and around station

Evidence or signs of illicit connections or illegal dumping

If flow or ponded runoff is observed at a dry weather field screening and analytical monitoring location, and there has been at least 72 hours of dry weather (defined as no storm producing rainfall greater than 0.1 inch), the Authority will make observations and attempt to ascertain the source of flow or ponding. This usually involves tracking the flow upstream and, if the source cannot be found and an illicit discharge is suspected, taking field measurements and collecting grab samples for analytical screening.

The Municipal Permit requires that, for a Copermittee with fewer than 125 major outfalls, 80 percent of outfalls must be visually inspected during dry weather conditions. Because there are only two major outfalls, both outfalls must be screened during each monitoring event (2 outfalls * 80% coverage = 1.6 outfalls, i.e., 2 outfalls). Informal field observations typically consist of a brief visual inspection, whereas a formal field observation completely documents the observations on a field form. For MS4 inspections, the Authority uses the MS4 Outfall Visual Observation Field Datasheet, developed by the Copermittees. The datasheet has four

parts: general site description, atmospheric and runoff conditions, field screening observations (including flow estimates) and a trash assessment. The field datasheet is reviewed and updated annually by the Copermittees as a group.

A description of the MS4 Outfall Visual Observation Field Datasheet sections follows.

*General Site Description*This section provides basic information (such as the location, date, time, and conveyance type) as well as a history of the flow status, indicating whether a site has previously been subject to persistent dry weather flow.

*Atmospheric and Runoff Conditions*This section of the form assesses the potential dry weather flow sources and destinations, and documents whether there is evidence of an obvious illicit discharge. Atmospheric conditions assessed include current weather, time and quantity of last rain, and tidal height, if applicable.

*Field Screening Observations*This section generally assesses the observed dry weather flow or ponded water (including variables such as odor, water clarity, the presence of floatables, and color, together with any visible deposits or stains) and the vegetation and biological characteristics of the area. Also recorded are flow estimates using the most appropriate method, including depth-velocity measurement, bottle-fill time, and leaf float velocity assessment. (This section needs to be completed only if flow or ponding is observed.)

*Trash Assessment*The assessment of trash records the spatial extent, types, and amount of trash present. A photograph of the site can document the site conditions for the record and for future reference, and should be taken when deemed appropriate by monitoring personnel.

A second field sheet, the Dry Weather Monitoring Field Datasheet, may be used if field screening measurements are taken. This field form contains much of the same information recorded on the MS4 Outfall Visual Observation Field Datasheet, with the addition of a Field Measurements section. Both the MS4 Outfall Visual Observation Field Sheet and the Dry Weather Monitoring Field Datasheet are in Attachment G.

If field samples are required, some or all of the following constituents will be analyzed in a sample of the flowing or ponded water at the applicable dry weather monitoring outfalls or inlet locations, depending on the source of the suspected illicit discharge:

Specific Conductance (estimates of total dissolved solids [TDS] will be calculated from conductivity)

Water temperature

pH

Turbidity

Reactive phosphorus (ortho-P)

Nitrate nitrogen

Ammonia nitrogen

Surfactants (methylene blue active substances [MBAS])

Additional constituents may also be analyzed to help identify the illicit discharge. Results of the field screening will be recorded on the Dry Weather Field Monitoring Datasheet. Field screening Data Quality Objectives (DQOs) are summarized in Table D2-10.

Table D2-10. Data Quality Objectives—Field Screening

Analyte	Container	Analytical Method	Reporting Limits	Accuracy
Specific Conductance	Plastic	Field Meter	0.01	±0.5%
pH	Plastic	Field Meter	1-14	0.01 units
Temperature	Plastic	Field Meter	0.01 °C	0.15
Turbidity	Plastic	Field Meter	0.05	2%
MBAS (surfactants)	Plastic	Field Kit	0.5 mg/L	0.125
Nitrate, NO_3-N	Plastic	Field Kit	1.35 mg/L	0.1
Reactive Phosphorous, PO_4-P	Plastic	Field Kit	0.07 mg/L	0.05
Ammonia, NH_3-N	Plastic	Field Kit	0.05 mg/L	0.05

Notes:
mg/L = milligrams per liter

If the source of a non-storm water discharge or ponding cannot be identified and eliminated on the basis of field observations and screening alone, a grab sample may be collected and submitted for analytical laboratory analysis. Personnel conducting the monitoring will use their discretion as to the need to collect a grab sample at a particular site. The following factors will be considered: the results of the field screening analysis, the conditions and characteristics of the site and the runoff, the occurrence of illicit connections or illegal discharges at the location in the past, the conditions and uses in the tributary area, and other relevant factors. Once results of the analyses are available, they will be recorded on the Dry Weather Field Monitoring Datasheet for that site.

If grab samples are collected, the following constituents will be analyzed in a laboratory certified by the State of California Department of Public Health:

Total hardness

Oil and grease

Diazinon and chlorpyrifos

Total and Dissolved cadmium, copper, chromium III, chromium VI, lead, nickel, silver, and zinc

Enterococcus, total coliform, and fecal coliform bacteria (Colilert and Enterolert may be used as alternative methods, with fecal coliform determined by calculations.)

PCBs

If persistent flow (as defined in Section 4.1 below) is observed at any of the locations, additional parameters from Table D-7 of the Municipal Permit will be analyzed.

Dry weather monitoring involves collection of grab samples only, and only when sampling is deemed necessary to identify the source of an illicit discharge. If sampling or analyses are conducted, records of monitoring information shall include [40 CFR 122.41(j)(3)]:

1) The date, exact place, and time of sampling or measurements

2) The individual(s) who performed the sampling or measurements

3) The date(s) analyses were performed

4) The individual(s) who performed the analyses

5) The analytical techniques or methods used

6) The results of such analyses

Field Equipment Checklist

The field equipment listed below will be used to conduct dry weather monitoring. This list will be reviewed prior to conducting monitoring to ensure that the proper materials are available.

1) Field Notebook:

Site map

Monitoring station checklist

Photographs of monitoring stations

Monitoring datasheets

Point of Contact (POC) list

Health and Safety Plan

2) Personal Protection Equipment:

Nitrile gloves

Protective eyeglasses or goggles

Steel-toed rubber boots/waders or work boots

Safety harness or flotation device

Hard hat

Safety vest

Safety rope

3) General Equipment:

Digital camera

Cellular telephone

Extra batteries for all meters

Pick or manhole puller

4) Sampling Equipment:

Sample collection equipment

Small, clear container for visual observations

Portable Field Test Kits, colorimeters or spectrophotometer, and reagents for meter

Multi-parameter or individual probes to measure temperature, electrical conductivity, pH, and turbidity

De-ionized water in squeeze bottles

Thermometer

Waste disposal bottles

Pump and tubing, or polypropylene bucket with rope, or a sampling rod

Sample bottles with preservatives

Coolers with bagged ice and bubble wrap

Flow measurement equipment (required equipment will depend on method used):

- Measuring tape for measuring stream width
- Folding scale for measuring stream depth
- Flow meter or wristwatch

Extra sample containers

5) Miscellaneous:

Clipboard

Pens and/or pencils

Permanent felt tip pen

Paper towels

Tape

Crate for carrying supplies and equipment

7.1 NON-STORM WATER PERSISTENT FLOW

The MS4 outfalls field screening monitoring conducted pursuant to the Municipal Permit Provision D.2.a.(2) revealed that neither of the major outfalls in SAN's jurisdiction have persistent flows. As stated in Attachment C of the Municipal Permit, a persistent flow is defined as "*the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events.*" Major MS4 outfalls will continue to be monitored for the presence of persistent flows as part of the MS4 outfall dry weather field screening monitoring program.

8.0 SAMPLING PROCEDURES AND QUALITY ASSURANCE/QUALITY CONTROL

Appendix D-1, Industrial Monitoring Implementation Plan, describes sampling and analysis procedures, instrument calibration procedures, and field and laboratory quality assurance and quality control (QA/QC) procedures for dry and wet weather monitoring programs. It also includes sections on data management and reporting, and health and safety.

9.0 INVESTIGATION ACTION CRITERIA

Reports of illicit discharges or illicit connections can originate from the following sources:

Field screening visual observations

Non-storm water analytical flow monitoring

Reports or notifications from hotlines or other sources

If reports of illicit discharges originate from sources outside of field staff conducting field screening or monitoring, reports will be assessed in a timely manner. The validity of a report or notification will be based on the inspector's best professional judgment, given the information that has been obtained. Valid reports will be prioritized for further investigation and all discharges reported and investigated. These reports will be included with the results (e.g., elimination of the discharge, enforcement actions issued, etc.) in the JRMP Annual Report Form as part of the WQIP Annual Report.

Obvious illicit discharges (e.g., based on color, odor, or exceedance of an action level) and any discharges that pose an immediate threat to human health or the environment will be investigated immediately. Any of the following circumstances will be reported to the California Emergency Management Agency (CalEMA) in accordance with the *California Hazardous Material Spill Release Notification Guidance*:

Discharges or threatened discharges of oil in marine waters

Any spill or other release of one barrel or more of petroleum products at a tank facility

Discharges of any hazardous substances or sewage, into or on any waters of the state

Discharges that may threaten or impact water quality

Any found or lost radioactive materials

Discharges of oil or petroleum products into or on any waters of the state

Hazardous Liquid Pipeline releases and any rupture, explosion, or fire involving a pipeline

Other non-storm water flows will be classified as persistent or transient. If a persistent flow is identified, monitoring personnel will use their discretion to determine whether a source investigation is necessary. The decision will be based on site-specific characteristics and may involve collection of analytical samples. If analytical samples are collected, the Authority will rely on the latest action criteria developed by the Copermittee dry weather monitoring workgroup, listed in Tables D2-17 and D2-18, to prioritize follow-up investigations. An exceedance of these criteria will necessitate a follow-up investigation to identify and eliminate the source causing the exceedance. Dry weather screening and analytical monitoring stations found to exceed dry weather monitoring criteria for any constituent will be given priority for further screening.

Upon WQIP implementation, the presence of a pollutant causing or contributing to a 303(d)-listed status in a receiving water body and the presence of a pollutant identified as a high-priority or focused priority water quality problem by the Authority (i.e., copper and zinc) will also be cause for a prioritized source investigation. The relevant 303(d)-listed waterbodies are identified in Table D2-19.

Table D2-17. Instantaneous Maximum Action Criteria for Analytes—Field Screening

Analyte	Action Level[1]	Source and Notes
pH (pH units)	<6.0 or >9.0	Municipal Permit and Ocean Plan water quality objective for discharges to Bays, Harbors, and Lagoons/Estuaries. Elevated pH is especially problematic in combination with high ammonia.
Orthophosphate-P (mg/L)	2.0	USEPA Multi-sector General Permit
Nitrate-N (mg/L)	10.0	Basin Plan and drinking water standards
Ammonia-N (mg/L)	1.0	Based on workgroup experience. May also consider un-ionized ammonia fraction.
Turbidity (NTU)	225	Municipal Permit and Ocean Plan water quality objective for discharges for Bays, Harbors, and Lagoons/Estuaries. Also base judgment on channel type and bottom, time since last rain, background levels, and, most importantly, visual observation (e.g., unusual colors and lack of clarity) and unusual odors.
Temperature (F or C)	Best Professional Judgment	Base judgment on season, air temperature, channel type, shading, etc.
Conductivity (mS/cm)	Best Professional Judgment	Values > 5 mS/cm may indicate IC/ID; however, EC may be elevated in some regions because of high TDS from groundwater exfiltration to surface water, mineral dissolution, drought, and seawater intrusion. Normal source ID and discharge elimination work is not effective in these situations. Knowledge of area background conditions is important. Values < 0.75mS/cm may indicate excessive potable water discharge or flushing.
Methylene Blue Active Substance MBAS (mg/L)	1.0	Basin Plan, with allowance based on Workgroup field experience and possible field reagent interferences

Notes:

1. The referenced action level will not be the sole criterion for initiating a source identification. Dry weather monitoring data will be interpreted using the various available information, including best professional judgment and within- and between-site sample variability.

mg/L = milligrams per liter, NTU = Number of Transfer Units, mS/cm = milli-Siemens per centimeter

Table D2-18. Action Criteria for Analytes—Analytical Monitoring

Analyte (Units)	Action Level[1]	Source and Notes
Oil and Grease (mg/L)	15	USEPA Multi-sector General Permit. If a petroleum sheen is observed, the sample will be collected from the water surface. Visual observations may justify immediate investigation.
Diazinon (g/L)	0.5	Response to diazinon and chlorpyrifos levels above 0.5 g/L will focus on education and outreach to potential dischargers in the target drainage basin. High levels will be investigated aggressively, as with other potential IC/IDs.
Chlorpyrifos (g/L)	0.5	
Dissolved Cadmium (g/L)	16	Municipal Permit and California Toxics Rule maximum daily action level (MDAL) criteria for saltwater used to determine the appropriate action level for individual samples.
Dissolved Copper (g/L)	5.8	
Dissolved Chromium III (g/L)	NA[2]	
Dissolved Chromium VI (g/L)	83	
Dissolved Lead (g/L)	14	
Dissolved Nickel (g/L)	14	
Dissolved Silver (g/L)	2.2	
Dissolved Zinc (g/L)	95	
Total Coliform (MPN/100mL)	10,000	Basin Plan objective for REC-1 bays and estuaries. The action level is reached if a single sample, verified with a repeat sample within 48 hours, exceeds 10,000 MPN/100mL.
Fecal Coliform (MPN/100mL)	400	Municipal Permit and Basin Plan non-storm water instantaneous maximum. The NAL is reached if more than 10 percent of samples exceed 400 MPN/100mL within a 30-day period.
Enterococcus (MPN/100mL)	104	Municipal Permit non-storm water and Basin Plan non-storm water instantaneous maximum designation for REC-1 waterbodies.

Notes:

1. The referenced action level will not be the sole criterion for initiating a source identification. Dry weather monitoring data will be interpreted using the various available information, including best professional judgment, and within- and between-site sample variability.

2. There is no CTR action level established for Chromium III in saltwater.

g/L = micrograms per liter; mg/L = milligrams per liter; MPN/100mL = most probable number per 100 milliliters

Table D2-19. Section 303(d)-Listed Receiving Water Bodies

Receiving Water Body	Pollutant of Concern	Discharging Outfalls
San Diego Bay	Polychlorinated Biphenyls (PCBs)	All
San Diego Bay Shoreline, Downtown Anchorage	Benthic Community Effects, Sediment Toxicity	1, 2, 3, 4
San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper	5, 6, 7
San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper	8, 9, 10, 11
San Diego Bay Shoreline, at Spanish Landing	Total Coliform	8, 9, 10, 11

10.0 INVESTIGATIONS AND ELIMINATION OF DISCHARGES AND CONNECTIONS

Follow-up source investigations and procedures for the elimination of illicit discharges and connections will be conducted as described below. Source investigations will typically be conducted by the Environmental Affairs Department (EAD) monitoring personnel. Source investigations are initiated when observations, field screening results, laboratory analytical results, or a reported complaint suggest a reasonable potential for the existence of an illicit discharge. Obvious illicit discharges or connections (e.g., discharges exhibiting unusual color, odor, sheen, or high volume), or discharges that pose an immediate threat to human health or the environment, warrant immediate investigation. All other identified discharges of non-storm water must be prioritized and investigated in a timely manner.

Investigations will result in the classification of all persistent non-storm water discharges into one of four endpoint categories, based upon the source of the discharge:

A—Natural in origin and conveyance

B—Illicit discharge/connection

C—Other non-storm water discharges

D—Unidentified

Table D2-20 identifies potential characteristics of Endpoint A discharges, flows that are natural in origin and conveyance. A complete list of Endpoint A discharge categories is provided in Provision E.2.a.(3) of the Municipal Permit, and may include stream flows, springs, uncontaminated groundwater infiltration, and discharges of potable water.

Illicit discharges (Endpoint B) may be identified using a combination of observations, field screening, and analytical results. Some common characteristics of illicit discharges are provided in Table D2-21.

Other categories of non-storm water discharges that may be exempt from classification as illicit discharges are listed in Provisions E.2.a.(1) through E.2.a.(5) of the Municipal Permit. Non-storm water discharges must still be regulated as illicit discharges if they are found to exceed non-storm water action levels or to contribute to pollution in the receiving waters. Table D2-22 summarizes some categories of exempt non-storm water discharges.

If the source of a discharge cannot be identified (Endpoint D), it will be addressed as an illicit discharge. This JRMP will be updated to address common and suspected sources of unidentified non-storm water discharges.

Table D2-20. Characteristics of Endpoint A Discharges

Example	Potential Characteristics	Potential Constituents
Groundwater or spring seepage into the storm drain system	Dissolved oxygen tends to be low Color tends to be clear Turbidity tends to be low Hardness tends to be high Total dissolved solids (TDS) tends to be high Bubbling into channel Seeping into MS4 pipe joints Cracks from tree roots Moist sides or bottom of channel High water table in region	Iron Manganese Selenium Sodium Calcium Nutrients

Table D2-21. Characteristics of Endpoint B Discharges

Source Category	Potential Characteristics	Potential Activities
Illicit Discharge or Connection	Foam/suds (MBAS) Colored discharge Low Dissolved Oxygen Oil Sheen Chlorine Odor High pH Low pH Odor Nitrogen Phosphorus Metals Trash/Materials High Turbidity Total Coliform, Fecal Coliform, Enterococci Sediment	Non-residential Car Washing Steam Cleaning Engine Cleaning Mat Washing Pool Discharge Concrete/Plaster Acid Washing Sewer overflows Construction Dumpster Leakage Greywater Discharge Over-Irrigation

Table D2-22. Categories of Endpoint C Discharges

Source Category	Potential Discharges
Other Non-Storm Water Discharge	Discharge covered under *General Waste Discharge Requirements for Discharges from Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay, Tributaries Thereto under Tidal Influence, and Storm Drains or Other Conveyance Systems Tributary Thereto* (NPDES Permit No. CAG919001) or *General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region Except for San Diego Bay* (NPDES Permit No. CAG919002)[1] Uncontaminated pumped groundwater Discharges from foundation drains[2] Water from crawl space pumps Water from footing drains[3]
	Discharge has coverage under *General Waste Discharge Requirements for the Discharges of Hydrostatic Test Water and Potable Water to Surface Waters and Storm Drains or Other Conveyance Systems within the San Diego Region* (NPDES Permit No. CAG679001)[4]
	Discharges to be Controlled through Statute, Ordinance, Permit, Contract, Order, or Similar Means[5] Air conditioning condensation Individual residential car washing Dechlorinated swimming pool discharges
	Emergency firefighting flows[6]
	Controlled irrigation with BMPs implemented (as authorized under the Industrial Permit)

Notes:

1. Addressed as illicit discharge only if discharge does not have coverage. [Municipal Permit E.2.a.(1)]
2. Provision E.2.a.(1) of the Municipal Permit applies to this category of non-storm water only if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year. Provision E.2.a.(3) applies to this category of non-storm water discharge only if the system is designed to be located above the groundwater table at all times of the year and the system is expected to discharge non-storm water only under unusual circumstances.
3. Provision E.2.a.(3) of the Municipal Permit applies to this category of non-storm water discharge only if the system is designed to be located above the groundwater table at all times of the year, and the system is expected to discharge non-storm water only under unusual circumstances.
4. Addressed as illicit discharge only if discharge does not have coverage. [Municipal Permit E.2.a.(2)]
5. Addressed as illicit discharge only if discharge is not controlled by Municipal Permit requirements via these means. [Municipal Permit E.2.a.(1)]
6. Addressed as illicit discharge only if the Authority or the Regional Water Board identifies the discharge as a source of pollutants to receiving waters. [Municipal Permit E.2.a.(5)]

Step 1—Location of Observation

Source investigations begin at the location where the observations that initiated the investigation were made. If the observations were made by someone other than the current investigators, or if the initial observations were made more than several hours prior to the initiation of the source investigation, the investigation should begin with a thorough visual inspection of the location. Investigators will take Global Positioning System (GPS) coordinates at the site and fill in the Dry Weather Field Monitoring Datasheet.

If flows exist, samples may be collected for field screening and laboratory analysis, as deemed appropriate by the investigators. If the illicit discharge is still occurring and is deemed to pose a substantial threat to resources and humans downstream, if feasible, actions should be taken immediately by the Authority to prevent or retard the discharge from flowing further downstream.

Step 2—Source Tracking

While at the observation location, the investigator should consult various resources (such as the MS4 map, land use maps, and aerial photographs) to determine the characteristics of the tributary areas. In some circumstances, the investigator may be able to identify probable sources of the illicit discharge based on the expected activities of certain upstream sites or the results of previous investigations and past dry weather monitoring reports. If so, the investigator may choose to go directly to these potential sources to investigate. If inspections of these potential sources do not reveal the source of the illicit discharge, or if potential sources are too numerous, then the investigator should track the discharge upstream.

If the discharge has ceased, it may be impossible to track the source. In these circumstances, the investigator should document that the discharge has ceased and cannot be tracked. A brief drive or walkthrough survey of the tributary area should be conducted and documented to verify that there is no obvious source. In some cases, the sources may still be identified by evidence at the site or further upstream. For example, if a sediment laden discharge was reported, an upstream site may reveal signs of sediment discharge such as deposits along curbs or in inlets, signs of eroded slopes, or exposed soils lacking required BMPs. Roads and road gutters should be checked for evidence of flows such as runoff from vehicle washing or irrigation. Areas in a road that have been dug up and re-paved may indicate a new or illicit connection to the MS4. Finally, the investigator will look for evidence of recent or past dumping, such as wet and/or stained pavement or gutters.

When source tracking, the investigator should use MS4 maps and other resources to aid in the investigation. Any traceable characteristic of the illicit discharge (color, constituents, odor, quantity, etc.) should be noted, as these will aid the investigator in tracking and identifying sources. The Authority's strategy to source tracking is to track the discharge upstream, thereby reducing the tributary area and potential sources. While working upstream along the MS4, the investigator may encounter tributary pipes or inlets, and each should be evaluated for their potential to be the conveyor of the discharge. If a pipe or inlet is dry, it can automatically be eliminated if the illicit discharge is still occurring. If a pipe or inlet is the source of the flow in the main portion of the MS4, then the tracking should continue along that pipe or inlet. If the main portion of the MS4 and the tributary pipe or inlet both contain flow, more detailed observations must be made. The investigator may be able to rule out a conveyance based on visual observations, characteristics of the illicit discharge, or field screening to identify constituents.

Step 3—Inspection of Potential Sources

Once the set of possible sources has been reduced to a manageable set, the investigator may choose to end the source tracking and continue the investigation by inspecting the various potential sources. Test strips or other field measurements can be used for quick preliminary results for multiple flows. However, if none of these potential sources can be identified as the source of the discharge or if the investigator cannot identify any potential sources, the source tracking may continue all the way to the source. It is generally easiest to track the largest flows first. If they are about the same size, start with the one that is easiest, shortest, or with the least number of junctions, or track those originating from areas with the greatest potential for illicit discharges.

Tracking along underground MS4 conveyances is more difficult because observations can be made only at the locations of manholes, outlets, and inlets. The Site Map (Figure 3) will be useful for these investigations. When the map indicates the confluence of two MS4 conveyances or if an unmapped confluence is suspected, if possible, the investigator should make observations at the point of confluence. Otherwise, the investigator should make observations at the nearest manhole or access point upstream along each conveyance. Manholes will not always need to be checked if there are no junctions between them; however, the investigator should be aware that the source of discharge may be an illicit connection or unmapped confluence existing between observation points. Investigators MUST NOT ENTER A MANHOLE unless confined-space certified and following established safety procedures. The investigator should check surrounding inlets, the surrounding area, and appropriate Authority personnel or records for evidence of infrastructure construction or other activities that might have resulted in an illicit connection. In the case of chronic illicit discharges for which a source cannot be identified, the Authority may choose to conduct dye testing, smoke testing, video monitoring, underground visual inspections, and/or continued water monitoring at the suspected source(s).

If flow is coming from another jurisdiction, the flow should be documented, and the relevant jurisdiction notified. Flows will not be tracked beyond the boundaries of Authority jurisdiction.

Step 4—Discharge Elimination

Once the source of a discharge has been identified, if the discharge is still occurring, it must be categorized as belonging to one of the four endpoints.

If the flow is found to be an illicit discharge, it must be eliminated; other non-permitted, non-storm water flows should be also eliminated, when possible. The investigator(s) should contact appropriate Authority personnel who will issue the necessary enforcement mechanism to the discharger to ensure that alterations are implemented to terminate the discharge and clean up the discharge. In cases where the responsible party is present at the source, or the discharge poses a substantial threat to humans or the environment, the investigator may choose to confront the responsible party before appropriate Authority personnel arrive to terminate the discharge as quickly as possible. The actions required of the responsible party to eliminate the illicit discharge will vary, depending on the type of illicit discharge. Cleanup or remediation actions may also be required of the responsible party, depending on the type and impact of the illicit discharge. The EAD will also determine if the discharge is an isolated incident that will be addressed through enforcement procedures, or if the category of discharge should be prohibited as an illicit discharge, as specified in Provision E.2.a.(6) of the Municipal Permit.

If a discharge is found to be coming from another jurisdiction, the Authority will formally notify a representative of the appropriate jurisdiction.

Step 5—Damage Assessment

After the discharge has been terminated, the inspector or other Authority personnel should travel downstream from the discharge to assess the impacts on downstream resources caused by the discharge. If downstream impacts are detected, additional remediation may be required of the responsible party and monitoring may also be necessary to ensure recovery of downstream areas. Authority personnel may also consider the level of downstream impact caused by the illicit discharge prior to deciding on which level of enforcement action is appropriate.

Step 6—Reporting

Based on the type of discharge and the damage assessment, the Authority may be required to immediately report the discharge to the Regional Water Board. The Authority submits the JRMP Annual Report Form to the Regional Water Board that includes a description of investigations and follow-up actions for illicit discharges and connections, reports the number of illicit discharges and connections identified, and reports the number eliminated for the previous fiscal year. Documentation and reporting requirements of non-storm water and illicit discharges are provided in Section 3.7.2.

11.0 ASSESSMENTS

Effectiveness assessments of SAN's monitoring programs are described in detail in Section 11.0 of this SWMP. In summary, the following assessments, required per Municipal Permit Provision D.4.b.(1), will be conducted on the basis of data collected during dry weather monitoring, and will be included in the WQIP Annual Reports and Report of Waste Discharge:

1) Progress toward prohibiting non-storm water and illicit discharges into the MS4 through the IDDE Program

2) Comparison between water quality sampling data and applicable non-storm water action levels, and determination of whether the analysis and assumptions used to develop WQIP strategies should be updated on the basis of this comparison

3) Identification of progress made toward meeting non-storm water quality goals and pollutant load reductions from different drainage areas

4) Identification of data gaps in the current dry weather monitoring program and revisions necessary to collect sufficient data for thorough water quality condition analysis

5) Identification of modifications to the dry weather MS4 outfall discharge monitoring locations and frequencies necessary to reduce or eliminate pollutants in non-storm water discharges from the MS4s in the WMA pursuant to Municipal Permit Provision D.2.b.(1)

APPENDIX D-2C: BMP EFFECTIVENESS SAMPLING

12.0 INTRODUCTION

Current and new BMP effectiveness studies will be incorporated into the wet weather monitoring program. These paired watershed and trend analysis studies, which started in 2006, are intended to evaluate the performance and effectiveness of structural and non-structural treatment control BMPs developed as part of recent SAN improvement projects, including the Green Build Terminal 2 West expansion and North Side improvements. The Authority will continue to evaluate the performance and effectiveness of BMPs in the following ongoing studies:

- Paired watershed monitoring – In a paired watershed study, one watershed is the control, within which no BMPs are added or removed; the other is the treatment (i.e., test) watershed, in which new BMPs are implemented. Two paired watershed studies are ongoing to evaluate BMPs in two land-use areas: airport gate area/ramp and short-term terminal parking lot. Four years of calibration monitoring have been conducted thus far.

- Trend analysis monitoring – This involves tracking a single monitoring location for 10 years as new BMPs are implemented. The intended goal is to confidently establish a downward trend in pollutant concentrations. Eight years of monitoring have been conducted thus far.

- Discrete BMP sampling – As a result of the completed development projects, a number of treatment control and LID BMPs have been installed throughout the airport property, such as CONTECH StormFilter® systems, Oldcastle (Krystar) PerkFilter™, and MetalZorb drain inserts, hydrodynamic separators, drain inserts, porous pavement, artificial turf, and bioswales. In an effort to evaluate the performance of these BMPs, the PerkFilter™ system, (which operates in a very similar way to the StormFilter®) installed in the Terminal 2 parking lot just upstream from the Drainage Basin 9 outfall and east of the Central Plant building was monitored and sampled for two storm events during the 2013-2014 season and five events during the 2014-2015 season (site S-B09-3). Construction on the Terminal 2 Parking Plaza began September 2016, with the construction area designated and blocked off prior to that, hence discrete BMP sampling was paused at the PerkFilter™. During the 2018 TCBMP inspections, the PerkFilter™ was found to be locked and investigations are underway to verify that it remains active and can be sampled for future seasons. The StormFilter® located west of the Central Plant building was removed during Terminal 2 Parking Plaza Construction in 2018. Monitoring and sampling at the PerkFilter location will continue during future seasons, once verified and maintained following its period of inactivity. Preliminary investigation of the airside StormFilter® system just upstream of the new Drainage Basin 15 outfall, prior to the 2013-2014 wet season, indicated that it was tidally influenced and/or impacted by groundwater, and remains unsuitable for monitoring/sampling. This site was removed from the monitoring location list when it was first identified as being impacted.

12.1 SAMPLING OBJECTIVES

The objectives of BMP effectiveness sampling are to monitor the performance and effectiveness of BMPs. The performance of structural and non-structural BMPs will be evaluated at locations that receive runoff from both industrial and non-industrial drainage basins to answer two questions:

- Are the BMPs reducing pollutant concentrations (for both primary and secondary POCs) to below benchmark values?

- Are the BMPs achieving the short-term and long-term objectives for reducing the pollutant load of the primary POCs (i.e., copper and zinc)?

Numeric goals are written into the WQIP for copper and zinc as the focused priority water quality condition for the Authority's jurisdiction. Long-term or final numeric goals were established to meet copper and zinc

reductions for Fiscal Year (FY) 2033, and short-term or interim goals were set to measure progress at five-year increments. The Authority has identified strategies to meet these numeric goals, in addition to the core BMPs required by the Municipal and Industrial Permits. Strategies include increased frequency and effectiveness of sweeping, rubber removal, power washing, and catch basin cleaning, enhanced BMP inspections, and a source identification study to identify the highest pollutant generating activities and areas.

Copper and zinc were identified as the priority POCs because they exceeded the benchmark values more than 50 percent of the time; i.e., they had the highest exceedance frequencies airport-wide and for most of the outfalls and drainage basins. The other analytes that exceeded benchmark values are considered, for the purposes of BMP effectiveness sampling, secondary POCs. During the 2014-2015 wet weather monitoring, nine pollutants exceeded benchmark values more than 50 percent of the time. These pollutants are, in descending order of exceedance frequency, copper (total and dissolved), zinc (total and dissolved), Enterococcus, chemical oxygen demand (COD), biological oxygen demand (BOD), ammonia, aluminum, iron, and total coliforms (Amec Foster Wheeler, 2015).

The number of samples required to evaluate the effectiveness of treatment control BMPs and BMP systems (i.e., combinations of structural and non-structural BMPs) is based on power analyses for the priority POCs. Based on the power analyses conducted in 2007, copper requires a feasible number of samples to produce meaningful data to compare to benchmark values, assess potential changes in mean concentrations over time, and detect differences between influent and effluent concentrations. The number of samples required for zinc is not considered feasible (Amec Foster Wheeler, 2007b).

Based on the power analyses, 14 samples are required to compare mean concentrations with benchmark values in airport operations areas; 14 samples are also required to detect an 80 percent reduction in influent concentrations, either through treatment at a discrete treatment control BMP or through treatment by a BMP system. For parking lot areas, 17 samples are required to compare mean concentrations with benchmark values.

The BMP effectiveness sampling programs are (1) Paired Watershed Monitoring, (2) Trend Analysis Monitoring, and (3) Discrete BMP Sampling.

12.2 BMP EFFECTIVENESS SAMPLING PROGRAMS

Data collected during the BMP effectiveness monitoring programs will be used to accomplish the following, per requirements of the Municipal Permit:

1) Evaluate BMP effluent analytical results against long-term and short-term water quality goals.

2) Compare BMP analytical data with WQIP numeric targets.

3) Evaluate the ability of installed BMPs to reduce pollutant loads to the maximum extent practicable (MEP).

4) Identify data gaps and additional monitoring necessary to evaluate BMP effectiveness.

5) Assess whether implemented BMPs are effective, and whether additional BMPs are required to reduce pollutants to meet water quality goals.

Monitoring locations for BMP system monitoring are discussed below.

Paired Watershed Monitoring

The effectiveness of BMP systems is being evaluated by continuing an ongoing paired watershed study to collect flow-weighted composite samples from a representative drainage basin and track trends as BMPs become fully implemented over time. In a paired watershed study, one watershed is the control, within which no BMPs are added or removed; the other is the treatment (i.e., test) watershed, in which new BMPs are implemented.

Two periods of monitoring are required: calibration and treatment. During the calibration period, the two watersheds are treated identically and a relationship between the control and treatment watersheds is established.

Two paired watershed studies are being implemented. The first pair consists of the parking lots for Terminal 1 and Terminal 2; the second pair is airport taxiway areas in Terminals 1 and 2. The paired watershed study calibration was conducted by the Authority during the four wet weather seasons from 2006-2007 through 2009-2010; the paired watershed sites have since been modified in the following ways:

- Paired watershed representing parking lots: The test parking lot watershed was originally represented by a composite of discharge collected at site S-B09-3 and S-B11-4. Access issues prevent sampling the StormFilter® BMP unit in Basin 11, so it was determined that samples will be composed of Basin 9 PerkFilter™ effluent. BMPs installed in Basin 9 include swales, tree planters, permeable pavement, and infiltration trenches. The control watershed remains the same.

- Paired watershed representing airport operations: The test watershed for airport operations was originally represented by site S-B08-14. The Authority evaluated a StormFilter® installed in Basin 15 for feasibility as a test location, because of the lack of new BMPs, either source control or treatment control, in Basin 8. Artificial turf was also installed in Basin 15, but this BMP is downstream of the potential monitoring location. Paired watershed monitoring will be delayed until the tidal/groundwater impacted situation in Basin 15 is resolved.

Calibration of the paired watershed study locations was completed in 2010, when a sufficient number of results had been collected to derive regression relationships between the control and treatment watersheds. Treatment sampling was slated to begin in 2013-2014 and was expected to last three years. All six monitoring locations for the paired watershed study were put on hold for monitoring because of various ongoing construction activities of the development projects, and the tidal/groundwater impaction of the airside StormFilter® BMP unit. Therefore, no paired watershed sampling was conducted during the 2013-2014 through 2018-2019 seasons. The paired watershed BMP effectiveness monitoring is expected to be resumed when future conditions allow. As noted previously, the goal is to detect a significant reduction in copper and zinc concentrations and loads by 2033.

Trend Analysis Monitoring

Samples will continue to be collected for BMP effectiveness monitoring, but the trend analysis monitoring location is no longer site S-B06-12 because aircraft no longer taxi, park or load and unload near this location (i.e., old Commuter Terminal, which no longer operates as a terminal, and has instead become the main administration building for the Authority).The trend analysis location was moved and since 2017pollutant trends monitoring has been performed annually on samples from site S-B12-12a. The goal is to obtain enough data to confidently establish a downward trend. The data must be carefully checked to meet all assumptions of the analysis before conclusions are drawn. The lack of an obvious downward trend does not necessarily mean that BMPs are not effective. This location should be sampled for a minimum of 10 years, or until all planned BMPs have been fully implemented. Eleven years of sampling had previously been conducted at site S-B06-12. Table D2-13 and D2-14 present a summary of this sampling program.

Table D2-13. Sampling Location for Trend Analysis Monitoring

Drainage Basin	Monitoring Location ID		Samples per Season	Minimum Number of Seasons to Sample	Number of Seasons Sampled	Description
8	S-B12-12a		5	10	0	Trend analysis site to determine reduction of pollutants over time

Table D2-14. Sampled Parameters at Trend Analysis Site

Parameter
Oil and Grease (O&G)
pH
Temperature
Specific Conductance (SC)
Total Suspended Solids (TSS)
Biological Oxygen Demand (BOD)
Chemical Oxygen Demand (COD)
Total Hardness
Total Metals (aluminum, copper, iron, lead, and zinc)
Dissolved Metals (copper and zinc)
Ethylene Glycol
Particle Size Distribution
Polycyclic Aromatic Hydrocarbons (PAHs)
Polychlorinated Biphenyls (PCBs)
Chlordane
Total and Dissolved Metals (Arsenic, Cadmium, Chromium III, Chromium VI, Lead, Mercury, Nickel, Silver)

Discrete BMP Sampling

Two treatment control BMPs were installed in the Remain Over Night (RON) Apron area as a component of the Green Build Terminal 2 West expansion project. These BMPs, a 1.75-acre artificial turf infiltration area and a StormFilter® high-rate media filter, are designed to treat runoff from Drainage Basin 15 prior to discharging to the Navy Boat Channel. The RON Apron BMP Monitoring Plan (URS, 2009) describes the monitoring program that will be instituted to evaluate the effectiveness of these BMPs; major goals of the monitoring program, as outlined in the monitoring plan, are:

1) Document the effectiveness of the StormFilter® BMP system in reducing pollutant of concern loads.

2) Document the estimated effectiveness of the infiltration BMP in reducing pollutant of concern (specifically, for copper and zinc) loads based on estimated influent flow rates.

3) Document the effectiveness of the airport-wide storm water and dry-weather runoff BMPs in reducing loads of pollutants of concern, specifically with respect to discharges from the RON Apron project to the Navy Boat Channel.

4) Assess SAN's progress in meeting short- and long-term airport-wide pollutant reduction objectives. The initial long term (10-year) pollutant load reduction objectives (61 pounds per year of copper and 35 pounds per year for zinc), and short-term (5-year) objectives (31 pounds per year for copper and 17 pounds per year for zinc) have now been replaced by the WQIP goals, as discussed previously.

5) Determine the level of effort required to operate and maintain the BMPs.

Ongoing evaluations of the StormFilter® BMP have indicated tidal and groundwater issues, which have prevented sampling. Also, no monitoring wells were evident in the artificial turf area, so monitoring of that location was not feasible. In order to evaluate the performance of a high-rate media filter BMP, discrete BMP

sampling was instead performed during 2013-2014 and 2014-2015 monitoring seasons at the underground PerkFilter™ vault installed outside the Terminal 2 parking lot, east of the HVAC building. Table D2-15 presents the sampling locations for the discrete BMP sampling program. Analytes sampled for discrete BMP sampling are shown in Table D2-16. However, as discussed previously, before any further monitoring can be conducted, it is important to verify the BMP and ensure maintenance, including cartridge replacement, has been conducted.

Table D2-15. Sampling Locations for Discrete BMP Sampling in Drainage Basin 9

Drainage Basin	Monitoring Location ID	Samples per Season	Minimum Number of Seasons to Sample	Description
StormFilter® Media Filter BMP				
9	S-B09-3i	5	3	Oldcastle (Krystar) PerkFilter™ Influent
9	S-B09-3e	5	3	Oldcastle (Krystar) PerkFilter™ Effluent
9	S-B09-3b	5	3	Oldcastle (Krystar) PerkFilter™ Bypass

Note: The Oldcastle (Krystar) PerkFilter™ operates in a similar manner to the Contech StormFilter® since both contain metals-targeted media-filled cartridge filtration devices in underground vaults.

Table D2-16. Sampled Parameters at Discrete BMP Sampling Sites

Parameter
Oil and Grease (O&G)
pH
Temperature
Specific Conductance (SC)
Total Suspended Solids (TSS)
Oil & Grease
Total Hardness
Total Metals (aluminum, copper, iron, lead, and zinc)
Dissolved Metals (copper and zinc)
Polycyclic Aromatic Hydrocarbons (PAHs)
Polychlorinated Biphenyls (PCBs)
Total Coliform
Fecal Coliform
Enterococcus

APPENDIX E
TENANT SUMMARY SHEETS


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

ACE

SIC Codes	7521
Primary Activity	Parking Lot Management
Drainage Areas	03, 05, 06, 08, 09, 11, 12
Nearest MS4 Inlet	< 200 ft.
Address	3665 North Harbor Dr. #200 San Diego, CA 92101

Contact Information

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Facility Description and Activities

*** Note : Two separate contracts under ACE, shuttles and parking lots. At the moment of Annual/Audit Inspections both contacts should be inspected together.

1.ACE Parking Management supplies 31 blue, red, green and orange airport buses. The shuttle buses are under a separate contract from the general parking lot management but both are ACE. ACE manages parking lots at CT, T1, T2PP and T2W, Long Term Parking Lot 1 (North Harbor), Employee Parking Lot, and Long Term Parking Lot (Washington St.).

2. Jordan Auto Spa is a vendor to ACE that performs dry washing techniques at the valet car lot. A Wash Water Management Plan was submitted to Environmental Affairs and the plan was approved on 5/4/2018. The work is performed in the valet hold lot underneath a canopy. They are committed to 100% waterless car washing that will be followed per their approved Wash Plan. Operational car washing supplies are stored in a truck dispatched to wash the vehicles that sign up for that service. All other supplies are stored onsite at the Airport in a storage locker in the valet hold lot.

3. There are 2 dumpsters in the parking lot at the base of the USO. SDCRAA is responsible for cleaning and having Republic pick up dumpster trash.

4. 3 Electric Golf carts, 2 pickup trucks, 1 valet van, 1 Prius, 1 Ford Escape, and one sweeper owned by SDCRAA and used by ACE.

5. Tenant performs as-needed maintenance of the sweeper onsite in designated maintenance area in a garage next to the bridge between Terminal 1 and Terminal 2 parking lots. The trucks, Prius, valet van, Ford Escape, and shuttle buses are serviced offsite. Golf carts are serviced onsite. The sweeper is stored under the awning attached to the garage.

6. Tenant receives fuel and stores it in a hazmat locker to fuel the leaf blower. Propane is stored at Lot 10 (Shuttle Hold Lot). Trucks, valet van, and Prius are fueled by Menzies onsite in Lot 10. The Ford Escape is serviced and fueled offsite.

7. Flammable materials storage locker has small amounts of fuel (for refueling of sweepers if required before the next Menzies visit).

8. Terminal parking lots are swept with the sweeper 2-3x times per week, and swept manually daily. Employee parking lots are swept 2-3 times per week with sweeper and manually daily. Lot 10 is swept by hand 3-5x per week.

9. Minor parking lot repairs are performed by ACE but not in the past year. However, major work would be contracted out.

10. ProDash is a subcontractor to ACE that performs washing of the shuttle buses. The subcontractor uses a full capture/no runoff system for washing and no supplies are stored onsite at Airport (all in van). An updated Wash Water Management Plan was submitted to the Environmental Affairs due to a change in the vendor and is currently under review.

11. The Shuttle Fleet consists of 32 propane buses. An above-ground propane tank is located in Lot 10 for fueling.

12. Propane is delivered once per day by Ferrell AutoGas.

13. Outdoor material containers are located between Terminal 1 & 2 parking in a shed, the Shuttle Hold Lot, and the Valet lot. There are 4 sheds and two repurposed parking booths they use to store materials.

14. Cars are detailed at the Valet Lot using dry methods by Jordan Auto Spa.

15. Batteries are removed and properly disposed of by Cottonwood Electric Cart Service or now known as Specialized Vehicle Company.

16. Portable lavatories are provided in the Long Term parking, Cell Phone Lot, and App Enabled Car parking. Lavatories are maintained by United Site Services.

17. Cal State Auto Parts recycles used auto parts, they come by 2x/week.

18. Dragonfly Automotive comes by 2x/week to recycle used tires.

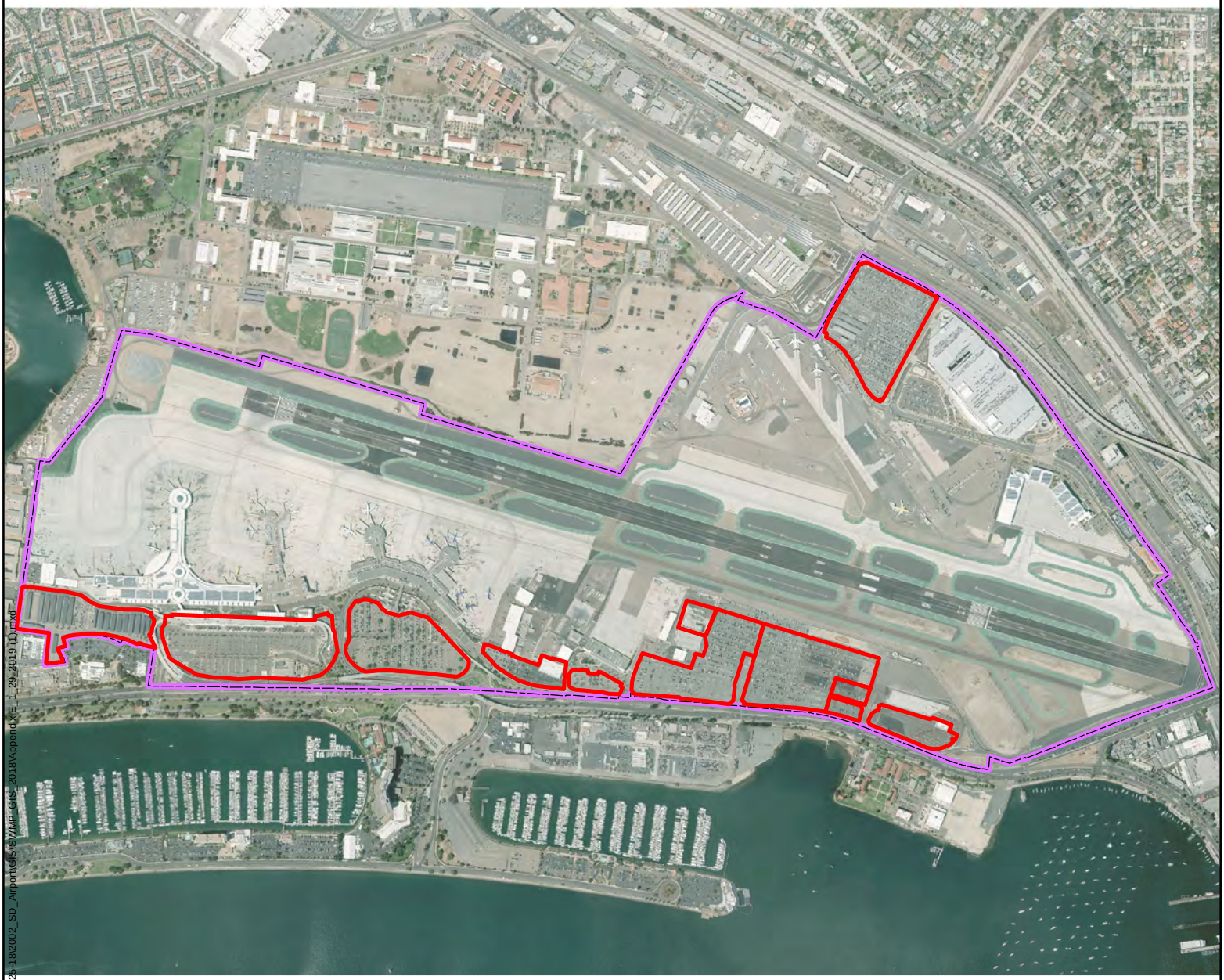
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Drainage system maintenance	Anti Freeze
Equipment storage	Cleaning Solutions
Fluid leaks	Fuel (Gas)
Fuel spills,Fuel transfer	Lavatory Chemical Wastes
Fuel storage	Lavatory Chemicals
Outdoor apron washdown	Lavatory Truck Wash Water
Outdoor waste storage	Lavatory Wastes
Tank fuel transfer	Oil & Grease
Trash collection	Paints
Vehicle parking	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Outdoor Material Storage	SC07 - 1, 2, 3, 6, 7, 8, 10, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12
Employee Training	SC10 - 1, 2, 4
Lavatory Service Operation	SC11 - 4, 7, 12, 13
Outdoor Wash down/Sweeping	SC12 - 2, 3, 4, 5, 6, 7, 8, 9
Parking Lots	SC16 - 1, 2, 3, 4, 5, 6, 11
Drainage System Maintenance	SC17 - 2, 5
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



Operating Area(s)

SDIA Boundary

N

0 1,000 2,000

Feet

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

Document Path: P:\Projects-South\CADGISVAUTOCAD\5025-18\002_SD_Airport\GIS\MXD_GIS_2018\Appendix E_1_29_2019 (1).mxd

PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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wood.

SAN DIEGO INTERNATIONAL AIRPORT

ACE
Operating Areas

FIGURE

E-1

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Air Canada Rouge & Jazz Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	12
Nearest MS4 Inlet	200 - 1000 ft.
Address	3665 North Harbor Dr. #223 San Diego, CA 92101

Contact Information

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Gina Vestal	Environmental Contact
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GVestal@atsstl.com	

Facility Description and Activities

** Fleet has changed to Air Canada Rouge and Jazz Airlines which are the low end less expensive division of Air Canada.

1. All equipment maintenance is done in the GES maintenance shop area by GES.

2. All aircraft maintenance is performed by CAS (maintenance services). DGS provides cargo services. ATS brings all cargo directly to the cargo building for DGS to load/unload.

3. Fueling is conducted by Menzies at gate. ATS conducts monthly station safety audits which include observing fueling. ATS requests a poundage of fuel to be put into the aircraft prior to each fueling.

4. Cleaning of vehicles is done at the wash rack. No aircraft cleaning is performed at SDIA.

5. All ground handling activities are performed by ATS, a subtenant to Air Canada.

6. Tenant operates out of Gate 34. This gate is shared with United who parks at this gate occasionally overnight.

7. Lavatory services are nightly for flights and are performed on demand for flights that turn daily. Lavatory services are done at the gate where the airplane is parked.

8. Potable water is flushed for 30 seconds on the ramp and allowed to evaporate.

9. ATS is a subtenant and performs services above the wing and below the wing for Air Canada Rouge. ATS does not perform services for Air Canada Jazz.

Significant Materials/Activities Potentially Exposed to Storm Water

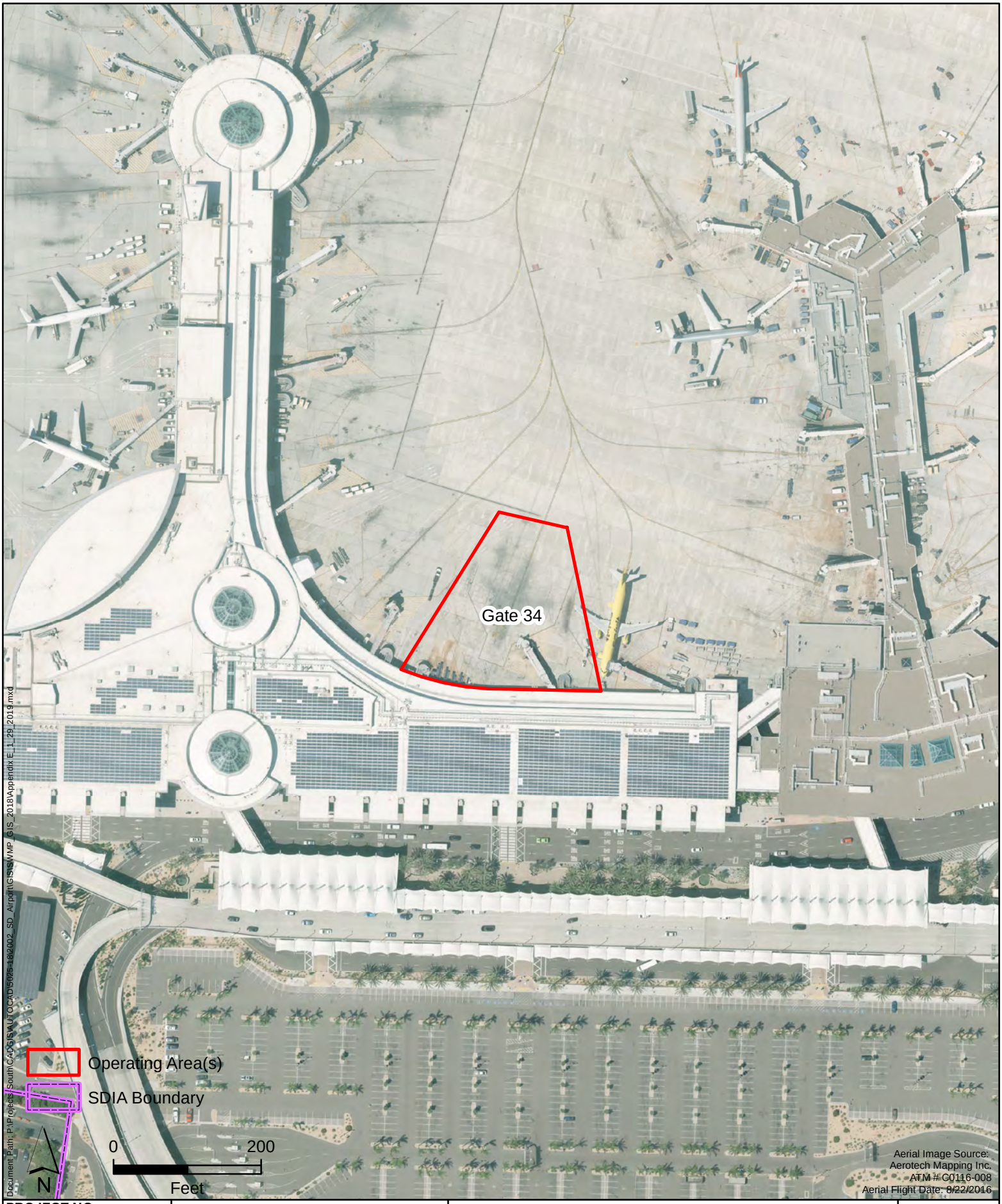
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Fuel
Equipment storage	Fuel (Gas)
Fluid leaks	Fuel (Jet)
Fuel spills,Fuel transfer	Hydraulic Fluids
Material loading/unloading	Lavatory Chemicals
Outdoor waste storage	Lavatory Truck Wash Water
Potable water flushing	Lavatory Wastes
Tank fuel transfer	Oil & Grease
Trash collection	

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7

Outdoor Material Storage	SC07 - 1, 2, 3, 4, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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wood.

SAN DIEGO INTERNATIONAL AIRPORT

Air Canada
Operating Areas

FIGURE

E-2

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Alaska Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	07, 08
Nearest MS4 Inlet	< 200 ft.
Address	3665 North Harbor Dr. #228 San Diego, CA 92101

Contact Information

Warren Paulsen — Supervisor - Maintenance

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Janet Baad — Environmental Contact

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janet.baad@alaskaair.com

Facility Description and Activities

1. DAL Global Services is a vendor to Alaska, and provides ground handling services and maintains their own vehicles. GES maintains all Alaska owned equipment and vehicles. Maintenance operations and materials for DAL have moved to the cargo area maintenance shop.
2. Alaska performs minor aircraft maintenance at the gate. Materials are stored indoors in the maintenance office, except for three large storage sheds outside. All three storage sheds have hazardous materials and all liquid has secondary containment.
3. There are two clam shell containers stored outdoors, each containing two barrels of hazardous liquids.
4. GAT is contracted to perform cargo handling.
5. GES maintains Alaska equipment, trucks, AC carts, etc.
6. Aircraft parts and materials are stored indoors in the Material Storage Area by Gate 16. All other significant materials are stored outdoors and contained in 3 covered sheds.
7. Wastes are stored in the Waste Accumulation.
8. Spill response material for fuel and lavatory spills is kept in a cart between Gate 16 and 17.
9. Operate out of gates 13 through 18. Aircraft Remain Over Night (RON) at gates 20 and 21 and aircraft is kept at Commuter Terminal 1 every night.
10. Aircrafts are dry washed only.
11. Contact Janet Baad for HAZMAT Business Plan.
12. Alaska and Virgin are merging and will be under one Single Operating System (SOS) as of January 2018.

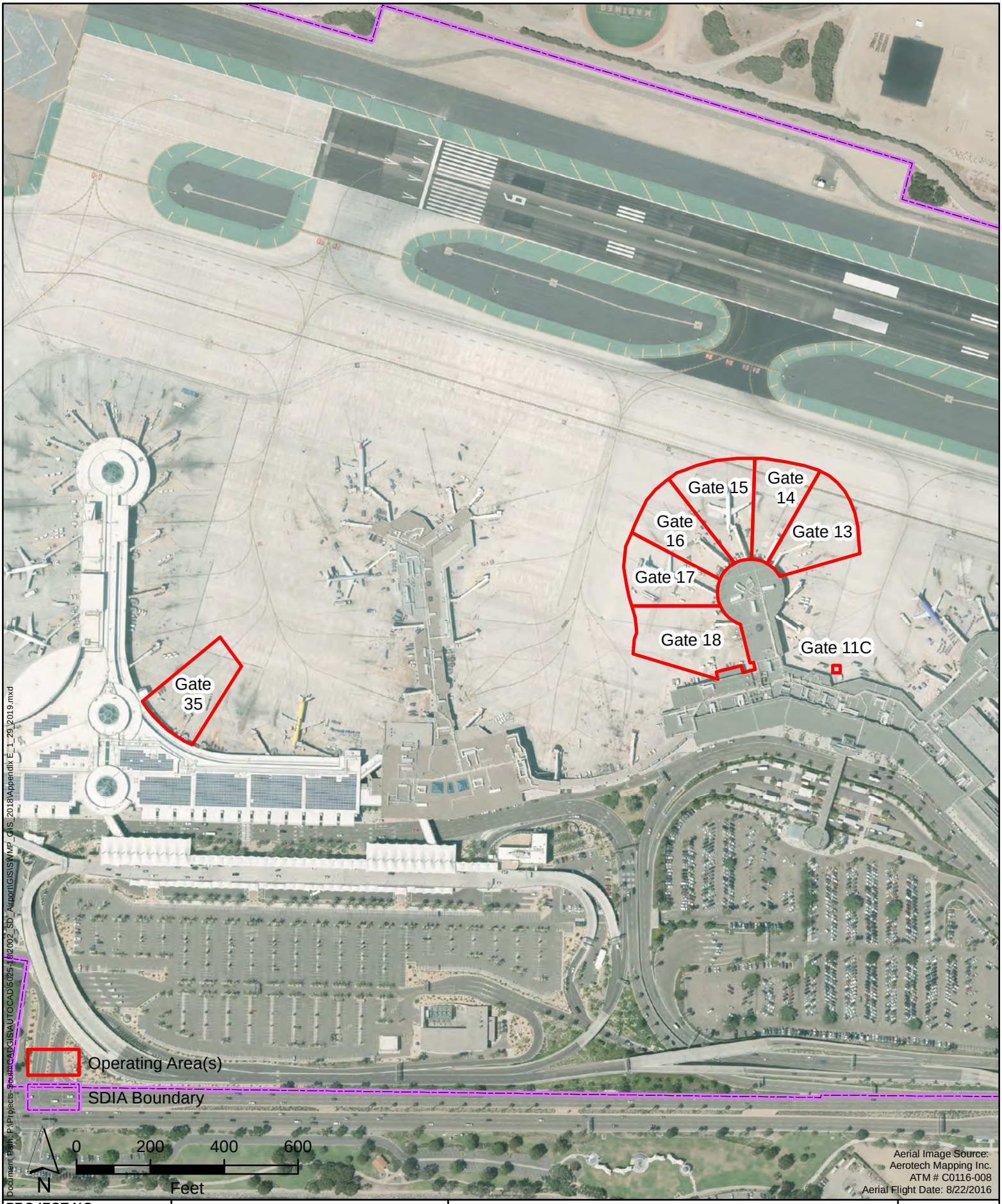
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Adhesives
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Degreasers
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Sump)
Outdoor waste storage	Hydraulic Fluids
Potable water flushing	Lavatory Chemical Wastes
Tank fuel transfer	Lavatory Chemicals
Trash collection	Lavatory Wastes
	Lubricants
	Oil & Grease
	Recyclables
	Sealants
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
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wood.

SAN DIEGO INTERNATIONAL AIRPORT

Alaska
Operating Areas

FIGURE
E-3

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Allegiant Air

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	08, 12
Nearest MS4 Inlet	200 - 1000 ft.
Address	3707 North Harbor Dr. T2E San Diego, CA 92101

Contact Information

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peter.dreissig@allegiantair.com

Facility Description and Activities

1. All equipment maintenance is done by GES. Daily vital fluid checks are performed by ATS staff and monthly Preventive Maintenance Inspections are conducted by Tom Mascarenas of GES. ATS is a subtenant to Allegiant.
2. Fueling is conducted by Menzies at the Gates. ATS conducts monthly station safety audits which include observing fueling. ATS requests a poundage of fuel to be put into the aircraft prior to each fueling.
3. Cleaning of vehicles is done at the washrack. No aircraft cleaning is performed at SIDA.
4. All aircraft maintenance is performed by Executive Air.
5. Tenant does not have a permanent gate, but frequently uses Gate 30.
6. Potable water is flushed for 30 seconds on the ramp and allowed to evaporate.
7. ATS is a subtenant of Allegiant and performs services above the wing and below the wing for Allegiant.

Significant Materials/Activities Potentially Exposed to Storm Water

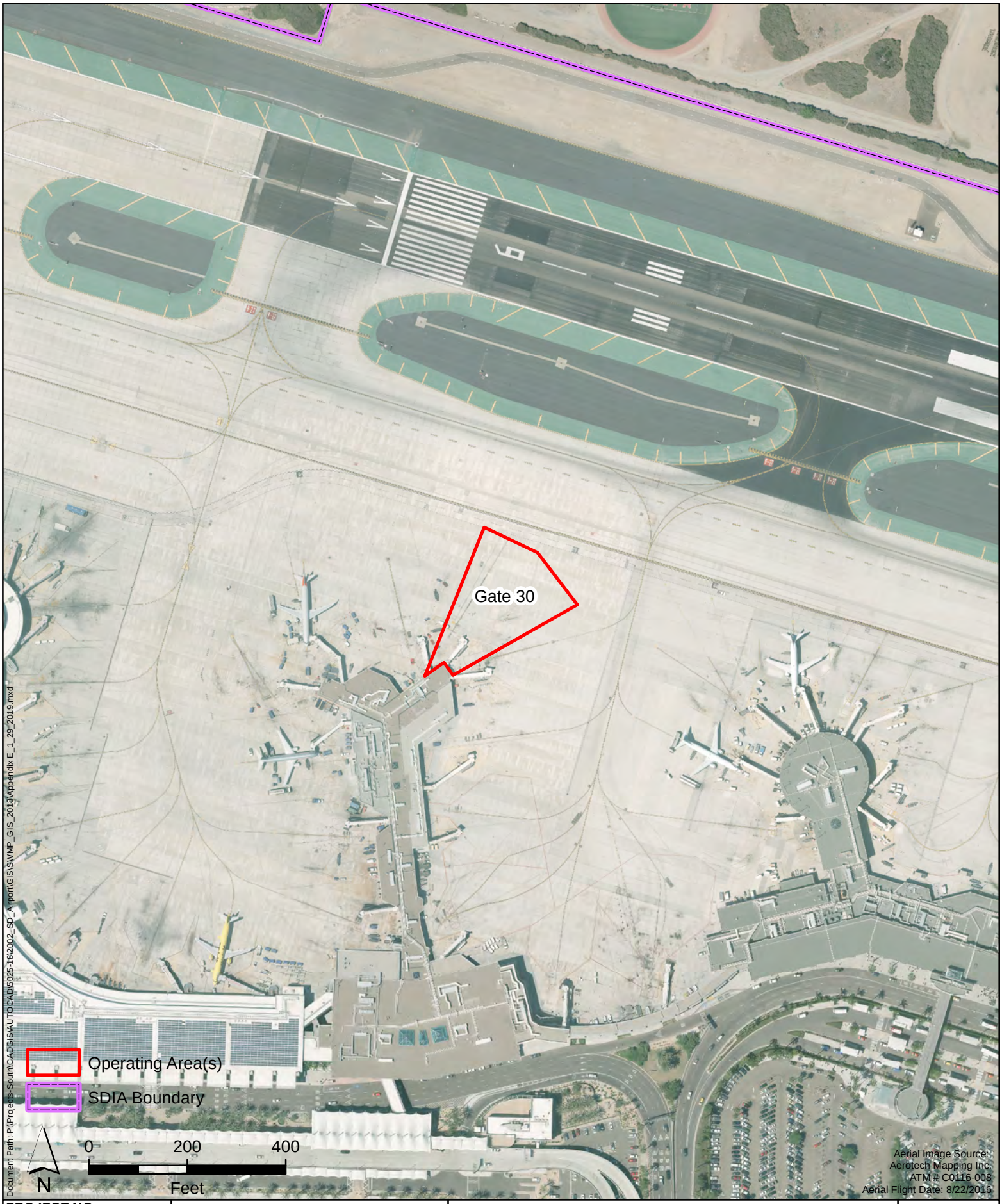
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Fuel
Fuel spills,Fuel transfer	Fuel (Diesel)
Material loading/unloading	Hydraulic Fluids
Outdoor waste storage	Lavatory Chemical Wastes
Potable water flushing	Lavatory Chemicals
Trash collection	Lavatory Wastes
	Lubricants
	Metals
	Oil & Grease
	Rubber Particulates
	Sediment
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 11, 12

Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		Allegiant Operating Areas	E-4
CHECKED BY: AA/NP			

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Allied Aviation

SIC Codes	5171
Primary Activity	Fuel Storage
Drainage Areas	06 , 07
Nearest MS4 Inlet	< 200 ft.
Address	3698 Pacific Hwy. #C San Diego, CA 92101

Contact Information

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Nathan Nop — Crew - Ops

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Facility Description and Activities

1. Allied Aviation main office is located in the North Ramp Area next to the ARFF station. A second "remote" fueling facility is located adjacent to the CT. An above ground OWS was installed (Jan 2013) at the remote fueling station and is functioning properly.

2. The Fuel Storage Facility has the following: - Three dual-position jet fuel unloading islands with spill containment. These pumps are used only as offload only. - Two 1,000,000-gallon jet fuel ASTs within secondary containment. - One 15,000-gallon diesel underground storage tank (UST). - One 15,000-gallon auto gas UST. - One 2,000-gallon aviation low lead gas storage. - A diesel/auto gas loading/unloading island with spill containment. - One 3,000-gallon waste fuel UST. - An equipment pad with spill containment. - A foam equipment building with a 1,500-gallon 3% aqueous foam concentrate AST. - A 12,000-gallon oil/water separator includes an 8,000-gallon holding tank to treat fuel spills.

3. The Remote Fueling Facility, operated by Allied Aviation and used by Menzies and Signature to load fuel trucks, has the following: - Five single-position refueler loading islands with spill containment. - One 12,000-gallon underground waste water tank. - One 3,000-gallon underground reclaimed fuel tank. - An underground pipeline conveying fuel from the Fuel Storage Facility.

4. A trailer unit or mini vac-truck of 250-gallon capacity is available to clean up spills, the unit is located directly outside the Allied Aviation Main Office.

5. NRC is the designated Oil Spill Response Organization (OSRO) to provide cleanup services in case of a spill.

6. Menzies trucks take Jet-A fuel at the Remote Fueling Facility and then take fuel to the gates. Jet fuel comes from 10th Avenue by an underground pipeline to two 1,000,000-gallon ASTs at the Fuel Storage Facility. An annual survey is performed on leak detection systems. Fuel is provided by Allied.

7. The only equipment maintenance performed is on the nozzle valves at the loading islands and the valves on pumps. Pipes at loading/unloading islands are painted.

8. At the Fuel Storage Facility, pig mats are placed over the storm drains that are not linked to the OWS, this is done only when there is a spill.

9. The emergency eye wash station is tested monthly and water is allowed to evaporate and does not reach the storm drain. A bermed area is created in the parking lot and all discharge goes into the drains connected to the OWS. IPS performs this task.

10. The only outdoor area that is cleaned is the concrete pad at the loading islands in the Remote Fueling Facility. The area is steam cleaned, and the discharge enters the 12,000-gallon underground wastewater tank. NRC collects and disposes of wastewater and picks up wastes.

11. The Firefighting equipment near the two 1-million gallon tanks are tested annually with water only to make sure adequate water pressure is available. The water is discharged into the storm drains. BMPs have been recommended to prevent discharge carrying any potential pollutants into the storm drain.

12. At the foam house, the test ports inside the house are used to test the water to foam ratio. No foam discharge is created in the process. During all equipment and facility testing, the test area is bermed and all waste water is collected and disposed off site.

13. NRC services the OWS and the 12,000-gallon wastewater UST annually and Amberwick collects all hazardous wastes. Annual wet weather sampling is done at catch basins per the Industrial Stormwater Permit.

14. Tenant has separate Storm Water Pollution Prevention Plan, Spill Prevention, Control, and Countermeasure Plan, and Facility Response Plan but is covered under the Authority's coverage for the IGP.

15. Quarterly scrubbing is scheduled to remove oil & grease stains within lanes at the remote fueling station.

16. Other providers include Integrated Corrosion Engineering and Western Pump. Cal-Detection performs trace test to determine if there is leak in the fuel pipes and cathotic protection for corrosion control. Western Pump performs maintains

underground alarms for DUSTO (Designated Underground Storage Tank Operator).

17. New lightning protection onsite to dissipate electricity from lightning.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Cargo handling	Adhesives
Drainage system maintenance	Anti Freeze
Equipment storage	Battery Acid
Fire fighting equipment testing	Brake Fluid
Fluid leaks	Cleaning Solutions
Fuel spills,Fuel transfer	Coolant
Fuel storage	Fire Fighting Foam
Material loading/unloading	Food Waste
Outdoor waste storage	Fuel
Pesticide usage	Fuel (Gas)
Tank fuel transfer	Fuel (Jet)
Trash collection	Fuel (Sump)
Vehicle parking	Hydraulic Fluids
Water/Fuel mixture within berm	Lubricants
	Oil & Grease
	Purple K
	Recyclables
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 6, 7, 8, 9, 10, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 3
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 2, 3, 5, 10, 11
Fire Fighting Foam Discharge	SC13 - 1, 2, 3, 4, 5
Parking Lots	SC16 - 1, 2, 6, 11, 12
Drainage System Maintenance	SC17 - 1, 2, 3, 4, 5, 6, 7
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Allied Aviation Operating Areas	E-5
DRAWN BY: CAB			
CHECKED BY: AA/NP			

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American Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	06, 07, 08, 12
Nearest MS4 Inlet	200 - 1000 ft.
Address	3707 North Harbor Dr. #103 San Diego, CA 92101

Contact Information

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Sumner Rabin	Manager - Customer Service
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Facility Description and Activities

1. Menzies Aviation is contracted to perform all fueling activities. (Effective October 10, 2012) Aircraft, vehicles and equipment are fueled where they are parked.

2. In August 2015, American scraped two (2) 8,400 gallon Jet A fueling trucks and one (1) combination 400 gallon diesel/350 gallon gasoline fueling truck that were not operational. One (1) 10,000 gallon Jet A fueling truck may be kept for use, but old trucks will be removed. The trucks are branded with Menzies decals. Menzies is responsible for their maintenance.

3. Aircraft maintenance is performed by American's own mechanics. Minor maintenance is performed at the gate. Major maintenance is performed in the gate or north ramp.

4. Vehicles and equipment maintenance is performed inside or outside American's Maintenance Shop using paint rollers.

5. Vehicles and equipment painting is done by GES.

6. GES is contracted to maintain the vehicles and equipment effective November 15, 2012.

7. GES is a subtenant to American and uses American's Maintenance Shop at the Cargo Building.

8. The wash rack was no longer in use as of May 2016. The wash rack was taken out and returned to the authority in September 2016.

9. Envoy is contracted to clean aircraft inside overnight.

10. Siemens is contracted to maintain jet bridges and belts.

11. American does not perform deicing operations (effective 2012).

12. American no longer does freight/cargo handling. WFS receives mail, supplies, etc. and GAT receives cabin supplies for American.

13. American Airlines has three designated waste accumulation areas - one between Gates 31 and 32, one in the shed, and one in stores next to the auto shop. One hazardous waste area is in the auto shop, though it is not an accumulation area. The two accumulation areas located at the auto shop were removed effective November 15, 2012.

14. Heritage Environmental Services is contracted to collect hazardous wastes accumulated by American Airlines. Some are recycled and some are treated and disposed of.

15. Tenant has an Emergency Contingency Plan, a Spill Prevention, Control, and Countermeasure Plan.

16. USAirways and American operations completely merged in April 2015.

17. USAirways merged into American's plan, policies, and procedures in April 2015.

18. As of September 2018, American no longer operates out of Gate 24.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Degreasers (Citrus based)
Fuel spills,Fuel transfer	Floatables
Material loading/unloading	Food Waste
Outdoor waste storage	Fuel

Potable water flushing	Fuel (Gas)
Tank fuel transfer	Fuel (Jet)
Trash collection	Fuel (Sump)
	Hydraulic Fluids
	Lavatory Chemical Wastes
	Lavatory Chemicals
	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Paints
	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 5, 7, 10, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 8, 9
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10
Outdoor Wash down/Sweeping	SC12 - 12
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019	American Operating Areas	E-6
DRAWN BY: CAB		
CHECKED BY: AA/NP		

wood.

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Aircraft Rescue & Fire Fighting

SIC Codes	9224
Primary Activity	Airport Rescue & Fire Fighting
Drainage Areas	06
Nearest MS4 Inlet	< 200 ft.
Address	3698 Pacific Hwy. San Diego, CA 92102

Contact Information

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Dean Robbins	Unknown
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Facility Description and Activities

1. Four fire fighting vehicles are stored and fueled indoors by Menzies.
2. Maintenance is done by Southern California Fleet Services in flat dirt parking lot area away from storm drains or within the ARFF station. All waste is taken off site by Inland Fire mechanics. Southern California Fleet Services brings in all maintenance equipment and fluids.
3. There are two storage areas outside the ARFF building. A shed in front of the ARFF houses the 3% foam, Purple K powder fire retardant and empty drums. A second container/shed holds tools and tires.
4. Firefighting equipment and foam testing is performed once a year on the North ramp. Ocean Blue is contracted to collect all runoff from the exercise. They barricade all storm drains and ramp area to collect test water. They vacuum up all runoff and foam for proper disposal. The nearest storm drain is connected to an oil-water separator that Ocean Blue blocks the end of and vacuums out if necessary.
5. Trucks are detailed using dry methods in the back parking lot. If washing is required, it is conducted at the Authority wash rack. Once per year the trucks are waxed by an outside vendor.
6. Foam trailor is stored full in the bay with the trucks (1000 gal, 3% foam concentrate).
7. Call station to reach all captains when needing to schedule a site visit.
8. ARFF are not responsible for equipment. It is all owned by the Airport Authority.
9. Airport Authority is responsible for storm drain cleaning and maintenance.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Building & Ground maintenance	Cleaning Solutions
Drainage system maintenance	Degreasers (Citrus based)
Equipment storage	Fire Fighting Foam
Fire fighting equipment testing	Food Waste
Fluid leaks	Fuel
Fuel spills,Fuel transfer	Fuel (Gas)
Herbicide usage	Landscape Wastes
Outdoor waste storage	Oil & Grease
Pesticide usage	Purple K
Tank fuel transfer	Trash
Trash collection	
Vehicle parking	

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 8
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6, 7

Outdoor Material Storage	SC07 - 1, 2, 3, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 1, 2, 3
Employee Training	SC10 - 1, 2, 3, 4
Fire Fighting Foam Discharge	SC13 - 1, 2, 3, 5
Parking Lots	SC16 - 1, 2, 4, 5, 6, 11
Drainage System Maintenance	SC17 - 2, 6
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		ARFF Operating Areas	E-7
DRAWN BY: CAB			
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Bradford

SIC Codes	4581
Primary Activity	Cargo Handling
Drainage Areas	06
Nearest MS4 Inlet	< 200 ft.
Address	2247 West Washington St. San Diego, CA 92101

Contact Information

Arturo Cruz — Supervisor - Ops
P 6196391201
alopez@airportlogistics.org

Jim Decock — Head of Concessions
P 6194002308
jdecock@san.org

Facility Description and Activities

1. Approximately 67 inbound (to the RDC) deliveries per day and approximately 17 outbound (from RDC to terminals) per day, which include food products, plastic totes, bread racks, milk crates, donations, and outbound parcels for UPS or FedEx.

2. Delivery trucks of vendors for various tenants load and unload materials at CRDC front loading dock. Bradford transfers the materials to their trucks at CRDC back loading dock for delivery to the tenants. Materials are delivered to tenant operating areas on the ramps. Tenants oversee the delivery and staging of materials on the ramp, and properly store those supplies. Recyclable materials and materials meant for disposal by a subcontractor/vendor are staged outside on the ramp until Bradford returns for pick up. This includes crates, pallets, kegs, used wasted oil, and other plastic containers

3. One refrigeration room and one cooler room in the warehouse.

4. The several trucks and vans used as a part of their operations are washed and all maintenance is done off site. (3 box trucks and 1 cargo van)

5. Once per week (usually Sunday) trash and recycling is transported from the RDC to the main compactor area on the south side ramp.

6. Trash containers are indoors and outdoors. Only two small gondolas outdoors and they have lids and are kept in a covered area.

7. All cleaning products used are “green.” Building and facility is certified LEED Gold. Cleaning supplies are the "Greenworks" line of products.

8. Outdoor sweeping in done on Sundays and sometimes Tuesdays.

9. Employees do annual training, including training on spill prevention and response, and batteries.

10. No hazardous materials are maintained or transported.

11. All materials are stored indoors.

12. Bradford does extraction and transport of grease from airport concessionaires. Extraction is done Monday’s, Wednesday’s and Friday’s at 1am by two methods: (1) Extraction unit with the capacity of 130 gallons is rolled into a truck and is transported to the terminals. The unit is then rolled into the terminals where hoses are used to extract the grease from the tenants grease containers. The unit is then transported by truck back to the RDC, where the grease is then transferred again into a large, indoor storage tank 865 gallon capacity; (2) the tenants empty their fryers at their close of shift into lined buckets and we pick up the lined buckets and exchange them with replacements. In addition, there is a covered 225 gallon receptacle located at the front of the RDC for by-product material (grill scrapings).

13. On a monthly basis, a grease recycling company (DarPro) comes to the RDC and uses hoses to transfer the grease from the storage tank into their trucks to transfer back to their facility. The WVO is converted into Bio diesel and sheet metal stamping oil.

14. Water is heated via solar heating system.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Cargo handling	Anti Freeze
Fluid leaks	Battery Acid
Herbicide usage	Cleaning Solutions
Material loading/unloading	Food Waste
Outdoor waste storage	Fuel
Pesticide usage	Fuel (Diesel)

Trash collection	Hydraulic Fluids
Vehicle parking	Landscape Wastes
	Oil & Grease
	Paints
	Pesticides/Herbicides
	Recyclables
	Sediment
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 5, 6
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Building & Ground Maintenance	SC09 - 2, 3, 5
Employee Training	SC10 - 1, 2, 3, 4
Parking Lots	SC16 - 1, 2, 4, 5, 6, 11, 12
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Bradford Operating Areas	E-8
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British Airways Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	15
Nearest MS4 Inlet	< 200 ft.
Address	3707 North Harbor Dr. #117 San Diego, CA 92101

Contact Information

David Johnson — Manager - Station
C 6192521820
dave.johnson@dnata.us

Nadia Higgins — Manager - General
P 6192780797 **C** 6199125308
Nadia.Higgins@ba.com

Facility Description and Activities

1. British Airways operates out of Gate 51 in Terminal 2 and sometime uses Gate 48 that is shared with Southwest, Alaska, JAL, Condor, Edelweiss, and Spirit.
2. British Airways aircraft fueling is carried out by Menzies.
3. British Airways has only one (1) vehicle and all maintenance of vehicle is performed offsite. Subcontractor dnata has 2 vehicles that are kept and maintained offsite.
4. Minor aircraft maintenance is performed at the gate by a British Airways flight engineer/mechanic.
5. Aircraft is not washed on site.
6. Heritage Environmental Services collects British Airways used oils monthly.
7. All freight/cargo handling is carried out by WFS. WFS occasionally receives deliveries (i.e. cabin supplies) for British Airways. CAS became WFS in early 2017.
8. Tenant has used the Airport Storm Water Management Plan, and has an Emergency Contingency Plan, and a Spill Prevention, Control, and Countermeasure Plan.
9. Flying Foods is a vendor for BA.
10. Dnata manages employees and equipment for BA. GSI became Dnata in January of 2017.
11. GAT performs lavatory services.
12. The airport wash rack is used occasionally to wash equipment and vehicles. BA may contract power wash cleaning services for a quarterly wash and/or steam clean. Company berms the area and vacuums the water.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Fluid leaks	Cleaning Solutions
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Jet)
Outdoor waste storage	Hydraulic Fluids
Potable water flushing	Lavatory Chemicals
Trash collection	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Paints
	Rubber Particulates
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2

Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		British Airways Operating Areas	E-9
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Cartwright Termite & Pest Control, Inc

SIC Codes	7342
Primary Activity	Facility Maintenance
Drainage Areas	08
Nearest MS4 Inlet	< 200 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

Jim Patterson — Pest Control Manager
P 6199472625
Jim.patterson@cartwrightsdia.com

Gregg Segel — Applications Developer
P 6196471475
gregg.segel@cartwrightsdia.com

Facility Description and Activities

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1. Material storage (pesticides) is off-site at headquarters at 1376 Broadway El Cajon 92021.

2. Materials used for operational purposes, pesticides and relevant applicators, are stored in a covered container on Cartwright trucks; those trucks are parked at the headquarters.

3. Miscellaneous equipment stored on-site behind fence at Gate 12 and are protected by overhead building awning. Miscellaneous equipment include rodent control supplies, shop vac, ladders, etc.

4. Spill kit is readily available on-site, within the office at Gate 12 and are also stored on the Cartwright trucks.

5. Trucks that are used by Cartwright daily are for meeting with tenants, inspecting pest control equipment, and other day-to-day tasks (not pest control applications) and are inspected daily for leaks and are well kept.

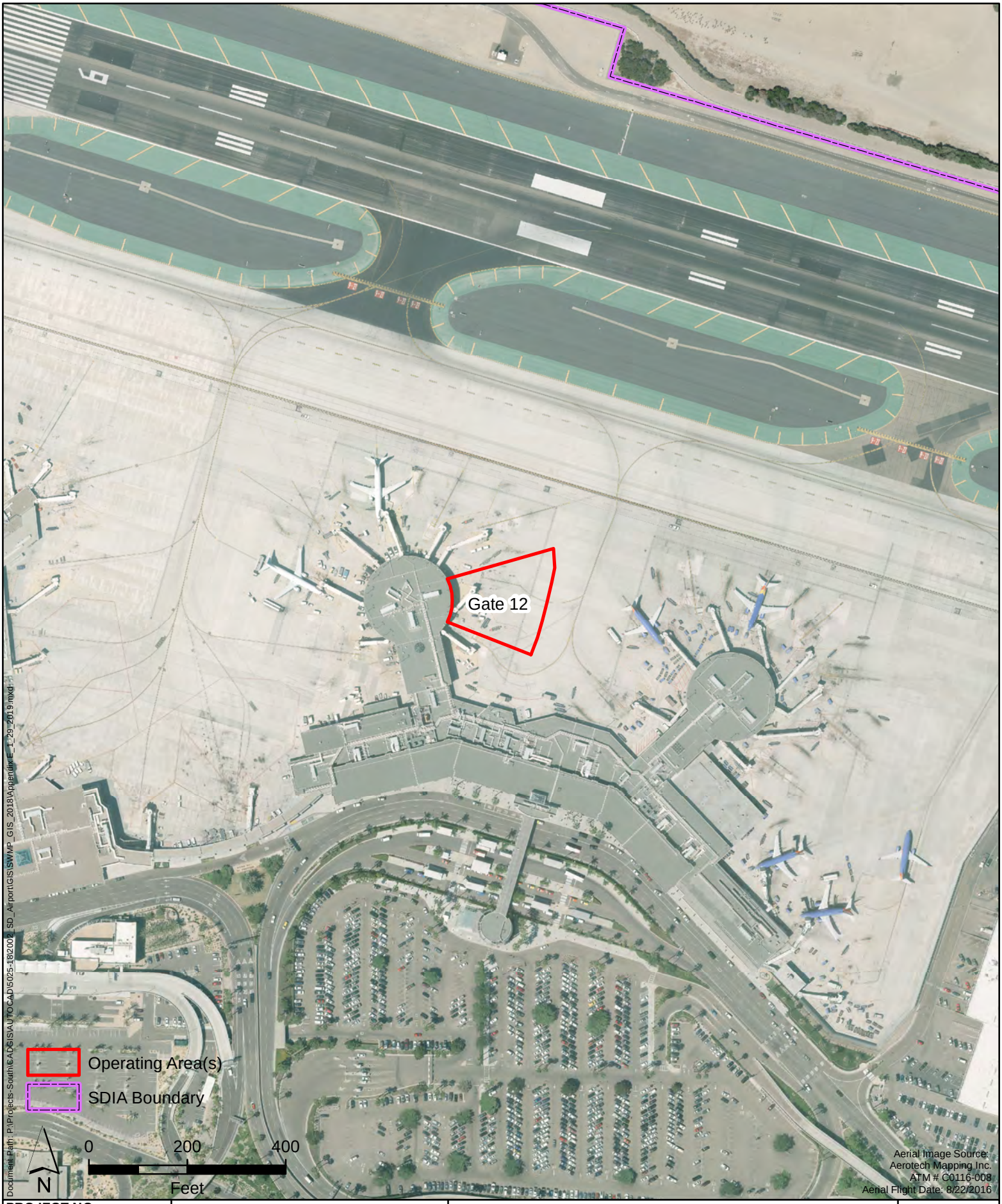
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Drainage system maintenance	Metals
Fluid leaks	Oil & Grease
Outdoor waste storage	Pesticides/Herbicides
Pesticide usage	
Tank fuel transfer	
Trash collection	

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 4, 5, 6, 11
Outdoor Material Storage	SC07 - 1, 2, 7, 11, 12, 13
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 3
Employee Training	SC10 - 1, 2, 4
Drainage System Maintenance	SC17 - 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Cartwright Operating Areas	E-10
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Conrac Solutions

SIC Codes	7521
Primary Activity	Parking Lot Management
Drainage Areas	03, 05
Nearest MS4 Inlet	< 200 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

Scott Anderson — Manager - Site
C 8582819170
sanderson@conracsolutions.com

Tyler Mclean — Assistant Manager
P 6195740647
tmclean@conracsolutions.com

Facility Description and Activities

1. The San Diego Rental Car Facility was constructed with the purpose of supporting airport related rental car operations at one convenient location. It includes a parking garage structure with a customer service area, and an area to service rental vehicles (referred to as the Quick Turn Around Area or QTA). The building can hold up to 5,000 vehicles.

2. The QTA includes car washes, fueling, vacuums and other equipment to prepare cars for the customers.

3. The site has one fuel farm with three (3) under ground storage tanks (UST). Each tank is 25,000 gallons and stores only regular unleaded gasoline. The total gasoline storage is approximately 75,000 gallons. Fueling area is on floors 1-3. There are 12 pumps and 24 fueling stations on floors 1-3. The fueling island overflow can hold up to 8,000 gallons, but will shut down fueling if it reaches 15 gallons. The fuel is provided by IPC.

4. The facility has three oil water separators (OWS) that are each approximately 10,000 gallons.

5. The tank for the generator contains diesel fuel and is approximately 900 gallons. Fuel is provided by IPC.

6. The oil room contains three (3) used oil containers that store 2,500 gallons each. There is one tank that stores new motor oil, it is 2,500 gallons.

7. There are five (5) maintenance bays on floors 1-3. Only light maintenance including tire rotations and oil changes are done one site. Heavy maintenance is conducted offsite. Some of the maintenance bays have used oil filter containers. All bays have waste oil containers that feed into the waste oil tank.

8. The car wash drains lead to the oil water separator. The water is recycled and reused in the car wash. The reclaimed water tank can hold up to 4,500 gallons on each floor. The car wash also uses reverse osmosis (RO) to clean the water for the final spray. The water that is not clean enough for the final spray is used in earlier steps within the car wash. The overflow from the RO water tanks lead to the OWS. Approximately 220 gallons of car wash soap are stored within each car wash bay. Floors 2 and 3 have five (5) wash bays. The first floor only has three (3) wash bays. Approximately 4,000 cars are washed per day.

9. The landscaping is done by Dreamscape and they visit the site three to four times per week. Herbicides are applied biannually. Fertilizers are applied quarterly and pesticides are applied as needed.

10. ACT Enviro is the vendor for all major spills. The threshold for calling ACT Enviro is a 25 gallon spill. A 55 gallon used absorbent drum is used to collect used absorbent that will be removed by ACT Enviro.

11. Dumpster cleaning is conducted in the service yard. All dumpsters are connected to the sanitary sewer.

12. Calico Building Services is contracted to clean the front of the building, parking lots, and trash containers.

13. Sweeping is conducted on a rotating calendar. All parking lots are swept monthly, and it is conducted at night to maximize the areas swept.

14. There are six (6) bioretention BMPs on the site. These TCBMPs are functioning well and drain within 24 hours.

15. Storage at the facility is under cover and within the building. Most materials are stored within cages on each floor against the east side of the building.

16. Repair and maintenance on fuel systems in cars is done by Western Pump.

17. The fourth floor is only for vehicle storage.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Building & Ground maintenance	Cleaning Solutions
Cargo handling	Degreasers (Citrus based)
Equipment storage	Fertilizers
Fluid leaks	Floatables

Fuel spills,Fuel transfer	Food Waste
Fuel storage	Fuel
Herbicide usage	Fuel (Diesel)
Material loading/unloading	Fuel (Gas)
Outdoor waste storage	Hydraulic Fluids
Pesticide usage	Landscape Wastes
Ramp/Taxiway scrubbing	Lubricants
Trash collection	Oil & Grease
Vehicle parking	Paints
	Pesticides/Herbicides
	Recyclables
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 5, 6, 8, 9, 10
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 9
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14
Building & Ground Maintenance	SC09 - 1, 2, 3, 5, 7
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11
Parking Lots	SC16 - 1, 2, 4, 5, 6, 11, 12, 13
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		Conrac Operating Areas	E-11
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Delta Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	07, 08, 12, 15
Nearest MS4 Inlet	< 200 ft.
Address	3835 North Harbor Dr. #107 San Diego, CA 92101

Contact Information

Jason Kempster — Manager - Station

P 6194912800 **C** 2062952356

jason.l.kempster@delta.com

Alfredo Magana — Crew - Maintenance

P 6192009423

Alfredo.c.magana@delta.com

Facility Description and Activities

**Compass is contracted to fly planes for Delta. Compass does not hold lease space; however, they land airplanes at the San Diego Airport.

1. WFS handles cargo for Delta.

2. DAL Global Services (DGS) is Delta's subtenant for GSE maintenance. DGS operates the GSE maintenance shop located at the cargo loading/unloading building. DGS performs vehicle and GSE maintenance for Delta. Maintenance is only performed inside the GSE maintenance shop, none is performed on the ramp. In addition to maintenance, DGS provides ground handling and baggage services.

3. Ground support equipment, cargo containers, dollies, and other items are stored behind the cargo building and the DGS maintenance shop and west ramp.

4. Delta's own technicians perform aircraft maintenance at the gates. Pacific Aircraft Maintenance has a contract with Delta as backup to Delta's technicians.

5. Vehicles and GSE are washed at Menzies' wash rack.

6. Spill kits are located at every gate with a larger cart on west ramp.

7. Delta/DGS each performs regular inspections of vehicles/GSE and aircraft during fueling operations.

8. All fueling is performed by Menzies.

9. Flushing of potable water lines is not performed.

10. Hazardous wastes are collected by Nexeo Solutions LLC (formerly Ashland), who does liquid waste recycling.

11. Tenant has a Corporate Storm Water Pollution Prevention Plan, a Hazardous Waste Emergency Plan, a Hazardous Waste Management Plan, and a FOD Plan.

12. Gate 38 and 37 are preferred gates. Gate 46 and 47 are out of service due to construction until 2019.

13. A Hazardous Materials locker is in a roll up cage outside at Gate 47.

Significant Materials/Activities Potentially Exposed to Storm Water

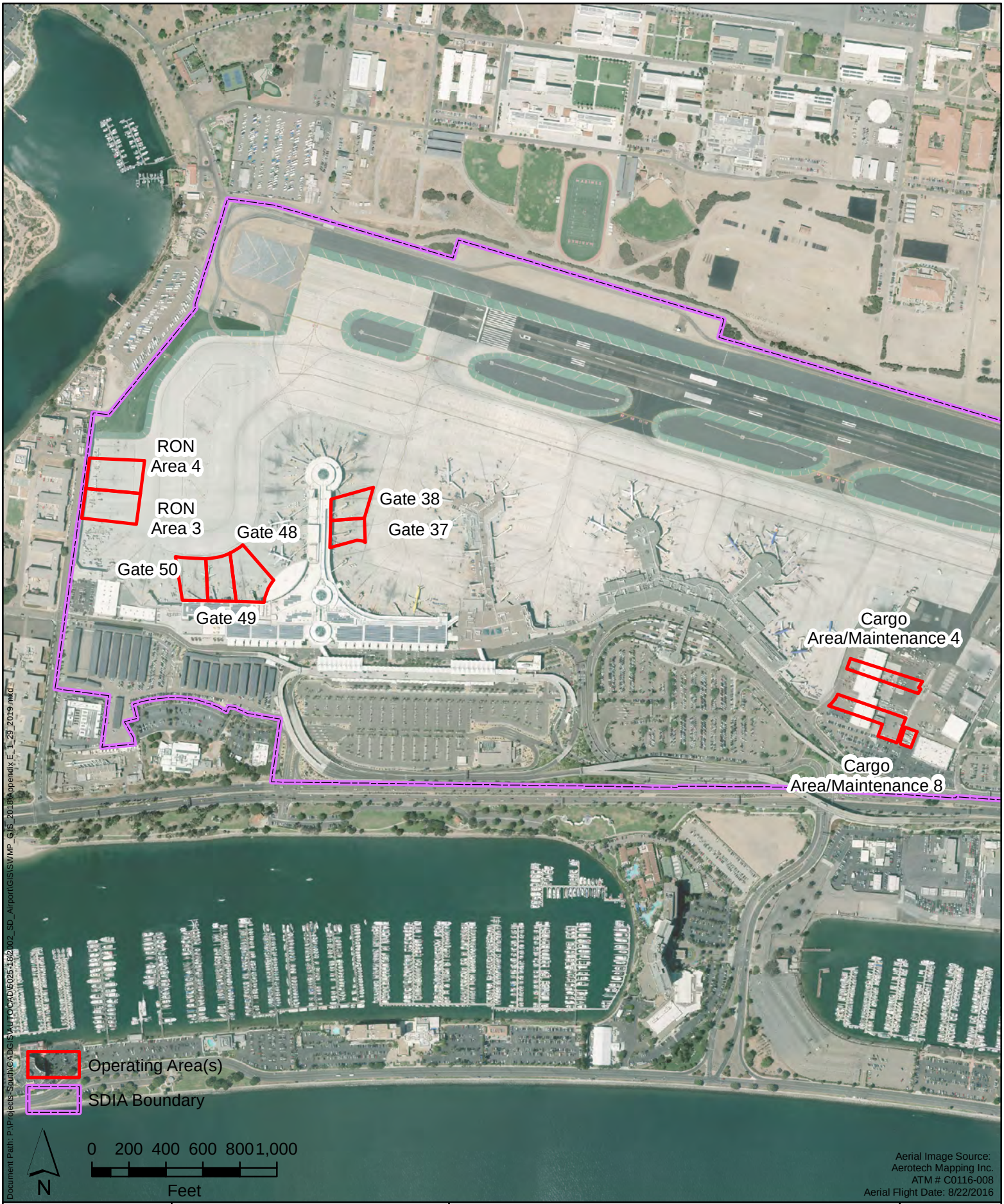
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Acetone
Cargo handling	Anti Freeze
Drainage system maintenance	Battery Acid
Equipment storage	Brake Fluid
Fluid leaks	Cleaning Solutions
Fuel spills,Fuel transfer	Coolant
Material loading/unloading	Degreasers (Citrus based)
Outdoor waste storage	Food Waste
Tank fuel transfer	Fuel
Trash collection	Fuel (Diesel)
Vehicle parking	Fuel (Gas)
	Fuel (Jet)

Fuel (Sump)
Hydraulic Fluids
Lavatory Chemical Wastes
Lavatory Chemicals
Lavatory Truck Wash Water
Lavatory Wastes
Lubricants
Metals
Oil & Grease
Purple K
Rubber Particulates
Sealants
Solvents
Transmission Fluid
Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 3, 5, 6, 7
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Outdoor Wash down/Sweeping	SC12 - 2, 3, 5, 12
Parking Lots	SC16 - 1, 2, 4, 6, 11
Drainage System Maintenance	SC17 - 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Delta Operating Areas	E-12
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DHL

SIC Codes	4513
Primary Activity	Air & Ground Freight
Drainage Areas	03, 05, 06
Nearest MS4 Inlet	< 200 ft.
Address	225 Washington St. San Diego, CA 92101

Contact Information

Heather McLeroy	Supervisor
P 6193586250	**C** 8586630990
heather.mcleroy@dhl.com	

David Tabali	Vendor - Primary Contact
dtabali@casusa.com	

Facility Description and Activities

1. DHL has one cargo plane (767 plane) that comes in in the AM.
2. DHL trucks come on site (through the WA St. entrance) to pick up cargo and take it back to off site facility for sorting.
3. WFS Cargo, which was previously IAS (vendor to DHL) unloads the plane and does all ground handling. CAS purchased IAS within FY16. The airport has contracts with WFS (previously CAS/IAS) under the name IAS, which is why it may still be on some current paperwork. WFS (previously CAS) does not lease space.
4. GDX also has 2 trucks that come on site to pick up cargo. Other vendors who drop off containers are Letter Ride, CEVA, and FasTrucking.
5. Plane is loaded in the PM with material from incoming trucks.
6. Atlas Air (vendor) does maintenance on the DHL plane on the ramp.
7. DHL ground service equipment is maintained and contracted through Signature/LGSTX. Equipment is taken to Signature if maintenance is required.
8. No washing of any equipment is performed on the ramp.
9. Signature fuel the DHL plane and ground service equipment.
10. Bathroom for the DHL portable lavatory is serviced by Diamond Environmental.
11. There is one DHL office trailer on site.
12. There are two self contained Diamond port-o-potties on site for DHL employees.
13. There are 2 conex containers on the ramp where maintenance supplies and equipment are stored. This belongs to Atlas Air.
14. Hazardous wastes are stored in clamshells outside.
15. All ground service equipment are parked on the ramp by the trailers.
16. DHL employees do safety training which includes spill response procedures.
17. Spill kit and supplies are located indoors in room at DHL trailer.
18. No aircraft lavatory services occur at SAN. All DHL aircrafts get serviced at PHX.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Cargo handling	Cleaning Solutions
Equipment storage	Degreasers (Citrus based)
Fluid leaks	Food Waste
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Jet)
Outdoor waste storage	Hydraulic Fluids
Tank fuel transfer	Lavatory Chemicals
Trash collection	Lavatory Wastes
	Oil & Grease

Paints

Recyclables

Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 5, 7, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 9
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 12, 13
Outdoor Wash down/Sweeping	SC12 - 12
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		DHL Operating Areas	E-13
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Edelweiss

SIC Codes	N/A
Primary Activity	Air & Ground Freight
Drainage Areas	15
Nearest MS4 Inlet	< 200 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

Cynthia Jackson Unknown

cynthia.jackson@flyedelweissusa.com

Margaret Alvarez Manager - Station

P 6195002956

marget.alvarez@flyedelweissusa.com

Facility Description and Activities

1. Tenant operates out of gate 48 primarily with 50 & 51 as backups.
2. Tenant has no office.
3. APS conducts ground handling and operations.
4. Menzies conducts fueling.
5. California Airline Services is a maintenance vendor
6. SkyChef does catering for vendor.
7. APS does airplane cleaning and security.
8. Siemens conducts bridge support and belt system support.
9. Flights run 2x per week from May-Oct.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Equipment storage	Battery Acid
Fluid leaks	Cleaning Solutions
Fuel spills,Fuel transfer	Food Waste
Fuel storage	Fuel
Potable water flushing	Fuel (Diesel)
Tank fuel transfer	Fuel (Gas)
Water/Fuel mixture within berm	Fuel (Jet)
	Hydraulic Fluids
	Lavatory Chemical Wastes
	Lavatory Chemicals
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Sediment
	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 8, 9

Outdoor Material Storage	SC07 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Lavatory Service Operation	SC11 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Potable Water System Flushing	SC14 - 1, 2, 3
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Edelweiss Operating Areas	E-14
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FedEx

SIC Codes	4513
Primary Activity	Cargo Handling
Drainage Areas	05, 06
Nearest MS4 Inlet	< 200 ft.
Address	2221 West Washington St. San Diego, CA 92110

Contact Information

Nathan Muren — Manager - Ops
P 6198509972
nmuren@fedex.com

Greg Chewett — Ramp Agent
P 6196889203
gregory.chewett@fedex.com

Facility Description and Activities

1. Aircraft loading/unloading occurs at four gates on the North Ramp area.
2. Menzies fuels aircraft, vehicles and equipment.
3. Two dumpsters utilized by FedEx's office are managed by EDCO and located outside of the parking lot.
4. Three above ground storage tanks are outside FedEx's office, two contain drinking water and one contains waste water. Palomar Water delivers potable water and United services the waste water regularly.
5. A spill kit is located at the new sort facility. It contains absorbent litter, mats, and sox.
6. Minor vehicle maintenance is conducted outdoors in designated vehicle maintenance area. Maintenance area is covered and has a spill protection area.
7. Hazardous waste and waste oil are stored in covered storage containers, on pallets, and inside sheds southeast of FedEx's offices. Safety Kleen is contracted to pick up hazardous wastes.
8. Significant materials are stored in covered storage containers on pallets inside the sheds southeast of FedEx's office.
9. Safety Kleen is contracted to clean up any hazardous material spills that may occur.
10. Vehicles are parked in front of and northwest of FedEx's offices.
11. Cargo loading and unloading equipment is staged in designated areas throughout the ramp. The old sort facility is used for documents. Other operations are performed at the new sort facility under the new covered area.
12. GAT performs lavatory and potable water services as needed. This rarely occurs.
13. Fleetwash washes some of the equipment and stains on the ramp. They utilize a system that captures the wash water and dispose of it offsite. The equipment does not utilize cleaning agents, only highly pressurized water for cleaning. They typically wash ground service equipment once a month. Aircraft are not washed at SAN.
14. Interstate recycles all used batteries.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Cargo handling	Anti Freeze
Equipment storage	Battery Acid
Fluid leaks	Brake Fluid
Fuel spills,Fuel transfer	Carburetor Cleaner
Material loading/unloading	Cleaning Solutions
Outdoor waste storage	Coolant
Potable water flushing	Degreasers
Tank fuel transfer	Degreasers (Citrus based)
Trash collection	Fuel
Vehicle parking	Fuel (Diesel)
	Fuel (Jet)
	Hydraulic Fluids
	Lubricants
	Metals

Oil & Grease
Paints
Recyclables
Sealants
Solvents
Transmission Fluid
Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6, 7
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 6, 7, 8, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 8, 9
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 2, 3, 5, 8, 9, 10, 12
Potable Water System Flushing	SC14 - 1, 2
Parking Lots	SC16 - 1, 2, 3, 4, 5, 6, 11, 12
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		FedEx Operating Areas	E-15
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FlagShip

SIC Codes	4581
Primary Activity	Janitorial
Drainage Areas	08
Nearest MS4 Inlet	< 200 ft.
Address	3835 North Harbor Dr. #130 San Diego, CA 92101

Contact Information

Gustavo Solis — Manager - Account

P 6192986793 **C** 9493900190

gsolis@Flagshipinc.com

Ramon Gaxiola — Manager - Ops

P 6194580599

ragaxiola@flagshipinc.com

Facility Description and Activities

1. FlagShip (formerly SPC) is responsible for cleaning the restrooms inside the airport and those on the airside. They empty all trash cans and recycling cans inside and outside the airport, but not the dumpsters. All trash is disposed in dumpsters located in T1 (Compactor/Segration Area) and T2 (Gate 23, Gate 48, and Gate 25). Flagship does not use dumpster in T2 parking lot near USO.

2. FlagShip cleans the floors and carpets inside the airport, including the gift shops and food courts, and they sweep sidewalks up to the curb on the landside and the airside using a sweeper that belongs to Flagship. They do not clean the baggage make up areas. They are also responsible for sweeping 10 ft from the building along on the land and airside.

3. Pressure Washing (information from Airport's Public Relations Specialist, updated 5/27/15): Flagship performs pressure washing Tuesdays through Saturdays between 11:00 pm and 4:00 am, and is scheduled on a 30 to 45 day rotation. Locations that receive pressure washing include terminal smoking areas, all baggage claim sidewalks, and ten feet from the building to the ramp and compactor areas. FlagShip also power-washes the trash compactor area near the Commuter Terminal, the dumpster area between Terminal 2 East and West, the HMS Host grease container area near Gate 27, and the dumpster area at Terminal 1, and the grease container. Carpet cleaning wastewater is also disposed of at the dewatering bin at the trash compactor area. The Airport Authority works with Flagship to use AC condensation water for the pressure washing operation. The AC condensation water is collected into 55 gallon drums, and once full the water is transferred to the pressure washer reservoirs. In 2014, more than 5,225 gallons of AC condensate was recovered and reused for a variety of purposes in airport maintenance, including pressure washing. FlagShip owns three pressure washers. This equipment is used to power-wash the sidewalks on the landside and the airside. The power washers are stored at Gate 17 and covered with a tarp. There is no set schedule for the three washers that are used. During power washing, water is heated to 200 degrees, which probably cools to 140-150 degrees by the time it reaches the surfaces, and at a pressure of 3,000 psi. The pressure washers used by Flagship are equipped with a water recollection and filtration system. They are designed to collect all residual water, filter, recycle and re-use the water throughout the operation of the equipment. An estimated 80–100 gallons of recovered AC condensate water is used per day washing occurs. The reclaimed AC condensate is not potable water and therefore not a violation of state and city water restrictions. As of October 2015, AC condensate was only collected at the new Green Build T2 gates and the busier T1 gates (not collected at Gate 1 or 2). Before starting the pressure washing operation, Flagship staff locates all storm water drains and covers the areas with berms or mats. They then remove and sweep all trash, debris and cigarette butts. Next, staff will determine the path that the water will run and will funnel the water using berms and bags into the vacuum/reclaim system. Once the job is complete, the wash water is vacuumed up, hoses are drained into the sanitary sewage system at the T1 compactor area and equipment is cleaned. The wash water is vacuumed up by a separate vacuum machine. Water booms are used during this operation to avoid discharges to the storm drains. Wash water is dumped to the dewatering bin at the trash compactor area.

4. Republic (a vendor to SDCRAA) is the company the collects the dumpster from the airport, which also performs a power washing on a schedule that does not coincide with Flagship's.

5. FlagShip also transports and unloads trash/recycling from trash cart system located between Terminal 1 and Terminal 2.

6. Diesel is used to heat water on the power washers; gasoline is used in the engine of the power washers.

7. FlagShip cleans the windows at T2W every 3 to 6 months using FlagShip equipment. All wash waters are collected and disposed of onsite.

8. Flagship uses battery operated pieces of equipment (vacuum, carpet cleaners, hard floor surface cleaners).

9. A truck mounted carpet extractor is used to clean carpets in terminals and is stored at Gate 17. All water is disposed of in T1 sump (via trash compactors).

10. All outdoor storage is at Gate 17 and some indoor storage is at this location as well.

11. Flagship has an oncall contract to pressure wash and scrub along the ramp and apron.

12. Flagship got rid of their pressure washing truck within the last year.

13. Flagship owns 4 trucks and 2 vans. Minor maintenance is done by Flagship maintenance staff under a tented area near

the Cargo buildings. Major maintenance is done offsite.

14. SANCO manages the contract and compliance for Flagship and Siemens. They do not directly oversee activities.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Fluid leaks	Battery Acid
Fuel spills,Fuel transfer	Cleaning Solutions
Material loading/unloading	Food Waste
Outdoor apron washdown	Recyclables
Outdoor washdown	Trash
Outdoor waste storage	
Tank fuel transfer	
Trash collection	

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 11
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 7
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
Building & Ground Maintenance	SC09 - 4, 7
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

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PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Flagship Operating Areas	E-16
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Frontier Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	08
Nearest MS4 Inlet	200 - 1000 ft.
Address	3665 North Harbor Dr. #223 San Diego, CA 92101

Contact Information

Fred Jones — Manager
P 6195428318 **C** 7185703794
fjones@wfs.aero

Samuel Schneider — Manager - Regional
P 9545910868
samuel.schneider@flyfrontier.com

Facility Description and Activities

1. Pacific Aircraft Maintenance (Flightline) does maintenance on Frontier's GSE and aircraft.
2. No cargo operations are performed in San Diego.
3. Pacific Aircraft Maintenance (Flightline) conducts minor aircraft maintenance while parked on ramp.
4. One hazardous materials locker is located outside of the bag room.
5. GSE equipment is a combination of gas, diesel, and propane. Menzies fuels gas and diesel GSE. Amerigas provides the propane.
6. Frontier has no electric vehicles.
7. Drip pans are used on an as-needed basis.
8. Sweeping is done every time before a flight comes in, every time a flight goes out, and on an as-needed basis.
9. The Airport Authority performs all ramp painting.
10. All oils and fluids used for maintenance are stored at Flightline Mechanics in the cargo shop area.
11. WFS is a vendor for Frontier for above and below wing services in SAN. Half of the ground equipment is owned by WFS and half is owned by Frontier. The WFS manager is Fred Jones.
12. Frontier operates out of Gate 12. Frontier 95% use, Cartwright 5% use.
13. Frontier uses alternative products where possible: Simple Green products, and products identified as biodegradable.

Significant Materials/Activities Potentially Exposed to Storm Water

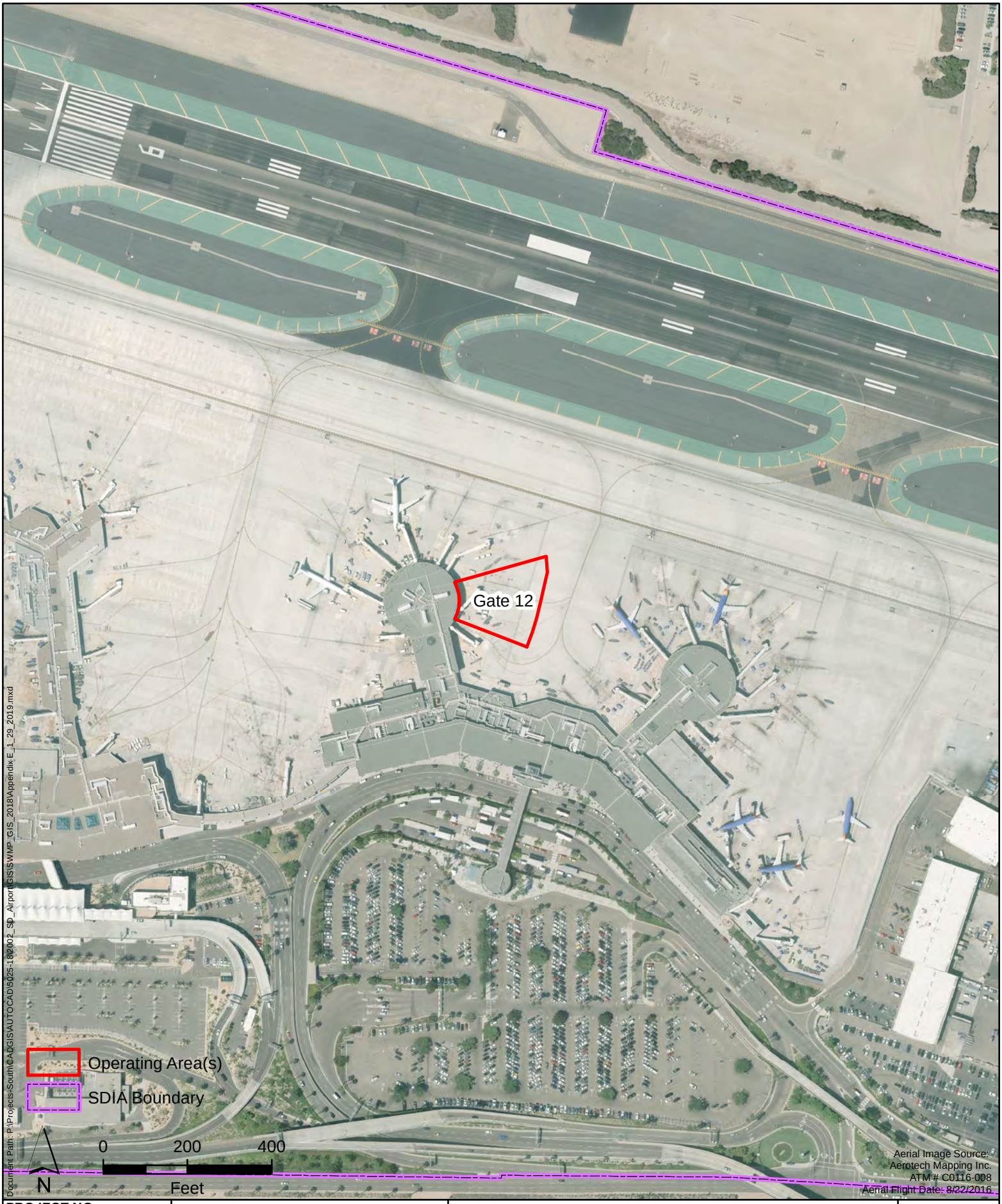
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Degreasers (Citrus based)
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Diesel)
Outdoor waste storage	Fuel (Gas)
Potable water flushing	Fuel (Jet)
Tank fuel transfer	Hydraulic Fluids
Trash collection	Lavatory Chemicals
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Paints
	Recyclables
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs

Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12, 13
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Frontier Operating Areas	E-17
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Hawaiian Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	15
Nearest MS4 Inlet	200 - 1000 ft.
Address	3835 North Harbor Dr. Ste 127 San Diego, CA 92101

Contact Information

Lila Da Luz — Manager
P 6192780975 **C** 7605800553
lila.daluz@hawaiianair.com

Ken Sturgill — Vendor - Primary Contact
P 6192200164 **C** 7757710699
ksturgill@atsstl.com

Facility Description and Activities

1. Airport Terminal Service (ATS) is a service provider who owns all ground support equipment, loads and unloads cargo, and performs lavatory services.
2. GES performs maintenance on vehicles and equipment and DGS handles cargo. Hawaiian has one mechanic as well as one Delta mechanic who assists with maintenance activities when Hawaiian's mechanic is away.
3. Menzies fuels aircraft and vehicles.
4. Aircraft are washed offsite in Honolulu. Pristine Fleet may provide aircraft exterior cleaning if necessary in San Diego.
5. No outdoor material or waste storage areas.
6. Two flights per day.
7. Siemens performs baggage belt maintenance and gate services.
8. Primary Gate 51, alternate gate is 4
9.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Acetone
Cargo handling	Adhesives
Equipment storage	Anti Freeze
Fluid leaks	Battery Acid
Fuel spills,Fuel transfer	Brake Fluid
Material loading/unloading	Cleaning Solutions
Outdoor waste storage	Coolant
Potable water flushing	Deicing/Anti-Icing Fluids
Tank fuel transfer	Fire Fighting Foam
Trash collection	Food Waste
	Fuel
	Fuel (Gas)
	Fuel (Jet)
	Hydraulic Fluids
	Lavatory Chemicals
	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants
	Metals
	Oil & Grease
	Paints
	Purple K
	Rust Preventer

Solvents

Transmission Fluid

Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Outdoor Wash down/Sweeping	SC12 - 12
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019	Hawaiian Operating Areas	E-18
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High Flying Foods

SIC Codes	5812
Primary Activity	Food & Beverage
Drainage Areas	08
Nearest MS4 Inlet	
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

Kimberly Hazard — Manager - Ops
P 8585310312
khazard@highflyingfoods.com

Kat Dillenback — Assistant Manager
P 4135129193 **C** 4135129193
kdillenback@highflyingfoods.com

Facility Description and Activities

1) Participates in the Airports compost program 2) Grease is picked up twice per week by Bradford 3) Does not operate any equipment 4) Bradford delivers products to T1 indoor/outdoor storage area at Gate 7 and T2 indoor storage unit 5) Flagship picks up trash, recycling, and compost directly from the store 6) All employees went through the airport compost training and managers occasionally inspect the compost for contamination

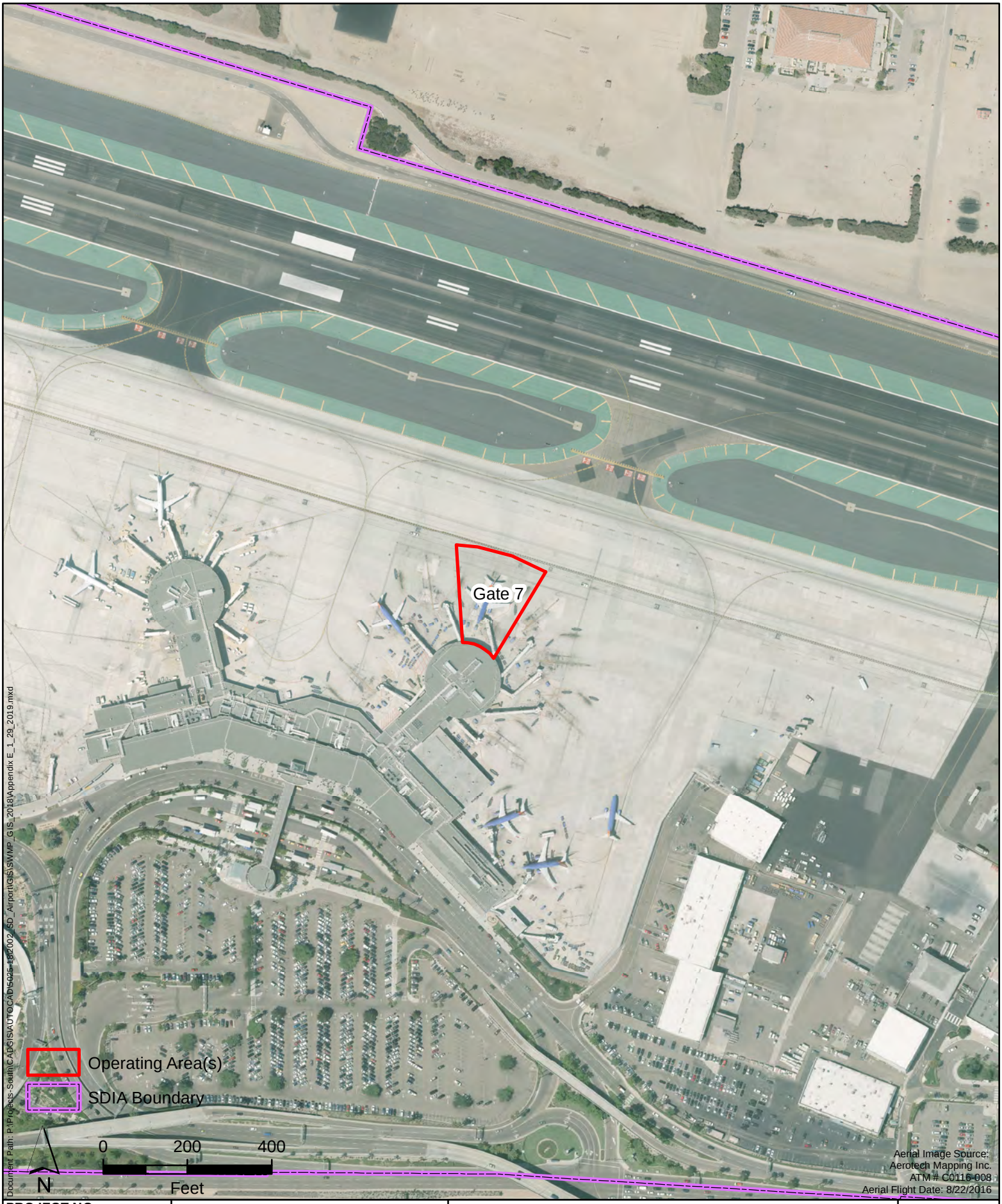
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Material loading/unloading	Cleaning Solutions
Outdoor waste storage	Food Waste
Trash collection	Oil & Grease
	Recyclables
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 6, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 5, 6, 7, 10

* Appendix B provides descriptions for each BMP category.



PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		HFF Operating Areas	E-19
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HMS Host

SIC Codes	5812
Primary Activity	Food & Beverage
Drainage Areas	08
Nearest MS4 Inlet	< 200 ft.
Address	3665 North Harbor Dr. San Diego, CA 92101

Contact Information

Gerald Eldred — Manager - General
P 6192315100 **C** 9099173527
gerald.eldred@hmshost.com

Donel Parsons — Manager - Ops
P 6192315100
Donel.Parsons@hmshost.com

Facility Description and Activities

***HMS Host operational area has reduced since the T2W has become active. 3 other Concession vendors operate at SAN.

1. All grease traps, common areas and hood cleaning is performed by SDCRAA.

2. Bradford is in charge of removing Waste Vegetable Oil (WVO) from deep fryers three times a week, during non operational hours.

3. Flagship removes trash and food waste. Food waste is collected in a small green container. HMS Host was the first concession to be part of the City of SD composting food waste program.

4. One vehicle is used for maintenance, which is parked by Gate 11. It is maintained and fueled offsite.

5. Small connex storage units are located outside between Gate 1 and 2. Additional indoor storage are located near Gates 48 and 25.

6. Ameil Porta is the Terminal Operations Manager who is the point of contact for maintenance. (aporta@san.org). Jim DeCock (jdecock@san.org) is the point of contact regarding any concession questions.

7. A1 Vent conducts vent cleaning in the stores.

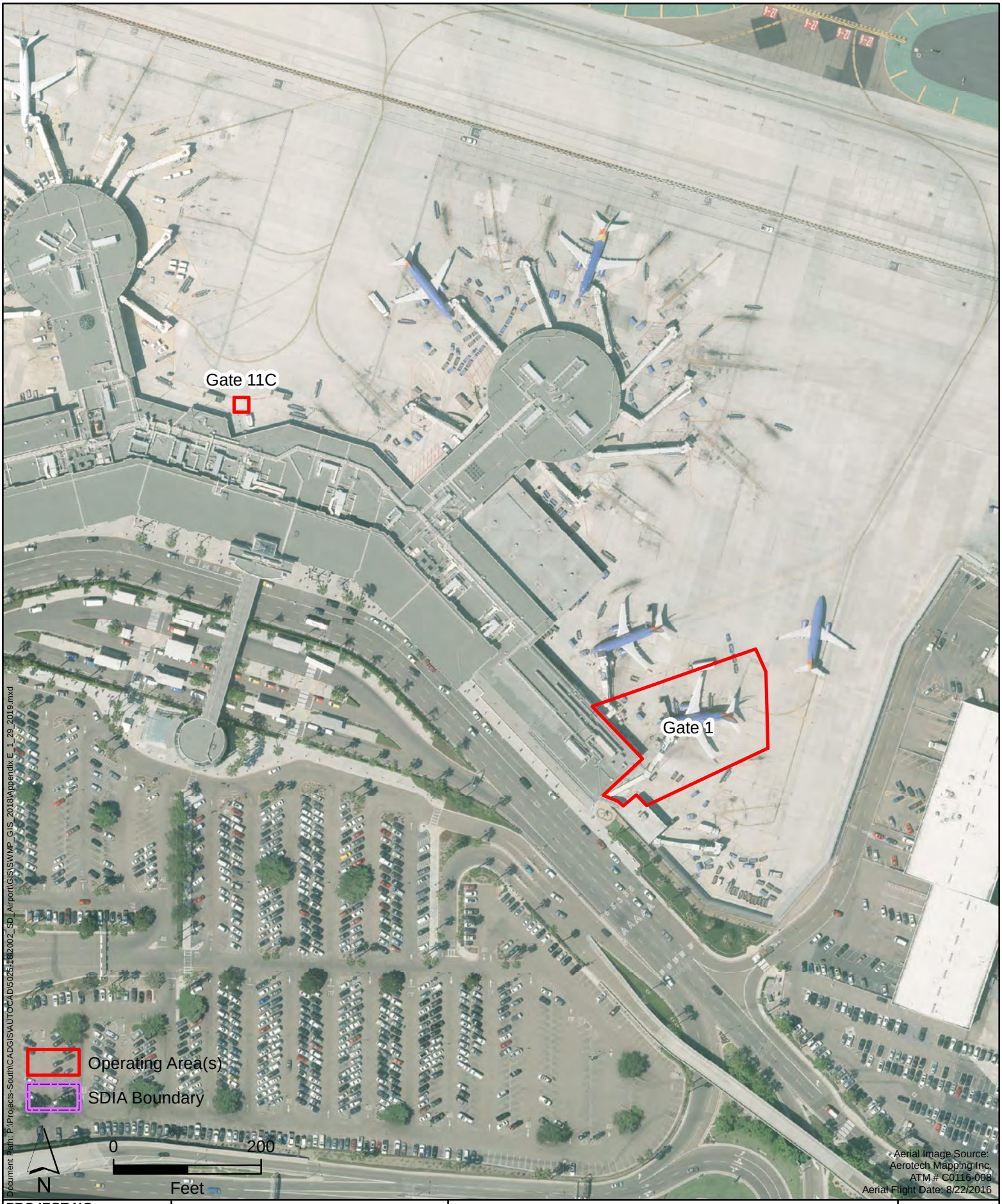
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Cargo handling	Cleaning Solutions
Equipment storage	Food Waste
Fluid leaks	Oil & Grease
Material loading/unloading	Recyclables
Outdoor waste storage	Trash
Tank fuel transfer	
Trash collection	

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		HMS Host Operating Areas	E-20
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Japan Airlines

SIC Codes	4512
Primary Activity	Passenger Carrier
Drainage Areas	15
Nearest MS4 Inlet	< 200 ft.
Address	3707 North Harbor Dr. #123 San Diego, CA 92101

Contact Information

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P 6195740662	
shiro.kamio@jal.com	
Alan Nakai	Manager
P 6195740549	**C** 6194819611
alan_n_.nakai@jal.com	

Facility Description and Activities

1. 1 flight per day out of Gate 48.
2. There is a JAL maintenance office is under terminal gate 48.
3. ATS handles below wing operations (trash, lav), cleaning inside the plane, passenger services and ticket counters, and ATS GSE maintenance (done at GES/Tom Mascarenas shop).
4. CAS handles maintenance on the JAL plane.
5. All maintenance related fluids and supplies are stored at either the GES or CAS shop areas.
6. Fueling is performed by Menzies.
7. Gate gourmet is used for international trash.
8. Prime flight is used for security.
9. Cargo is handled by WFS at the warehouse and ATS at the plane. Cargo items are occasionally perishable so there is some dry ice.
10. FOD walks are done by ATS before flights arrive.
11. No aircraft washing or deicing is done at SAN.
12. Training: employees receive annual training on safety & security, haz material handling, dangerous goods, and spill response.
13. JAL does not use potable water on aircrafts.
14. ATS is a subtenant and performs services below the wing for JAL.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Cleaning Solutions
Equipment storage	Fuel
Fluid leaks	Fuel (Gas)
Fuel spills,Fuel transfer	Hydraulic Fluids
Material loading/unloading	Lavatory Chemicals
Outdoor waste storage	Lavatory Truck Wash Water
Tank fuel transfer	Lavatory Wastes
Trash collection	Lubricants
	Oil & Grease
	Paints

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9

Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		JAL Operating Areas	E-21
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JetBlue Airways

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	12
Nearest MS4 Inlet	200 - 1000 ft.
Address	3835 North Harbor Dr. #108 San Diego, CA 92101

Contact Information

Brian Zeugschmidt — Manager - Station
P 6197250807 **C** 6197783808
brian.zeugschmidt@jetblue.com

Joseph Aguilera — Supervisor
P 6197250807
joseph.aguilera@jetblue.com

Facility Description and Activities

1. JetBlue owns two stairs trucks that run off of diesel.
2. GAT is a subtenant that provides ground handling services. They manage lavatory operations and trash disposal.
3. No cargo operations are performed in San Diego anymore.
4. WFS (previously Certified Aviation Services) is contracted for ground vehicle and equipment maintenance.
5. A small amount of significant materials are stored in a flammable material storage room located between Gate 37 and Gate 38. JetBlue is certified by the City as a small quantity generator.
6. 3E provides all MSDS information for go/no go items collected from travelers.
7. A spill kit is located between Gate 36 and Gate 37.
8. Menzies performs all fueling activities for JetBlue.
9. Tenant uses the Airports' SWMP and has a Spill Prevention Plan. A computer based storm water module is required every October.
10. Primary gate is 36 and secondary gate is 34. Gate 33 is used overnight
11. Five flights are scheduled daily between 11:00 AM and 10:30 PM.
12. Tires are stored outdoors with tarps over them.

Significant Materials/Activities Potentially Exposed to Storm Water

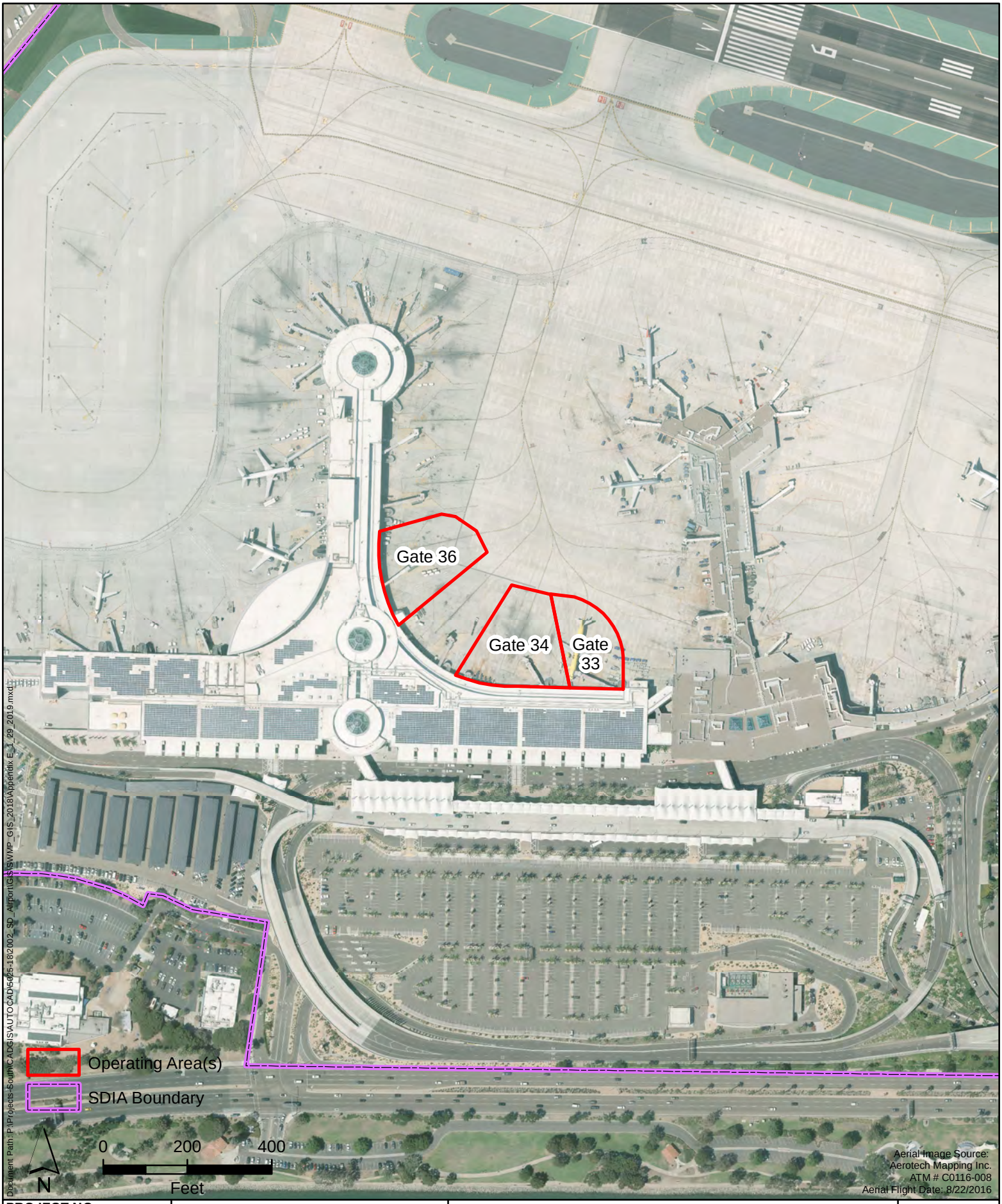
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Food Waste
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Jet)
Outdoor waste storage	Hydraulic Fluids
Potable water flushing	Lavatory Chemical Wastes
Tank fuel transfer	Lavatory Chemicals
Trash collection	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Rubber Particulates
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		JetBlue Operating Areas	E-22
DRAWN BY: CAB			
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Lufthansa

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	15
Nearest MS4 Inlet	< 200 ft.
Address	3835 N. Harbor Drive Suite 134 San Diego, CA 92110

Contact Information

Oliver Maatsch — Manager - Station
P 3103079174
oliver.maatsch@dlh.de

ShahRukh Rahman — Duty Manager
P 6194522205 **C** 4087025934
shahrukh.rahman@dlh.de

Facility Description and Activities

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1. Tenant has 3 employees.
2. Flight support is provided by Nevada Air Service.
3. Fueling is conducted by Menzies.
4. Tenant operates out of Gate 51 at 5x per week.
5. Tenant uses Hallmark for passenger services.
6. Tenant uses LSG for catering.
7. SAS is used for wheelchair assistance.
8. Dnata conducts all ground handling services.
9. Maintenance is conducted by USAS, AAS, CAS, CaAS, LLC.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Acetone
Cargo handling	Adhesives
Equipment storage	Anti Freeze
Fluid leaks	Battery Acid
Fuel spills,Fuel transfer	Brake Fluid
Material loading/unloading	Cleaning Solutions
Outdoor waste storage	Coolant
Tank fuel transfer	Food Waste
Trash collection	Fuel
	Fuel (Gas)
	Fuel (Jet)
	Hydraulic Fluids
	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants
	Metals
	Oil & Grease
	Paints
	Rust Preventer
	Solvents
	Transmission Fluid
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs

Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Outdoor Wash down/Sweeping	SC12 - 2, 3, 5, 12
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		Lufthansa Operating Areas	E-23
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Menzies Aviation

SIC Codes 4581

Primary Activity Fueling Services

Drainage Areas 06, 07, 08, 12, 15

Nearest MS4 Inlet < 200 ft.

Address 2340 Stillwater Rd.
San Diego, CA 92101

Contact Information

Barry Lopez — Manager - General

P 6193296110 **C** 6192506916

barry.lopez@menziesaviation.com

John Soto — Supervisor

P 6193296113 **C** 6192090033

john.soto@menziesaviation.com

Facility Description and Activities

1. Menzies main office and shop is located east of the cargo area next to the American Airlines maintenance shop.
2. Vehicle maintenance is conducted inside Maintenance Shop. Tenant has implemented a Vehicle Discrepency Report (VDR) to identify leaking truck and to minimize the amount of vehicles may be leaking during fueling.
3. Waste accumulation areas are located inside Maintenance Shop.
4. Outdoor material storage container/shed contains drums of used absorbent and fuel filters. HTS is the vendor that removes the 55 gallon drums that store the "oily sludge" in the shed.
5. One onsite storm drain inlet drains to OWS. The Authority is responsible for maintenance.
6. Menzies operates 16 refueling Jet A trucks, and the capacity of the tanks range from 7,000 to 10,000 gallons. Three other vehicles include a gasoline truck, a bio diesel truck, and a split diesel/gasoline tanker.
7. Refueling trucks fueled at the Allied remote fueling facility.
8. Two eyewash stations - one indoors and one in parking lot.
9. Vehicles are washed weekly at the wash rack, which is bermed and connect to the sanitary sewer.
10. Asbury Environmental picks up oil and coolant waste. HTS (Hazardous Transportation Services) picks up all other waste.
11. Initial and annual refresher training for employees. Airlines provide their training so Menzies personnel follow fueling procedures and safety protocols.
12. Sweeping is performed Wednesday afternoon.
13. Tenant has a Storm Water Pollution Prevention Plan, and a Spill Prevention, Control, and Countermeasure Plan.
14. Tenant uses the emergency response companies Ocean Blue.
15. Cintas is the vendor that removes the used oil rags from the Menzies maintenance shop.
16. San Diego Mobile Welding is called for heavy maintenance.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Building & Ground maintenance	Adhesives
Cargo handling	Anti Freeze
Equipment storage	Battery Acid
Fluid leaks	Brake Fluid
Fuel spills,Fuel transfer	Cleaning Solutions
Fuel storage	Coolant
Material loading/unloading	Degreasers (Citrus based)
Outdoor waste storage	Fuel
Tank fuel transfer	Fuel (Gas)
Trash collection	Fuel (Jet)
Vehicle parking	Fuel (Sump)
	Hydraulic Fluids
	Lubricants
	Metals

Oil & Grease

Paints

Transmission Fluid

Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 8
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 5, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 1, 8, 9
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 2, 8, 12
Parking Lots	SC16 - 1, 2, 4, 6, 11
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		Menzies Operating Areas	E-24
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Mission Yogurt

SIC Codes	5812
Primary Activity	Food & Beverage
Drainage Areas	08
Nearest MS4 Inlet	
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

Rob Ziemer Manager - General

C 8583348333

rob.ziemer2@gmail.com

Facility Description and Activities

1. Receives all food and product deliveries from Bradford directly to the store.
2. Mission yogurt does not have any outside refrigeration or storage.
3. Flagship picks up compost, waste, and recyclables directly from the store.
4. Mission yogurt does not use any oil and grease in their food operations.
5. Load and unload food products at T2 west and T1. Bradford delivers to level 1 hallway in T2 and to level 1 door at T1.
6. A member of the Green Concessions Program since 201
7.

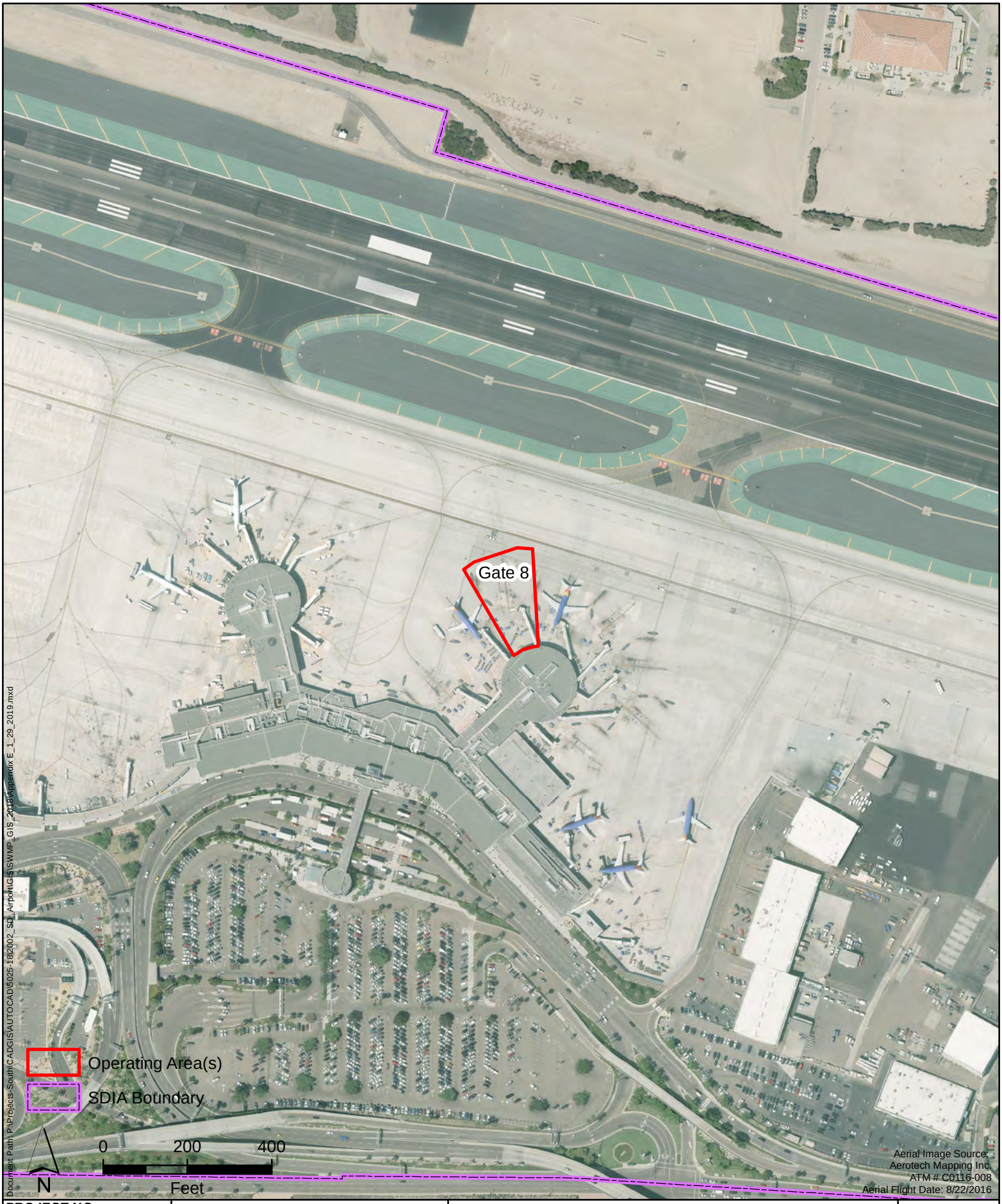
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Material loading/unloading	Food Waste
Outdoor waste storage	Recyclables
Trash collection	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 6
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Housekeeping	SC18 - 1, 2, 3, 4, 5
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



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ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Mission Yogurt Operating Areas	E-25
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San Diego County Regional Airport Authority

SIC Codes	4581
Primary Activity	Facility Maintenance
Drainage Areas	01, 03, 05, 06, 07, 08, 09, 15
Nearest MS4 Inlet	< 200 ft.
Address	3835 North Harbor Dr. San Diego, CA 92101

Contact Information

Tom Covey	Supervisor - Maintenance
P 6194002753	
tcovey@san.org	
Michael Threadgill	Supervisor
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mthreadg@san.org	

Facility Description and Activities

1. Road sweeping: Cannon Pacific is contracted to sweep the roads into and out of the airport Monday through Friday, 1 am - 4 am, using a 600Tymco sweeper. Cannon sweeps all the roads in front of the Terminals including the Commuter Terminal, overpasses leading into and exiting the airport, and from McCain Road to P-18 gate. Cannon Pacific does not sweep Harbor Drive, as it is handled by the City, or any Parking Lots own or leased by the airport, which are handled by the Authorities Ground Transportation Department and contracted through ACE. Sweepings are collected and disposed of at the Sycamore Landfill. Cannon Pacific performs daily pre-trip and post- trip inspections of their equipment. All records of sweeping activities are kept by Cannon Pacific and the Airport Environmental Department. Records are updated monthly through invoices that have all the information on them. ACE is contracted to sweep and maintain all parking areas including the cell phone parking lot.

2. Ramp sweeping: Facilities Maintenance sweeps all areas inside the AOA gates and the perimeter roads. Sweeping is done 4 days a week during evening hours. Sweeping alternates weeks between each ramp area - Terminal 1, Terminal 2, Cargo areas, and North Ramp. Within each area, each terminal and taxiway is swept at least once every two weeks. Some areas are swept twice in a week on request. Two machines operate on Regen-Air technology. Sweeping equipment is inspected monthly by GES and is fixed as needed. FMD also inspects and sweeps each terminal building, up against the building every other month, as a part of the ramp walk program. The debris/sweepings are vacuumed up into the unit and are disposed of in the lowboy container located on the NE corner of the air traffic control tower. FMD notifies Environmental Affairs when the dumpster needs to be emptied.

3. Ramp scrubbing: Abhe & Svoboda performs ramp scrubbing twice a year using a 3,500 psi industrial pavement wash. The wash water is collected using storage containers and collected by Ocean Blue who filters and reuses the water.

4. Runway rubber removal: Is conducted by Abhe & Svoboda, every 6-8 weeks since the new runway rehabilitation project is in progress, but will resume to every 4 weeks after project completion depending on skidometer testing results. They are an all in one system which sprays on the rubber removal solution, scrubs the runway, rinses and vacuums up the rubber particles, removal solution and water. The rubber removal solution is a biodegradable chemical (DC101), 55 gallons of the solution is used for every 10,000 square feet of surface. Only the solution needed is brought on site during each rubber removal. The rubber is dumped using the lined rubber removal lowboy by the ATC tower and FedEx operating area. Ocean Blue is responsible for disposal of waste and waste water generated.

5. Oil/water separators: There are 9 oil water separators at the airport: 1 in Allied Aviation's main jet fuel tank storage area, 1 in Allied Aviation's remote fueling station, and 3 in Conrac's service yard are tenant maintained. The remaining 4 oil water separators are maintained by the Authority: 2 on the north ramp, 1 on the Commuter Terminal Ramp, 1 downstream of Menzies' maintenance facility. The oil water separator on the west ramp north of Terminal 2 West has been removed due to construction. Each installed oil water separator has an alarm system. If the oil reaches a certain level, or oil leaks to the ground, an alarm goes off. Alarms are checked periodically by the tenant and Authority. The treatment control BMPs, including OWSs are inspected on an annual basis and Environmental contracts Ocean Blue to clean the OWSs on an as-needed basis. Maintenance has occurred at two OWS closest to ATC tower and the one closest to the cargo area in 2009/2010; and the OWS near the cargo area was again maintained in December 201

6. The 2017-2018 treatment control BMP inspections were completed in June 2018 and the report was completed thereafter, requiring maintenance of all the OWS. Criteria used for cleanout is the amount of sediment at the bottom of the tanks and the amount of oil & grease & floatables at the top of the tank. The criteria are generally based on whether or not the units function properly and would be expected to function properly for an upcoming rainy season given the amount of sediment/oil/floatables/etc. Maintenance indicator lights will also call for maintenance. 6. FMD (contact David Niccum) contracts Ocean Blue to perform maintenance of the 19 grease interceptors, scheduled for every 30 to 90 days (dependent on the size). 3,000- Gallon interceptors at the airport: (Interceptors (1) Terminal 2 between the West and East connector (2) Terminal 1. A 2,000 gallon interceptor installed at the Terminal 2 West under Gate 48. Terminal 1 between gates 1 and 2 has a 320-gallon grease interceptor. The grease receptacles have 3 baffles in tandem. The wastewater from restaurants enters the receptacles and goes to the first baffle then the second, and then the third. Ten 25 to 50-gallon grease traps on the airside of the Terminals 1 and 2; some below ground and some above ground. There are also two grease traps inside of the building. One is located at the Terminal 2 West Baggage Claim, and the other is in the SSP preparation area. These also have the baffle

system. Grease is vacuumed out of the small traps every 4 weeks, the rest between 2 to 3 months, as required by the City of San Diego, and then they are rinsed in a similar procedure to the grease receptacles, but on a smaller scale, using a 400-gallon tank. Beyond the baffle system, the units are linked to the sanitary sewer.

7. United Stormwater is contracted to clean the storm drains. Types of storm drains include: Drop inlet, Curb inlet, Trench drains, Slit drains, and Separators. Drop inlet, Curb inlet, Trench drains, Slit drains, are cleaned quarterly. Inspections of all storm water conveyance systems occur annually. Separators and underground storm drain pipes leading to city of San Diego drainage systems are cleaned annually. Records are updated after each cleaning event. Records are stored in the Facilities Management and in the Environmental Affairs Department. Contractor vehicles are equipped with large waste water storage capacity and reclamation devices. Wastes from storm drain cleaning are measured for silt, green waste, trash, heavy metals and amount of water consumed to perform the cleaning operation. The contractor is responsible for all waste disposal. The Planning and Environmental Affairs Department has contracted Ocean Blue for maintenance for Authority owned OWS and replacement of filter fabric material at storm drain inlets on an as-needed basis.

8. TCBMPs: The Authority Planning and Environmental Affairs Department performs annual inspections on all TCBMPs: oil/water separators (OWSs), various inlet filters, high-rate media filters (Contech StormFilters®, BioClean and ClearWater Best Management Practice [BMP] Units), grate inlet skimmers, trench drain filters, hydrodynamic separators (HDSs) (Contech Continuous Deflective Separator [CDS]), and modular wetland treatment units. Additionally, there are pervious areas made up of artificial turf, pavers, an infiltration trench, asphalt strips, bioretention areas and bioswales. Inspections were performed in June 2018 and a TCBMP required maintenance report was generated by Environmental Affairs. Maintenance of Authority-owned TCBMPs are performed by FMD and their contractors. Tenant-owned TCBMPs are maintained by the responsible tenant.

9. Fire hydrant flushing: The Airport Authority is responsible for fire hydrant flushing at the airport once a year.

10. Fire suppression system testing is done quarterly by A & D Sprinklers Inc. All water flows to the sanitary sewer system, evaporates, or infiltrates. If no dirt area is available, then it is taken to the sewer.

11. Trash/recycling managed by Amiel Porta: Flagship is contracted to collect trash and recyclables. All trash and recyclables are taken to compactors in the Terminal 1 compactor area, under Sunset Cove, and at Gate 25. Flagship also sorts trash and recycling to determine if any bags were dumped in the wrong tipper container. The sorter is responsible for keeping all staged compactor areas clean and free of debris and creating cardboard bails. Signs are posted at the disposal sites in the kitchens and restaurants, on the containers, carts and compactors, and at the central waste and recycling center. Allied Waste services (DBA Republic Services) removes the waste from the airport. All compactors and dumpsters are emptied daily. Additional bins are available for metal, wood, cardboard, and food waste. Flagship cleans the tipper containers and gondolas used to stage and haul trash from the terminals to the compactor area. Tippers containers are cleaned once per week using a hot water pressure washer and gondolas are cleaned everyday once they are emptied at the end of a shift. The tipper compactors are cleaned in the Terminal 1 compactor area. Wash water is diverted to a sanitary sewer system located in Terminal 1 compactor area. The compactors and compactor area are cleaned and pressure washed by Allied Waste quarterly. This water is captured to be disposed in the sanitary sewer drain, within the bermed compactor area. The food waste compactor is cleaned at the facility when serviced. Daily visual audit is performed as part of the driver's duty. They report repairs/exchanges needed in a monthly report and they get submitted to our container department to perform such repairs/replace dumpsters. **All dumpsters are replaced on an as-needed basis.

12. Spill kits: spill response materials (kits contain kitty litter, sandbags, plastic tarps, absorbent sox and pads, shovels, and brooms). They are located in various places on the air field. There are six spill kits. Ocean Blue is responsible for stocking the spill kits when they run low on equipment.

13. Significant materials storage: the machining/welding shop (Shop 2 on Winship Lane). Pesticides, diesel, gasoline, and turpentine are stored in flammable materials storage lockers near the runway generator area east of the Commuter Terminal, and paints and a non-skid spray for metal steps are stored in a metal shed in the boneyard. Metal parts and other materials are stored in the boneyard and near the runway generator area east of the Commuter Terminal and covered in shop 2, not all are covered and on pallets.

14. Vehicle maintenance is conducted by GES for all Authority Vehicles. GES maintains runway closure signs, and is contracted to maintain the light towers and generators, and do onsite oil changes. Bay City Electrical maintains generators and changes the oil onsite.

15. Menzies fuels vehicles at four places: Maintenance shop at 2412, 2415 and 2417 Winship Lane, the Commuter Terminal and the valet lot by Gate P18. They also fuel all light towers and generators.

16. FMD maintains the triturator area. A new triturator area was installed next to the waste segregation area in January 2015.

17. Roundup is used for weed control. Aztec Landscaping perform landscaping services. They bring their own pesticides and remove their landscape wastes. Aztec's staging area is on the north side of the airport on Washington Street, across from FedEx. They use Roundup for weed control and perform landscaping services. FMD also used herbicides in-house for weeds but starting April 2018, all herbicide application is performed by Aztec Landscaping.

18. Spill response materials are not in vehicles, there are only spill kits in trailers.

19. Hazardous wastes are stored at the 90 Day Facility. Ocean Blue is contracted to collect hazardous wastes as needed.

20. All chemicals are stored in shop 1 or in the specific trades shops (shop 2).

21. Stormwater pollution prevention training is performed annually by the Environmental Affairs Department.

22. FMD staff are trained to protect storm drains when performing maintenance and construction activities.

23. Pressure Washing: Flagship performs pressure washing Tuesdays through Saturdays between 11:00 pm and 4:00 am. Locations that receive pressure washing include terminal smoking areas, all baggage claim sidewalks, all curbside walk areas, transportation island sidewalks, and elevated departure roadway sidewalks. Due to the high volume of foot traffic in these areas (approximately 50,000 passengers daily) that leaves spills, stains, cigarette butts/ashes, and debris, it is a health and safety risk not to pressure wash these areas. In 2014, the Airport Authority began recovering condensate – liquid created by condensation – from air conditioning units installed in passenger boarding bridges. The Airport Authority works with Flagship to use AC condensation water for the pressure washing operation. The AC condensation water is collected into 55 gallon drums, and once full the water is picked up by Ocean Blue and is transferred to the Flagship washing stations (3). In 2014, more than 5,225 gallons of AC condensate was recovered and reused for a variety of purposes in airport maintenance, including pressure washing. in 2018, more than 100,000 gallons of condensate were collected from 16 jet bridges a year. The wash stations used by Flagship are equipped with a water recollection and filtration system. They are designed to collect all residual water, filter, recycle and re-use the water throughout the operation of the equipment. An estimated 80–100 gallons of recovered AC condensate water is used per day washing occurs. Once the job is complete, the wash water is vacuumed up, hoses are drained into the sanitary sewage system and equipment is cleaned.

24. Boneyard: Materials were observed with cover or properly stored with the exception of metal bins with large bulky items. FMD has installed a lockable gate to prohibit abandoning items. Rules were determined for owner identification, expected storage time and to meet environmental open air storage compliance. Tenants have been notified that all outdoor materials require proper cover and containment. The yard is also shared with local law enforcement for a small training site. Since August 2018 the boneyard has been temporarily closed off to store EMAS material. Paint tests are conducted next to the Boneyard to test striping procedures and glassbead laydown.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Acetone
Building & Ground maintenance	Adhesives
Cargo handling	Asphalt Debris
Drainage system maintenance	Battery Acid
Equipment storage	Caulking
Fluid leaks	Cement
Fuel spills,Fuel transfer	Cleaning Solutions
Fuel storage	Coolant
Herbicide usage	Degreasers (Citrus based)
Material loading/unloading	Food Waste
Outdoor waste storage	Fuel
Pesticide usage	Hydraulic Fluids
Ramp/Taxiway scrubbing	Landscape Wastes
Runway rubber removal	Lavatory Chemicals
Tank fuel transfer	Lavatory Wastes
Trash collection	Lubricants
Vehicle parking	Metals
Water/Fuel mixture within berm	Oil & Grease
	Paints
	Pesticides/Herbicides
	Purple K
	Recyclables
	Rubber Particulates
	Rust Preventer
	Sealants
	Solvents
	Transmission Fluid
	Trash
	Turpentine

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5, 6, 8
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Building & Ground Maintenance	SC09 - 1, 2, 3, 5, 6, 8, 9
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 1, 2, 3, 4, 7, 12, 13
Outdoor Wash down/Sweeping	SC12 - 1, 2, 3, 4, 5, 7, 8, 9, 11, 12
Runway Rubber Removal	SC15 - 1, 2, 3, 4
Parking Lots	SC16 - 1, 2, 3, 4, 5, 6, 12
Drainage System Maintenance	SC17 - 1, 2, 3, 4, 5, 6, 7
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Erodible Areas	SC20 - 1, 2, 3, 4, 5, 6
Building Repair & Construction	SC21 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

SDCRAA

SDIA Boundary

N

0 1,000 2,000

Feet

Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

wood.

SAN DIEGO INTERNATIONAL AIRPORT

SDCRAA
Operating Areas

FIGURE

E-26

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Siemens

SIC Codes	4581
Primary Activity	Facility Maintenance
Drainage Areas	08, 12, 15
Nearest MS4 Inlet	< 200 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

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Facility Description and Activities

*Siemens contract expanded in August 2015 to include operation and maintenance of all baggage conveyor belts and jet bridges.

1. Siemens operates and maintains all baggage claim and conveyor belt areas.

2. Siemens maintains all jet bridges. Flagship is contracted to wash the jet bridges two times annually

3. Siemens maintains ticket counter and bag room belt systems. 5. Training is carried out by the corporate office, based out of Dallas, TX. 6. SANCO manages the contract and compliance for Siemens and Flagship. They do not directly oversee ground activities. 7. All materials are stored indoors in locked cabinets under T2 West. 8. Some equipment and golf carts are battery operated. Batteries are charged with a portable external battery that shuts off automatically when fully charged. 9. All vehicles and equipment are maintained and washed offsite. 10. Baggage conveyor belts run through underground tunnels in T1 and T2. There is a sump pump in each tunnel that collects water that accumulates in the tunnels during rain events. 11. All airside baggage claim areas are swept once a week.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Equipment storage	Battery Acid
Fluid leaks	Cleaning Solutions
Trash collection	Fire Fighting Foam
	Fuel
	Lubricants
	Oil & Grease
	Paints
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 10, 11, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 8, 9, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8

* Appendix B provides descriptions for each BMP category.

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PROJECT NO.:	5025-18-2002
DATE:	JANUARY 2019
DRAWN BY:	CAB
CHECKED BY:	AA/NP

wood.

SAN DIEGO INTERNATIONAL AIRPORT

Siemens
Operating Areas

FIGURE
E-27

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Signature Flight Support

SIC Codes	4512, 4522
Primary Activity	Corporate General Aviation
Drainage Areas	01, 03
Nearest MS4 Inlet	200 - 1000 ft.
Address	3300 Admiral Boland Way San Diego, CA 92101

Contact Information

Reginald Bridges Assistant Manager

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Manny Fernandez Supervisor - Maintenance

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Manny.Fernandez@signatureflight.com

Facility Description and Activities

**** Signature previously know as Landmark Aviation. Name change as of April 2016 1) New building on 3300 Admiral Boland Way has 2 office buildings and 5 hangars 2) Building 1 – FBO Lobby and customer offices 3) Hangars 1 – 5 are used for AC parking 4) No longer has an UST 5) Signature has reduced the number of AC Fuel truck to 3 JetA and 1 Avgas truck. 15K gallons of JetA and 750 Gallons of AVGAS 6) One duel product truck for Diesel and Auto gas a total of 825 gallons 7) Secured covered cabinets located near fuel trucks for hazardous waste 3 cabinets total 8) Asbury Environmental collects waste oil. Allied Aviation collect unused unleaded gasoline, jet fuel and diesel for recycling. Oil Recycling collects absorbent with oil. (Company may change to Safety Kleen after the move). 9) Eye wash stations and showers located in all 5 hangars 10) Jet Wash no longer does business here and CBF continues to do mostly dry wash 11) GSE equipment is fueled with Diesel or unleaded 3 to 4 times weekly. Fuel is now purchased from Allied at the rack as needed. Most equipment is now electric. 12) Aircraft lavatories are serviced by Signature. Signature disposes of lavatory waste at the triturator. 13) Tenant has a Spill Prevention, Control, and Countermeasure Plan 14) CAS is a subtenant to Signature.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Building & Ground maintenance	Battery Acid
Cargo handling	Cleaning Solutions
Drainage system maintenance	Fertilizers
Equipment storage	Floatables
Fluid leaks	Food Waste
Fuel spills,Fuel transfer	Fuel
Fuel storage	Fuel (Diesel)
Herbicide usage	Fuel (Gas)
Material loading/unloading	Fuel (Jet)
Outdoor waste storage	Hydraulic Fluids
Pesticide usage	Lavatory Chemical Wastes
Tank fuel transfer	Lavatory Chemicals
Trash collection	Lavatory Wastes
Vehicle parking	Lubricants
Water/Fuel mixture within berm	Oil & Grease
	Pesticides/Herbicides
	Recyclables
	Sediment
	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 5, 6, 7, 9, 10
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 8
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 1, 2, 3, 5
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10
Parking Lots	SC16 - 1, 2, 6, 11, 12
Drainage System Maintenance	SC17 - 1, 2, 3, 4, 5, 6, 7
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Structural Treatment Control BMPs	TC01 - 1, 2, 3, 4

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		Signature Operating Areas	E-28
CHECKED BY: AA/NP			

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Southwest Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	07, 08, 09
Nearest MS4 Inlet	< 200 ft.
Address	3665 North Harbor Dr. T1 San Diego, CA 92101

Contact Information

George Parker — Supervisor - Maintenance

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Edward Martin — Manager - Maintenance

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Facility Description and Activities

1. Most ground support equipment and vehicle maintenance (including painting) is conducted inside the Maintenance Shop. Some minor vehicle and ground support equipment maintenance is performed on ramp by Executive Air, a subtenant to Southwest.
2. Menzies fuels aircraft, vehicles, and ground support equipment.
3. There is a hose at the hose bib near Gate 9. It is used only to fill up containers for watering plants in the office.
4. Potable water is allowed to run for 1 minute then turned off and linked to aircraft. This is performed as far away from the storm drains as possible, and the water evaporates before reaching storm drain.
5. Southwest has spill bins at Gates 1 and 10. These bins contain absorbents, brooms, shovels, and disposal drums.
6. Aircraft cleaning is performed offsite (Phoenix, Oakland, and Dallas).
7. Significant materials are stored in flammable materials storage lockers.
8. Wastes are stored in Hazardous Waste Accumulation Areas in the gate area and inside the Maintenance Shop.
9. Hazardous wastes are picked up every 3 months. Safety Kleen recycles oil, Toxguard recycles antifreeze, and Nexeo Solutions collects all other hazardous wastes.
10. ABM Services, a subtenant to Southwest, performs cabin services for Southwest and other airlines.
11. Executive Air (now called PAM/Flightline), a subtenant to Southwest, performs aircraft maintenance for various airlines at the gate areas.
12. Southwest is at Gates 1A through 11 at T1.
13. Southwest performs deicing at the gates. At gates 4, 5, 9, and 10 they push back from the gate to get past the storm drains. Air Operations is notified every time deicing is performed. Monthly usage is sent to EAD. A zamboni is used to vacuum up the excess liquid that falls onto the ramp and is disposed of. Deicing is not performed in the rain. All deicing mixing is conducted at the triturator.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft deicing	Anti Freeze
Aircraft sanitary services	Battery Acid
Cargo handling	Carburetor Cleaner
Equipment storage	Cleaning Solutions
Fluid leaks	Deicing/Anti-Icing Fluids
Fuel spills,Fuel transfer	Food Waste
Material loading/unloading	Fuel
Outdoor waste storage	Hydraulic Fluids
Potable water flushing	Lavatory Chemicals
Tank fuel transfer	Lavatory Wastes
Trash collection	Lubricants
Vehicle parking	Metals

Oil & Grease
Paints
Recyclables
Solvents
Transmission Fluid
Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 3, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Aircraft Deicing/Anti-Icing	SC05 - 1, 2, 3, 4
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 4, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 9
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Outdoor Wash down/Sweeping	SC12 - 2, 12
Potable Water System Flushing	SC14 - 1, 2, 3
Parking Lots	SC16 - 1, 2, 6, 11
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Southwest Operating Areas	E-29
DRAWN BY: CAB			
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SP Plus Corporation

SIC Codes	4173
Primary Activity	Parking Lot Management
Drainage Areas	05, 08
Nearest MS4 Inlet	< 200 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

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Facility Description and Activities

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1. Spill kit (kitty Litter) is available and stored in the Supervisor vehicle & Office Storage on site.

2. Maintenance is performed off-site at 4902 Market St. San Diego CA. 92102, PO Box 742077, San Diego CA. 92174. Maintenance facility has 250 Gallon drums for waste oil, 50 gallon drums for hazmat materials, and two 55 gallon drums for the used oil filters. Roughly, every 3 weeks Mammoth Environmental comes to pick up the used oil/coolant/haz mat materials.

3. SP+ currently has 1 Full Time Utility worker that inspects and cleans the yard. Landscaping/Janitorial services will be performed daily/monthly by Aztec Landscaping Inc starting August 1, 2018.

4. SP+ Fleet consists of 30 CNG 40" Transit Buses. Since September 7, 2018, the fleet was updated to 16 CNG El Dorado 40" Transit Buses & 14 CNG Gillig 40" Transit Buses.

5. CNG Fueling is performed at Shell Station on India Street. Diesel was fueled onsite to the North West fence line in bus yard by Menzies (formerly ASIG) prior to September 7, 2018. Since September 7, 2018, diesel fueling stopped to 8 Diesel Gillig 40" Buses.

6. Oil/Coolant is stored in SP+ Pod Container. All used Oil/Anti Freeze is performed at Maintenance Facility and is disposed of by Federal/State Law. Mops, Brooms, etc are stored in office storage on-site.

7. Hazardous Materials are not stored/performed on-site. BMP document was provided: "Leading the Way: Environmental Protection and Compliance".

8. Training is performed through SP+ company program "Standard University".

9. Trash is disposed of in the covered dumpsters located East of SP+ Building in enclosed doors. Trash is picked up daily by Republic Services.

10. A Wash Water Management Plan was submitted to the Authority and approved on July 30, 2018. Fleet washing is conducted by Precision Fleet Washing. Their headquarters is 5175 Riverview Ct. Fallbrook, CA 92028. 24 buses are washed on Wednesdays at 1900 hours. Truck based pressure washers and water recovery equipment is located at Precision Fleet Wash Facility. Wash water is collected using vacuum equipment that is pumped into facility trucks holding tanks. The water is taken to Precision Fleet Washing facility where it is filtered and disposed of in accordance to all Local, State, and Federal Regulations. Storm drains are covered during washing activities and is diverted and recovered by the vacuum system.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Drainage system maintenance	Coolant
Fluid leaks	Fuel
Outdoor apron washdown	Fuel (Diesel)
Outdoor waste storage	Hydraulic Fluids
Ramp/Taxiway scrubbing	Oil & Grease
Trash collection	Rubber Particulates
Vehicle parking	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2

Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 4, 5, 6, 7, 8, 11, 12, 13
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Outdoor Material Storage	SC07 - 1, 2
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Outdoor Wash down/Sweeping	SC12 - 1, 2, 3, 5, 6, 7, 8, 9, 12
Parking Lots	SC16 - 1, 2, 4, 6, 11, 12
Drainage System Maintenance	SC17 - 1, 2, 5, 6, 7
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

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Aerial Image Source:
Aerotech Mapping Inc.
ATM # C0116-008
Aerial Flight Date: 8/22/2016

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		SP Plus Operating Areas	E-30
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Spirit Airlines

SIC Codes	4512, 4581
Primary Activity	Passenger Carrier
Drainage Areas	08, 12
Nearest MS4 Inlet	< 200 ft.
Address	3707 North Harbor Dr. #227 San Diego, CA 92101

Contact Information

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Joseph Hearn — Manager
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Facility Description and Activities

1. FOD walks are performed before and after each flight and a FOD bucket is kept on the stairs. FOD walks are performed before, during, and after each flight.
2. Operate primarily out of Gate 33 for domestic flights and Gate 20 and 22 for international flights.
3. GAT is the ground handler who handles above and below wing, as well as storing all significant materials. GAT also provides all equipment (loaders and tugs). GAT has a spill kit.
4. Pacific Aircraft Maintenance is contracted for maintenance on aircraft which is sometime performed at the gate.
5. Spirit has 6 daily flights 3 days of the week, and 7 daily flights 4 days a week. International flights run 3 days/week.
6. Menzies conducts fueling and handles any spills.
7. No washing, deicing, hazmat, or cargo.
8. Spirit has required training (which is done at headquarters or online) that covers spill prevention. GAT receives storm water training through JetBlue.
9. One GAT cart is stored at Gate 33 with supplies for on the plane (tp, paper towels, cleaning supplies) and one tow bar is also stored at Gate 33.
10. Only one Spirit employee at San Diego location. Employees at the front ticket counter are working through GAT.
11. LSG collects trash from GAT's collection for international flights, and disposes via incineration. This occurs on a daily frequency.
12. All equipment and vehicles are owned by GAT. GAT previously conducted the maintenance for the ground service equipment. The mechanic left during 2016, and now all maintenance is being conducted by GES.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Adhesives
Cargo handling	Anti Freeze
Equipment storage	Battery Acid
Fluid leaks	Brake Fluid
Fuel spills,Fuel transfer	Cleaning Solutions
Material loading/unloading	Coolant
Outdoor waste storage	Fire Fighting Foam
Potable water flushing	Food Waste
Tank fuel transfer	Fuel
Trash collection	Fuel (Gas)
	Fuel (Jet)
	Hydraulic Fluids
	Lavatory Chemicals
	Lavatory Truck Wash Water
	Lavatory Wastes
	Lubricants

Metals
Oil & Grease
Recyclables
Solvents
Transmission Fluid
Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 12
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

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PROJECT NO.: 5025-18-2002	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019	Spirit Operating Areas	E-31
DRAWN BY: CAB		
CHECKED BY: AA/NP		

wood.

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SSP

SIC Codes	5812
Primary Activity	Food & Beverage
Drainage Areas	08, 12
Nearest MS4 Inlet	200 - 1000 ft.
Address	3225 North Harbor Dr. San Diego, CA 92101

Contact Information

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Mario Donato — Manager - Ops
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Facility Description and Activities

1. Currently operates out of T1 West and T2 East and West.
2. Operates two battery operated golf carts which are dry washed as needed.
3. Flagship picks up waste, recycling, and compost directly from stores. SSP uses 2 dumpsters for trash and cardboard at T2 East and T1 West.
4. Bradford picks up grease directly from the stores 3 times per week and delivers back to CRDC.
5. Participates in airport's composting program. The first three compost loads (monitored under an initial probationary period) taken to the dump were free of contamination. Green waste is checked quality control.
6. Outdoor loading area is located next to Gate 10 and at Gate 11.
7. Dry good storage is located in the storage room within the breezeway at Gate 25.
8. Perishable items are received within ten (10) minutes. Dry goods are received within forty-five (45) minutes. Bradford drops off materials at Gate 25.
9. Bradford picks up the wash rags and brings back to CRDC. Aramark is a vendor that collects the wash rags at CRDC and provides the cleaning services of the wash rags that are used in the restaurants.

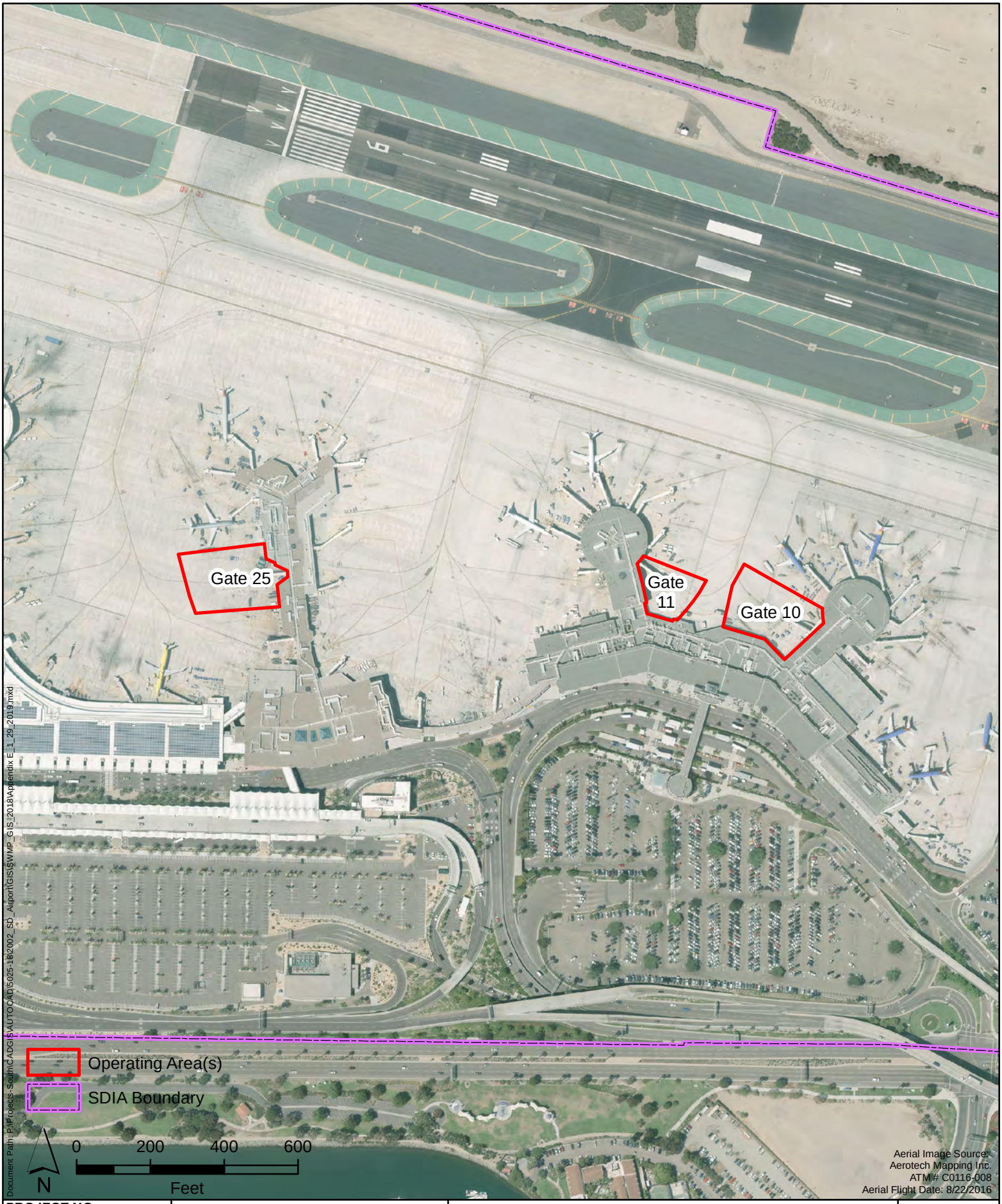
Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Fluid leaks	Battery Acid
Material loading/unloading	Cleaning Solutions
Outdoor waste storage	Food Waste
Trash collection	Oil & Grease
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 4, 5, 6
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



PROJECT NO.: 5025-18-2002	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019	SSP Operating Areas	E-32
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CHECKED BY: AA/NP		

wood.

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Sun Country Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	08, 09 , 12
Nearest MS4 Inlet	< 200 ft.
Address	3835 North Harbor Dr. #107 San Diego, CA 92101

Contact Information

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Philip Wasson — Manager - Station
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Facility Description and Activities

1. Operate out of Gates 21.
2. Separate from Delta as of May 1, 2015.
3. Fueling performed by Menzies.
4. APS performs equipment maintenance.
5. Trash and recycling is collected by Flagship.
6. Executive Air/Pacific Aircraft Maintenance performs aircraft maintenance.
7. GES performs ground equipment services and maintenance.
8. Luggage handling is performed by Siemens.
9. January-March 2017, Sun Country will conduct flights four days per week (Thursday, Friday, Sunday, Monday). There will be one flight per day.
10. Starting September 2016, Sun Country will return to conducting flights 6 days per week.

Significant Materials/Activities Potentially Exposed to Storm Water

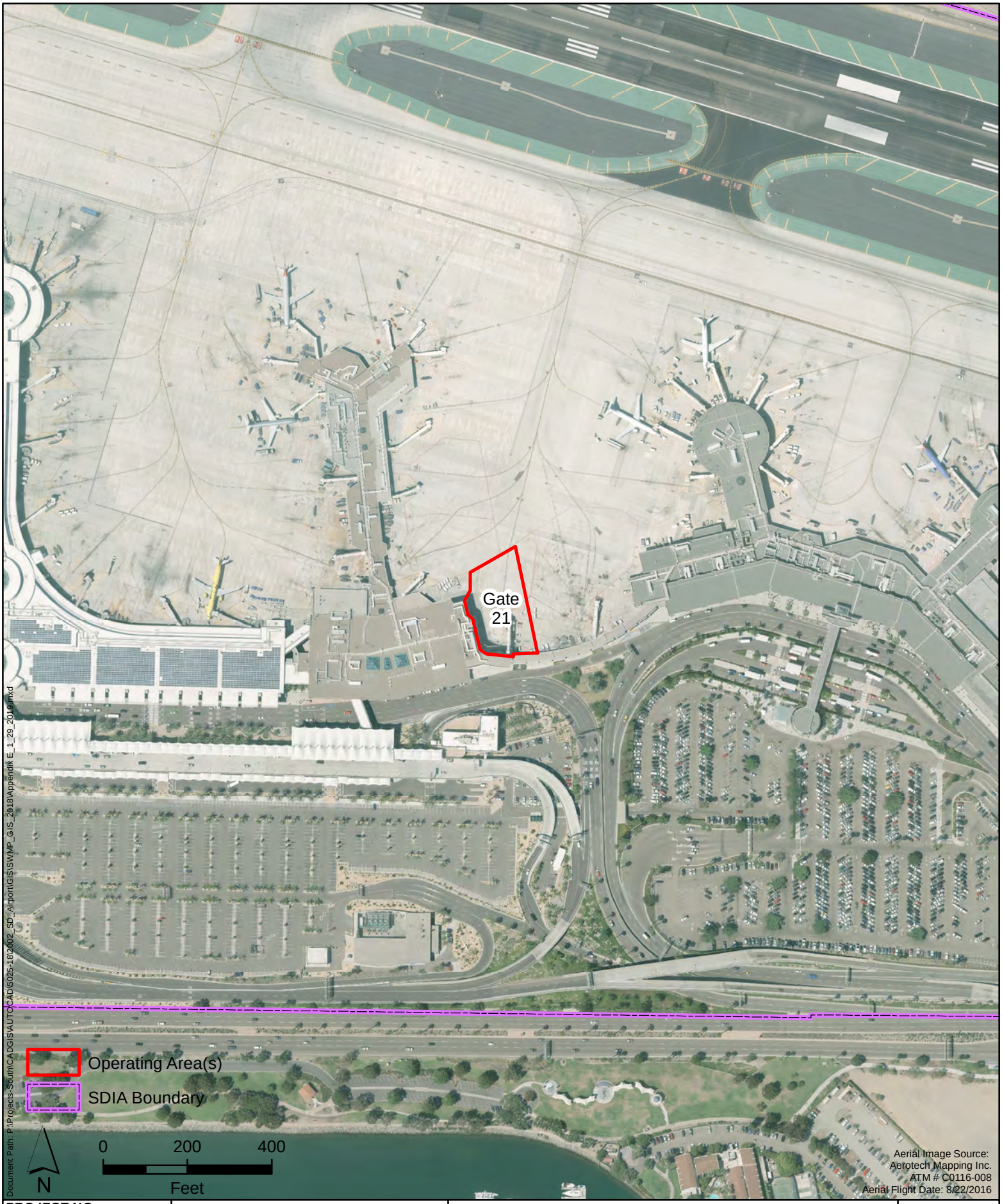
Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Fluid leaks	Cleaning Solutions
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Diesel)
Outdoor waste storage	Lavatory Chemical Wastes
Trash collection	Lavatory Chemicals
	Lavatory Wastes
	Lubricants
	Oil & Grease
	Paints
	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 11, 13
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7

Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.



PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		Sun Country Operating Areas	E-33
DRAWN BY: CAB			
CHECKED BY: AA/NP			

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United Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	07, 12, 15
Nearest MS4 Inlet	< 200 ft.
Address	3855 N. Harbor Suite #115 San Diego, CA 92101

Contact Information

John Woodard	Supervisor - Air Ops
P 6197855523	**C** 2026692757
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Dan Young	Supervisor - Ops
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dan.young@united.com	

Facility Description and Activities

*Effective July, 2015, United Express (formerly operated out of commuter terminal) will be relocated to United gates and ticket counters in Terminal 2.

1. United performs maintenance of its own GSE equipment at their maintenance shop located next to the cargo loading/unloading building. Aircraft maintenance is performed by United.

2. Jetstream conducts air freight processing. Loading and unloading is done by United.

3. U.S. Aviation is responsible for cleaning of aircraft interior and dumping lavatory waste.

4. AccuFleet, a subtenant to United, performs aircraft washing at the gates or remote parking at night. All wash water is vacuumed up and disposed of at the Triturator. AccuFleet equipment is parked by United GSE maintenance shop.

5. Waste is stored in a Hazardous Waste Accumulation Area outside United's maintenance shop.

6. Lavatory deodorant is stored outdoors, at GSE shop with secondary containment.

7. Lavatory deodorant is added to the lavatory truck at the GSE shop and water within the Triturator Area.

8. Safety Kleen collects and disposes of hazardous waste and waste oil.

9. Gate Gourmet provides food service for United.

10. Menzies provides aircraft and equipment fueling at the gates or remote parking areas where the vehicles are parked.

11. As of August 2013 United and Continental operate under one operational plan.

12. As of Summer 2018, Gates 41 and 42 are 100% United operations.

13. GSE is cleaned by UPS employees at the wash rack.

14. United operates Gate 45 during the night from 9pm-9am only while Delta operates out of Gate 45 during the day.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Adhesives
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Coolant
Fuel spills,Fuel transfer	Degreasers
Material loading/unloading	Degreasers (Citrus based)
Outdoor waste storage	Food Waste
Tank fuel transfer	Fuel
Trash collection	Fuel (Diesel)
	Fuel (Gas)
	Fuel (Jet)
	Lavatory Chemical Wastes
	Lavatory Chemicals
	Lavatory Truck Wash Water

Lavatory Wastes
Lubricants
Oil & Grease
Paints
Purple K
Rubber Particulates
Solvents
Transmission Fluid
Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 7, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019			
DRAWN BY: CAB		United Operating Areas	E-34
CHECKED BY: AA/NP			

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UPS

SIC Codes	4513
Primary Activity	Cargo Handling
Drainage Areas	05, 06
Nearest MS4 Inlet	< 200 ft.
Address	3140 E Jurupa St. #G105 Ontario, CA 91761

Contact Information

Kim Rafail Supervisor
P 6192937512
krafail@ups.com

Matthew Ballard Environmental Coordinator
P 9099747653 **C** 9092144919
matthewballard@ups.com

Facility Description and Activities

1. UPS loads and unloads its aircraft at the north ramp next to IAS.
2. A spill kit, located next to the loading/unloading area, contains absorbent pads, booms, and a spill response manual.
3. UPS's own technicians perform maintenance of aircraft and equipment.
4. Most maintenance of tugs and loading equipment occurs outside, including oil changes for tugs. Aircraft maintenance is performed outside.
5. Menzies fuel UPS aircraft, vehicles, and ground support equipment.
6. Worldwide Flight Services, Inc. (WFS Inc.) is a vendor that provides man power for loading/unloading services.
7. Asbury picks up used hazardous wastes, waste oil and antifreeze and transports them off site.
8. NRC Environmental is contracted to clean up hazardous materials waste following spills. GAT performs lavatory services on the UPS aircraft once a week.
9. Diamond Environmental pumps out lavatory waste from the two trailer buildings.
10. UPS stores all of their equipment including tires, oil, waste oil, lubricants, hazardous waste, etc. in mobile minis that are covered, closed, locked. Materials within are on spill pallets and are well organized.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Degreasers (Citrus based)
Fuel spills,Fuel transfer	Fuel
Material loading/unloading	Fuel (Gas)
Outdoor apron washdown	Hydraulic Fluids
Outdoor waste storage	Lubricants
Ramp/Taxiway scrubbing	Metals
Tank fuel transfer	Oil & Grease
Trash collection	Rubber Particulates
Vehicle parking	Solvents
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2

Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 7, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14
Building & Ground Maintenance	SC09 - 8
Employee Training	SC10 - 1, 2, 3, 4
Lavatory Service Operation	SC11 - 3, 4, 8, 11
Outdoor Wash down/Sweeping	SC12 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 12
Parking Lots	SC16 - 1, 2, 4, 6
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		UPS Operating Areas	E-35
DRAWN BY: CAB			
CHECKED BY: AA/NP			

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West Jet Airlines

SIC Codes	4512, 4522
Primary Activity	Passenger Carrier
Drainage Areas	15
Nearest MS4 Inlet	200 - 1000 ft.
Address	3707 North Harbor Dr. T2E San Diego, CA 92101

Contact Information

Ken Sturgill — General Manager
P 6192200164 **C** 7757710699
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Dan Mesaros — Manager - Regional
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dmesaros@westjet.com

Facility Description and Activities

1. All equipment maintenance is done in the GES maintenance shop area by GES. Daily vital fluid checks are performed by ATS staff and monthly Preventive Maintenance Inspections are conducted by Tom Masarenas of GES.
2. Fueling is conducted by Menzies at the Gate. ATS conducts monthly station safety audits which include observing fueling. ATS requests a poundage of fuel to be put into the aircraft prior to each fueling.
3. Cleaning of vehicles is done at the washrack facility. No aircraft cleaning is performed at SIDA.
4. All ground handling activities are performed by ATS.
5. All aircraft maintenance is performed by Executive Air.
6. West Jet operates out of Gate 49.
7. Potable water is flushed for 30 seconds on the ramp and allowed to evaporate.
8. ATS is a subtenant and performs services below the wing for West Jet.

Significant Materials/Activities Potentially Exposed to Storm Water

Potential Pollutant Sources	Potential Pollutants
Aircraft sanitary services	Anti Freeze
Cargo handling	Battery Acid
Equipment storage	Cleaning Solutions
Fluid leaks	Fuel
Fuel spills,Fuel transfer	Lavatory Chemicals
Material loading/unloading	Lavatory Wastes
Outdoor waste storage	Lubricants
Potable water flushing	Metals
Trash collection	Oil & Grease
	Sediment
	Trash

Best Management Practices Applicable to Facility

Activities	BMPs
Non-Storm Water Management	SC01 - 1, 2, 4, 7
Outdoor Equipment Ops Maintenance Areas	SC02A - 1, 2
Aircraft, Ground Vehicle & Equipment Maintenance	SC02B - 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Electric Vehicle Maintenance	SC02C - 1, 2, 3, 4, 5, 6, 8, 9
Aircraft, Ground Vehicle & Equipment Fueling	SC03 - 1, 2, 4, 5, 6, 8
Aircraft, Ground Vehicle & Equipment Cleaning	SC04 - 1, 2, 3, 5
Outdoor Loading/Unloading of Materials	SC06 - 1, 2, 3, 4, 6, 7
Outdoor Material Storage	SC07 - 1, 2, 3, 11, 12
Waste Handling & Disposal	SC08 - 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14
Employee Training	SC10 - 1, 2, 3, 4

Lavatory Service Operation	SC11 - 3, 4, 5, 6, 7, 8, 9, 10, 11
Potable Water System Flushing	SC14 - 1, 2
Housekeeping	SC18 - 1, 2, 3, 4, 5, 6, 7, 8, 9
Safer/Alternative Products	SC19 - 1, 2
Spill Prevention, Control & Clean Up	SR01 - 1, 2, 3, 4, 5, 6, 7, 8, 9

* Appendix B provides descriptions for each BMP category.

PROJECT NO.: 5025-18-2002	wood.	SAN DIEGO INTERNATIONAL AIRPORT	FIGURE
DATE: JANUARY 2019		West Jet Operating Areas	E-36
DRAWN BY: CAB			
CHECKED BY: AA/NP			

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APPENDIX F
AUTHORITY RULES & REGULATIONS


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

RULES & REGULATIONS

at San Diego International Airport

MASTERING THE ART OF AIRPORTS

SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY
3225 NORTH HARBOR DR., SAN DIEGO, CA 92101
619.400.2404 | SAN.ORG

San Diego International Airport
Rules and Regulations

The statements contained herein express the policy of the San Diego County Regional Airport Authority, duly adopted as the Rules and Regulations, and are intended to ensure the safe and efficient operations of the San Diego International Airport.

These Rules and Regulations govern the general conduct of the public, tenants, employees and commercial users of the San Diego International Airport as their activities relate to the possession, management, supervision, operation and control of the airport by the San Diego County Regional Airport Authority.

Issued and Approved by:

San Diego County Regional Airport Authority

3225 North Harbor Drive, San Diego, CA 92101 (619) 400-2400 I www.san.org

v6.0 – February 2017

All amendments to this document require document owner review and approval. Other approvals may be required.		
REVISION NUMBER	**EFFECTIVE DATE**	**SUMMARY OF AMENDMENTS:**
Original	January 2003	Original Document
v1.0	March 2003	Revised
v2.0	October 2010	Complete Revision
v2.1	April 2011	1) 2.21 Solicitation and Expressive Activities. 2) 2.22 Commercial, Filming and Recording. 3) 5.3 Parking Areas. 4) 7.3 Enforcement.
v2.2	July 2011	1) 3.2.5.C.1.e (3) Ground Operations, Starting and Running Engines, Starting Engines. 2) 5.4.B.1 Commercial Transportation Vehicles, Ground Transportation Permits, Vehicle Restrictions. 3) 5.4.D Commercial Transportation Vehicles, Transferability of Permits. 4) 5.4.X Commercial Transportation Vehicles, Lost Property and Luggage.
v3.0	October 2011	1) 3.2.5.F.5.b & c (2.) Ground Operations, Aircraft Parking. 2) 5.4.B.1 (5) Commercial Transportation Vehicles, Ground Transportation Permits, Vehicle Restrictions. 3) 5.4.N Commercial Transportation Vehicles, Driver Appearance.
v3.1	January 2012	1) 3.4.5 Fueling Operations. 2) 3.2.5.A Ground Operations, Ramp Operations. 3) 3.2.10.A Aircraft Washing. 4) 3.2.10.B Aircraft De-icing. 5) 3.3.4.A Vehicle Operations, Motor Vehicle and Equipment Operation around Aircraft. 6) 3.3.4.B Parking. 7) 3.3.4.C Speed Limits and Operations on the Air Operations Area (AOA). 8) 3.3.4.D Cleaning, and Maintenance of Vehicles.
v3.1	April 2012	No amendments for Quarter Ending March 31, 2012

All amendments to this document require document owner review and approval. Other approvals may be required.		
REVISION NUMBER	**EFFECTIVE DATE**	**SUMMARY OF AMENDMENTS**
v3.2	July 2012	1) 2.9 Obstructions and Roadway Use 2) 7.7 Schedule of Administrative Penalties 3) 3.3.4.C.2.a Vehicle Operations, Speed Limits and Operations on Air Operations Area (AOA). 4) 5.4.Z.3 & 5.4.Z.4 Commercial Transportation Vehicles, Conversion Incentives and Non-Conversion Fees.
v3.3	Oct 2012	1) Definitions and Acronyms. 2) 5.4.B.1.4 Commercial Transportation Vehicle, Ground Transportation Permits, Vehicle Restrictions. 3) 5.4.Z.1.a Commercial Transportation Vehicles, Ground Transportation Vehicle Conversion Incentive-based Program, Standard Age Replacement Policy.
v4.0	January 2013	1) 5.4.S. (4.) Commercial Transportation Vehicles, Taxicabs and Vehicles for Hire, Background Check Procedures for Vehicle for Hire Drivers, Acceptable Identification Documents. 2) 5.4.Z. (3.) Commercial Transportation Vehicles, Ground Transportation Vehicle Conversion Incentive-Based Program, Conversion Incentives. 3) 5.4.Z. (4.) Commercial Transportation Vehicles, Ground Transportation Vehicle Conversion Incentive-Based Program, Non-Conversion Incentives. 4) 6.2.B., Added New Regulation 6.2.B. (2.) General Safety Duties, Fire Extinguishers; includes applicable cross references to 3.2.5.A. (1.) Ground Operations, Ramp Operations, Section 3.2.5.C.1.d Ground Operations, Starting and Running Engines, Section 3.4.5 (A.) Fueling Operations. 5) 7.7 Schedule of Administrative Penalties – added violation for 6.2.B.(2.) Ramp Fire Extinguishers.
v4.1	July 2013	1) 7.3 (d) Enforcement

All amendments to this document require document owner review and approval. Other approvals may be required.		
REVISION NUMBER	**EFFECTIVE DATE**	**SUMMARY OF AMENDMENTS**
v5.0	January 2014	1) 2.8 Signage 2) 5.4 (M) Driver's Examination 3) 1.3 Enforcement 4) 2.16 Restricted Areas 5) 2.17.D.3 Badges, Unauthorized Uses of Badges 6) 5.4.S.3.a.1, Commercial Transportation Vehicles, Taxicabs and Vehicles for Hire, Spare Taxicab Use Policy. 7) 7.6.A.1 Appeals, Administrative Penalties and Suspension or Revocation of SAN ID Badges and Privileges.
v5.1	April 2014	1) Reviewer's and Approver's – Historical Document 2) 1.6 Technical Content, Revisions and Access to Airport Rules and Regulations 3) 1.7 Department Contact Information by Section 4) 2.21 Solicitation and Expressive Activities 5) 2.22 Commercial Photography, Filming and Recording 6) 4.2.E Business Conduct, Occupancy, Lock and Keys 7) 4.4.A Improvements, Approval Required 8) 4.4.B Improvements, Approval Process 9) 4.5.B.1 Security, Construction, Ensuring Compliance 10) 4.9.C Signage and Tenant Advertising, Banners 11) 4.9.D Signage and Tenant Advertising, Digital Corporate Welcome Signs 12) 4.9.E Signage and Tenant Advertising, Community Outreach Program, Regional Non-Profit Organizations 13) 4.9.F Signage and Tenant Advertising, Holiday Decorations 14) 5.2.I Regulations Applicable to All Motor Vehicles, Accidents 15) 5.2.J Regulations Applicable to All Motor Vehicles, Towed Vehicles 16) 5.4.S.3 Commercial Transportation Vehicles, Taxicabs and Vehicles for Hire, Spare Taxicab Use Policy 17) 6.2.D General Safety Duties, Safety Inspections 18) 7.3 (d) Enforcement 19) 7.7 Schedule of Administrative Penalties

All amendments to this document require document owner review and approval. Other approvals may be required.		
REVISION NUMBER	**EFFECTIVE DATE**	**SUMMARY OF AMENDMENTS**
v5.2	July 2014	1) 1.7 Department Contact Information 2) 2.21 Solicitation and Expressive Activities 3) 2.22 Commercial Photography, Filming and Recording 4) 3.3.4.A.7 Vehicle Operations, Motor Vehicle and Equipment Operation around Aircraft 5) 3.4.9.A, Foreign Object Debris (FOD), General 6) 4.2.E Business Conduct, Occupancy, Lock and Keys 7) 4.4.A Improvements, Approval Required 8) 4.4.B Improvements, Approval Process 9) 4.5.B.1 Security, Construction, Ensuring Compliance 10) 4.9.C Signage and Tenant Advertising, Banners 11) 4.9.E Signage and Tenant Advertising, Community Outreach Program, Regional Non-Profit Organizations 12) 4.9.F Signage and Tenant Advertising, Holiday Decorations
v5.3	October 2014	1) Definitions and Acronyms 2) 5.4 Commercial Transportation Vehicles 3) 5.4 Commercial Transportation Vehicles, B. Ground Transportation Permits, 1. Vehicle Restrictions, 2. Permit Terms and Fees, 3. Automated Vehicle Identification (AVI) Program, 4. Vehicle Inspections 4) 5.4 Commercial Transportation Vehicles, C. Driver's Permits, 1. Restrictions on Issuance and Exceptions, 3. Term and Fees 5) 5.4 Commercial Transportation Vehicles, F. Insurance 6) 5.4 Commercial Transportation Vehicles, D. Issuance and Transfer of Permits 7) 5.4 Commercial Transportation Vehicles, A. Conformance with Laws, I. Vehicle Condition, J. Identification, K. Pickup Areas, M. Driver's Examination, N. Driver's Appearance, O. Duty to Transportation, P. Non-Discrimination, Q. Fares and Receipts. 8) 5.3 Parking Areas 9) 5.2 Regulations Applicable to all Motor Vehicles, B. Traffic Signs, Markers and Devices
v5.4	January 2015	1) Section Definitions and Acronyms 2) Section 3.2.5.F Ground Operations, Aircraft Parking 3) Section 3.3.1.D Air Operations Area (AOA) Driver's Permits (Informational Section)

		4) Section 5.3 Parking Areas 5) Section 5.4 Commercial Transportation Vehicles, U. Courtesy Vehicles (Hotel, Off-Airport Parking, Rental Car and others), 1. Rules of Operation 6) Section 5.4 Commercial Transportation Vehicles, Z. Ground Transportation Vehicle Conversion Incentive-Based Program 7) Section 5.4 Commercial Transportation Vehicles, Z. Ground Transportation Vehicle Conversion Incentive-Based Program, 2. Hotel/Motel Shuttle Consolidation Incentive Program 8) Section 7.6.A. Appeals, Administrative Penalties and Suspension or Revocation of SAN ID Badges and Privileges
v5.5	April 2015	1) Section Definitions and Acronyms 2) Section 3.2.5 Ground Operations, B. Push Back/Tow Out Procedures 3) Section 3.2.5 Ground Operations, D. Aircraft Taxiing 4) Section 3.2.5 Ground Operations, E. Aircraft Towing 5) Section 3.2.5 Ground Operations, F. Aircraft Parking
v5.6	July 2015	1). Section 2 General Conduct, 2.2 Smoking 2). Section 2 General Conduct, 2.18 Security Equipment and Directives 3). Section 2 General Conduct, 2.9 Obstructions and Roadway Use 4). Section 3 Operations 5). Section 6 Fire Safety and Hazardous Materials , 6.2 General Safety Duties, A. Fire Alarms 6). Section 7 Administrative Procedures, 7.7 Schedule of Administrative Penalties
v5.7	October 2015	1). Section 5.4 Commercial Transportation Vehicles, B. Ground Transportation Permits, 1. Vehicle Restrictions, 2. Vehicle Identification, 3. Vehicle Inspections 2). Section 5.4, Commercial Transportation Vehicles, C. Driver's Permits and Requirements; 1. Restrictions on Issuance and Exceptions, 2. Application Procedures 3). Section 5.4 Commercial Transportation Vehicles, F. Insurance 4). Section 5.4 Commercial Transportation Vehicles, G. Vehicle Registration 5). Section 5.4 Commercial Transportation Vehicles, I. Vehicle Condition, J. Identification, K. Pickup Areas, M. Driver's Examination, N. Driver's Attire and Personal Hygiene, O. Duty to Transport Passengers
v5.8	January 2016	1). Section 2 General Conduct, 2.23 Meet and Greet Areas
v5.9	July 2016	1). Section 5 Motor Vehicle and Ground Transportation Operations, 5.2 Regulations applicable to all Motor Vehicles

		2). Section 7 Administrative Procedures and Penalties, 7.6 Appeals
v5.10	October 2016	1). Section 5, 5.4 Commercial Transportation Vehicles, L. Hold Lot and Shuttle Island Procedures
v6.0	February 2017	1). Section 1. 1.6 Technical Content, Revisions and Access to Airport Rules & Regulation 2). Section 3, 3.2.5 Ground Operations, A. Ramp Operations, B. Push Back/Tow Procedures 3). Section 3, 3.2.5 Ground Operations, E. Aircraft Towing 4). Section 3, 3.2.5 Ground Operations, D. Aircraft Taxiing 5). Section 3, 3.2.5 Ground Operations, F. Aircraft Parking 6). Section 3, 3.2.6 Gate Usage and Assignments, D. Remain Overnight Aircraft (RON) 7). Section 3,3.3.3 Authorized Air Operations Area for Motor Vehicles 8). Section 3.3.4 Vehicle Operations, C. Speed Limits and Operations on the Air Operations Area (AOA) 9). Section 3,3.3.5 Vehicles Operating on Movement Areas 10). Section 3, 3.4.3 Fueling Operations 11). Section 3,3.4.7 Fuel Spills, , B. Reporting 12). Section 5, 5.3 Parking Areas 13). Section 5, 5.4 B. Ground Transportation Permits, 1. Vehicle Restriction 14) Section 5, 5.4 Commercial Transportation Vehicle, Q. Fares and Receipts

Contents

DEFINITIONS AND ACRONYMS

Definitions

"Air operations area" (AOA) means the area of the Airport situated within the perimeter fence line which is used primarily for aircraft parking, taxiing, refueling, landing, take off and surface maneuvering; includes the airfield, aprons, ramps, taxiways and aircraft movement areas.

"Air traffic control tower" (ATCT) means the facility operated by the Federal Aviation Administration (FAA) which controls the air and ground movement of aircraft and ground vehicles operating on the movement areas of the Airport.

"Aircraft parking area" means the defined areas of the Airport intended exclusively for parking of aircraft and loading or unloading of passengers and cargo.

"Airport" means the San Diego International Airport, Lindbergh Field (SDIA).

"Airport service equipment" means the vehicles and equipment routinely used for service, maintenance or construction.

"Alternative fuel vehicle" (AFV) means a vehicle that runs on an energy source, fuel or blend of fuels; acceptable fuels and energy sources include, but are not limited to, compressed natural gas, biodiesel from a waste product and electricity that achieves a reduction of at least 10 percent (10%) carbon intensity relative to petroleum fuel, as contained in Governor Schwarzenegger's Executive Order
S-01-07.

"Apron" means the defined area of the Airport intended to accommodate aircraft for the purposes of loading or unloading passengers or cargo, refueling, parking or maintenance. See "Ramp."

"Authority" means the San Diego County Regional Airport Authority (SDCRAA).

"Automatic vehicle identification system" (AVI) means the system for the automatic tracking of vehicle movement on the Airport roadways and parking facilities; includes the placement of a transponder or other device upon a vehicle.

"Best management practices" (BMPs) means storm water management practices employed to prevent or reduce storm water and surface water pollution; includes, without limitation, the use of tarps or covers for the outdoor storage of materials, the use of spill-containment pallets for the storage of liquids, and the prompt cleanup of spills.

"Charter vehicle" means any vehicle issued a Charter-Party Carrier of Passengers Certificate by the California Public Utilities Commission.

"Clean Air Vehicle" (CAV) means a vehicle that meets the criteria for a low emission vehicle as defined in the California Vehicle Code §5205.5, Low Emission Vehicle Identification for High-Occupancy Vehicle Lane Use. A CAV qualifies as an "alternative fuel vehicle" (AFV) under the Airport Authority's Ground Transportation Vehicle Conversion Incentive-Based Program.

"Commercial ground transportation operator" or "operator" includes any business that provides ground transportation services to Airport patrons for compensation or as a courtesy service; includes, but is not limited to, taxicabs, charter vehicles (TCP), vehicles for hire (PSC), and courtesy vehicles.

"Commercial ground transportation vehicle" means a motor vehicle of a type required to be registered with the Department of Motor Vehicles of the State of California that is used or maintained for the transportation of persons for hire, compensation or profit; includes, but is not limited to, all passenger stage corporations, charter party carriers, taxicabs, and courtesy vehicles.

"Courtesy vehicle" means any vehicle used by a hotel, rental car company, off-airport parking lot, or any other service transporting passengers where there is no charge for said services.

"Driver" includes any employee, agent or independent contractor of a commercial ground transportation operator or Airport tenant who drives or operates a motor vehicle or equipment upon the Airport.

"Emergency vehicle" includes aircraft rescue and fire fighting vehicles, ambulances, and other authorized vehicles approved and routinely operated for response to emergency situations, including mutual aid.

"Executive Director" means the President/CEO of the Airport.

"Fire Code" means the 2007 California Fire Code. [Code of Regulations, Title 24, Part 9]

"Foreign object debris" (FOD) means any type of debris on aircraft ramps, aprons or aircraft movement areas; includes, without limitation, nuts, bolts, plastic, cans, rocks, baggage pieces and parts.

"Ground service equipment" (GSE) means vehicles and equipment approved and used on the aircraft aprons or parking areas in support of airport operations.

"Hazardous material" means any substance or material capable of posing an unreasonable risk to health, safety and/or property; includes gasoline, diesel fuel, other petroleum hydrocarbons, natural gas liquids, antifreeze, chemical de-icing materials, lavatory chemicals, and any

substance whether solid, liquid, or gaseous in nature which is defined as a hazardous substance or hazardous waste under any federal, state, or local statute, regulation, rule or ordinance, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, the Clean Air Act, and the Clean Water Act, or the Hazardous Materials Transportation Act.

"Hazardous waste" includes any waste or combination of wastes as defined in the Code of Federal Regulations, 40 CFR Part 261.3, 49 CFR Part 171.9 or the California Code of Regulations, 22 CCR § 66261, *et seq*.

"Hearing officer" means the individual or individuals appointed by the Authority to hear the evidence and information regarding parties facing administrative action.

"Improvement" means any upgrade or change made to the original condition; compare "Maintenance."

"Instrument landing system (ILS) critical area" means the area established near the glide slope antenna that is protected from vehicular and aircraft intrusion in order to prevent the disruption of aircraft navigation equipment on approach to landing. This area is marked and identified by various methods, including signage. Vehicles are not authorized to maneuver through this area without clearance from the air traffic control tower (ATCT) when the area is active.

"Maintenance" means maintaining the existing property/leasehold in the original condition; compare "Improvement."

"Material safety data sheet" (MSDS) means a document containing basic product information related to the safe handling, storage and disposal of a chemical or material.

"Motor Vehicle": *Generally*, *as defined by the California Vehicle Code*. However, ramp vehicles that are not licensed to operate under state provisions shall be subject to the same limitations and regulations governing the operation of a motor vehicle within the confines of the air operations area (AOA).

"Movement area" includes the runways, taxiways, safety areas, instrument landing system (ILS) critical areas, height restrictive areas and other areas of the Airport which are normally under the control of the ATCT by reason of their function to support the landing, take-off and ground maneuvering of aircraft.

"Non-dedicated streets" means streets under the control and jurisdiction of the Authority and not dedicated to any other governmental agency.

“Non-movement area” means the areas at the Airport that are used for the parking of aircraft that are not under the direct control of the air traffic control tower (ATCT); includes aprons and ramps.

“Non-peak hours” includes the hours between 11:30 p.m. and 5:00 a.m.

“Non-storm water” includes any runoff or discharge to the storm drain system not composed entirely of storm water.

“Notice to airmen” (NOTAM) means a notice containing information concerning the establishment, condition or change in any component of the National Airspace System (including facilities, services, procedures and hazards) of which the timely knowledge is essential to personnel concerned with flight operations.

“Operator”: See “Commercial Ground Transportation Operator.”

“Permittee” includes any individual, company, organization, entity or affiliate permitted to operate ground transportation service vehicles within the Airport.

"Person" includes any individual, corporation, association, partnership (general or limited), joint venture, trust, estate, limited liability company, governmental body, or other legal entity or organization.

“Pre-arranged transportation” includes any provision of commercial ground transportation services from the Airport, where such transportation was contracted or arranged for, by, or on behalf of the passenger either (1) in advance of the passenger’s arrival at the Airport, or (2) after the passenger’s arrival at the Airport by communicating with a ground transportation service provider; includes transportation provided by a courtesy vehicle where the passenger is not directly charged for such transportation.

“President/CEO”: The powers and duties of the President/CEO may be exercised or performed by an assistant or such person as the President/CEO may designate. The President/CEO is also referred to as “Executive Director” with no change in meaning.

“Public Parking Facilities” includes all parking facilities provided specifically for the public while at the Airport.

“Ramp” means the areas where aircraft are parked, unloaded, loaded, refueled or boarded. See “Apron.”

“Ramp Control Facility” (RCF) is where contracted personnel provide ramp control services in the form of traffic sequencing, separation and issue pushback control instructions within

designated non-movement areas. The Ramp Control Facility is located on the roof of Terminal Two West between Gate 38 and Gate 45.

“Restricted area” includes any area of the Airport where access is restricted to use by the tenants or the Authority for its operations only.

“Runway” means the area designed for the landing or taking off of aircraft, identified by a broken white centerline, solid white edge lines and white edge lights.

“Scheduled Operations” includes aircraft operations conducted in accordance with a published schedule between points within the continental United States (domestic), or into or out of the continental United States (flag).

“Security Identification Display Area” (SIDA) means the area identified in the Airport Security Program (ASP) which requires increased security and a continuous display of Airport-issued or approved identification media.

“Solicitation” includes any uninvited initiation of a conversation or other uninvited contact by a driver, other employees, representative or agent (whether formal or informal) of any ground transportation service provider with any person, for the purpose of enticing or persuading said person to use any service or facilities provided by the ground transportation service provider or any affiliate thereof.

“Sterile Concourse” means that portion of the passenger terminal used exclusively by persons who have successfully passed through the security screening process and have been screened according to TSA standards as set forth in Parts 1540 and 1544 of the Transportation Security Regulations (TSRs).

“Storm Water” means runoff which originates from precipitation events, whether rain or snow. Storm water runoff is that portion of precipitation that flows across a surface and into the storm drain system or directly into receiving water (e.g., San Diego Bay).

“Storm Water Code” means the Authority Code prescribing uniform requirements and prohibitions related to the management and control of storm water or non-storm water discharges into any storm water conveyance system on airport property or into any receiving water from airport property. Also known as the "San Diego County Regional Airport Authority Storm Water Management and Discharge Control" and “Storm Water Ordinance.” [Authority Code §§ 8.70 to 8.79].

“Storm Water Management Plan” (SWMP) means the written plan prepared by the Authority that outlines a comprehensive program to reduce and eliminate pollutants from entering the

storm drain system and receiving waters (e.g., San Diego Bay). The SWMP describes potential pollutant sources at the Airport and the management programs in place or required for use to reduce or eliminate impacts to storm water or receiving water quality. Also known as the "SAN Storm Water Management Plan."

"Storm Water Pollution Prevention Plan" (SWPPP) means a written plan that outlines the steps and procedures to be taken to prevent, reduce, and/or eliminate the pollutants potentially generated by a specific tenant or operation or construction project from entering the storm drain system and/or a receiving water (e.g., San Diego Bay).

"Taxicab" means a passenger vehicle for hire designed to carry no more than eight persons, excluding the driver, used to transport passengers on public streets, and where the charges for use of said vehicle are determined by a taximeter.

"Taxicab and vehicle for hire stand" means the areas on Airport property designated and reserved for parking only while waiting to pick up passengers for hire.

"Taxicab or vehicle for hire line" means the areas on or about the Airport designated by sign or other suitable means which are reserved for taxicabs or vehicles for hire only while waiting to advance in turn to a vacancy at the taxicab or vehicle for hire stand.

"Taxicab services provider" means a ground transportation service provider who transports passengers in a taxicab.

"Taxiway" means the areas designed for the passage of aircraft between the non-movement areas and the runway. Taxiways are identified by a solid painted yellow centerline and blue edge lights.

"Tenant" means any person holding any right to use the Airport terminal buildings or airfield under any type of agreement with the Authority and the agents, employees, contractors and subcontractors of such person; includes, but is not limited to, airlines, licensees, permittees, and badge holders.

"Transportation Network Company" is an organization, whether a corporation, partnership, sole proprietor or other form, operating in California providing transportation services for compensation using an online-enabled application (app) or platform to connect passengers with drivers using their personal vehicles. All TNC transportation services must be prearranged through the use of the app or online enabled device.

"TNC Vehicle" means any passenger vehicle engaged in providing Transportation Network Company services and issued a Transportation Network Company permit by the California Public Utilities Commission.

“Trip” includes each instance a ground transportation vehicle enters onto a transportation plaza at the Commuter Terminal, Terminal 1 or Terminal 2 at the Airport.

“Trip fee” means a fee payable to the Authority for each trip of a permittee’s vehicle.

“Vehicle for hire” means any vehicle issued a Passenger Stage Corporation (PSC) certificate by the California Public Utilities Commission (CPUC).

“Vehicle identification decal” means a decal issued by the Authority to be placed on each permitted ground transportation service provider’s vehicle to identify those vehicles approved to operate on Airport premises.

“Vehicle service road” means the roadway used for vehicle movement about the perimeter of the aircraft movement areas.

“Waybill” means a document containing a charter operator’s TCP number, driver’s name, vehicle number, passenger name(s), number of persons in party, location of pick up, and airline and flight number on which the passenger(s) arrived or will arrive. See Public Utilities Code § 5381.5.

Acronyms

AC	Advisory Circular, issued by the Federal Aviation Administration (FAA)
ACM	Airport Certification Manual
ACS	Access Control System
ADA	Americans with Disabilities Act of 1990
AFV	Alternative Fuel Vehicle
AGL	Above Ground Level
AOA	Air Operations Area
API	American Petroleum Institute
APU	Auxiliary Power Unit
ARFF	Aircraft Rescue and Firefighting
ASP	Airport Security Program
ASTM	American Society of Testing Materials
ATCT	Air Traffic Control Tower
ATO	Airport Traffic Officer
AVI	Automatic Vehicle Identification System
BMP	Best Management Practices
CAD	Computer Aided Drafting
Cal EMA	California Emergency Management Agency
Cal OSHA	California Occupational Safety and Health Act
CAV	Clean Air Vehicle
CCTV	Closed Circuit Television

CPUC	California Public Utilities Commission
CSR	Customer Service Representative
CT	Commuter Terminal
CVC	California Vehicle Code
CVRB	Curfew Violation Review Board
DBA	Doing Business As
DHS	Department of Homeland Security
DMV	Department of Motor Vehicles
DOD	Department of Defense
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FAA FAR's	Federal Aviation Administration Federal Aviation Regulations
FBO	Fixed Base Operator
FEDEX	FedEx Corporation
FOD	Foreign Object Debris
GA	General Aviation
GIS	Geographical Information System
GSE	Ground Service Equipment
GPU	Ground Power Unit
HVAC	Heating, Ventilating and Air Conditioning
ID	Identification
ILS	Instrument Landing System
LAMC	Lindbergh Airline Managers Council

MS4s	Municipal Separate Storm Sewer Systems
MSDS	Material Safety Data Sheet
MTDB	Metropolitan Transit Development Board
NAS	Naval Air Station
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NTSB	National Transportation Safety Board
PIN	Personal Identification Number
PPR	Prior Permission Required
PSC	Passenger Stage Corporation
RCF	Ramp Control Facility
RON	Remain Overnight
SDCRAA	San Diego County Regional Airport Authority
SDIA	San Diego International Airport
SIDA	Security Identification Display Area
SOC	Security Operations Center
SPCC	Spill Prevention, Control and Countermeasures
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TCP	Transportation Charter Party
TIPR	Tenant Improvement Project Review

TNC	Transportation Network Company
TSA	Transportation Security Administration
TSR	Transportation Security Regulations
UL	Underwriters Laboratories
UPS	United Parcel Service of America, Inc.
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USPS	United States Postal Service

San Diego International Airport

Rules and Regulations

SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

Sections 1 – Section 7

Authority Codes are italicized

Regulations appear in regular font

Informational material appears in gray font

SECTION 1

1.0 INTRODUCTION

1.1 SCOPE, PURPOSE AND APPLICABILITY

These Rules and Regulations of the San Diego County Regional Airport Authority ("Authority") govern the conduct, use, actions and operations of tenants, lessees, concessionaires, airlines, permittees, licensees, commercial users of San Diego International Airport (Lindbergh Field) ("Airport") and such entities' contractors, subcontractors and invitees. The Rules and Regulations are equally applicable to the employees of the above identified entities and the employees of the Authority. The Rules and Regulations are promulgated by the President/CEO under the powers enumerated in Board Policy 1.40, Board Code 6.01 and California Public Utilities Code §§ 170013(b) and 170026(b). The Rules and Regulations are intended to ensure the safe, secure, efficient and environmentally sound operation of the Airport. Incorporated within the Rules and Regulations, as a helpful reference, are citations to various relevant Authority Codes duly adopted by the Board of Directors which are applicable to all persons using or visiting the Airport.

1.2 AUTHORITY

A. Ownership and Operation

The Airport, certificated by the Federal Aviation Administration ("FAA") and the State of California, is operated by the Authority. The Authority is governed by a nine-member board composed of appointed and elected officials representing the entire San Diego County ("Board").

B. Delegation of Authority

Authority Code § 1.10 (a). Whenever a power is granted to, or a duty is imposed upon the President/CEO by the provisions of this Code, such power or duty may be exercised or performed by an assistant or such person as the President/CEO may designate.

C. Emergency Conditions

Authority Code § 7.20 (a). In the event of a disaster or emergency, the President/CEO of the Authority may: (1) utilize city and county departments, law enforcement agencies, local medical resources and disaster preparedness groups for assistance; and (2) issue such directives and take such action as necessary to protect people, property and assets, and promote the safe operation of the facilities and airports under the jurisdiction of the Authority.

(b). The President/CEO, in the event of a disaster or emergency, may order all occupants to leave the facilities and airports under the jurisdiction of the Authority,

or portions thereof, and prevent access to such areas for such time as may be necessary to assure the safety of the public and employees.

(c). The President/CEO, in the event of a disaster or emergency may close or restrict the use of all airport roadways to vehicular traffic in the interest of public safety.

(d). For purposes of this section, "disaster" or "emergency" includes, without limitation, the actual or threatened existence of conditions such as any hurricane, tornado, storm, high water, earthquake, landslide, mudslide, drought, fire, explosion, civil disturbance, war and other catastrophe or threats that cause or may cause substantial damage or injury to persons or property within the Authority's area of jurisdiction.

D. Compliance

The use of or entry into the Airport by any person or entity for any commercial or business purpose shall be deemed to constitute an agreement to comply with these Rules and Regulations. Compliance with the Rules and Regulations includes compliance with the Airport Security Program ("ASP"). For more information, contact the Manager, Aviation Security and Law Enforcement.

Successful compliance depends to a great extent on the full and active cooperation of all tenants and commercial users and their employees. This requires a thorough knowledge and understanding of applicable Rules and Regulations through ongoing education and training.

E. Governance

Regulation.

1. All persons shall be governed by the applicable laws of the United States, the State of California, the City and County of San Diego, and any other rules, regulations and ordinances as adopted by the Authority while upon the properties owned and operated by the Authority. No person shall use Airport property or facilities for any act deemed illegal by any applicable law.

These Rules and Regulations shall in no way supersede or abrogate regulations set forth by the Transportation Security Administration ("TSA") or in the Federal Aviation Administration Federal Aviation Regulations ("FAA FARs") by which this airport is governed.

F. Severability

Regulations:

1. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of these Rules and Regulations or any part thereof, is for any reason held to be unconstitutional or invalid or ineffective by any court of competent jurisdiction, or other competent agency, such decision shall not affect the validity or

effectiveness of the remaining portions of these Rules and Regulations or any part thereof.

2. The Authority hereby declares that it would have promulgated each section, subsection, subdivision, paragraph, sentence, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases be declared unconstitutional or invalid or ineffective.

3. If the application of any provision or provisions of these Rules and Regulations to any lot, building, sign or other structure, or parcel of land is found to be invalid or ineffective in whole or in part by any court of competent jurisdiction, or other competent agency, the effect of such decision shall be limited to the property or situation immediately involved in the controversy, and the application of any such provision to other properties and situations shall not be affected.

4. This section shall apply to every portion of these Rules and Regulations as it has existed in the past, as it now exists and as it may exist in the future, including all modifications thereof and additions and amendments thereto.

1.3 ENFORCEMENT

Authority Code § 6.01. Any person subject to the Rules and Regulations who violates or fails to comply with the Rules and Regulations will be deemed to be in violation of this Code. The President/CEO of the San Diego County Regional Airport Authority or his or her designee may promulgate a schedule of fines and penalties for any violation of the Rules and Regulations.

Authority Code § 1.17. Whenever in this Code any act or omission is made unlawful, it shall include causing, permitting, aiding or abetting, such act or omission.

The President/CEO (President/CEO) has the overall responsibility for enforcing compliance with these Rules and Regulations. On a day-to-day basis, this responsibility and commensurate authority is delegated to the Authority's designated representatives and to the Harbor Police Department, the law enforcement agency assigned to the Airport.

Any person in violation of the Rules and Regulations or failing to comply with any requirements of these Rules and Regulations may be subject to an administrative fine or penalty, and/or be denied use of the Airport. Violations of these Rules and Regulations shall include but are not limited to causing, permitting, aiding or abetting, or attempting such act or omission.

The safety of patrons and the security of the Airport are of primary importance and are protected and supported by the full powers of the Authority Code, state and federal

law. Persons involved in criminal activities may be detained, arrested and prosecuted to the full extent of the law.

Airport tenants, permittees, licensees, concessionaires and others holding Authority agreements, when leasing or controlling portions of the Airport, are responsible for ensuring that their employees, sub-tenants, contractors, sub-contractors and visitors using their facilities understand and comply with these Rules and Regulations. Each additionally shall be responsible for compliance with all requirements of the Airport Security Program (ASP) delegated to them for their exclusive or other used areas and shall be held liable for any fines, penalties or other monetary assessments imposed upon the Airport by any agency having jurisdiction with respect to any violations involving these areas.

1.4 SPECIAL NOTICES, ADVISORIES AND DIRECTIVES

Special notices, advisories or directives of an urgent or short-term operational nature shall be issued under the authority of these Rules and Regulations.

1.5 RATES, FEES AND CHARGES

Regulation.

A. All persons, including without limitation tenants, permittees, lessees, licensees, concessionaires, car rental agencies, and invitees, shall pay all applicable fees, rates, licenses and charges that may be established by the Board.

New charges may be established from time to time. Accounts not paid shall incur overdue billing charges. Any permission granted by the Authority under the Rules and Regulations is conditioned upon the payment of any and all applicable fees and/or charges established by the Authority.

All funds are payable to the San Diego County Regional Airport Authority ("SDCRAA" or "Authority").

1.6 TECHNICAL CONTENT, REVISIONS AND ACCESS TO AIRPORT RULES AND REGULATIONS

The technical content and accuracy of information in these Rules and Regulations are provided by each department that has authority over the subject matter. The Authority's Airside Operations Department is responsible for working with Authority departments and other stakeholders to maintain, revise, and publish the Rules and Regulations.

These Rules and Regulations include sections of the Authority Code where relevant. In some instances, words and phrases in the Authority Code have been abbreviated to increase readability; however, in all cases, the original language of the Code controls and is not superseded by the version provided herein. The Airport Code in its entirety is available online at:

http://www.san.org/sdcraa/about_us/codes_policies.aspx

The Rules and Regulations are subject to change. In this update, information previously contained in annexes and miscellaneous Authority documents have been incorporated. The current contents of the Rules and Regulations can be accessed from the Authority's website www.san.org.

1.7 DEPARTMENT CONTACT INFORMATION

Department Name:	Department Telephone Number
Access Control Office (Badging)	(619) 400-2765
Airside Operations	(619) 400-2710
Aviation Security and Public Safety	(619) 400-2762
Business & Financial Management	(619) 400-2575
Environmental Affairs	(619) 400-2782
Ground Transportation	(619) 400-2685
Noise Mitigation	(619) 400-2781
Terminals & Tenants	(619) 400-2694
Vision, Voice & Engagement	(619) 400-2871

SECTION 2

2.0 GENERAL CONDUCT

2.1 SCOPE AND APPLICABILITY

This section prescribes general conduct throughout the San Diego International Airport ("Airport").

2.2 SMOKING

Authority Code § 7.03. (a) The following definitions shall apply to this section:
(1) "Electronic Delivery System" means an electronic device, commonly consisting of a heating element, battery, and electric circuit, that can be used to deliver nicotine or any other substance and uses inhalation to simulate smoking. Electronic Delivery System includes, without limitation, any electronic cigar, cigarette, cigarillo, pipe, or hookah, or other similar product, regardless of name or descriptor.
(2) "Tobacco Product" means any: (A) cigar, cigarette, smokeless tobacco, roll-your-own tobacco, liquid nicotine; or (B) other substance delivered by or through an Electronic Delivery System.
(3) "Smoking" or "Smoke" means the burning of, carrying of, inhaling from, exhaling from, or the possession of a lighted cigarette, lighted pipe, or any other matter or substance which contains nicotine, tobacco, or other matter. Smoking also includes the use of Electronic Delivery System intended to emulate smoking, which permits a person to inhale a vapor, mist or aerosol that may or may not contain nicotine or a Tobacco Product.
(4) "Use" means to consume by Smoking, burning, chewing, exhaling, heating, inhaling, vaporing, or any other forms of ingestion or inhalation.

(b) Except in designated smoking areas, no person shall Smoke or use any Tobacco Product or Electronic Delivery System at the facilities and airports under the jurisdiction of the San Diego County Regional Airport Authority or in violation of any federal, state, or local law.

Regulation.

No person shall smoke any tobacco product in any outdoor area within twenty (20) feet of any entrance or exit to any passenger terminal building, office building, or other business facility at the Airport.

2.3 LITTER AND REFUSE

Authority Code § 7.41 (a). It shall be unlawful for any person to dump any material or throw garbage, offal, rubbish, litter, sewage, refuse or foreign material of any kind upon any lot, tract of land, street, alley, lane, court, sidewalk or place under the jurisdiction of the Authority without the written permission of the President/CEO.

Authority Code § 7.41 (b). It shall be unlawful for any occupant, lessee, tenant or licensee of any premises within said area to place, or allow to be placed, or allow to remain on any premises within said area such garbage, offal, rubbish, litter, sewage, refuse or foreign material of any kind without the written permission of the President/CEO.

Nothing in this section shall be construed to limit the operation of any duly ordained regulation of any city whose corporate limits extend into the facilities and airports under the jurisdiction of the Authority.

Regulations:

A. No person shall transport litter or refuse without covering the materials being transported.

B. All tenants providing receptacles for litter or refuse shall provide adequate covers to ensure against any leaking, dripping, sifting or otherwise escaping of any materials.

C. Every person depositing garbage, debris or refuse in any unauthorized location shall clean up the deposited material immediately in an effective manner.

2.4 POLLUTION PREVENTION AND CONTROL AND DUMPING

Authority Code § 8.72 (a). No person shall Discharge, cause, permit or contribute to the Discharge of any of the following to the Storm Water Conveyance System or Receiving Waters (capitalized terms used in this Section are defined in Section 8.71 of this Code):

(1) Any liquids, solids or gases which by reason of their nature or quantity are flammable, reactive, explosive, corrosive or radioactive, or by interaction with other materials could result in fire, explosion or injury;

(2) Any solid or viscous materials that could cause obstruction to the flow or operation of the Storm Water Conveyance System or Receiving Waters;

(3) Any noxious or malodorous liquid, gas or solid in sufficient quantity, either singly or by interaction with other materials, which creates a public nuisance, hazard to life, or inhibits authorized entry of any person into the Storm Water Conveyance System or Receiving Waters;

(4) Any medical, infectious, toxic or hazardous material or waste; or

(5) Other Pollutants that injure or constitute a hazard to human, animal, plant, or fish life, or create a public nuisance.

2.5 ILLEGAL DISCHARGES AND ILLICIT CONNECTIONS

Authority Code § 8.73 (a). No person shall Discharge Non-Storm Water to the Storm Water Conveyance System, unless authorized by a separate or general NPDES Permit or if the Discharge is exempted or conditionally exempted by the Municipal Storm Water and Urban Runoff NPDES Permit, as provided or as subsequently amended or if granted as a special waiver or exemption by the Regional Board.

2.6 ABANDONMENT

Authority Code § 7.10 (a). No person shall willfully abandon any personal property on the facilities and airports under the jurisdiction of the Authority. Any items left unattended for distribution is prohibited and shall be considered an abandoned item.

Regulation.

All persons shall remove their unattended personal property on the Airport when notified by an Authority representative. Should such person fail or refuse to remove the unattended personal property, after thirty (30) days such property shall be considered abandoned and disposed of without cost or liability to the Authority. If the Authority incurs expenses to have said item disposed of, the person shall reimburse the Authority.

2.7 DAMAGE OR ADDITIONS TO AIRPORT PROPERTY

Authority Code § 7.04. No person shall destroy, injure, deface or disturb in any way, any building, sign, equipment, marker or other structure, trees, flowers, lawn or any other properties on the facilities and airports under the jurisdiction of the Authority, including, without limitation, the Airport; nor alter, make additions to, erect any building or sign, or make any excavations at such facilities and airports without the Authority's prior written authorization.

Regulation.

Every person damaging Airport property shall repair such damage at their sole cost and expense, or, if the damage is repaired by the Authority, shall reimburse the Authority for incurred costs.

2.8 SIGNAGE

Regulation.

No person shall post or distribute any sign, advertisement or circular upon Airport property without the prior written permission of the President/CEO or responsible Authority Department.

2.9 OBSTRUCTIONS AND ROADWAY USE

Authority Code § 7.12 (a). No person shall travel on any portion of the facilities and airports under the jurisdiction of the Authority except upon the designated roads, sidewalks or other places provided for the particular class of traffic, nor occupy those roads and walks in such a manner that would hinder or obstruct their proper use.
(1) No person shall operate any wheeled vehicle in or on any portion of the facilities principally designed for the movement of pedestrian traffic. Such areas include but are not limited to sidewalks, walkways, and the interior of any building.
(2) For the purpose of subsection (a) (1) above; a wheeled vehicle includes but is not limited to; unicycles, bicycles, tricycles, skateboards, roller skates, roller blades, wheeled footwear, and wheeled motor vehicles.

(3) Subsection (a) (1) shall not apply to designated Authority representatives, law enforcement officers acting in the performance of their official duties, tenant employees acting in accordance with their respective lease provisions, or any passenger or member of the public needing a wheeled vehicle for mobility or medical reasons (e.g. stroller, wheelchair, or gurney).

Authority Code § 7.12 (b). No person shall obstruct access to the use of any building, grounds, roads, walkway, sidewalk or other facility located upon any facility and airports under the jurisdiction of the Authority.

Authority Code § 7.12 (c). No person shall erect any table, chair, easel, mechanical device or structure, or place any object that would obstruct access or egress within or outside any terminal building, facility or airports under the jurisdiction of the Authority without the prior written authorization from the President/CEO or his or her designee.

Regulations.

A. No person shall operate any wheeled vehicle in or on any portion of the facilities principally designed for the movement of pedestrian traffic except designated Authority representatives, law enforcement officers acting in the performance of official duties, tenant employees acting in accordance with their respective lease provisions, or any passenger or member of the public needing such device for mobility or medical reasons (i.e. stroller, wheelchair, or gurney). Such areas include but are not limited to; sidewalks, walkways and the interior of any building.

B. A wheeled vehicle includes but is not limited to; unicycles, bicycles, tricycles, skateboards, roller skates, roller blades, wheeled footwear, and wheeled motor vehicles.

2.10 USE OF BAGGAGE CARTS

Authority Code § 7.11 (a). Use of baggage carts is restricted to persons who have rented the units for transporting their baggage, packages or similar items. No person shall use baggage carts without paying the appropriate fee through the rental device. No person shall tamper with the rental device.

Authority Code § 7.11 (b). Baggage carts are not allowed on escalators.

Authority Code § 7.11 (c). Baggage carts may not be removed from the facilities and airports under the jurisdiction of the Authority.

Authority Code § 7.11 (d). Employees, tenants and contractors of the Authority are not allowed to keep nor stow baggage carts.

Authority Code § 7.11 (e). No unauthorized persons shall dispense or sell baggage carts. It shall be prohibited for any person to come to the facilities and airports under the jurisdiction of the Authority for the express purpose of returning or otherwise using such carts for financial benefits.

Regulation.

Baggage cart concessionaires shall promptly collect baggage carts and return them to the cart dispensers.

2.11 ANIMALS

Authority Code § 8.20 (a). No person shall bring or allow an animal on the facilities and airports under the jurisdiction of the Authority, except as follows:

(1) Service animals;

(2) Animals properly crated for shipment by air; and

(3) Domestic animals if restrained by a leash or confined in such a manner as to be under the positive control of the owner or handler; provided, however, that such domestic animals shall not be allowed in airport terminal buildings or passenger loading areas.

Authority Code § 8.20 (b). No person shall enter any terminal or the air operating area of any facility or airport under the jurisdiction of the Authority with a dog or other animal except a guide dog permitted under federal, state or local laws, or one properly confined in a suitable container for shipment.

Authority Code § 8.20 (c). No person shall permit any animal to urinate or defecate upon the sidewalks or upon the floor of any facilities or airports under the jurisdiction of the Authority.

Authority Code § 8.20 (d). No person shall feed or perform any other act to encourage the congregation of birds or other animals on any facility or airport under the jurisdiction of the Authority.

Authority Code § 8.20 (e). No person shall hunt, pursue, trap, catch, injure or kill any animal on any facility or airport under the jurisdiction of the Authority other than in the conduct of their official duties.

2.12 LOST AND FOUND PROPERTY

Authority Code § 7.13 (a). Any person finding a lost article in the common areas of the facilities and airports under the jurisdiction of the Authority shall surrender such property to the Authority.

Regulation.

Any person finding any lost article in the common areas of the Airport shall surrender such property to the Airport Lost and Found.

Articles found by tenants in their exclusive leasehold areas may be held in their lost and found areas.

For Lost and Found Office assistance call:

Phone: 619-400-2140

Fax: 619-400-2141

The office is open from 7:00 AM until 11:00 PM, and can also be reached online at www.san.org.

2.13 REQUESTS FOR LAW ENFORCEMENT ASSISTANCE

The Harbor Police Communications Center should be notified of any medical incident requiring assistance by calling (619) 686-8000. Such incidents include calls originally directed toward 911.

Requests for any type of law enforcement assistance (Harbor Police, Customs & Border Patrol, narcotics task force, etc.) should be made directly to the Harbor Police Communications Center. Although dialing 911 is acceptable, by dialing the Harbor Police Department directly persons requesting assistance can be assured of the quickest response by police officers and paramedics. The request should include the nature of the problem and type of assistance desired.

2.14 WEAPONS

Authority Code § 7.02 (a). No person, except a peace officer or a member of the Armed Forces on official duty, shall carry any weapon, explosive, or inflammable material on or about his or her person, openly or concealed, on the facilities and airports under the jurisdiction of the Authority, without the permission of the President/CEO.

Authority Code § 7.02 (b). No person may furnish, give, sell or trade a weapon on Authority property.

Authority Code § 7.02 (c). For the purposes of this section, the term "weapon" includes, but is not limited to, firearms, explosive devices, dirks, bowie knives, blackjacks, switch blade knives, slingshots, metal knuckles or similar devices or instruments.

Authority Code § 7.02 (d). This section shall not apply to persons transporting for lawful purposes any weapons which are carried in said person's luggage in accordance with the Authority's codes, policies, rules and regulations and applicable federal, state and local laws.

<u>Regulations:</u>

A. No person shall carry any weapon or explosive on the Airport except Harbor Police officers, authorized law enforcement officers, authorized active duty members of the U. S. military on official duty, or others designated by the President/CEO.

   Additional restrictions may apply for entry into sterile concourses or onto the AOA.

B. All persons, except those described in A, above, shall surrender weapons, explosives and other prohibited objects in their possession to any Harbor Police officer currently on duty or other authorized Authority representative.

2.15 TRESPASSING

Authority Code § 7.05 (a). It shall be unlawful for any person, to remain within a passenger terminal at the Airport between the hours of 11:00 p.m. and 6:00 a.m. of the following day after having been requested to leave the terminal by a representative of the Authority or by a duly appointed law enforcement officer. This section does not apply to:

(1) Any person holding a valid airline ticket for travel within 24 hours;

(2) Any person in the terminal meeting a specific and identifiable arriving passenger or accompanying a departing ticketed passenger;

(3) Any Airport employee;

(4) Any employee of a government entity or an approved business located or doing business within the Airport terminal; and

(5) Any person whose presence in the terminal is substantially and directly related to the air transportation of passengers or property.

Authority Code § 7.05 (b). It shall be unlawful for any person, whose actions at the Airport constitute a proximate and cognizable threat to the safety of personnel or to Airport security, to remain on Airport property after having been requested to leave the property by a duly appointed law enforcement officer.

Authority Code § 7.05 (c). It shall be unlawful for any person to remove any food item, including a beverage, from an unattended table within a food-serving concession area at the Airport and thereafter consume said item where the person neither originally purchased the food item nor received permission from the purchaser of the food item to consume the food item. For the purpose of this section, "food-serving concession area" means any area adjacent to a food-serving business or concession within which are located dining tables for the convenience of the customers of the food-serving business or concession.

Regulations:

A. All persons who refuse to comply with these Rules and Regulations after being requested to do so by Authority personnel may be considered a trespasser and be subject to applicable laws.

B. No person shall make use of or loiter on or near any shop, building, equipment or facility of any tenant, permittee or licensee of the Airport without the specific permission of the tenant, permittee or licensee. Violators may be deemed trespassers.

2.16 RESTRICTED AREAS

Regulation.

No person shall enter or attempt to enter any sterile, restricted, or limited access area of the Airport; any security identification display area (SIDA); or any other restricted area of the Airport or terminal facilities that is identified as being closed to the public, except persons in compliance with one or more of the following provisions:

1. Persons who enter in accordance with a security clearance pursuant to the Authority Airport Security Program (ASP) and authorized by the Transportation Security Administration (TSA);
2. Persons assigned duties in the AOA or other restricted areas and bearing a proper Airport security identification badge;
3. Employees or authorized representatives of the Authority or other federal, state or local governmental agencies having proper business on the AOA or restricted areas and bearing a proper Airport security identification badge, or under direct escort of an authorized Authority representative or Airport tenant who is validly badged in accordance with the ASP; or
4. Passengers under appropriate supervision of an air carrier or authorized Authority personnel, entering upon the aircraft apron for the purpose of enplaning or deplaning an aircraft.

Cross-reference: See Authority Code § 7.01 (b) – Personal Conduct.

2.17 BADGES

A. Display of SAN Identification (ID) Badge

Regulation.

1. All persons wearing a SAN Identification (ID) badge must wear the ID badge at or above the waistline on the outermost garment and display the ID badge such that the front of the ID badge is visible to approaching persons.

B. Visitor Badges

Regulations:

1. All tenants shall ensure that each of their visitors is issued and wears a SAN visitor's badge, and that an appropriate log is maintained of issued visitor's badges.
2. All tenants shall ensure that their visitors relinquish issued visitor's badges before leaving the Airport.
3. All tenants shall ensure that any visitors who require access to restricted areas are escorted at all times by an authorized person who possesses a valid ID badge indicating "escort authority" in accordance with these regulations. All persons

conducting such an escort shall accompany the escorted person at a distance no greater than 25 feet and control the activities of the visitor at all times. No authorized escort shall escort more than five visitors at a time.

Visitor's badges are valid for a maximum period of 24 hours.

C. Issuance of SAN Identification (ID) Badge

The Authority does not issue ID badges to any person under eighteen (18) years of age at the time of application.

D. Unauthorized Uses of Badges

Regulations:

1. No person shall wear an ID badge issued to a different person.
2. No person shall use any badge outside of the areas described by the restrictions listed upon the badge.
3. No person shall use any form of Airport-issued identification or access media for the purpose of bypassing the passenger screening process and boarding or attempting to board an aircraft.

E. Badge Inspection

Regulations:

1. All persons wearing an ID badge shall submit the badge for inspection by any other person wearing such a badge when so requested.
2. All persons discovering that a badge holder has used a badge in any area in violation of the restrictions listed on that badge shall immediately report the violation to the Harbor Police Department or the Aviation Security and Public Safety Department.

F. Invalidation of Badge

Regulation.

1. No person shall mutilate or alter any Authority-issued badge, identification card or access media.

Mutilation or alteration of a SAN identification (ID) badge shall render it invalid.

Mutilation or alteration of any Airport-issued identification/access media may be punishable as a criminal offense pursuant to California Penal Code § 594.

G. Lost or Stolen Badge

Regulation.

1. All persons who lose or determine that their badge has been stolen or lost shall immediately notify the Harbor Police Department and the Access Control Office.

The Access Control Office can be reached at (619) 400-2765.

H. Revocation or Surrendering a SAN Identification (ID) Badge

Regulations:

1. All tenants shall ensure that the badge of any agent, employee or other person acting on the tenant's behalf who is terminated, transferred or resigns employment at the Airport is immediately returned to the Access Control Office.
2. All persons failing to comply with the provisions outlined herein and of the Airport Security Program (ASP) may have their ID badge revoked.

2.18 SECURITY EQUIPMENT AND DIRECTIVES

Authority Code § 7.01 (b).

(5) No person shall willfully tamper, alter, move or otherwise affect any security device, CCTV camera, PIN pad coding box, electromagnetic locking device or other such device, or perimeter fence, gate, or gate tracking device.

(6) No person shall willfully activate any security or emergency notification device or cause a security or emergency alarm, when no threat to security or emergency condition exists.

Authority Code § 7.07 (a). No person shall tamper, alter, move or otherwise affect any security device, sign, CCTV camera, PIN pad coding box, electromagnetic locking device or other such implement, or perimeter fence gate or gate tracking device located on the facilities or airports under the jurisdiction of the Authority. No person may place any object within five feet of the perimeter fence of any facilities or airports under the jurisdiction of the Authority or at any distance that would obscure that portion of such fence.

Authority Code § 7.07 (b). No person shall activate any security device or cause a security alarm, when no threat to security or emergency condition exists.

Authority Code § 7.07 (c). Any person inadvertently activating a security alarm or other device shall remain at the location of the activation until an authorized officer of the Authority or other security representatives arrive, determine the cause of the activation and verify the individual's authority to access that portion of such facilities or airports.

Regulations:

A. No person shall in any way attempt to bypass or test any security screening procedures for the purposes of exposing inadequacies of such systems, unless authorized by law to do so. For this part, authorized personnel shall include Harbor Police, Airport security representatives, authorized airline employees, and agents of

the Federal Aviation Administration (FAA) and Transportation Security Administration (TSA) authorized to perform such tests.

B. No unauthorized person shall breach or violate any TSA Security Directive applicable to the Airport.

2.19 VENDING MACHINES

Regulation.

No tenant shall install any vending machine for the sale of goods in the Airport without the Authority's permission.

2.20 STORAGE OF EQUIPMENT, FIXTURES AND CARGO

Regulation.

No person shall use any area of the Airport outside of that person's leased premises for the storage of equipment, fixtures, cargo or other property without prior written permission from the Authority. Any person using such areas for storage without first obtaining Authority permission shall have sole liability for any damage arising from or out of removal or storage of those goods, including the payment of rent for the use of the premises.

2.21 SOLICITATION AND EXPRESSIVE ACTIVITIES

Regulation.

No person shall solicit funds for any purpose at the Airport without the prior permission of the Authority. Any person engaging in solicitation or expressive activities shall conform to the guidelines that the Authority's Board or President/CEO may from time to time adopt prescribing the location and manner in which such activities may be conducted.

For more information, contact the Terminals & Tenants Department at (619) 400-2694.

Cross-reference: See Authority Code § 8.40 – Expressive Activities.

2.22 COMMERCIAL PHOTOGRAPHY, FILMING AND RECORDING

Authority Code § 7.14 (a). No person shall take a still, motion or sound motion picture, photograph or video on the Airport for commercial purposes without prior written permission of the President/CEO. This prohibition does not apply to an official representative of an accredited news organization photographing, filming or video recording an event on the Airport.

Authority Code § 7.14 (b). No person shall take a still, motion or sound picture, photograph or video on the Airport in a manner which is intended to or does:

(1) Interfere with the safe operation of the Airport;

(2) Obstruct or impede any screening or inspection process of passengers, luggage or cargo; or

(3) Disrupt the operation or activities of the Airport, or of any tenant, licensee or permittee of the Authority.

Regulation.

No person shall take a still, motion or sound motion picture, photograph or video on the Airport for commercial purposes without the permission of the President/CEO.

Subject to Authority Code §7.14(b), an official representative of an accredited news organization is authorized to take a still, motion or sound motion picture, photograph or video of events on the Airport; however, advance notification to the Department of Terminals & Tenants is strongly advised.

For more information or to contact the Department of Terminals & Tenants call (619) 400-2694.

2.23 MEET AND GREET AREAS

The Meet and Greet Areas are designed to establish a reserved area for the prearranged meeting and greeting of SDIA passengers, to arrange for their arrival and departure, and to provide them with further instructions and information before proceeding to their next destination. A Meet and Greet Activities Permit is not required for any person or persons wishing to meet travelers at the SDIA, but is offered as an option for groups or individuals wishing to reserve a specific location for the purpose described above. The Meet and Greet Areas are not designated by SDCRAA as public forum for First Amendment/Free Speech purposes. First Amendment/Free Speech area are designated elsewhere within the SDIA and are governed under SDCRAA's Expressive Activities Permit.

To obtain an application form, permit and for more information, please contact Terminals & Tenants Department at (619) 400-2694.

SECTION 3

3.0 AIRFIELD OPERATIONS

3.1 SCOPE AND APPLICABILITY

This section prescribes required procedures for aeronautical operations, vehicle operations and fueling operations on the air operations area (AOA).

3.2 AERONAUTICAL OPERATIONS ON THE AIR OPERATIONS AREA (AOA)

3.2.1 GENERAL RULES

A. Compliance

Authority Code § 8.10 (a). Federal aviation regulations pertaining to aircraft operations shall be observed at all times.

Authority Code § 8.10 (k). The President/CEO shall have the authority to detain any aircraft for nonpayment of any charges due the Authority, or for the violation of any codes, rules or regulations of the Authority contained herein.

Regulation.

1. Every person conducting aeronautical activities at the Airport shall conform to the regulations of the Federal Aviation Administration (FAA), Transportation Security Administration (TSA) or any successor agency, the directives of the Authority, and these Rules and Regulations.

B. Negligent Aircraft Operations

Authority Code § 8.10 (g). No person may run an engine of, or taxi, an aircraft on the airports under the jurisdiction of the Authority in a manner that endangers any person or property or so as to compromise or diminish the safety of operations on such airports.

Regulations:

1. No person shall operate an aircraft at the Airport in a careless or negligent manner, in disregard to the rights and safety of others, without due caution and circumspection, or at a speed or in a manner which endangers, or is likely to endanger, persons or property.
2. No person shall operate an aircraft constructed, equipped or loaded in such a manner as to endanger, or to be likely to endanger, persons or property.

3. All persons using any part of the Airport shall be liable for any property damage, personal injury or death caused by their carelessness or negligence on or over the Airport.

4. Any aircraft operated so as to cause property damage; personal injury or death on or at Airport may be retained in the custody of the Authority. The Authority shall have a lien placed on the aircraft until all charges for damages are paid.

C. Damage to Authority Property

Authority Code § 8.10 (i). Airport property that is damaged or destroyed by an accident or otherwise shall be paid for by parties responsible therefore.

Regulations:

1. Any person who damages Airport property including but not limited to, light fixtures, buildings or other assets, shall be responsible to the Authority for such damages, and the amount thereof shall be paid within 30 days or such reasonable time as is approved by the President/CEO, or his or her designated representative.

2. Any person damaging any Airport property as a result of operating an aircraft or other motorized equipment shall report such damage immediately to the Airside Operations Department. Failure to do so shall constitute grounds for the Authority to prohibit further use of any Airport facility including the runway and taxiways in addition to other remedies available under other applicable law.

   The Airside Operations Department can be reached at (619) 400-2710.

D. Commercial Aircraft Operations

Regulation.

1. All persons conducting business on the Airport shall have the appropriate written agreement, license or permit with the Authority and shall be responsible to pay all applicable use fees, charges, permit fees and/or landing fees. Failure to do so may cause a lien to be placed against the aircraft as provided by applicable law.

E. Radio Communications

Regulation.

1. All persons landing or taking off at the Airport shall ensure that their aircraft has a properly functioning two-way radio capable of communicating with the Airport's Federal Aviation Administration (FAA) Air Traffic Control Tower (ATCT).

F. Air Operations Area (AOA) Smoking

Authority Code § 8.11 (k). Smoking of any Tobacco Product or Electronic Delivery System is prohibited throughout any airport operating area under the jurisdiction of the Authority. The terms "Smoking," "Tobacco Product," and "Electronic Delivery System" shall have the meaning set forth in Authority Code § 7.03.

G. Unauthorized Use of Aircraft

Regulation.

1. No person shall interfere or tamper with any aircraft, put in motion the engine of such aircraft, or use any aircraft, aircraft parts, instruments or tools without the permission of the owner or by specific direction of the President/CEO, or his or her designated representative.

H. Use of Commercial Space on the Air Operations Area (AOA)

Regulations:

1. No person shall use or occupy any Airport air operations area for any commercial purpose except a purpose pertaining to the servicing of one or more tenants, concessionaires, or airlines; activities associated with an airline or governmental agency; or an authorized purpose connected with maintenance and operation of the Airport.
2. Every person so authorized shall carry and/or display personal identification of the type and in the manner specified by the Authority's Aviation Security and Public Safety Department.

I. Storm Water Compliance

The Airport Authority Board has adopted Authority Code Sections 8.70 to 8.79, known as the "San Diego County Regional Airport Authority Storm Water Management and Discharge Control" ("Storm Water Code"). The Storm Water Code sets forth uniform requirements and prohibitions for dischargers and places of discharge to the storm water conveyance system and receiving waters necessary to adequately enforce and administer all laws and lawful standards and orders or special orders that provide for the protection, enhancement and restoration of water quality. The Storm Water Code applies to all persons and places located on property within the Authority's jurisdiction that discharge storm water or non-storm water into any storm water conveyance system or receiving water. Any person violating any of the provisions or failing to comply with the mandatory requirements of the Storm Water Code is subject to enforcement action. The President/CEO shall administer, implement and enforce the provisions of the Storm Water Code.

There are a wide variety of airport-, airline-, aircraft-, and ground support-related activities conducted at the Airport that are subject to the requirements of one or

both of the following National Pollutant Discharge Elimination System (NPDES) storm water permits:

- State Water Resources Control Board Water Quality Order No. 97-03-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities, as amended, modified, revised, or re-issued (the "General Industrial Permit"); and
- California Regional Water Quality Control Board, San Diego Region, Order No. R9- 2007-0001, National Pollutant Discharge Elimination System (NPDES) No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego (County), the incorporated cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority, as amended, modified, revised, or re-issued (the "Municipal Permit").

The Authority has prepared a Storm Water Management Plan (SWMP) that outlines a comprehensive program to reduce and eliminate pollutants from entering the storm water conveyance system and receiving waters. The Storm Water Management Plan (SWMP) describes potential pollutant sources at the Airport and the management programs in place to reduce or eliminate them.

Regulations:

1. All persons at the Airport shall comply with the current National Pollutant Discharge Elimination System (NPDES) Permit No. CAS000001 ("General Industrial Permit") and NPDES No. CAS0108758 ("Municipal Permit") regarding stormwater discharges and shall respond to all Authority requests for pertinent information regarding facilities, operations, and activities.
2. Each Airport tenant, service provider and other commercial user shall be fully aware of federal, state and local storm water pollution prevention laws and regulations, the Storm Water Code, the National Pollutant Discharge Elimination System (NPDES) permits applicable to the Airport, the Storm Water Management Plan (SWMP) and the requirement to comply with each. Airport tenants, service providers and other commercial users are also responsible for ensuring that their contractors or sub-contractors comply with these requirements.
3. Any spillage or release of gasoline, jet fuel, oil, grease, lavatory chemicals, lavatory waste, waste water of any kind, or any other material or pollutant which may degrade the environment or may be unsightly or detrimental to the pavement in any area of the Airport shall be removed immediately by the party or operator responsible, using suitable procedures in a manner acceptable to the

President/CEO, or his or her designated representative. The failure of the responsible party to act promptly to immediately remedy the spill or release may result in a determination by the President/CEO or his or her designated representative to expend Authority resources to protect public health and safety, property and the environment and to seek reimbursement for such expenditures from the party responsible.

Cross-references: See Rules and Regulations Sections 3.4.7 Fuel Spills, and 3.4.8 Lavatory Chemical and/or Lavatory Waste Spills.

J. Construction Activity on the Air Operations Area (AOA)

Regulation.

1. No person shall engage in construction activity on the AOA until and unless all provisions of the Airport's Operational Safety and Security Requirements are met.

   The Airport's Operational Safety and Security Requirements are available by contacting the Airside Operations Department at (619) 400-2710.

K. Special Events on the Air Operations Area (AOA)

Regulations:

1. No person shall conduct any special or non-standard event on the AOA, including, but not limited to a cookouts or barbecue, without written authorization from the Airside Operations Department prior to each occurrence.
2. Every request to conduct a special or non-standard event shall be submitted to the Authority and include the date, time, place, nature, hosting organization, number of participants and other operational information as requested by the Authority.
3. Every special or non-standard event shall be conducted in compliance with the security measures established by the Authority and the TSA.

   The Airside Operations Department can be reached at (619) 400-2710.

L. Minimizing Bird-Strike Potential

Regulation.

1. All persons conducting any activity on the AOA shall ensure that:
   a. There is no bird-feeding activity;
   b. Unsecured trash bags containing foodstuffs are not to be left on the ramp or AOA;

c. Food containers, whether full, empty or nearly empty, are not discarded on the ramp, in baggage carts, on flatbed vehicles or on other uncovered vehicles; and

d. The lids of all dumpsters and trash containers are closed when not actually being loaded or unloaded.

3.2.2 AIR TRAFFIC RULES

A. Flight Tests and Practice Operations

Authority Code § 8.10 (c). Practice instrument approaches and touch and go landings are prohibited at the SDIA.

Regulations:

1. Prior to conducting any aircraft flight test or maneuver within the Airport traffic area, the aircraft operator shall make all necessary arrangements and receive all clearances in advance from the Federal Aviation Administration (FAA) and the Authority's Airside Operations Duty Manager on duty.
2. No person in an aircraft shall conduct any type of practice low approach at the Airport.

B. Aircraft Operations

Regulations:

1. All persons conducting aircraft surface operations shall do so only upon hard-surfaced runways, taxiways, taxi lanes and aprons.
2. No person shall use any taxiway for the takeoff or landing of an aircraft.
3. No person shall pass over any Airport building, structure or any adjacent motor vehicle parking area or bridge during an aircraft landing or takeoff unless landing at Naval Air Station (NAS) North Island, or otherwise instructed by the Air Traffic Control Tower (ATCT).
4. No person shall conduct any formation flight, takeoff or landing.
5. No person shall conduct any acrobatic maneuver.
6. No person shall land or launch any motorless aircraft, hot air balloon, ultra-light aircraft, hang glider, or other device not licensed or certified by the FAA without prior authorization of the President/CEO or his or her designee.
7. The operator of any United States Department of Defense (DOD) aircraft intending a flight operation into the Airport shall notify the Airside Operations Department prior to the operation. This notification procedure applies to

operations conducted with any United States DOD aircraft having a military registration or call sign with the exception of United States Coast Guard flights to and from the United States Coast Guard facility on North Harbor Drive.

C. Parachute Operations

Regulation.

1. No person shall parachute over or into the Airport or within the Airport Traffic Area without prior written permission from the FAA ATCT and the President/CEO.

3.2.3 AIRPORT USE REGULATIONS

All operators of aircraft must comply with Authority Code § 9.40 - Airport Use Regulations.

3.2.4 AIRCRAFT ACCESS AUTHORIZATION

Regulation.

A. No person shall enter any aircraft without the consent of the owner or person in charge thereof.

3.2.5 GROUND OPERATIONS

Authority Code § 8.10 (l). No person shall park or stand an aircraft or load or unload aircraft passengers on a public landing area, public ramp and apron area, public passenger ramp and apron area, public cargo ramp and apron area, public aircraft parking and storage area or operational area at the airports under the jurisdiction of the Authority except at such places as may be permitted by the President/CEO.

A. Ramp Operations

Regulations:

1. Every person operating an aircraft shall ensure that the aircraft is operated so as not to blast, injure or damage any person, property, equipment, building, or other aircraft.

   Cross-reference: See Regulations; Section 6.2.B Fire Extinguishers.

2. Every tenant shall police and keep their ramp areas clean and free of all debris.

   a. All tenants shall provide clearly marked FOD containers for collecting material that is picked up from the aprons. Containers shall be present in sufficient quantities to facilitate disposal of picked up materials. Containers shall have a cover and be small enough to be easily emptied, but heavy enough to resist spillage and will be placed in such a location so that they are not impacted by aircraft jet blast.

b. All tenants shall empty their FOD containers at least daily or more frequently, if necessary.

c. All tenants shall ensure that outside trash containers (e.g., cans, dumpsters and compactors) are covered, checked frequently, and emptied as necessary to prevent spillover of trash.

3. No person shall leave any ground service equipment (GSE), including but not limited to, chocks and airstairs, on the Commuter Terminal of the Remain Overnight Ramps (RON) when such ramps are not being used for RON aircraft.

4. All tenants shall ensure that lavatory service equipment is well-maintained and compatible with the waste receptacles provided by the Authority. No tenant shall dump lavatory waste directly into the sewerage system except at the alternate dump site when the triturator is out of service or when directed by the Airside Operations Department. All tenants shall report any spillage of lavatory waste to the Airside Operations Department and shall immediately clean up such spillage.

   The Airside Operations Department can be reached at (619) 400-2710.

   Cross-reference: See Rules and Regulations Section 3.4.8 Lavatory Chemical and/or Lavatory Waste Spills

5. No person shall erect or position any light on a terminal, ramp or apron area so as to interfere with an aircraft operator's ability to see while operating an aircraft.

6. Every person scrubbing an aircraft ramp or apron shall use an approved vacuum-type scrubber. The waste water picked up from any ramp shall be disposed of in a triturator or approved designated opening to the sanitary sewer system.

B. Push Back/Tow Out Procedures

Regulations:

1. Every person conducting an aircraft movement on a terminal ramp between the hours of 0600-2400 shall coordinate such operation with the ATCT for Gates 1-18, 20, 21, 22, 24, 26, 28, 30, 32 and the Ramp Control Facility (RCF) for Gates 23, 25, 27, 29, 31, and 33-51. Every person conducting an aircraft movement on a terminal ramp between 2400-0600 shall coordinate with the ATCT only.

2. Every person operating an aircraft shall exercise extreme caution when maneuvering the aircraft in any terminal ramp area.

3. Prior to the pushback or tow out of an aircraft, from the hours of 0600-2400, the person operating the aircraft shall contact the ATCT ground controller for traffic

advisories for Gates 1-18, 20, 21, 22, 24, 26, 28, 30, 32 and the RCF for Gates 23, 25, 27, 29, 31 and 33-51. Between the hours of 2400-0600, all aircraft movement shall be coordinated with the ATCT.

4. Any person pushing an aircraft back from or towing an aircraft out a terminal gate from a parking ramp shall give way to other aircraft already being taxied, towed or pushed back on the ramp.
5. No person operating an aircraft shall delay taxiing from a ramp for a period of time that would cause undue delay to subsequent taxiing aircraft.
6. No person operating an aircraft shall conduct power back or power out procedures from the terminal gate areas including the Commuter Terminal. No person shall taxi into or out of positions N1, N2, N9 or N10 on the North Ramp without the express permission of the Airside Operations Duty Manager.

C. Starting and Running Engines

1. Starting Engines

Regulations:

a. No person shall operate any aircraft engine within a hangar, within fifty (50) feet of a hangar, or so close to the hangar that it creates a hazard to persons or property.

b. No person shall operate any aircraft engine until ground personnel grant clearance and all standard safety procedures have been met.

c. No person shall start or run any aircraft engine unless a licensed pilot or licensed mechanic is in the aircraft attending the engine controls.

d. No person shall start any aircraft engine unless there are fire extinguishers provided nearby in accordance with National Fire Protection Association (NFPA) Code 407.

Cross-reference: See Regulations; Section 6.2.B Fire Extinguishers.

e. All persons conducting engine cross bleed starts shall:

(1) advise the ATCT ground control of the request to push back all the way onto Taxiway Bravo and intent to conduct an engine cross bleed start;

(2) after receipt of clearance from the ATCT to push back to Taxiway Bravo, push the aircraft back until it is lined up over the taxiway centerline; and

(3) not start the cross bleed until the aircraft is positioned as described in (2) above and until the ground crew confirms that the procedure can be initiated without adverse impact to other aircraft, vehicles or personnel and without creating any other unsafe conditions.

2. Engine Run-ups

Authority Code § 8.10 (b). No person shall perform any engine run up at a power setting above idle power between 11:30 p.m. and 6:30 a.m. (2330 - 0630 hours) (local time) at the San Diego International Airport (the "SDIA").

Regulations:

a. No person conducting any propeller engine run-up at the Commuter Terminal shall exceed normal breakaway power.

b. No person conducting any jet engine run-up shall exceed idle power except on Taxiway C, facing west, between C4 and C6.

D. Aircraft Taxiing

Authority Code § 8.10 (j). No aircraft shall be taxied into or out of any hangar.

Regulations:

1. No person shall taxi any aircraft on the Airport when there is any danger of collision with any person or object.
2. All persons taxiing aircraft shall taxi at a safe speed and in a reasonable manner. Pilots shall use minimum power while taxiing on the ramps and taxi lanes adjacent to any terminal building.
3. No person shall taxi any aircraft onto any portion of the Airport without first establishing radio communication with and coordinating the operation through the ATCT or the RCF. Anyone taxiing an aircraft that does not have a pilot's license will need to have Airport Movement Area Training.
4. No person shall operate an aircraft on the Airport unless the aircraft is equipped with wheel brakes in proper working order.
5. No person taxiing shall taxi an aircraft between the main terminal gates and any aircraft parked or being repositioned on the terminal apron.
6. Every person taxiing an aircraft will taxi expeditiously after landing and clear the runway as promptly as possible, consistent with safety.
7. No person shall taxi an aircraft into or out of any hangar.
8. All persons taxiing aircraft on the Airport shall proceed with navigation lights illuminated during the hours between sunset and sunrise.

9. All persons taxiing aircraft on the Airport shall yield to other aircraft taxiing on the right, unless otherwise instructed by the ATCT or the RCF.

E. Aircraft Towing

Regulations:

1. No person shall engage in the towing of any aircraft unless and until that person has received movement area training as required by the Authority.
2. No person shall tow any aircraft onto a movement area without prior clearance from the ATCT and the RCF.
3. No person responsible for the operation of aircraft towing equipment shall operate or permit the operation of the equipment unless it is equipped with an operable radio transceiver capable of two-way communications with the ATCT on the ground-control frequency and the RCF on ramp frequency and operated by a person trained in aeronautical radio communications technique, terminology, phraseology and procedures.
4. Every person towing an aircraft shall comply at all times with all ATCT and RCF instructions.
5. No person shall operate an aircraft towing vehicle (e.g., tug or tractor) unless it is equipped with functioning and operable lights and brakes per the manufacturer's specifications.
6. Every person operating a towing vehicle at night shall operate the equipment with the lights on and ensure that any towed aircraft is either lighted (i.e., all aircraft position lights are on) or illuminated (i.e., external lights are shining onto the aircraft to make its fuselage, wingtips and tail visible).
7. No person towing an aircraft shall stop en route unless specifically directed otherwise by the ATCT, RCF or an Airside Operations Duty Manager.
8. Unless otherwise directed by the ATCT or RCF, every person operating an aircraft tow vehicle shall use the following towing procedures:
    a. Contact "Lindbergh Ground" on the ground frequency (123.90 MHz) for Gates 1-18, 20, 21, 22, 24, 26, 28, 30 and 32.
        (1) Identify yourself with your radio call sign.
        (2) Indicate your present location, your intention and your destination.

b. Contact "Ramp Control Tower" on the ramp control frequency (129.775 MHz) for Gates 23, 25, 27, 29, 30, and 33-51 and during the hours of 2400-0600 to contact the ATCT.

   (1) Identify yourself with your radio call sign.

   (2) Indicate your present location, your intention and your destination.

c. Do not proceed until positive clearance is received from ATCT or the RCF. Strictly comply with ATCT and RCF instructions.

d. Upon receiving clearance from the ATCT and RCF, tow the aircraft from its departure location directly onto the nearest taxiway, using caution not to collide with any structures such as taxiway edge lights, signs, markers, or other fixed or moving objects (e.g., vehicle, aircraft, ground service equipment, etc.).

e. Contact the ATCT and RCF upon clearing the movement area after entering the intended aircraft parking area.

F. Aircraft Parking

Authority Code 8.10 § (d). No aircraft shall be parked, stored or repaired on airports under the jurisdiction of the San Diego County Regional Airport Authority (the "Authority") except in the areas designated for such use.

Authority Code 8.10 § (e). At the direction of the President/CEO of the Authority or his or her designee (the "President/CEO"), the operator, owner or pilot of any aircraft on the airports under the jurisdiction of the Authority shall move the aircraft from the place where it is parked or stored to any other place designated on the airports under the jurisdiction of the Authority. In event of the failure or refusal to comply with such directions, the Authority may cause the aircraft to be moved to such place at the operator's expense and without liability for damage that may result from such moving.

Regulations:

1. No person shall park any aircraft on the Airport except in areas, and in the manner, designated by the President/CEO or his or her designee.

2. No person shall position unscheduled or non-air carrier aircraft on a main terminal ramp or any overnight parking ramp without prior direction from the President/CEO or his or her designee.

3. The operator of any aircraft at the Airport shall move the aircraft from the place where it is parked or stored to any other place designated on the Airport at the direction of the President/CEO or his or her designee. In an event of the failure

or refusal to comply with such direction, the President/CEO may cause the aircraft to be moved to such place at the operator's expense.

4. The operator of any aircraft using the North Ramp shall comply with the following procedures:

   a. Positions N1 to N11, are administered by Airport Operations.

   b. Aircraft may not taxi into or out of positions N1, N2, N9 or N10. On being towed off the ramp, aircraft at these positions may not use any engine power setting higher than “idle” until the aircraft is positioned parallel to and on the centerline of Taxiway C.

   c. Aircraft may taxi into or out of positions N3, N4, N5, N6, N7, N8, and N11 only under all of the following conditions:

      (1) When there is sufficient clearance for the unobstructed and safe maneuvering of the aircraft; and

      (2) When the aircraft movement is guided by qualified personnel; and when there is certainty that the aircraft engine exhaust will not cause property damage, bodily injury, or interference with other aircraft using the ramp or Taxiway C.

   d. Aircraft must park tail to north except for position N11, unless otherwise authorized by the Airside Operations Department.

   e. Ground Service Equipment (GSE) may be staged between the north edge of the ramp and the ramp lighting poles.

   f. Aircraft parked on positions N8, N9 or N10 must have a tow bar and tug attached at all times and have personnel available to immediately relocate aircraft, if required.

   g. No aircraft larger than Group V shall be parked on the North Ramp without special coordination with the Airside Operations Department.

   h. Operation of aircraft APU or GPU is restricted to the minimum necessary to complete required maintenance.

3.2.6 GATE USAGE AND ASSIGNMENTS

A. General

Authority Code § 8.10 (m). No person shall use an air terminal building gate position at the airports under the jurisdiction of the Authority without permission from the President/CEO.

Regulations:

1. No person shall park an aircraft or leave an aircraft parked and unattended on the movement area or non-movement areas, except as permitted by the President/CEO.
2. No person shall use an aircraft gate except on a pre-assigned and reserved basis under conditions approved by the President/CEO or his or her designee.

B. Usage of Gates Assigned to Other Airlines

Regulations:

1. No airline may use a gate assigned to another airline without prior permission from the leasehold airline, unless authorized by the President/CEO or his or her designee.
2. Every airline authorizing use of its own preferential gate facilities by another airline shall assume full responsibility for such usage and shall ensure usage is in accordance with all agreements with the Authority.

C. International Gate Usage

Regulation.

1. No person shall conduct an international flight operation requiring the use of the Federal Inspection Service Facility (including, but not limited to, Customs, Border Protection, United States Department of Agriculture (USDA) at Gate 20, 21 and 22 without first obtaining the prior approval and schedule through the U. S. Customs Service, Border Protection, and the President/CEO or his or her designee.

D. Remain Overnight Aircraft (RON)

Regulation.

1. No person shall conduct an overnight operation without complying with the guidelines and procedures of the RON Plan.

   The process of assigning RON aircraft parking positions at the Airport is the administrative responsibility of the Air Service Development Department.

E. Parts Delivery Aircraft Parking

Regulations:

1. General aviation operators delivering any parts or maintenance equipment to any airline shall park at or near the appropriate leasehold gate only for the express purpose of unloading parts and equipment.

2. Every general aviation operator shall either reposition its aircraft to the FBO or depart the Airport immediately after doing so.
3. Every general aviation operator shall park its aircraft only in a tenant leasehold area or on an available parking ramp (North, East or West) as assigned by the Airside Operations Department without impacting any other operators.

3.2.7 CHARTER FLIGHT AND ITINERANT OPERATIONS

Regulations:

A. Every person conducting a charter flight or itinerant air carrier operation shall comply with all existing safety and security procedures as directed by the Authority and outlined in the Airport Security Program (ASP).

B. Every person engaged in ground handling shall submit a charter flight advisory form to the Airside Operations duty manager's office at least 24 hours prior to operation and shall notify the Airside Operations duty manager of any changes or follow-up information as such information becomes available.

Forms are available by telephoning (619) 400-2710.

C. Every person engaged in ground handling shall be responsible for all vehicle escorts and shall provide at least one escort for every two vehicles, with all vehicles in full view and under positive control of the escort at all times.

D. Every person engaged in ground handling shall be responsible for maintaining positive control of all passengers per TSA security requirements, with charter aircraft sponsor airlines being responsible to oversee the enplane/deplane procedures and to comply with TSA security requirements.

E. Every person enplaning or deplaning passengers shall use either a loading bridge (jet-ways) or portable air stairs and shall not permit said passengers to use jet-way crew stairs.

F. Every person who requires security at the location of any aircraft on the Airport due to the condition, kind, type or mission of the aircraft shall notify and receive permission from the Manager, Aviation Security and Law Enforcement, prior to placement of such personnel.

3.2.8 HELICOPTER OPERATIONS

A. Arrival

Regulation.

1. Every person operating a rotary wing aircraft arriving at the Airport shall follow Air Traffic Control Tower instructions, remaining on or north of Taxiway C's centerline until reaching below 20 feet above ground level. The aircraft shall land

(landing wheels touching and resting on the pavement) then ground or air taxi to its final destination on the Airport in accordance with Air Traffic Control Tower instructions.

B. Departure

Regulation.

1. All persons operating any rotary wing aircraft departing the Airport shall contact the ATCT for taxi clearance. The aircraft shall ground or air taxi at or below 20 feet above ground level, and depart the Airport in accordance with Air Traffic Control Tower instructions. During initial take-off and climb out, the aircraft shall remain on or north of Taxiway C's centerline until reaching a minimum altitude of 100 feet above ground level (AGL).

C. Noise Abatement

Regulation.

1. All helicopters are considered Stage 2 aircraft for noise abatement purposes (Federal Aviation Administration (FAA) AC36-1 (H)) and are subject to the daily Airport departure prohibition between 10:00 p.m. and 7:00 a.m. The only exceptions are aircraft operating under a life flight call sign. Noise abatement requirements and restrictions relevant to operating at the Airport can be found in the "Remarks" section of the FAA National Oceanic and Atmospheric Administration (NOAA) Southwest United States version of the Airport Facility Directory.

3.2.9 AIRCRAFT INCIDENTS AND ACCIDENTS

Aircraft rescue and firefighting (ARFF) vehicles have priority over all other personnel and vehicles in response to an emergency. The Airside Operations duty manager continues to be in charge of the Airport while the ARFF units respond to the incident.

A. Emergency Response

Regulations.

1. No person shall interfere with any ARFF units responding to an emergency situation.
2. No person other than an ARFF unit shall enter the periphery of an incident scene until summoned or escorted into the area by the Airside Operations duty manager or ARFF units.
3. All personnel and equipment proceeding onto the Airport movement area during an emergency situation or incident shall receive prior clearance from the ATCT.

B. Notification/Coordination

Authority Code § 8.10 (h). The pilot of an aircraft involved in an accident on the airports under the jurisdiction of the Authority causing personal injury or property damage shall report it fully to the President/CEO within 24 hours of such accident. In the event that he or she is unable to do so, the owner or his or her agent and witnesses shall make such report.

1. Air Carriers

Regulation.

a. All air carriers involved in any accident or incident while at the Airport shall immediately marshal their assets (personnel/equipment) and standby to be escorted to the appropriate site after the Airside Operations duty manager has notified the airline station manager or the Airline Operations office.

2. Air Carriers not based at the Airport

The Airside Operations Duty Manager will coordinate with the FBO or other air carriers to assist in the removal of disabled aircraft from the runway and/or taxiways.

3. General Aviation

Any general aviation or corporate aircraft owner/operator requiring assistance in the removal of disabled aircraft may contact the Airside Operations duty manager. The FBO may provide assistance if specifically requested by the aircraft owner/operator. The Airside Operations duty manager shall determine whether an escort is needed for any fixed base operator assistance provided.

C. Aircraft Accident Reports

Regulations:

1. All persons involved in any accident or incident at the Airport causing personal injury, death or property damage shall make a prompt and complete report concerning the accident to the office of the President/CEO in addition to all other reports required to be made to other agencies.
2. When a written report of an accident is required by the Federal Aviation Regulations (FARs), a copy of such report shall be submitted to the President/CEO.

D. Disabled Aircraft

Authority Code § 8.10 (f). The owner of an aircraft, or part thereof, that is disabled on the airports under the jurisdiction of the Authority shall have it promptly removed to an area designated by the President/CEO, unless he or she is required to delay it pending investigation of an accident. In the event such aircraft, or part thereof, is not removed as directed by the President/CEO, the Authority may remove it at the

owner's expense and without liability for additional damage resulting from the removal.

Regulations:

1. No person may move any aircraft involved in an accident or incident when the matter falls within the jurisdiction of the NTSB or FAA until such federal officials have given permission for the removal, and such permission has been verified by the President/CEO, or his or her designated representative on the scene.
2. The operator of any disabled aircraft at the Airport shall be responsible for the prompt removal of their aircraft and any parts thereof as directed by the President/CEO.

3.2.10 AIRCRAFT WASHING AND DE-ICING

A. Aircraft Washing

Regulations:

1. No person shall wash any aircraft except in areas designated by and in a manner authorized in writing by the Authority's Environmental Affairs Department in coordination with the Airside Operations Department.

   All requests for approval of the manner of aircraft washing at the Airport shall be submitted in writing to the Environmental Affairs Department, and must contain, at a minimum, the following information:

   a. name of airline, tenant, or aircraft owner or operator;
   b. the location where aircraft wash activities will be conducted;
   c. the general timeframe and/or frequency of proposed activities (for example, daily, weekly, seasonally in the fall/winter, occasionally, sporadically);
   d. the name of company or firm conducting aircraft wash activities, if other than the airline, tenant, or aircraft owner or operator;
   e. a description of the methods, materials, chemicals (including Material Safety Data Sheets (MSDS)), if any, and equipment used in the aircraft wash activities;
   f. the methods and means of storage and handling of material and equipment used in the aircraft wash activities;
   g. the methods and means to manage, contain, and dispose of contaminated materials resulting from or associated with the aircraft wash activities; and
   h. a list of the stormwater pollution prevention Best Management Practices (BMPs) used to control potential pollutants related to the activity.

See: SAN Storm Water Management Plan (SWMP), Appendix B, Best Management Practice (BMP) SC-04.

2. Any spillage or release of de-icing fluid must be promptly cleaned up by the responsible party in accordance with Section 3.2.1.I.3 (under Storm Water Compliance).

B. Aircraft De-icing

Regulations:

1. No person shall de-ice any aircraft except in areas designated by and in a manner authorized in writing by the Authority's Environmental Affairs Department in coordination with the Airside Operations Department.

   All requests for approval of the manner of de-icing at the Airport shall be submitted in writing to the Environmental Affairs Department, and must contain, at a minimum, the following information:

   a. name of airline, tenant, or aircraft owner or operator;
   b. the location where aircraft de-icing activities will be conducted;
   c. the general timeframe and/or frequency of proposed activities (for example, daily, weekly, seasonally in the fall/winter, occasionally, sporadically);
   d. the name of company or firm conducting aircraft de-icing activities, if other than the airline, tenant, or aircraft owner or operator;
   e. a description of the methods, materials, chemicals (including Material Safety Data Sheets (MSDS)), if any, and equipment used in the aircraft de-icing activities;
   f. the methods and means of storage and handling of material and equipment used in the aircraft de-icing activities;
   g. the methods and means to manage, contain, and dispose of contaminated materials resulting from or associated with the aircraft de-icing activities; and
   h. a list of the stormwater pollution prevention BMPs used to control potential pollutants related to the activity.

      See: SAN Storm Water Management Plan (SWMP), Appendix B, Best Management Practice (BMP) SC-05.

2. Authorization of the manner in which de-icing is conducted may require the authorized party to provide reports in a form specified by the Authority regarding the number of de-icing operations conducted and/or the amount of de-icing fluids and/or waste water collected during a specified period and/or other operational aspects of the activity.

3. Any spillage or release of de-icing fluid must be promptly cleaned up by the responsible party in accordance with Section 3.2.1.I.3 (under Storm Water Compliance)

4. All persons using glycol shall adhere to stormwater pollution control BMPs. Proper technique shall be used when de-icing aircraft to ensure that only the amount of chemical needed to complete the operation is applied. To the extent possible, alternative de-icing and anti-icing techniques shall be used to minimize the use of glycol.

   Techniques for minimizing glycol use are described in FAA advisory circulars (ACs).

3.2.11 MAINTENANCE AND REPAIR OF AIRCRAFT

A. Designated Locations

Regulation.

1. No person shall repair any aircraft, aircraft engine, propeller or other aeronautical equipment in any area of the Airport other than those specifically designated for such purposes by the Airside Operations Department, unless specifically permitted by the Airline Operating Agreement or exempted as follows:

   a. Minor adjustments may be made while the aircraft is on a loading ramp preparing to depart.

   b. Emergency repairs may be made to an aircraft that is located in an area not immediately posing a hazard to other aircraft movements, providing such repairs are made only to enable the aircraft to be moved to an approved service location.

B. Gates

Regulations:

1. No person shall make any adjustment or repair on or to any air carrier aircraft at a gate position on the terminal apron that interferes with the operations of another air carrier aircraft.

2. No person shall make any adjustment or repair to any air carrier aircraft at a gate position on the terminal apron without first coordinating them with the Airside Operations Department.

3. Any aircraft being repaired at a terminal gate position shall be moved immediately upon the request of the Airside Operations Department.

C. Hangars

Regulations:

1. No person shall repair any aircraft in a storage area of a hangar, other than inspecting and replacing minor parts not involving the use of open flames or heat.
2. No person shall start or operate any aircraft engine inside any hangar.

D. Containers

Regulations:

1. All tenants and parties responsible for aircraft maintenance shall inspect all containers used for the storage of aviation maintenance-related fuels, greases, oils, flammable liquids or waste products for leaks and proper integrity.
2. All such containers shall identify the type of material stored.
3. All such containers, as well as the location of the storage containers and equipment, shall be maintained in accordance with NFPA guidelines and the City of San Diego fire codes.

3.2.12 STORAGE OF GROUND SERVICE EQUIPMENT

Regulations:

A. No person shall operate any GSE unless it is clearly identified with the name or logo of the responsible company.

B. The operator of any equipment that is no longer being used or is unserviceable shall ensure it is transferred to an area designated or approved by the Airside Operations Department and a date for removal is provided.

C. All operators shall regularly inspect all stored equipment for leaks of fluids.

D. All operators shall immediately stop, control, clean up and report any leaks in accordance with these Rules and Regulations and other applicable laws.

3.2.13 STORAGE OF AIRCRAFT AND PARTS

Authority Code 8.10 § (d). No aircraft shall be parked, stored or repaired on airports under the jurisdiction of the San Diego County Regional Airport Authority (the "Authority") except in the areas designated for such use.

Authority Code 8.10 § (e). At the direction of the President/CEO of the Authority or his or her designee (the "President/CEO"), the operator, owner or pilot of any aircraft on the airports under the jurisdiction of the Authority shall move the aircraft from the place where it is parked or stored to any other place designated on the airports under the jurisdiction of the Authority. In event of the failure or refusal to comply with such

directions, the Authority may cause the aircraft to be moved to such place at the operator's expense and without liability for damage that may result from such moving.

Regulation.

A. No person shall use any area of the Airport for parking or storage of aircraft without the written permission of the Airside Operations Department.

3.3 VEHICLE OPERATIONS ON THE AIR OPERATIONS AREA (AOA)

3.3.1 AIR OPERATIONS AREA (AOA) DRIVER'S PERMITS

Regulations:

A. Every person operating a motor vehicle or equipment on the AOA shall have a valid California Drivers license or an out-of-state driver's license valid in the State of California in their immediate possession.

B. No person shall operate a motor vehicle or equipment on the AOA with a suspended or revoked driver's license. The suspension or revocation shall result in the automatic revocation of AOA driving privileges.

C. All drivers on the AOA, except those driving emergency vehicles responding to emergencies, shall carry a valid airport-issued driver's permit.

D. No person, except those driving an emergency vehicle responding to an emergency, shall drive on the AOA without having first passed an AOA driving test.

AOA driving tests are administered by the Aviation Security and Public Safety Department. An endorsement is placed on the SAN ID badge indicating a valid AOA driver.

3.3.2 REGISTERING OF VEHICLES

A. Air Operations Area (AOA) Vehicle Permits – Vehicles Licensed by the State of California

Regulations:

1. Prior to operating a motor vehicle with a valid California license plate on the AOA, all persons shall register with the Access Control Office and be issued a vehicle authorization permit, except emergency vehicles responding to emergencies and vehicles under proper escort.

   Vehicle authorization permits are issued by Access Control Office as follows:

   a. Motor vehicle permits are classified into three different categories (permanent, temporary, and visitor) as determined by the President/CEO.

b. AOA vehicle permit applications must be fully completed and signed by the master leaseholder, vendor or contractor prior to submission to the Access Control Office for approval and issuance of permits.

c. Evidence of valid insurance must be submitted with each AOA vehicle permit application and proof of current coverage shall be filed with the Access Control Office annually.

2. All persons issued an AOA motor vehicle permit shall display such permit in the lower corner of the front windshield on the passenger or driver side. Permits shall not be covered by any device that obstructs the view of such permit.

   Display of motor vehicle permits on the passenger side is preferred.

   Failure to display any required permit may result in the removal of the vehicle from Airport property and the cancellation of any permit issued. Removal shall be at the vehicle owner's expense.

3. Every tenant sponsoring a vendor vehicle or equipment shall obtain a visitor AOA vehicle permit and provide an appropriate tenant escort for the vehicle/equipment and operator prior to such vehicle/equipment/operator entering or operating on the AOA. Every escort shall be conducted by a person holding a valid escort authorization and AOA driver endorsement. The escorted vehicle shall be in view and under the positive control of the person providing the escort at all times, in accordance with applicable escort requirements.

B. Air Operations Area (AOA) - Vehicles Not Licensed by the State of California

Regulations:

1. All persons operating a motor vehicle on the AOA not licensed by the State of California shall ensure that such vehicle is equipped with at least two headlights and two red tail lights. All lights shall be kept illuminated during operation between sunset and sunrise.

2. All persons operating a motor vehicle on the AOA shall dim the headlights of the vehicle when meeting oncoming aircraft.

3. No person shall operate a vehicle not licensed by the State of California on the AOA other than authorized tenant employees who have been issued an airport driver’s permit and only for the purpose of tenant business.

C. Air Operations Area (AOA) Vehicle Identification

Regulations:

1. Every person operating an unescorted motor vehicle or equipment on the AOA shall ensure that such vehicle or equipment displays a logo or sign which clearly identifies the entity responsibility for the operation of the vehicle.
2. The logo or sign identifying an unescorted motor vehicle or equipment on the AOA shall be of a contrasting color scheme, placed on both sides of the vehicle, and shall be identifiable at a distance of not less than 100 feet.

D. Large Vehicles

Regulations:

1. No person shall tow any trailer or semi trailer on the AOA unless it is equipped with a braking device or system that will adequately hold and stop such trailer in the event it becomes disengaged from the towing vehicle.
2. All persons moving, positioning or parking large, tall or slow vehicles (e.g., large cranes, vehicles carrying oversize loads, backhoes, earth movers, dump trucks) shall coordinate with and receive approval from the President/CEO prior to operating on the AOA.

3.3.3 AUTHORIZED AIR OPERATIONS AREA (AOA) AREAS FOR MOTOR VEHICLES

Regulations:

A. No person shall operate any motor vehicle on the AOA other than on a vehicle service road, leasehold, airline terminal building ramp or overnight parking apron.

B. No person shall operate any motor vehicle on any portion of the Airport movement area other than vehicles approved by Airport Operations.

C. No person shall operate any vehicle in the ILS Critical Area when that area is active.

D. No person shall operate any contractor vehicle outside of the contractor's authorized work area, lay down area or prescribed travel/haul route.

3.3.4 VEHICLE OPERATIONS

A. Motor Vehicle and Equipment Operation around Aircraft

Regulations:

1. Every person operating a vehicle or equipment shall yield the right-of-way to aircraft at all times.
2. No person shall drive any vehicle or equipment in front of a taxiing aircraft.
3. No person shall drive any vehicle or equipment under the wing of an aircraft unless in the act of servicing the aircraft.

4. No person shall drive any vehicle or other equipment within fifty (50) feet of an aircraft during fuel servicing operations unless the vehicle or equipment is being used to service the aircraft.
5. All persons backing up any service vehicle or other equipment shall ensure safe clearance from all aircraft, equipment and vehicles.
6. No person shall drive a vehicle or equipment on the AOA if it is constructed, equipped or loaded so as to endanger persons or property.
7. No person shall operate any motorcycle, motorbike, three-wheeled motor vehicle, roller or inline skates, roller blades, skateboard, bicycle or scooter, or personal transporter (e.g., Segway-type vehicle) on the AOA, with the exception of Harbor Police officers performing their official duties.

   Upon request, the Authority may approve exceptions to the prohibition on bicycles provided that the bicycles (two or three wheels) are equipped with an operating headlight, reflective tape or reflectors, orange flag, company logo or markings; and directly supports an operational need. The storage location of bicycles or bicycle racks on the AOA shall be approved in advance by the Airport Authority.
8. No person shall drive any vehicle on the terminal apron:
   a. across any active passenger loading lane (i.e., between the aircraft and the terminal gate or bus when passengers are being boarded or are disembarking);
   b. under any loading bridge that is moving or being repositioned; or
   c. between the terminal and an aircraft during a pushback, with the exception of company service vehicles, Harbor Police, or the Airside Operations Department. Such drivers shall follow the direction of the aircraft's ground crew when present.
9. No person shall operate a vehicle or equipment to tow an aircraft on the AOA without prior clearance from the ATCT.
10. No person shall tow an aircraft between sunset and sunrise unless the aircraft has navigation lights illuminated or other lighting that ensures the visibility of the moving aircraft.
11. No person shall tow more than four baggage carts or container carts.

B. Parking

Regulations:

1. No person shall park any aircraft service vehicle or equipment on the AOA without first engaging the emergency parking brake or using wheel chocks.
2. No person shall leave any vehicle or equipment parked on the AOA with a key in the ignition switch, with the motor running, or without the emergency brake engaged.
3. Every person operating a vehicle or equipment on the AOA that becomes disabled shall remain with the vehicle or equipment until such time as it can be removed for repair or until such time as Harbor Police directs otherwise.
4. No person shall park any vehicle or equipment on the AOA so as to become a hazard to any aircraft entering or departing a gate position.
5. No person shall park any vehicle or ground equipment near any aircraft in such a manner as to prevent the ground equipment from being readily driven or towed away from the aircraft in an emergency.
6. No person shall park any vehicle or equipment in a manner so as to block:
    a. the fence barrier openings or emergency entrances to the AOA;
    b. airport service equipment and aircraft rescue and fire fighting vehicles;
    c. ambulances, emergency vehicles and equipment;
    d. fire hydrants and fire lanes;
    e. building entrances and exits;
    f. loading bridges or any paved access ways, roadways, or vehicular traffic areas; or
    g. fuel spill response trailers and carts.
7. All vehicles and equipment on the AOA, including, but not limited to, carts, stands, trucks, and tugs, shall be parked in assigned positions.
8. All portable loading ramps, baggage trucks and other such equipment on the AOA shall be equipped with brakes or suitable locking devices which shall be securely set when the equipment is not in use.

C. Speed Limits and Operations on the Air Operations Area (AOA)

Regulations:

1. All persons driving any vehicle or equipment on the AOA shall obey all signs, lights and mechanical devices, unless specifically directed otherwise by Harbor Police or Airside Operations Department personnel.
2. In the absence of a posted speed limit, all persons driving on the AOA shall adhere to the following speed limits:
    a. perimeter road between Taxiway C6 and Taxiway B10 (the instrument landing system (ILS) critical area) - 25 mph, except within the vicinity of the glideslope antenna where the speed limit of 10mph is posted.
    b. perimeter road - 25 mph (except in the vicinity of the Least Tern Nesting Ovals during Least Tern Nesting Season, April 1 through September 15).
    c. terminal apron - 20 mph
    d. within 50 feet of any aircraft or in the tunnels and baggage claim areas – 5 mph

D. Cleaning, and Maintenance of Vehicles

Regulations:

1. All persons operating mobile service equipment on the AOA shall ensure that such equipment is in good repair at all times.
2. No person shall drive a vehicle or operate equipment on the AOA with any technical or mechanical defect which impairs its safe operation.
3. No person shall drive a vehicle or operate equipment on the AOA which causes the release of any fluid or material into the environment.
4. No person shall operate any vehicle on the AOA when any California Vehicle Code (CVC) safety item is malfunctioning or missing from such vehicle or causes the driver's view to be obstructed.
5. No person shall wash any vehicle or equipment except in areas designated and in a manner approved in writing by the Environmental Affairs Department in coordination with the Airside Operations Department.

    All requests for approval of the manner of vehicle and/or equipment washing shall be submitted in writing to the Environmental Affairs Department, and must contain, at a minimum, the following information:

    a. name of the tenant, or vehicle and/or equipment owner or operator;
    b. the location where the wash activities will be conducted;

c. the general timeframe and/or frequency of proposed activities (for example, daily, weekly, seasonally in the fall/winter, occasionally, sporadically);

d. the name of the company or firm conducting the wash activities, if other than the tenant, or vehicle and/or equipment owner or operator;

e. a description of the methods, materials, chemicals (including Material Safety Data Sheets (MSDS)), if any, and equipment used in the wash activities;

f. the methods and means of storage and handling of material and equipment used in the wash activities; and

g. the methods and means to manage, contain and dispose of contaminated materials resulting from or associated with the wash activities; and

h. a list of the stormwater pollution prevention Best Management Practices (BMPs) used to control potential pollutants related to the activity.

See : SAN Storm Water Management Plan (SWMP), Appendix B, Best Management Practice (BMP) SC-04 and SC-12.

6. Any spillage or release of de-icing fluid must be promptly cleaned up by the responsible party in accordance with the Section 3.2.1.I.3 (Under Storm Water Compliance).

E. Cleaning and Servicing of Lavatory Equipment

Regulation.

1. No person shall clean or service any lavatory vehicle outside of the triturator area without the prior approval of the Airside Operations Department.

F. Alcohol and Drugs

Regulation.

1. No person shall operate any vehicle or equipment on the AOA while under the influence of any alcohol or drug.

   Any violation of this regulation will be reported immediately to the Harbor Police.

G. Accidents

Regulations:

1. No person shall leave any vehicle or equipment involved in an accident on the AOA resulting in damage to property or bodily injury before notifying the Harbor Police Department and Airside Operations Department.
2. No vehicle or equipment involved in any accident on the AOA shall be moved until the Harbor Police accident investigation is complete.

H. Emergency Vehicles

Regulation.

1. All persons shall yield to emergency vehicles or equipment responding to any emergency on the Airport.

I. Ensuring Security

Regulation.

1. All persons proceeding through any gate of entry or exit shall secure such gate immediately afterward.

Failure to secure the gate may be deemed cause to rescind any permit and access to the AOA. This is also a TSA security violation and may be cited by the Authority, Harbor Police or members of the TSA.

3.3.5 VEHICLES OPERATING ON MOVEMENT AREAS

Regulations:

A. Every person driving on a taxiway, runway or other area controlled by the ATCT shall EITHER:
   1. have been trained in proper radio and movement area procedures;
   2. have available two-way radio communications with the ATCT; and
   3. receive clearance and permission from the ATCT to access those areas; OR
   4. be escorted by a driver who has the above training, capabilities and clearance; and
   5. receive prior approval from the Airside Operations Department.

B. Every person driving while under the control of the ATCT shall adhere to all regulations, instructions, procedures and advisories of the FAA.

   Violation of this regulation shall be cause for termination of driving privileges on the airfield.

C. Every person operating any vehicle or equipment on the movement areas shall ensure that such vehicle or equipment is readily identified by paint scheme, logo, flag or other device as specified in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5210-5B (as amended).

D. Every person operating any vehicle or equipment within any area under the control of the ATCT shall have an operational need and have completed the movement area training.

The Airside Operations Department, Harbor Police Department, ARFF and Airport maintenance vehicles, in compliance with this section, are permitted to operate wherever necessary with permission from the ATCT.

E. Every person operating any vehicle or equipment between sunset and sunrise on the movement areas shall display an amber or red flashing or rotating beacon.

Vehicles operating on the service road are not required to have rotating/flashing lights displayed.

3.3.6 ABANDONMENT

Regulations:

A. No person may abandon any vehicle or equipment on Airport property. The owner of any vehicle or equipment found to be inoperative, unlicensed to operate under the CVC, or otherwise reasonably found to be abandoned shall be responsible for all expenses incurred in the removal of such vehicle or equipment.

Notification of such removal is made by the Harbor Police.

B. No person shall leave any vehicle unattended for any reason while in an area of the AOA not designated for parking.

C. Every person leaving a vehicle unattended in an area not designated for parking on the AOA shall notify the Airside Operations Duty Manager's office immediately and give the location, duration, and reason for leaving the vehicle unattended.

3.4 FUELING OPERATIONS AND SPILL PROTECTION ON THE AIR OPERATIONS AREA (AOA)

3.4.1 GENERAL

Authority Code § 8.11 (l). The Authority's President/CEO or his or her designee may adopt and set forth additional rules and regulations relating to aircraft fueling operations.

Regulation.

A. Every tenant who stores, handles, or dispenses aircraft fuel ("fueler") at the Airport, except a fixed based operator (FBO) or the operator of an aircraft at the Airport, shall use the aviation fuel storage facility and delivery facilities designated by the Authority for such use.

If the designated facilities are not available, the tenant may make other arrangements, provided that such alternative arrangements are approved in advance by the Authority.

3.4.2 COMPLIANCE

Authority Code § 8.11 (a). Every fueler must meet and comply with all applicable federal, state and local laws regulating the storage, handling and dispensing of aviation fuel.

Regulations:

A. Every fueler shall meet all applicable guidelines of the NFPA, the American Society of Testing Materials (ASTM) and the American Petroleum Institute (API).

B. Every fueler shall comply with all currently applicable FAA guidelines and advisory circulars (ACs).

C. Every fueler shall comply with all currently applicable United States Environmental Protection Agency (EPA) Oil Pollution Prevention and Spill Prevention, Control, and Countermeasure (SPCC) Rule requirements (40 CFR part 112).

3.4.3 INSPECTIONS

Regulations:

1. Every fueler shall make its physical facilities at the Airport available for inspection by the Authority at least once every three months for compliance, in accordance with 14 Code of Federal Regulations part 139.321(d). A record of each inspection shall be retained for at least twelve (12) consecutive calendar months.

2. Every fueler shall immediately take corrective actions to remedy any discrepancies noted by the Authority and a written report of corrective actions taken shall be sent to Airside Operations within ten (10) days of the observed discrepancy.

3.4.4 STORAGE FACILITIES

Regulations:

1. Every fueler shall perform at least one leakage test per month on each of its storage tanks and fueling pipelines.

2. Every fueler shall ensure that its fuel storage tanks and fueling vehicles are identified by the type of fuel and fuel octane stored.

3. Every fueler shall have adequate procedures for sampling and testing fuels. All tests and test schedules shall be performed in accordance with applicable regulations. Test results shall be retained for at least 24 months.

3.4.5 FUELING OPERATIONS

Authority Code § 8.11 (b). No aircraft shall be fueled or drained while an engine is running or while the aircraft is in a hangar or an enclosed space.

Authority Code § 8.11 (c). During all fueling operations, the aircraft shall be grounded by a method approved by the President/CEO.

Authority Code § 8.11 (d). Lighting of an open flame is prohibited within 50 feet of any fueling operation.

Authority Code § 8.11 (e). Aircraft being fueled shall be positioned so that aircraft fuel system vents or fuel tank openings are not closer than 25 feet to any terminal building, hangar, service building, or enclosed passenger concourse other than a loading walkway.

Authority Code § 8.11 (g). Adequate fire extinguishers shall be within ready reach of personnel engaged in fueling operations. Extinguishers shall not be located near fuel hoses, pumps, meters or valves.

Authority Code § 8.11 (h). No electrical or radio equipment shall be operated on aircraft during fueling operations in a manner that endangers any person or property on the facilities and airports under the jurisdiction of the Authority.

Authority Code § 8.11 (i). All fuel dispensing equipment shall be kept in a safe and non-leaking condition.

Regulations:

A. No person shall fuel any aircraft while one or more of its engines are running, except when conducted under procedures approved by the FAA and consistent with proper safety practices.

   Cross-reference: See Regulations; Section 6.2.B Fire Extinguishers.

B. No person shall engage in any aircraft fueling or fuel draining operation without proper spill response equipment and supplies readily accessible at the point of fueling or fuel draining.

C. Every person shall immediately suspend all fueling or fuel draining operations if a lightning flash is reported or observed within five (5) miles of the Airport and shall not resume any fueling or fuel draining operations until fifteen (15) minutes after the last observed lightning flash.

   The Airside Operations duty manager will notify all fueling agents of the suspension and when fuel transfer activities may be resumed.

D. All persons conducting fueling operations shall ensure that qualified personnel are stationed at the aircraft fuel control panel during pressure-fueling operations.

E. Every person conducting fueling operations shall ensure that all fuel dispensing equipment hoses, funnels or apparatus used in fueling or draining fuel from aircraft are properly grounded in accordance with FAA and NFPA guidelines.

F. No person shall act in any manner or use any material that is likely to cause a spark within fifty (50) feet of any aircraft during fueling operations.

G. Every person observing any fire in a fuel delivery device servicing an aircraft shall notify the Harbor Police Department (“HPD”) immediately.

H. In the event of any fire in a fuel delivery device servicing an aircraft, fueling shall be discontinued immediately and all emergency valves and dome covers shall be shut down at once.

I. No person shall fuel any motor vehicle or other equipment on the Airport other than at an approved location or at an Authority-approved dispensing device.

3.4.6 FUEL SERVICE VEHICLES

A. General

Authority Code § 8.11 (f). Fuel trucks shall be parked at least 50 feet from any hangar or building unless engaged in active fueling of an aircraft.

Regulations:

1. Every person operating any aircraft fueling or defueling equipment shall remain with such equipment while it is connected to an aircraft.
2. No person shall operate any fueling vehicle designed for or employed in the transportation of fuel on a taxiway or runway at any time.
3. Every person operating a fuel service vehicle shall maintain air pressure for the brakes such that the vehicle can immediately move during an emergency.
4. Every person operating aircraft fueling or defueling equipment shall stabilize such equipment with an emergency brake and chock blocks during fueling or defueling operations and while parked unattended.
5. No person shall stage any fuel service vehicle on a terminal ramp overnight.
6. No person shall back up any vehicle used for fueling within twenty (20) feet of any aircraft unless a person is posted to assist as a guide.
7. Every person conducting a fueling operation shall ensure that the aircraft and aircraft fueling vehicle are adequately bonded.
8. Every person conducting a fueling or defueling operation shall hold open by hand any self-closing nozzles or dead man controls during the entire operation.
9. Every person conducting a fueling or defueling operation shall ensure that the nozzles and dispenser are labeled according to fuel type.
10. Every person operating a fuel servicing vehicle shall ensure that the vehicle has two (2) fire extinguishers with a rating of 20- B: C, one mounted on each side of the vehicle.
11. Every person operating a fuel servicing vehicle shall ensure that the vehicle has sufficient spill absorbent materials on board to properly contain a spill of at least five (5) gallons.

B. Vehicle Parking

Regulations:

1. Every person parking an aircraft fuel service vehicle shall ensure that the vehicle is positioned and in a condition ready to facilitate egress in the event of an emergency.
2. Every person parking an aircraft fuel service vehicle shall maintain at least ten (10) feet of clear space between adjacent vehicles for access by fire suppression personnel and equipment.
3. Every person parking an aircraft fuel service vehicle shall ensure that the vehicle is located and positioned to prevent potential fuel spillage from entering into any storm or slit trench drain.
4. No person driving a fuel service vehicle shall enter any structure other than a maintenance facility.
5. No person shall park or leave unattended any fuel service vehicle within fifty (50) feet of any hangar, aircraft, passenger terminal, fuel storage facility or occupied structure.

3.4.7 FUEL SPILLS

A. Prevention

Regulations:

1. Every fueler, owner or operator of a fuel or oil storage facility ("fueler") who files a Spill Prevention Control and Countermeasure Plan (SPCC) with the United States EPA pursuant to the Federal Water Pollution Control Act (PL 92-500) shall also file a copy of the SPCC with the Authority's Environmental Affairs Department. The SPCC shall be renewed every three years, with all updates and changes filed with the Environmental Affairs Department.
2. Every person conducting fueling or defueling operations shall arrange for the proper handling and disposal of any trash, waste or other hazardous materials generated, including but not limited to, used oil, solvents and other waste.
3. Every person conducting fueling or defueling operations shall develop adequate procedures to limit fuel spills.
4. Every fueler shall prepare a fuel spill contingency plan, including notification and clean-up procedures.

5. Every fueler shall train its fuel service personnel in the appropriate use of fire extinguishing and spill response equipment.
6. Every tenant involved in or contracting for fueling operations shall maintain an adequate supply of fuel absorbent materials readily available to respond in the event of a fuel spill.
7. Every tenant involved in or contracting for fueling operations shall maintain a valid contract with a hazardous materials emergency response and cleanup services provider (hazardous materials contractor) and shall provide the name of the company to both Airside Operations and the Environmental Affairs Department in writing.

B. Reporting

Regulations:

1. Every person shall promptly report any fuel spill to their supervisor and the Airside Operations Department.
2. Every person shall immediately report to HPD if a spill presents an immediate fire hazard or otherwise endangers life or property and or, if the spillage is over ten (10) feet in length in any dimension or over 50 square feet in area.
3. When a fuel spill does not require ARFF units to respond, every person causing the fuel spill shall stand by with a fire extinguisher during the clean-up process.
4. Every person operating any vehicle or equipment causing a fuel or oil spill which seeps into a sewer, storm or slit trench drain; which cannot be controlled or cleaned up using on-site in-house absorbent equipment and manpower; or which reaches or has the potential to reach the San Diego Bay must be reported to Airside Operations, the local emergency agency, the National Response Center and the State of California Office of Emergency Management Agency (Cal EMA) as soon as the responsible party has knowledge of the spill or discharge and notification can be provided without substantially impeding cleanup or other emergency measures.

   Local emergency agencies can be contacted by dialing 911.

   The National Response Center can be contacted at (800) 424-8802 or (202) 267-2675 or contact Harbor Police at 619-686-8000.

   The State of California Office of Emergency Management Agency (Cal EMA) can be contacted at (800) 852-7550 or (916) 845-8911.

C. Safety and Clean Up Procedures

Authority Code § 8.11 (j). No aircraft shall be started when there is fuel on the ground under or near the aircraft.

Regulations:

1. Every person operating any vehicle or equipment creating any spillage or release of gasoline, jet fuel, oil, grease or other petroleum-based product or hazardous material shall remove the material immediately by suitable procedures in a manner acceptable to the President/CEO.
2. Every person conducting an aircraft or vehicle refueling operation in the immediate vicinity of a fuel spill shall terminate such operation.
3. No person shall operate any electrical or automotive equipment within one hundred (100) feet of any spill until safe conditions are restored.
4. No person shall start or move any aircraft, vehicle, or spark-producing equipment within any spill area before the area is declared safe by either the Airside Operations Department or the ARFF captain.
5. When a spill occurs and no fire is present, no person shall move any fuel delivery vehicle or equipment in the immediate area until the spillage is dispersed or removed and the area is deemed safe as determined by the ARFF captain.
6. No person shall continue any fueling operation until after a spill is cleaned up and final approval is given from the Airside Operations Department.
7. Every person conducting a fuel spill clean-up operation shall prevent fuel from entering any storm or slit trench drain.
8. No person shall permit any type of fuel, grease, oil, flammable liquid or contaminant of any kind to flow into or be placed in any storm or slit trench drain.
9. Emergency clean-up using the storm drain shall only be accomplished on the North Ramp or the Terminal 2 West Ramp where the storm drains are equipped with approved separation device. Immediately following the clean-up process, the fuel shall be removed from the separation device by the fueling agent at the responsible party's expense.
10. Every person responsible for a fuel, grease, oil, flammable liquid or contaminant spill of any kind shall take immediate action to begin clean-up operations.
11. Every person cleaning a fuel, grease, oil, flammable liquid or contaminant spill of any kind shall use absorbent substances or absorbent pads. The contaminated

absorbent material shall be placed in metal containers and shall be properly disposed of in a timely manner in accordance with applicable laws and regulations.

12. All persons responsible for fuel, grease, oil, flammable liquid or contaminant spill of any kind that is larger than the responsible party can adequately handle or that reaches the storm drain system shall immediately obtain the clean up and fuel recovery services of the Hazardous Materials Contractor.

    Cross-reference: See Regulation 3.4.8.B.

13. Every person responsible for any fuel, grease, oil, flammable liquid or contaminant spill of any kind shall be liable for all costs associated with the control, containment, clean up, disposal and damages to the Airport facilities resulting from the spill or clean-up operations.

3.4.8 LAVATORY CHEMICAL AND/OR LAVATORY WASTE SPILLS

A. Reporting

Regulations:

1. Every person in the AOA shall promptly report any lavatory chemical or lavatory waste spill to their supervisor and the Airside Operations Department.
2. Every person responsible for any lavatory chemical or lavatory waste spill which seeps into the storm or slit trench drains; which cannot be controlled or cleaned up using on-site in-house absorbent equipment and manpower; or which reaches or has the potential to reach the San Diego Bay shall report such spill to Airside Operations, the local emergency response agency, and the State of California Office of Emergency Management Agency (Cal EMA) as soon as the responsible party has knowledge of the discharge and the notification can be provided without substantially impeding cleanup or other emergency measures.

   The local emergency response agency can be contacted by dialing 911.

   The State of California Office of Emergency Management Agency (Cal EMA) can be reached at (800) 852-7550 or (916) 845-8911.

B. Safety and Clean Up Procedures

Regulations:

1. Every person conducting spill clean-up operations shall prevent lavatory chemicals and lavatory waste from entering any storm or slit trench drain.

2. Every person responsible for any lavatory chemical and lavatory waste spill shall take immediate action to begin clean-up operations.
3. Every person when cleaning any lavatory chemical or lavatory waste spillage shall use absorbent substances or pads. The contaminated absorbent material shall be placed in metal containers and be properly disposed of in a timely manner in accordance with applicable laws and regulations.
4. Every person conducting lavatory chemical or lavatory waste spill clean-up operations shall properly disinfect all impacted surfaces.

3.4.9 FOREIGN OBJECT DEBRIS (FOD)

A. General

Regulations:

1. Every person with access to the air operations area (AOA) shall keep the aprons, ramps and grounds of the Airport free of all FOD.

   Cross-reference: See Rules and Regulations Section 3.2.5 Ground Operations.

2. Every tenant providing a trash container at the Airport (e.g., cans, dumpsters, compactors) shall ensure that the container is covered, checked frequently, and emptied as necessary to prevent spillover of trash.
3. No person shall establish a break area (tables, chairs, trash can, etc.) on the ramp without prior approval from the Airport Authority. Unauthorized break areas on the ramp will be removed by the Authority.

B. Foreign Object Debris (FOD) Containers

Regulations:

1. Every tenant on the AOA shall provide and maintain clearly marked and covered FOD containers for the deposit of materials picked up from the aprons and other areas of the Airport.
2. Every tenant providing and maintaining one or more FOD containers shall empty such containers on a scheduled basis and as necessary.

SECTION 4

4.0 TERMINAL AND TENANT OPERATIONS

4.1 SCOPE AND APPLICABILITY

This section specifies the general required procedures for terminal and tenant operations at the Airport.

An agreement with the Authority is required to operate on the Airport.

4.2 BUSINESS CONDUCT/OCCUPANCY

A. Conducting Business in Common Areas

Authority Code § 8.41 (a). It shall be unlawful for any person to engage in any performance as an entertainer or engage in any business or commercial activity on any of the facilities or airports under the jurisdiction of the San Diego County Regional Airport Authority (the "Authority"), except as authorized by a valid grant, franchise, lease, certificate or permit from the Authority.

(b). Every person violating any of the provisions of this section shall be guilty of a misdemeanor.

Regulations:

1. Every tenant conducting aeronautical or aeronautical support activities at the Airport shall conform with all applicable regulations of the Federal Aviation Administration (FAA), the Transportation Security Administration (TSA) or any successor agency, directives of the Authority (including, but not limited to, the Airport Certification Manual (ACM) and the Airport Security Program (ASP)), and these Airport Rules and Regulations.
2. No tenant shall conduct business in any public area or other common area of the Airport including, but not limited to, sidewalks, entrances, passages, elevators, vestibules, stairways, corridors, driveways or parking areas.
3. All tenants shall only use common areas as passageways to and from their respective work areas or to reach, as customers, the leaseholds of other tenants.

B. Prohibited Uses of Premises

Regulation.

1. No tenant shall occupy or permit any portion of its premises to be occupied in any manner whatsoever beyond the use(s) set forth in its agreement with the Authority.

C. Damage to Fixtures and/or Facilities

Regulation.

1. Every tenant misusing any fixture or facility on the Airport premises shall bear the cost of repairing damage resulting from such misuse.

   Repair costs may be billed to the tenant, subtenant or affiliated entity through additional rent or other cost recovery.

D. Theft

Any theft or loss should be reported to the Harbor Police Department at (619) 686-8002.

The Authority will not be responsible for lost or stolen personal property from any tenants' leased premises or common areas regardless of whether such loss occurs when the area is locked against entry or not.

E. Locks and Keys

Regulations:

1. No tenant shall make a duplicate of any security key for a lock on any door or gate on Airport premises leased to the tenant without first obtaining approval of the President/CEO or his or her designee.

   For more information, contact the Authority's Terminals & Tenants Department at (619) 400-2694.

2. No tenant shall install any additional door lock without the prior written consent of the President/CEO or his or her designee.

3. All tenants that have lost a security key shall be responsible for all costs associated with any resulting re-keying or re-pinning.

   The Authority provides all initial door locks in each tenant's leased premises. All subsequent lock changes requested by the tenant, if approved by the Authority, shall be completed by the Authority at tenant's sole expense and cost. The Authority shall furnish to each tenant a reasonable number of keys to the tenant's leased premises at the initial move in. All subsequent key requests shall be at the tenant's sole expense and cost.

4.3 CLEANLINESS

Regulations:

A. All tenants shall keep their leased areas and adjacent areas clean and free of rubbish and trash. Nothing shall be swept or thrown into the corridors, hallways or stairwells.

B. All tenants shall close all corridor doors to their leaseholds when those doors are not in use.

Cross-reference: See Rules and Regulations Section 6.6.C. Hangar Safety/Spills and Leaks.

4.4 IMPROVEMENTS

A. Approval Required

Regulation.

1. Prior to commencing any tenant improvement or construction project on the Airport, the tenant shall first obtain the written approval of the President/CEO or his or her desginee, regardless of the scope of work.

No tenant improvement project, including "minor" projects such as new telephone or data lines, is exempt from this regulation.

For more information, contact the Authority's Terminals & Tenants Department at (619) 400-2694.

B. Approval Process

Proposed tenant improvements and construction projects ("tenant improvements") shall be submitted to the Terminals & Tenants Department for review and approval prior to the tenant commencing work on the project.

Tenant improvements shall comply with the Authority's standards as contained in the Authority's Tenant Design Criteria, Airport Sign Policy, the Lindbergh Field Design and Construction Standards, and other standards as may be amended or implemented. All submittal forms and standards can be obtained from the Authority's Terminals & Tenants Department at (619) 400-2694. Incomplete or non-complying submittals may be rejected or placed on hold pending provision of a conforming submittal.

Submittals of accurate and complete as-built drawings are required for projects involving extensive remodeling, and/or electrical, mechanical, and structural systems and other projects as may be required in the Authority's discretion.

Authority review is not a substitute for any other required applicable permits or approvals including, but not limited to, those issued by the following agencies: City of San Diego Development Services (building, electrical, plumbing, heating, and ventilating and air conditioning (HVAC), fire and temporary permits), County of San Diego Department of Environmental Health, and the Federal Aviation Administration (FAA).

C. Hot Work

Cross-reference: See Rules and Regulations Section 6.3.C. Fire Hazards/Open Flames

D. Tenant and their Contractors

Regulations:

1. No contractor of a tenant on the Airport shall commence any type of construction work prior to the tenant obtaining approval in writing from the President/CEO or his or her designee.
2. All tenants conducting any improvement project shall ensure that such project conforms with the President/CEO's written approval.

   Authority representatives including, but not limited to, the Construction Inspector may direct a tenant or tenant contractor to correct improvements or construction operations and/or stop construction when a project is either unauthorized or not complying with the written conditions of approval for that project.
3. All tenants shall control and direct their contractors working at the Airport.
4. All contractors and subcontractors of an Airport tenant shall procure, provide and maintain insurance coverage naming the Authority as an additional insured, insuring such risks in such amounts and with a company meeting the minimum requirements set by the Authority.
5. All tenants conducting any construction work at the Airport shall perform such work in accordance with all laws and regulations; pursuant to a valid building permit; and in a good and workmanlike manner.
6. All tenants conducting any construction work at the Airport shall ensure that their activities do not result in any damage to the Airport or other tenant property, improvements or possessions.

4.5 SECURITY

A. General

Regulations:

1. All tenants shall ensure the internal security of leased areas, including company aircraft and aircraft parking ramps.
2. All tenants shall have in place an approved program to prevent any unauthorized access to any restricted areas or the AOA via their leasehold or an operating area.

3. All tenants shall screen all unidentified and unbadged persons entering or found in their leasehold or operating area.
4. All tenants loading or off-loading any passengers shall provide an authorized and badged employee as an escort during passenger loading or off-loading to prevent unauthorized access to the aircraft and the AOA.
5. All tenants shall ensure that departure gate access doors remain closed and locked during any non-flight activity.

B. Construction

1. Ensuring Compliance

Regulation.

a. All tenants shall ensure complete compliance with all applicable security requirements specified in the Airport Security Program (ASP) for any construction or other contracted services they conduct at the Airport.

Although Transportation Security Administration (TSA) officials, Harbor Police Officers, Aviation Security and Public Safety Department, Airside Operations Department, Terminals & Tenants and Facilities Development personnel monitor Airport construction activities, it is the responsibility of the tenant (including any contractor and/or designated Chief of Security, if applicable) to ensure compliance with the requirements set forth by the Authority.

For construction activity on the AOA, refer to the Airport Operational Safety & Security Requirements on the AOA (available at www.san.org).

2. Briefing

Regulation.

a. No tenant shall begin or permit any work on the Airport until the tenant, the tenant's contractor, and the contractor's Chief of Security (if such employee is required) has received a briefing from the Manager, Aviation Security and Law Enforcement, or his or her designated representative.

3. Perimeter Fence and Gate Security

Regulations:

a. All tenants conducting any construction project requiring access through the Airport perimeter fence shall:

(1) only use designated and approved perimeter access gates and follow pre-approved travel routes;

(2) obtain SAN Identification (ID) badges allowing access to pre-determined and approved areas; and

(3) not install any type of locking device on any gate unless approved by the Manager, Aviation Security and Law Enforcement, or his or her designated representative.

b. Every tenant modifying the Airport perimeter security system shall obtain the prior approval of the Manager, Aviation Security and Law Enforcement. Security fencing and/or gate construction shall be in conformity with applicable Federal Aviation Regulations (FARs) and Advisory Circulars (ACs). The integrity of the perimeter fence and gate system shall be strictly maintained at all times without exception. Gaps between gate end posts and fence support posts shall not exceed two inches. Gaps under fencing shall not exceed four inches from the bottom of the fence fabric to surface grade.

4. Doorway Security

Regulations:

a. All tenants engaged in construction shall maintain positive security controls to prevent unauthorized access to restricted areas of the Airport. Full height barrier walls, if installed, shall be maintained to provide a secure barrier at all times. Existing doorways and installed temporary doorways shall be secured or guarded with authorized SAN Identification (ID) badged personnel at all times. Temporary doors installed for use by the tenant or contractor personnel that allow access to restricted areas shall be secured with a lock issued by Airside Operations Department, or by other means approved by the Manager, Aviation Security and Law Enforcement.

b. No tenant shall:

(1) modify a security access door closure device or automatic locking mechanism;

(2) use an emergency exit (alarmed door) for access unless authorized by Airside Operations; or

(3) allow a security access door to be propped open unless a guard is physically posted at the door to prevent unauthorized access and Airside Operations is notified in advance.

The Airside Operations Duty Manager will notify and authorize the Security Operations Center (SOC) to disregard the Door Open Too Long alarm until the work at the door under repair is complete. This prevents the Harbor Police Department (HPD) from being dispatched unnecessarily to respond to

the alarm. Guards must be approved by the Manager, Aviation Security and Law Enforcement, and the Contractor's Chief of Security.

All security access doors must close and lock automatically.

5. Airport SAN Identification (ID) Badge Requirements for Contractors

Regulations:

a. Every tenant engaged in any work at the Airport shall ensure that there is at least one contractor supervisor/foreman with a photo SAN identification (ID) badge in each work area at all times. The contractor supervisor/foreman shall escort and vouch for all contractor personnel wearing SAN identification (ID) visitor badges with "escort required" limitations in the work area.

b. Every tenant engaged in any work at the Airport shall ensure that all personnel wearing a visitor badge are under escort at all times when in restricted areas of the Airport. An escort must be a Security Identification Display Area (SIDA) badge holder with "escort" authority.

c. Every tenant engaged in any work at the Airport shall ensure that:

(1) all of its visitors display orange visitor badges;

(2) all of its visitors are in view and under the positive control (not more than 25 feet) of a SAN Identification (ID) badge holder at all times; and

(3) no more than five (5) visitors accompany any escort at a time.

4.6 STORM WATER COMPLIANCE

The Airport Authority Board has adopted the SDCRAA Code Sections 8.70 to 8.79, known as the SDCRAA Storm Water Management and Discharge Control ("Storm Water Code"). The Storm Water Code sets forth uniform requirements and prohibitions for dischargers and places of discharge to the storm water conveyance system and receiving waters necessary to adequately enforce and administer all laws, standards, orders and special orders that provide for the protection, enhancement and restoration of water quality. The Storm Water Code applies to all tenants, persons and places located on property within the Authority's jurisdiction that discharge storm water or non-storm water into any storm water conveyance system or receiving waters. Any tenant violating any of the provisions or failing to comply with the mandatory requirements of the Storm Water Code is subject to enforcement action.

There is a wide variety of airport, airline, aircraft, and ground support-related activities conducted at the Airport that are subject to the requirements of one or both of the following National Pollutant Discharge Elimination System (NPDES) storm water permits:

- State Water Resources Control Board Water Quality Order No. 97-03-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities ("General Industrial Permit"), as amended, modified, revised, or re-issued; and

- California Regional Water Quality Control Board, San Diego Region, Order No. R9- 2007-0001, National Pollutant Discharge Elimination System (NPDES) No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego (County), the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (SDCRAA) ("Municipal Permit"), as amended, modified, revised, or re-issued;

The Authority has prepared a Storm Water Management Plan (SWMP) that outlines a comprehensive program to reduce and eliminate pollutants from entering the storm water conveyance system and receiving waters. The Storm Water Management Plan (SWMP) describes potential pollutant sources at the Airport and the management programs in place to reduce or eliminate them.

Regulations:

1. All tenants at the Airport shall comply with the current applicable General Industrial and Municipal Permits of the California Regional Water Quality Control Board and shall respond to all Authority requests for pertinent information regarding facilities, operations, and activities.
2. Each Airport tenant, service provider and other commercial user shall be fully aware of and comply with federal, state and local storm water pollution prevention laws and regulations, the Storm Water Code, the National Pollutant Discharge Elimination System (NPDES) permits applicable to the Airport, and the Storm Water Management Plan (SWMP). Airport tenants, service providers and other commercial users are also responsible for ensuring that their contractors and sub-contractors comply with these requirements.
3. Any spillage or release of gasoline, jet fuel, oil, grease, lavatory chemicals, lavatory waste, waste water of any kind, or any other material or pollutant which may degrade the environment or may be unsightly or detrimental to the pavement in any area of the Airport shall be removed immediately by the party or operator responsible, using suitable procedures in a manner acceptable to the President/CEO. The failure of the responsible party to act promptly to immediately remedy the spill or release may result in a determination by the President/CEO to expend Authority resources to protect public health and safety, property and the environment and to seek reimbursement for such expenditures from the party responsible.

Cross-references: See Rules and Regulations Sections 3.4.7 Fuel Spills, and 3.4.8 Lavatory Chemical and/or Lavatory Waste Spills.

4.7 CARE OF BUILDING

A. Covering or Obstructing Windows and Doors

Regulations:

1. No tenant shall cover or obstruct any door, sash, window, glass door, light or skylight that reflects or admits light into the common areas of the Airport.
2. No bottles, parcels, showcases, inventory, wares or merchandise of any type shall be placed on any windowsill or in the public portions of any terminal building.
3. No tenant shall construct or place any window display case or platform anywhere such that it can be viewed from or through an outside window or door without prior written approval as to the design, content, location, construction and suitability of the subject matter from the President/CEO.
4. No tenant shall attach any awning, shade or other window covering (including but not limited to curtains, blinds, drapes or screens) to the inside or outside walls or to the inside or outside of windows of any leasehold without the prior written consent of the President/CEO.

   Any items requiring President/CEO consent must be of the quality, type, design, color, material, and general appearance specified by the Authority.

B. Baggage Storage Cases

Regulation.

1. No tenant shall use any baggage storage case located in any baggage claim area other than for the temporary storage of luggage or other travel-related, passenger-owned items.
2. No tenant shall apply any poster or other promotional material to the inside of any panel of a glass case in the baggage storage area. Any affixed items must be promptly removed at the request of the Authority.

C. Tenant Restrooms

Regulation.

1. No tenant shall use any restroom for any purpose other than those purposes for which it was constructed.

D. Defacing Exterior Surfaces

Regulation.

1. No tenant shall mark, drive nails or screws into, drill into, paint or in any way deface the exterior walls, roof, foundations, bearing walls or pillars of any leasehold or building without the prior approval of the Authority. The expense of repairing any breakage, stoppage or damage resulting from such activity will be borne solely by the tenant.

E. Utility Systems

Regulations:

1. No tenant shall install or use any water cooler, ice machine, air conditioning unit, heating or other similar type equipment without the prior written consent of the President/CEO.
2. All tenants installing or maintaining electrical equipment shall ensure that only trained and qualified electricians install and maintain the equipment. Facilities containing such equipment shall be regularly inspected to correct any hazard resulting from operational use.
3. No tenant shall install any temporary or makeshift wiring other than extension lights.
4. All tenants using any explosion-proof or vapor-tight equipment shall regularly maintain such equipment in accordance with safety standards.
5. No tenant shall install any semi-permanent or permanent electrical installation without Authority approval.

F. Painting and Battery Work

Cross-reference: See Rules and Regulations 6.3.D Fire Hazards/Paint Spraying/Stripping, Battery Work and Doping

G. Hot Work

Cross-reference: See Rules and Regulations 6.3.C. Fire Hazards/Open Flames

4.8 CLOSURE OF ENTRANCES

The Authority reserves the right to close and keep locked any and all entrances and exit doors of the Airport, including but not limited to gates into parking areas, during such hours the President/CEO deems appropriate for the cleaning, maintenance or protection of the Airport.

4.9 SIGNAGE AND TENANT ADVERTISING

A. Permanent Signage

Regulation.

1. No tenant shall exhibit, inscribe, paint or affix any sign, advertisement, notice or other lettering on any part of the outside or inside (if visible from outside) of a leasehold or terminal facility surface, including, but not limited to, ticket counters, gate check-in counters and ticket lift podiums without the prior written consent of the President/CEO.

   The President/CEO may remove any violating object without any liability and may charge the expense incurred by such removal up to and including repair and rehabilitation costs to the tenant as additional rent or cost recovery.

   The President/CEO shall have the right to prohibit any advertising or business conducted by a tenant on the Airport that, in his or her opinion, tends to damage the reputation of the Authority and/or may encourage tenants to refrain from or discontinue advertising or business.

B. Signage Content

Regulations:

1. No tenant shall display any sign or signage content other than the business name, address, product, service or principal use of the premises.
2. No tenant shall display any signage containing advertisements that include any rates or prices.

   Tour and service information brochures offered by a tenant may be permissible at the business counters and must be kept in an acceptable display case (e.g., Lucite holder).

C. Banners

Regulation.

1. No tenant shall post or display any banner prior to receiving approval from the President/CEO.

   The President/CEO reserves the right to limit the number of banners and signage placed at the Airport.

   Approval Process

   Tenants must deliver banners to the Terminals & Tenants Department for approval. A letter explaining the purpose of the banner may be requested. No advertising or political messages of any type will be allowed on banners or signs.

Upon approval of the banner, the Terminals & Tenants Department will affix an Authority approval sticker to the lower right corner of the banner. The Authority approval sticker will contain the approval expiration date. Approval is for a maximum of thirty (30) days. Extensions may be authorized upon written request.

Installation

The Facilities Management Department is responsible for the installation and removal of all banners.

Banners may not be displayed in areas that block airport signage, exit signs, fire extinguishers, or pull boxes. Banners may hang no lower than ten (10) feet from the floor.

Banners should be constructed of lightweight, fire retardant materials. Plastic banners are not permitted.

D. Digital Corporate Welcome Signs

Digital corporate welcome signage supplied by the San Diego Convention and Visitors Bureau (San CVB) and the San Diego Convention Center Corporation may be placed on the 70-inch digital displays in the baggage claim areas of the Commuter Terminal, Terminal 1 and Terminal 2. The welcome signs may appear for approximately ten (10) seconds every sixty (60) minutes, depending on the availability of space.

Digital corporate welcome signage specifications require static images and 1920 x 1080 HD video files in MPEG-2 HD, WMV-HD, MPEG-4 or AVI format.

All requests for digital corporate welcome signs from the San Diego Convention and Visitors Bureau (San CVB) or the San Diego Convention Center Corporation must be sent with artwork attached to the Senior Marketing Specialist II, Vision, Voice & Engagement. Contact Vision, Voice & Engagement at (619) 400-2871 for assistance. Once approved by the Authority, all digital corporate welcome signs will be forwarded to a consultant with start and end dates as identified by the Senior Marketing Specialist II, Vision, Voice & Engagement.

No other welcome signs shall be placed on the digital baggage claim screens without pre-approval of the Authority.

E. Community Outreach Program – Regional Non-Profit Organizations

As part of the Community Outreach Program, a number of wall wraps in Terminals 1 and 2 have been designated for a diverse group of local not-for-profit organizations that reflect the region's diversity and uniqueness.

A rotating schedule of not-for-profit organizations will be developed by the Art Program Manager and the Senior Marketing Specialist II, Vision Voice & Engagement. Each wall wrap will have a three-month rotation allowing for 48

organizations to participate in a 12-month period. A request for proposals will be issued to the region's not-for-profit organizations to solicit participation. All art requires prior Authority approval. Wall wrap dimensions depend on location. Specifications will be provided upon acceptance into the program.

F. Holiday Decorations

Regulation.

1. All tenants shall remove at their own expense any holiday or other decorations deemed offensive in the judgment of the Terminals & Tenants Department.

   Tasteful decorations are permitted at ticket counters and gate areas.

   Any damage to Airport facilities resulting from decorations may be charged to the tenant as additional rent or cost recovery.

G. Solicitation of Business

Regulations:

1. No tenant shall solicit business in the terminal outside of their leased areas, in parking areas or in other common areas.
2. No tenant shall distribute any handbills or other advertising matter on automobiles parked in the parking areas or elsewhere.

4.10 TERMINAL PAGING SYSTEM

Regulations:

A. No tenants shall use the terminal paging system other than for essential announcements, such as updated departure/arrival times, flight cancellations and gate changes. All paging announcements are to be made in a brief, clear and concise manner.

B. All tenants with access to the paging system shall warn all employees that nonessential information over the paging system is strictly prohibited.

The Airport paging system is the property and responsibility of the Authority. Any repairs, modifications or maintenance to the system is performed by the Authority or in accordance with tenant plans pre-approved by the Authority.

Where damage due to misuse or negligence has occurred, the Authority may repair the system or return it to its former configuration. The cost of such work will be billed to the responsible tenant as additional rent or cost recovery.

4.11 DELIVERIES

A. Use of Public Areas

Regulations:

1. All tenants shall ensure that deliveries to and from their leasehold are made only in such a manner and at such times as prescribed and approved by the President/CEO.
2. All tenants shall ensure that the movement of any bulky merchandise or materials into or out of their leasehold occurs through the public entrances during non-peak hours between 11:30 p.m. and 5:00 a.m.
3. All tenants shall assume all risks and liability for any damage to property or injury to persons where such damage or injury is a result of services provided to the tenant.
4. All tenants moving in or out of their leasehold areas shall repair, at their sole cost and expense, any damage to the building caused by their move.
5. All tenants shall keep loading areas neat, clean and free of any debris or spillage at tenant's sole cost and responsibility.
6. No tenant shall permit any items, trash or other refuse to be left unattended in any common area. The responsible tenant shall reimburse the Authority for the cost of removal in the event of any violation.
7. No tenant shall use in any public area of the Airport any hand truck or dolly for the delivery or receipt of merchandise other than one equipped with rubber tires and side guards.

B. Use of Escalators

Regulation.

1. No tenant shall use an escalator at the Airport to transport any type of equipment, concession supplies, construction supplies or contractor materials. Any damage to any escalator shall be borne by the offending tenant.

4.12 NOISE

Regulation.

A. No tenant shall make or permit to be made any unseemly or disturbing noises disturbing or interfering with other occupants of the terminal or other structures, whether by the use of any musical instrument, radio, television set, voice machine, paging system, unusual noise or otherwise.

4.13 VERMIN AND PESTS

Regulation.

A. Any tenant that misuses or neglects their leasehold or leased terminal area such that it becomes infested with vermin or pests shall at their own expense cause the vermin or pests to be exterminated immediately. The tenant shall employ licensed exterminators as pre-approved in writing by the President/CEO.

   The tenant's failure to act promptly to immediately remedy the infestation may result in a determination by the President/CEO to expend Authority resources to protect public health and safety, property or the environment. The Authority may use all means available to seek reimbursement for such expenditures from the tenant.

4.14 ELECTRONIC EQUIPMENT

Regulations:

A. No tenant shall use or bring upon the leasehold any electronic equipment, computers, data processing equipment or other equipment that may interfere with the electronic equipment of the Authority or another tenant.

B. No tenant shall erect, install or otherwise maintain any aerials, transmitters or antennas without prior written consent from the President/CEO.

4.15 QUEUING LINES AND STANCHIONS

Regulation.

A. All tenants shall ensure that queuing lines and stanchions do not unreasonably impede access and egress through any public area. In the event such lines unreasonably impede passenger flow, the tenant shall make immediate corrections.

   The Authority recommends that queuing lines be controlled with stanchions with stanchion-mounted signs. Stanchion-mounted signs must contain professionally manufactured messages. Handwritten signs are not acceptable and may be removed by Authority personnel. The tenant may use a colored connection strap that identifies their name and/or corporate identity.

   Stanchions must be free from damage (e.g., damaged or loose stanchion bases, broken connection straps or straps tied together). Such stanchions and damaged stanchion-mounted signs are not acceptable and will be removed by Authority personnel.

   Unless prior permission is received from the President/CEO, interior stanchions must be chrome and exterior stanchions must be black powder-coated and weather-resistant.

SECTION 5

5.0 MOTOR VEHICLE AND GROUND TRANSPORTATION OPERATIONS

5.1 SCOPE AND APPLICABILITY

This section prescribes general required operating procedures for all motor vehicles and ground transportation service operations at the Airport. Except in cases of emergency involving the protection of life and/or property, motor vehicles shall be operated in strict accordance with these rules and regulations, Authority Codes, and the California Vehicle Code (CVC).

5.2 REGULATIONS APPLICABLE TO ALL MOTOR VEHICLES

Authority Code § 9.30 (j). Unless otherwise provided, any applicable state and local laws relating to the operation of motor vehicles on the public highways thereof, apply to the operation of motor vehicles on the facilities and airports under the jurisdiction of the Authority.

A. Speed Limits

Authority Code § 9.30 (h). No person shall drive any vehicle in excess of posted speed signs and in no event in excess of 15 miles per hour, unless otherwise posted. A violation of this provision shall constitute a misdemeanor.

Authority Code § 9.31 (a). It shall be unlawful to operate any vehicle on the facilities and airports under the jurisdiction of the Authority in excess of posted speed limits.

B. Traffic Signs, Markers and Devices

Authority Code § 9.30 (e). No vehicle shall be parked or operated on the facilities and airports under the jurisdiction of the Authority in violation of posted signs.

Authority Code § 9.32 (a). The President/CEO is hereby instructed to have lines or markings painted or placed upon the curb or upon the street for the purpose of designating parking spaces. Vehicles shall park within the lines or markings so established. It shall be unlawful to park any vehicle across any such line or marking or to park said vehicle in such position that the same shall not be entirely within the area so designated by such lines or markings.

*Authority Code § 9.34 (a). No person shall stop, stand or park any vehicle on facilities or airports under the jurisdiction of the Authority, including the Airport (collectively, the "**Facilities**"), in violation of posted signs or curb markings.*

Authority Code § 9.34 (b). The Authority's President/CEO is authorized to determine such parking restrictions and locate such signs or curb markings as are necessary or appropriate to give notice of any restriction and the applicable hours, times or days any such restriction is effective.

C. Pedestrian Right of Way

Regulation.

1. Every person driving a motor vehicle at the Airport shall yield the right-of-way to any pedestrian who crosses a roadway, access way, designated crosswalk or drive, except where the movement of vehicular traffic is being regulated by an authorized officer of the Authority, a peace officer, or traffic control signals.

D. Vehicle Condition

Authority Code § 9.30 (l). No person shall operate any vehicle that: (1) is so constructed, equipped, or loaded, or which is in such physical or mechanical condition, as to endanger persons or property; or (2) that has attached thereto an object or equipment (including that which is being towed) that drags, swings, or projects so as to be hazardous to persons or property.

E. Permission

Authority Code § 9.30 (m). Unless prior written approval is obtained from the President/CEO, only those motor vehicles licensed to travel on the public highways of the State of California shall be permitted on the roadways, access roads, apron or other vehicular traffic areas of the facilities and airports under the jurisdiction of the Authority.

F. Repairs

Authority Code § 9.30 (n). No person shall clean or make repairs to vehicles anywhere on the facilities and airports under the jurisdiction of the Authority other than in areas designated for this purpose, except for minor repairs necessary with respect to a temporarily disabled vehicle.

G. Loading and Unloading of Vehicles

Authority Code § 9.36 (a). No person shall stop a vehicle for loading, unloading, or any other purpose on the facilities and airports under the jurisdiction of the Authority, including, without limitation, the Airport, other than in areas specifically designated for such use, and only in the manner prescribed by signs, markings, voice recordings or other means provided.

H. Airport Temporary Curbside Parking Permit Rules

Regulations:

1. No emergency vehicle shall park at the curb before contacting an airport traffic officer (ATO) and the ATO performs a cursory inspection, with the exception of Authority and Airport-assigned emergency vehicles, Airport Operations vehicles, and Airport Facilities Maintenance vehicles. All emergency vehicles parked curbside shall be secured at all times.

2. All persons parking a media vehicle at a curb shall adhere to the following procedures:

    a. An ATO shall be contacted prior to parking at the curb.

    b. The ATO shall perform a cursory inspection of the media vehicle.

    c. The media vehicle shall display valid media placards issued by the County or City of San Diego or be marked with station insignia.

    d. The media vehicle shall be parked at the east end of the curb for Terminal 1, to the west of valet parking for Terminal 2, or in front of the pet relief area for the Commuter Terminal (CT).

    e. A member of the media shall remain with the vehicle at all times.

    For more information, contact the Airport Operations Department at (619) 400-2710.

    All other media vehicles should use the parking lots. Media vehicles may park in the Airport parking lots for up to three hours at no cost. A business card is required for parking validation.

3. All persons parking a delivery vehicle at the curb shall adhere to the following procedures:

    a. The delivery vehicle shall display a valid SAN AOA placard or curbside permit.

    b. The driver shall contact an ATO.

    c. ATO shall perform a cursory inspection.

    d. The delivery vehicle shall be secured at all times.

    Other temporary permits may be issued on an as-needed basis under special circumstances. Vehicles may only be parked as per the terms and conditions on the permit. Vehicles shall be secured at all times. The driver shall make contact with an ATO who will verify the permit and make a cursory inspection of the vehicle.

    Any failure to comply with these procedures or the instructions of authorized personnel may result in the immediate revocation of the temporary permit and subject the vehicle to citation and impound. Permits shall be surrendered to any ATO, harbor police officer or Authority Ground Transportation Department employee upon request.

I. Accidents

Authority Code § 9.30 (d). Any accident involving injury or property damage shall be reported to the President/CEO.

Contact the Ground Transportation Department at (619) 400-2685.

Regulation.

1. Every operator of a motor vehicle involved in any accident which results in the injury or death of any person or damage to any property shall immediately stop such vehicle at the scene of the accident and render assistance as needed. The operator shall give their name, address, license and registration numbers, and the name and address of their insurance company to any person injured, any owner of the damaged property, or any peace officer present, and shall notify the Harbor Police immediately. The operator shall make a report of the accident as may be required by and in accordance with applicable law.

J. Towed Vehicles

Authority Code § 9.37 (a). The President/CEO has the authority to remove from any area on the facilities and airports under the jurisdiction of the Authority, including, without limitation, the Airport, any vehicle which is disabled, abandoned or parked in violation of these rules and regulations, or which presents an operational or security problem to any other area of such facilities and airports and may store the same at the owner's or operator's expense and without liability for damage which may result while removing, towing or storing.

Regulation:

The following steps will be taken to resolve the issue of a towed vehicle:

1. A "Notice of Storage" shall be mailed or personally delivered to the registered and legal owners within 48 hours, excluding weekends and holidays, and shall include all of the following information:
   (a) The name, address, and telephone number of the agency providing the notice.

   (b) The location of the place of storage and description of the vehicle, which shall include, if available, the name or make, the manufacturer, the license plate number, and the mileage.

   (c) The authority and purpose for the removal of the vehicle.

   (d) A statement that, in order to receive their poststorage hearing (See Section 7.6 (C)), the owners, or their agents, shall request the hearing in person, writing, or by telephone within 10 days of the date appearing on the notice.

2. The poststorage hearing shall be conducted within 48 hours of the request, excluding weekends and holidays. The public agency may authorize its own officer or employee to conduct the hearing if the hearing officer is not the same person who directed the storage of the vehicle.

3. Failure of either the registered or legal owner, or his or her agent, to request or to attend a scheduled hearing shall satisfy the poststorage hearing requirement.

4. The Authority shall be responsible for the costs incurred for towing and storage if it is determined in the poststorage hearing that reasonable grounds for the storage are not established.

Contact the Ground Transportation Department at (619) 400-2685.

5.3 PARKING AREAS

Authority Code § 9.33 (a). Jurisdiction. The Authority is authorized pursuant to §21100 and 22500 et. seq. of the California Vehicle Code, §170016 of the California Public Utilities Code, and other applicable laws to enact and appoint personnel to enforce parking regulations at the Airport.

Authority Code § 9.33 (b). Authorization. Airport Traffic Officers ("ATOs") and other Authority personnel designated by the President/CEO that are assigned to the enforcement of the Authority's codes, applicable section of the California Vehicle Code, and other applicable laws relating to illegal parking and related violations within the jurisdiction of the Authority are authorized to issue written notices of violation thereof stating the vehicle license number, make of vehicle, the time and date of illegal parking, street location and reference to the appropriate section violated together with fixing a time and place for appearance by the registered owner to answer said notice. Such notice shall be attached to said vehicle in a conspicuous place upon the vehicle so as to be easily observed by the person in charge of such vehicle upon his or her return thereto. The President/CEO may authorize representatives of regulatory agencies to enforce their own regulations on Airport property.

Authority Code § 9.33 (c) Penalty. For the purposes of regulating the use and safety of streets, parking and traffic and as a deterrent to illegal parking, the following penalties are established:

Type of Violation	Authority Code Sections(s)	Penalty Within 30 Days of Issuance	After 30 Days	After 65 Days
Out-of-Stall	9.32(a); 9.34(e)	$35.00	$70.00	$80.00
Unauthorized Airport	9.30(e); 9.30(f); 9.30(n); 9.34(a);	$67.00	$134.00	$144.00

Parking, Stopping, or Standing	9.34(c); 9.34(d); 9.34(f); 9.34(k)			
No Valid Employee Lot Permit	9.34(l)	$35.00	$70.00	$80.00
Unauthorized Commercial Airport Parking, Stopping, or Standing	9.34 (m)	$250.00	$250.00	$250.00

Authority Code § 9.33 (d) Payment of Penalties. The owner or operator of a cited vehicle for a parking code violation may elect to mail the applicable penalties within the time established for payment thereof in accordance with the information specified in the notice of violation; provided, however, said owner or operator shall be and remain responsible for the delivery and payment thereof.

Authority Code § 9.33 (e) Failure to Pay. Failure to pay the appropriate penalty as provided herein or failure to contest the violation in accordance with the information specified in the notice of violation will result in proceeding against the registered owner and or the vehicle operator for violation of the appropriate code section in accordance with the provisions of §40220 of the California Vehicle Code.

Authority Code § 9.33 (f) State Mandate Surcharges. The President/CEO is authorized to adopt procedures and delegate authority for the collection of additional mandated surcharges or fees imposed pursuant to applicable state or municipal law.

A. Public Parking

Authority Code § 9.34 (c). No person shall park a vehicle within any public vehicular parking area except upon the payment of such parking fees and charges as prescribed by the Authority.

Authority Code § 9.34 (d). No person shall enter or use a motor vehicle parking facility or parking space contrary to its posted or restricted use.

Authority Code § 9.34 (e). No person shall park or leave a vehicle unattended in any motor vehicle parking facility or parking space without having positioned said vehicle in a designated stall or area in such a manner as not to obstruct the proper movement of other vehicles in the parking facility or utilization by other vehicles or driveways or adjacent parking spaces.

Authority Code § 9.34 (f). The President/CEO has the authority to store vehicles parked in vehicular parking areas, for nonpayment of parking charges.

Authority Code § 9.34 (g). No person, unless authorized by the President/CEO, or the authorized parking facility operator, shall remove a claim check from a parking facility claim check dispensing machine, other than as an operator of a vehicle entering a parking facility, in which case, such person shall remove only one claim check from the dispensing machine.

Authority Code § 9.34 (h). It shall be unlawful for any person to remove a claim check or checks from, or to otherwise operate, a parking facility claim check dispensing machine, for the purpose of avoiding or enabling another person to avoid payment of the lawful charge of the use of such parking facility.

Authority Code § 9.34 (i). No person shall remove or attempt to remove a vehicle from a parking facility by presenting a claim check other than the claim check originally dispensed to the operator at the time the vehicle entered such parking facility.

Authority Code § 9.34 (j). No person shall present a parking claim check requiring payment of parking fees upon exiting a motor vehicle parking facility which does not indicate an accurate record of the length of time said vehicle was actually within the parking facility; inaccuracies of time recording equipment excepted.

B. Reserved Parking

Authority Code § 9.34 (k). No person shall park any vehicle in any space marked "reserved" without a valid permit issued by the Authority. All such vehicles shall be allowed only within a space or area specifically assigned to them. Parking shall be allowed only within spaces that comply with said designation, and then only for the times officially indicated by such authorized signs.

C. Airport Employee Parking Facilities

Authority Code § 9.34 (l). No person shall park or operate a vehicle on any parking facility established for the use of persons employed at the Authority unless such vehicle has properly affixed thereto a valid and un-expired parking decal or hang tag.

Regulation.

1. No person shall alter, falsify, forge, duplicate or in any manner reproduce or counterfeit any employee parking facility decal or hang tag.

5.4 COMMERCIAL TRANSPORTATION VEHICLES

A violation of any of the following provisions may be penalized by suspension or revocation of privileges and/or as a misdemeanor.

Authority Code § 9.11 (a). No person shall operate or drive or cause to be operated or driven any Taxicab, Vehicle for Hire, Charter Vehicle, TNC Vehicle, scheduled ground transportation service, hotel or other courtesy vehicle or any other commercial ground transportation service (except as provided in Section 9.23 of this Code) over and upon

the non-dedicated private streets for the transportation of persons and baggage from or within the Airport without all valid and necessary permits issued by the Authority.

Authority Code § 9.24 (a). Violations of any of the provisions of Sections 9.01 to 9.24, inclusive, of this Code shall be charged as a misdemeanor and subject to:

(1) Imprisonment in the county jail not exceeding six months;

(2) A fine not exceeding one thousand dollars ($1,000);

(3) Having their vehicle impounded; or

(4) Having any combination of subsections (1), (2), and (3) above imposed.

Authority Code § 9.34 (m). No person shall stop, stand or park, or cause to be stopped, standing, or parked, any commercial ground transportation vehicle on Facilities in violation of posted signs or curb markings.

A. Conformance with Laws

Authority Code § 9.21 (i). Any authorized ground transportation service shall be provided in conformance and abeyance of:

(1) All lawful orders or instruction from authorized officers of the Authority;

(2) Any and all rules and regulations now in force or which may be changed, added, modified or adopted by the Authority for operation of transportation services at the Airport; and

(3) Any and all laws, ordinances, statutes, rules, regulations, orders, permits or certificates from the Airport, any governmental authority, municipal, state or federal, lawfully exercising authority over such person holding an Authority permit, including persons, employees, drivers and agents.

B. Ground Transportation Permits

Authority Code § 9.12. The President/CEO or his or her designee of the Authority may issue permits authorizing ground transportation service for the transportation of persons and baggage from or within the Airport. A valid permit is permission for the person to whom it is given, including said person's employee, driver or agent, to transport, by a vehicle to which a decal or trade dress is affixed, passengers and baggage over and upon the non-dedicated private streets within the Airport, in accordance with the rules, regulations, and standing time limits established and designated by the President/CEO from time to time.

Authority Code § 9.23 (a). No ground transportation permit shall be required for the operation of ground transportation services for the transportation of persons and baggage from the Airport to any government-owned public transportation system.

Authority Code § 9.23 (b). No permit shall be required for the transportation of persons and baggage from the Airport by a vehicle operated for the transportation of passengers pursuant to a tour charter party license issued by the California Public

Utilities Commission operating under an agreement or contract, with a passenger capacity of 25 persons or greater.

1. **Vehicle Restrictions**
   Authority Code § 9.12 (a).

   (1) Beginning July 1, 2012, the total number of authorized vehicle decals for Taxicab permits shall not exceed 450 for the Airport. A reserve list shall be retained and may be used by the President/CEO for possible replacements. The President/CEO has the discretion to determine the number of taxicabs that may serve the Airport each day.

   (2) The total number of authorized Vehicle for Hire operators shall not exceed nine.

   (3) The total number of authorized TNC permittees shall not exceed ten.

   (4) No Vehicle for Hire operator may transfer a vehicle decal except as provided in Section 9.19 of this Code. Authorized Vehicle for Hire operators may increase the number of vehicle decals for their fleet each calendar year by the higher of two vehicles or 10% of their then existing fleet.

   Authority Code § 9.19 is reprinted herein in Rules and Regulations section 5.4.D.

   (5) No Taxicab, Charter Vehicle, Vehicle for Hire, Courtesy Vehicle, or TNC Vehicle shall be operated at the Airport the appropriate current Airport-issued vehicle decal or approved vehicle trade dress and having passed inspection as provided by this Code. No Taxicab, Charter Vehicle, Vehicle for Hire, Courtesy Vehicle, or TNC Vehicle more than ten (10) years old shall be allowed to operate at the Airport.

   (6) The Board reserves the right to increase or decrease the number of ground transportation service permits or otherwise further limit or restrict the days or times for operation of the Permit Holders as provided herein or as may be provided pursuant to a duly adopted resolution.

   Contact the Authority's Ground Transportation Department at (619) 400-2685 for more information.

2. **Permit Terms and Fees**
   Authority Code § 9.12 (b). A ground transportation service permit may be issued any time during the calendar year and shall not exceed the expiration date. Irrespective of the date of issuance of any permit, every ground transportation

service permit shall expire at the end of the permit term period during which it was issued unless any such permit is sooner terminated, suspended, revoked or cancelled. No permit shall be extended nor shall any permit be renewed or transferred except as provided in this Code.

(1) Trip fees or any other fees and charges for a ground transportation service provider shall be set by resolution of the Board.

3. Vehicle Identification

Authority Code § 9.12 (c). All authorized Airport Commercial Ground Transportation Service Provider vehicles shall display an approved vehicle decal or trade dress and have an Authority-approved and operable Automated Vehicle Identification ("AVI") transponder or Global Positioning System ("GPS") unit.

(1) No person shall remove, damage or tamper with a vehicle decal or AVI transponder or GPS unit unless given written authorization by the Authority.

(2) No person shall evade or attempt to evade an Airport AVI reader or GPS System.

(3) No TNC shall operate a vehicle at the Airport without the Authority approved trade dress.

Regulations:

a. All authorized ground transportation service shall have AVI transponders affixed to their Airport-permitted vehicles.

b. Only Airport-authorized personnel shall mount AVI transponders on permitted vehicles.

c. No operator shall remove any AVI transponder without the permission of the Authority's Ground Transportation Department.

d. Every operator who removes a vehicle from service shall return the AVI transponder to the Authority's Ground Transportation Department along with the vehicle decal within five (5) days of the vehicle being taken out of service.

e. All operators shall be responsible in full for any replacement costs for lost transponders.

   The current replacement cost for a transponder is $75.00.

f. Any vehicle that does not have a transponder shall be placed out of service.

g. Any operator found to have tampered with or damaged a transponder shall be subject to suspension or revocation of their Airport permit.

h. Any operator found evading or attempting to evade an AVI reader shall be subject to suspension or revocation of their Airport permit.

4. Vehicle Inspections

Authority Code § 9.12 (d). Each vehicle for which there is a vehicle decal, permit, or trade dress shall pass inspection at an Authority approved Inspection Station prior to operating at the Airport, and shall be subject to further inspection at other times as required by the President/CEO.

Contact the Authority's Ground Transportation Department for more information at (619) 400-2685.

5. Temporary Ground Transportation Service Permit

The Authority's Ground Transportation Department has temporary ground transportation service permits available for current Airport-permitted charter operators. These permits may be used on rented vehicles that are placed into service for periods not to exceed thirty (30) days. Permits may be moved from vehicle to vehicle only as provided.

The number of temporary ground transportation service permits issued to an operator shall not exceed ten percent (10%) of their permanent vehicle decals. An exception may be granted for a maximum of ten (10) decals upon submitting proof of need to the Authority.

Regulations:

a. All operators shall display any temporary ground transportation service permit on the right side of the vehicle dashboard. Vehicles not properly displaying permits are subject to a citation.

b. All charter vehicle operators using temporary ground transportation service permits shall submit an Airport Authority insurance compliance form to the Ground Transportation Department prior to placing a temporary vehicle into service.

   Airport Authority insurance compliance forms are available on the Authority's website at www.san.org. The form may be delivered in person or faxed to (619) 400-2686. Failure to submit the insurance form prior to using the temporary permit may result in the revocation of the permit.

c. Every person operating under a temporary ground transportation service permit shall submit such permit for inspection at the request of any ATO or other authorized personnel.

Misuse of a temporary ground transportation service permit may result in the operator losing the privilege of obtaining future temporary permits.

6. Complaints

Authority Code § 9.17 (a). Every Airport Ground Transportation Service Permit Holder shall respond within ten days to any written complaint concerning transportation services provided or arranged by the Permit Holder to or from the Airport.

Authority Code § 9.17 (b). A Permit Holder also shall respond within ten days to any inquiries from the Authority regarding service complaints and provide copies of any requested correspondence and records.

C. Driver's Permits

Authority Code § 9.13 (a). Except as provided in Section 9.23 of this Code, no person shall drive or operate a commercial ground transportation vehicle at the Airport for the purpose of picking up passengers, except pursuant to a valid ground transportation permit issued by the Authority. For purposes of this Article, a commercial ground transportation vehicle shall include, but not be limited to, a Charter Vehicle, Courtesy Vehicle, Taxicab, Vehicle for Hire and TNC Vehicle.

Authority Code § 9.23 (a). No ground transportation permit shall be required for the operation of ground transportation services for the transportation of persons and baggage from the Airport to any government-owned public transportation system.

Authority Code § 9.23 (b). No permit shall be required for the transportation of persons and baggage from the Airport by a vehicle operated for the transportation of passengers pursuant to a tour charter party license issued by the California Public Utilities Commission operating under an agreement or contract, with a passenger capacity of 25 persons or greater.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for more information.

1. Restrictions on Issuance and Exceptions

Authority Code § 9.13 (b). Every Permittees holding a commercial ground transportation permit shall conduct a background check, as required by the Authority and state law on all its Drivers. Permittees shall not allow any person, as defined below, to operate a commercial ground transportation vehicle.

(1) Any person required to register as a sex offender pursuant to the California Sex Offender Registration Act (California Penal Code §290, et seq.);

(2) Any person required to register with the chief of police pursuant to California Health and Safety Code §11590, et seq;

(3) Any person convicted of a felony;

(4) Any person convicted of violating any of the following:

(i) California Vehicle Code §23152 or §23153;

(ii) The vehicle code of another state or jurisdiction for driving a vehicle upon a highway while under the influence of an intoxicating liquor, drugs or narcotics;

(iii) California Vehicle Code §23103 or §23104; or

(iv) The vehicle code of another state or jurisdiction for reckless driving.

(5) Any person who has been convicted of a crime, the nature of which the Authority determines indicates the applicant's unfitness to operate a commercial ground transportation vehicle for hire in a safe and lawful manner, including, but not limited to, assault or battery, or any form thereof;

(6) Any person who is addicted, as defined in California Welfare and Institutions Code §3009, to any substance prohibited by the Uniform Controlled Substances Act unless enrolled and successfully participating in a drug treatment program approved by a court of relevant jurisdiction;

(7) Any person who, within the twelve (12) months immediately preceding the submission of an application pursuant to this section, is convicted of, or held by any final administrative determination to be a negligent driver pursuant to California Vehicle Code §12810.5;

(8) Any person who provides false information when applying for an Authority Driver's Permit; or

(9) Any person who alters, falsifies, forges, duplicates or in any manner reproduces or counterfeits, or displays or causes to be displayed any Driver's Permit issued pursuant to this Section or by the Authority.

Authority Code § 9.13 (c).

(1) The provisions of Subsections (b)(1), (b)(2), (b)(3), (b)(4) and (b)(5) above shall not apply when five (5) years have elapsed from the later of:

(i) the last date of applicant's discharge from a jail or penal institution;

(ii) the last date of applicant's discharge from parole; or

(iii) the last date on which applicant was placed on probation.

(2) For the purposes of Subsection (b) above, conviction includes, but is not limited to, a plea or verdict of guilty, a finding of guilty by a court or jury in a trial, a plea of nolo contendere, or a forfeiture of bail.

2. Application Procedures

Authority Code § 9.13 (c).

(3) The President/CEO shall determine the appropriate background check required prior to authorizing drivers to operate at the Airport pursuant to any permit.

(4) Permit holders shall comply with the reasonable requests of the President/CEO to audit the efficacy of background checks conducted on drivers operating at the Airport pursuant to any permit.

(5) A Taxicab Driver who is in possession of a valid Taxicab Driver's Identification Card issued by the San Diego County Sheriff's Department may be deemed in compliance with the background check requirements of this Code.

(6) If, after investigation, the Authority determines that the application for a Driver's Permit should be denied, the Authority shall prepare a Notice of Denial of Application setting forth the reasons for such denial. Such Notice shall be either sent by registered mail to the applicant or personally delivered. Any person who has had an application for a Driver's Permit denied may request a hearing in accordance with the provisions of this Code.

3. Term and Fees

Authority Code § 9.13(d).

(1) A Driver's Permit may be issued any time during the calendar year for a term not to exceed one (1) year.

(2) A Driver's Permit may be renewed within the thirty (30) days prior to its expiration date by making application to the Authority, unless such permit is terminated, suspended, revoked or cancelled. A Driver's Permit shall not be renewable thirty (30) days after the expiration date of the Permit.

(3) The fee for a Driver's permit shall be set by resolution or ordinance of the Board.

(4) Prior to the issuance or reissuance of a Driver's Permit, satisfactory proof of compliance with this Code shall be submitted to the Authority.

(5) Prior to the issuance or reissuance of a Driver's Permit, the applicant must provide proof of a valid current California Driver's License of the class required by the Authority.

4. Replacement

Airport taxicab and vehicle for hire drivers may replace a lost or stolen driver's permit upon payment of a permit fee. Any driver found operating with a previously replaced Airport driver's permit will be immediately placed out of service and the Authority may opt not to reissue a permit.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for further information.

D. Issuance and Transfer of Permits

Authority Code § 9.19 (a). Issuance of Commercial Ground Transportation Permits, vehicle decals and driver permits

(1) Commercial Ground Transportation Service Permits, vehicle decals and Driver Permits are issued by the Authority for the purpose of granting the privilege to conduct business and provide commercial transportation services at the Airport.

(2) A Commercial Ground Transportation Service Permit, vehicle decal and Driver Permit is personal to the individual to whom it is issued.

(3) The Authority has absolute discretion to authorize the issuance of Commercial Ground Transportation Permits, vehicle decals and/or Driver Permits on an annual basis.

(4) The Authority may exercise its discretion to not authorize the renewal of Commercial Ground Transportation Service Permits, vehicle decals and/or Driver Permits or to change the way Commercial Ground Transportation Service Permits, vehicle decals and/or Driver Permits are granted or allocated at any time.

(5) Holders of Commercial Ground Transportation Service Permits, vehicle decals and Driver Permits shall have no expectation of or right of renewal in any Commercial Ground Transportation Service Permit, vehicle decal or driver permit.

(6) The President/CEO may require, as a condition of issuing a Commercial Ground Transportation Service Permit, that the holder of said Permit join an Authority-approved industry association where said association is all of the following:

(i) A legal entity consisting of a minimum number, to be determined by the President/CEO, of holders of similar Commercial Ground Transportation Service Permits; and

(ii) Open to all holders of similar Commercial Ground Transportation Service Permits on a fair, equitable and non-discriminatory basis; and

(iii) A party to a memorandum of agreement with the Authority concerning ground transportation operations at the Airport; and

(iv) In compliance with such other requirements as determined by the President/CEO as being in the best interests of the Authority.

Authority Code § 9.19 (b). Transferability

*(1) The holder of a Commercial Ground Transportation Service Permit, vehicle decal or Driver Permit shall not in any manner, directly or indirectly, by operation or law or otherwise, sell, assign, hypothecate, transfer, or encumber ("**transfer**") in whole or in part said Permit, decal or Driver Permit without the prior, express written consent of the President/CEO.*

(i) In the event the holder of a Commercial Ground Transportation Service Permit, vehicle decal and/or Driver Permit is a corporation, partnership or legal entity other than a natural person, the prior written consent of the President/CEO shall be required for any transfer of any stock, interest, ownership or control of that corporation, partnership or legal entity.

(ii) The President/CEO may deny any request to transfer a Commercial Ground Transportation Service Permit, vehicle decal and/or Driver Permit in his or her absolute discretion.

*(2) Taxicabs and TNC Vehicles. In the event the Board exercises its discretion to issue Commercial Ground Transportation Service Permits for Taxicabs or TNC Vehicles ("**Taxicab/TNC Permits**") for any subsequent one-year period after June 30, 2014, the holder of any Taxicab/TNC Permit no longer wishing to operate under said Taxicab/TNC Permit must do one of the following:*

(i) Return the Taxicab/TNC Permit to the Authority; or

*(ii) Transfer the Taxicab/TNC Permit to an Authority-approved recipient ("**Transferee**"), and*

a. Pay the Authority a one-time transfer fee of $3000,

b. Secure the prior written consent of the President/CEO, and

c. Advise the Transferee in a writing approved by the Authority that the Taxicab/TNC Permit is no longer transferrable and must be returned to the Authority if the Transferee no longer wishes to operate under the Taxicab/TNC Permit.

(3) Vehicles for Hire.

(i) If the holder of a Commercial Ground Transportation Service Permit for Vehicles for Hire proposes to transfer all vehicle decals issued to the holder, the vehicle decals may be transferred to any person or entity provided that person or entity is approved by the California Public Utilities Commission and the prior written consent of the President/CEO is obtained.

(ii) If the holder of a Commercial Ground Transportation Service Permit for Vehicles for Hire proposes to transfer only a portion of its vehicle decals, the vehicle decals may only be transferred to another person or entity holding a current valid Commercial Ground Transportation Service Permit for Vehicles for Hire and only after first obtaining the prior written consent of the President/CEO.

Regulation:

1. To be eligible for a Ground Transportation Service Permit at the Airport, all taxicab owners must join an Authority-approved industry association where said association is all of the following:
    a. A legal entity consisting of at least 5 active holders of similar Ground Transportation Service Permits; and
    b. Open to all holders of similar Ground Transportation Service Permits on a fair, equitable and non-discriminatory basis; and
    c. A party to a memorandum of agreement with the Authority concerning ground transportation operations at the Airport; and
    d. In compliance with such other requirements as determined by the President/CEO as being in the best interests of the Authority.
2. To be eligible for a Ground Transportation Service Permit at the Airport, all Vehicle for Hire owners must join an Authority-approved industry association where said association is all of the following;

a. A legal entity; and

b. Open to all holders of similar Ground Transportation Service Permits on a fair, equitable and non-discriminatory basis; and

c. A party to a memorandum of agreement with the Authority concerning ground transportation operations at the Airport; and

d. In compliance with such other requirements as determined by the President/CEO as being in the best interests of the Authority.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for more information.

E. Suspension, Revocation, Denial and Fine of Permits and Services

Authority Code § 9.22 (a). The President/CEO shall suspend, revoke or deny the Ground Transportation Service Permit or driver permit, as applicable, for failure to comply with any of the provisions of Sections 9.01 to 9.13, inclusive, of this Code pertaining to ground transportation services. Any such suspension or revocation shall be separate from any civil or criminal proceedings and shall not be a basis for relief of liability or responsibility pursuant to the proceedings. The action of the President/CEO shall be subject to the appeals provisions provided herein.

Authority Code § 9.22 (c). The Permit Holder or applicant shall be notified that they may file a written appeal with the President/CEO. Each appeal must be perfected by a letter addressed to the President/CEO and delivered to the Authority Clerk, or postmarked with the United States Postal Service, within ten business days of the date notice of the decision of the President/CEO addressed to the party making the appeal is placed with the United States Postal Service, which letter of appeal must state that an appeal from the decision of the President/CEO is desired. If no appeal is filed within the said ten days, it shall be grounds to deny a hearing and any untimely filed appeal shall be dismissed by the Hearing Officer. A suspension or revocation shall immediately become effective if an appeal is not timely filed within the ten business days. If an appeal is timely filed, the revocation or suspension shall be stayed pending the final determination of the appeal. In the event the permit, which is the subject of the action, expires and a new permit is issued to the same operator prior to the suspension or revocation taking effect and being fully carried out, or prior to final decision on appeal, the new permit shall be issued conditioned upon and shall be subject to the pending suspension or revocation. If no appeal is taken, said new permit shall be so suspended or revoked. If on appeal and suspension or revocation is the final decision, the new permit shall be so suspended or revoked. There shall be no requirement for further notice or hearing regarding the new permit.

Authority Code § 9.22 (d). When an appeal is timely filed, the President/CEO shall cause the appeal to be assigned to a Hearing Officer. The matter shall be heard no later than 60 calendar days from the date of the filing of the appeal. The Hearing

Officer shall notify the parties in writing of the time, date and place of the hearing. The notice shall be sent to the appellant by registered or certified mail, or hand-delivery. The Hearing is an informal administrative proceeding with the rules of evidence relaxed from strict judicial practice. In that regard, hearsay evidence is admissible. All parties may be represented by legal counsel, witnesses shall be sworn and be subject to cross-examination, and cumulative or repetitive evidence should not be admitted. The Hearing Officer may subpoena witnesses and establish additional procedures within the provisions of California Government Code Sections 11507.5 through 11511 and as may be required to serve the interest of justice. The Hearing Officer may uphold the suspension, revocation or denial or reverse or modify the decision which is the subject of the appeal, or make a different decision. A copy of the decision of the Hearing Officer specifying findings of fact and reasons for the decision shall be furnished to the parties within ten business days of the conclusion of the Hearing.

Authority Code § 9.22 (e). The final decision of the Hearing Officer shall be the final administrative remedy. There shall be no rehearing or reconsideration. The final decision shall be subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6.

Authority Code § 9.22 (f). An exception to the hearing provisions above shall be made when, in the opinion of the Authority, there is a clear and immediate threat to the safety and protection of the public, the Authority may suspend or revoke a permit prior to a Hearing being held. The Authority shall prepare a written notice of suspension or revocation which includes a statement of the action, a concise explanation of the reasons for the action, the statutory basis relied upon for such action, and an explanation of the Permit Holder's right to request a Hearing from the Authority. Such notice shall be either sent by certified mail to the Permit Holder or be personally delivered. The Permit Holder may request a Hearing from the Authority within five business days of receipt of notification that the permit has been suspended or revoked in the manner provided above in Subsection (c). The Hearing Officer shall notify the appellant of time and place of such Hearing and the Hearing shall be conducted in the manner prescribed in this Section. The Hearing shall be held not more than 15 business days from the date of receipt of said request for Hearing. The suspension or revocation shall not be stayed during pendency of said appeal Hearing.

Authority Code § 9.22 (g). It shall be unlawful for any person to operate any Ground Transportation Service Vehicle from a facility or airport under the Authority's jurisdiction providing any ground transportation from such facility or airport during the period of any suspension or revocation of the permit or the driver's permit.

Authority Code § 9.22 (h). No person shall use or give permission to use any vehicle or Taxicab to provide any ground transportation service from a facility or airport under the Authority's jurisdiction during the period of any suspension or revocation of the permit.

Authority Code § 9.22 (i). When a permit has been suspended or revoked, the operation of any vehicle or taxicab authorized by such permit shall cease.

Authority Code § 9.22 (j). Whenever any person or permit holder acquires an address different from the address previously given the Authority, the person shall within ten (10) business days thereafter notify the Authority, in writing, of the old and new address.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for further information.

F. Insurance

Authority Code § 9.14 (a). No person shall operate, drive, or cause to be operated or driven any Taxicab, Vehicle for Hire, Charter Vehicle, TNC Vehicle, scheduled ground transportation service, hotel or other courtesy vehicle or any other commercial ground transportation service (except as provided in Section 9.23 of this code)("Insured Drivers") over and upon the non-dedicated private streets for the transportation of persons and baggage from or within the Airport unless they establish and maintain in effect the forms of financial responsibility for public liability and workers' compensation specified in this Section.

(1) Insured Drivers shall maintain a valid policy of automobile liability insurance executed and delivered by a company authorized to carry on insurance business in the State of California, with an AM Best Company financial rating acceptable to the President/CEO. The minimum terms and limits of said policy shall be set from time to time by the President/CEO. The terms of the policy shall provide that the insurance company assumes financial responsibility for injuries to persons, property and employees caused by the operation of the Insured Drivers and their authorized drivers and Airport Ground Transportation Service Permitted vehicles.

(2) Insured Drivers shall maintain a valid policy of workers' compensation insurance for all its drivers and shall include a waiver of subrogation endorsement in favor of the Authority.

Authority Code § 9.14 (b). A valid certificate of insurance issued by the company providing the insurance policy required under the provisions of this section shall be filed with and approved by the President/CEO. This certificate, with appropriate endorsements to the underlying policies, shall provide that the Authority and its officers, employees and agents are named as additional insureds. It shall also provide that the insurer will notify the Authority at least 30 days prior to a reduction in coverage or cancellation of the policy. The certificate also shall state:

(1) The insurance policy number;

(2) The type and limits of coverage, including any deductibles or self-insured retention;

(3) The specific vehicle(s) insured for vehicle liability coverage;

(4) The effective dates of the policy; and

(5) The certificate's date of issue.

G. Vehicle Registration

Authority Code § 9.15 (a). No Airport Ground Transportation Service Permit shall be issued without proof of valid vehicle registration provided to and approved by the Authority.

Authority Code § 9.15 (b). California vehicle registration shall list the Driver, Permit Holder or the Permit Holder's "dba" as the registered owner. If a vehicle is leased or rented, then a copy of a valid lease or rental agreement shall be provided to and approved by the Authority prior to any permit being issued.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for more information.

H. Financial Ownership and Operating Records

Authority Code § 9.16 (a). Every holder of an Airport Ground Transportation Service Permit shall maintain:

(1) Financial records in accordance with good accounting practices;

(2) Ownership records; and

(3) Operating records in a form, and at intervals, which shall be determined from time to time by the Authority.

Authority Code § 9.16 (b). Ownership and operating records shall be made available to the Authority upon demand at any reasonable time. The Permit Holder shall retain operating records for a minimum of six (6) months from the date the records are created.

Authority Code § 9.16 (c). For the purposes of this Section, ownership records shall include, but are not limited to the following:

(1) Copies of the Articles (or Certificate) of Incorporation as filed with the Secretary of State of the entity's state of incorporation;

(2) Records identifying all corporate officers and board members. A corporation shall report any change in corporate officers or members of its board within ten (10) days of the effective date of such change;

(3) A stock register recording the issuance or transfer of any shares of the corporate stock; and

(4) The registration cards issued by the State of California Department of Motor Vehicles to the Permit Holder for all vehicles operating on Authority property under the authority of a Ground Transportation Service Permit.

Authority Code § 9.16 (d). For the purposes of this Section, operating records shall include, but are not limited to the following:

(1) Typed or written radio dispatch records;

(2) Any log that describes the trips transporting passengers and baggage to and from the Airport;

(3) Copies of the daily trip log required pursuant to Metropolitan Transit Development Board Ordinance 11;

(4) Waybills as defined under the California Public Utilities Commission General Order 157; and

(5) Any other similar records.

Authority Code § 9.16 (e). In order to ensure compliance with the foregoing sections, the Authority shall perform annual audits of each Ground Transportation Service Permit Holder.

Authority Code § 9.16 (f). If found to be out of compliance, the Ground Transportation Service Permit Holder may be subject to revocation of permit as set forth in this Code.

I. Vehicle Condition

Authority Code § 9.21 (a).

(1) No person shall operate, drive, or cause to be operated or driven any Taxicab, Vehicle for Hire, Charter Vehicle, TNC Vehicle, scheduled ground transportation service, hotel or other courtesy vehicle or any other commercial ground transportation service over and upon the non-dedicated private streets of the Airport unless it is in safe operating condition and in good repair. Its lighting equipment shall be in good working order. There shall be no cracked or broken windshields, windows or mirrors. The muffler and exhaust system shall be adequate to prevent excessive or unusual noise and shall not emit excessive smoke, flame, gas or oil. Exterior paint and markings shall not be faded or discolored. The vehicle shall have in operational condition, a heater, air conditioner and defroster. The vehicle shall be maintained in

a clean condition, both with regard to the interior and exterior. In any vehicles required to have a taximeter, the person driving shall make certain that: the taximeter is in proper recording position at all times; the meter reading is visible to any passenger; and the meter light is burning during hours of darkness. The vehicle shall be further maintained in condition as provided in accordance with rules and regulations established by the President/CEO.

(2) The Authority may inspect any vehicle. If the inspection reveals that such vehicle is not in reasonable good repair or operating condition, from the standpoint of the safety, health and comfort of passengers, then the vehicle shall be ordered out of service by an Airport Traffic Officer or other Airport representative until such time as remedial repairs and corrections have been made. When such repairs and corrections have been made, such vehicle shall be reinspected by an Airport-approved inspection service with proof of the repair and correction to determine whether or not proper repairs and corrections have been made and in no case shall the vehicle be permitted to resume its operation until such repairs and corrections have been made.

J. Identification

(1). Personal/Individual. Authority Code § 9.21 (b). All persons operating a commercial ground transportation vehicle at the Airport shall have and be in possession of proof of insurance in full force and effect equal to the requirements of the Authority, a valid driver's license of the class required issued by the State of California and, any required identification cards. The Driver shall present any of these documents upon the demand of an authorized officer of the Authority or any peace officer.

Regulation:

1. All operators shall ensure that the driver's identification card (placard) and the company name and vehicle number are clearly displayed in the driver compartment of the vehicle. The driver's identification card shall be posted on the dash of the vehicle and at all times be clearly visible to the passengers.

The Authority has reviewed this rule with the Metropolitan Transit Development Board (MTDB) and there is no conflict with its regulations. Drivers found to be in non-compliance with this regulation will be subject to a citation and may be placed out of service.

(2). Vehicle. The vehicle shall be registered in the State of California and properly display, as approved by the President/CEO, the required exterior markings, state license plates, approved trade dress and licensing decals.

K. Pickup Areas

Authority Code § 9.21 (c).

(1) No person shall stop, park or stand any vehicle while awaiting for any passenger or employment at any location on Airport property other than at an authorized stand, designated area, line or zone. Passenger pickups shall take place only at designated stands and zones after following authorized procedures as may be established by the President/CEO and within vehicle standing time limits and parking regulations. The above rules may be waived for disabled passengers.

(2) No person shall solicit any customer's patronage in any manner while on Airport property or in an Airport terminal building.

(3) Taxicab and Vehicle for Hire drivers shall use only the assigned Taxicab or Vehicle for Hire line and stand as respectively designated by the President/CEO. Taxicab or Vehicle for Hire line means an area at the Airport designated by sign or other suitable means which is reserved for Taxicabs or Vehicles for Hire only while waiting to advance in turn to a vacancy at a Taxicab or Vehicle for Hire stand. "Taxicab and Vehicle for Hire stand" means an area on Airport property so designated and reserved for parking only while waiting to pick up passengers for hire.

(4) Before entry onto Airport property without passengers or after discharging passengers on Airport property, every Taxicab or Vehicle for Hire operator shall proceed to the off Airport hold lot as designated by the President/CEO and wait with the vehicle at the hold lot until an authorized officer or designate issues a time-stamped dispatch ticket and dispatches the vehicle and operator to the Airport. The vehicle operator shall give the valid dispatch ticket to an authorized officer or designate on duty at the Airport before the operator is authorized to pick up or engage any passenger for hire. Picking up any passenger for hire after or while leaving off any other passenger without proceeding through the designated hold lot and being issued a valid dispatch ticket is prohibited. The President/CEO, from time to time, may establish, change or modify the rules, regulations and dispatch procedures for operation of the off-Airport hold lots.

(5) Notwithstanding any other regulation, any prospective passenger may select for hire any Taxicab or Vehicle for Hire, wherever located at the stand.

(6) The driver of each Taxicab or Vehicle for Hire in a Taxicab or Vehicle for Hire line shall at all times, until engaged for hire, remain in the driver's seat at the wheel of the vehicle or outside and within close proximity of the vehicle, except in case of emergency or personal necessity.

(7) The driver of each Taxicab or Vehicle for Hire at the Taxicab or Vehicle for Hire stand shall at all times, until engaged for hire, remain in the driver's seat at the wheel of the vehicle; provided, however, when engaged for hire, the driver may assist a passenger and load baggage into the vehicle. In case of an emergency or personal necessity, the driver may leave a Taxicab which is at the Taxicab stand.

(8) After a Taxicab exits a Taxicab stand, each vehicle at its rear shall at once be moved toward the head of the Taxicab stand and the Taxicab at the head of the Taxicab line shall be moved forward to occupy the vacancy in the Taxicab stand. Likewise, each vehicle to the rear in the Taxicab line shall be moved toward the head of the Taxicab line.

(9) No owner or operator of a Taxicab, Vehicle for Hire or Charter Vehicle, or TNC shall at any time while at the Airport by words, gesture or otherwise, solicit, persuade or urge or attempt to solicit, persuade or urge any person to use or hire any vehicle.

(10) If the driver of a Taxicab occupying the position at the head of the Taxicab stand refuses to accept and transport a passenger for hire or refers the passenger to a different Taxicab, the Taxicab and driver who refused or referred the passenger shall immediately be dispatched to the rear of the Taxicab line and the driver shall immediately remove the Taxicab from the head of the Taxicab stand.

On February 7, 2003, the Airport went to an elevated security level as directed by the Transportation Security Administration (TSA). Due to the Airport security level, Authority Code § 9.21(c)(7) (requiring drivers to remain in their vehicle while on the stand) will be strictly enforced. Any taxicab found unattended at the stand will be cited and immediately towed. Drivers who need to leave the stand for personal necessity will be required to notify the customer service representative (CSR) prior to leaving the vehicle unattended on the transportation island. Be advised that a taxicab will be required to return to the hold lot if the vehicle is bypassed during the passenger loading process.

Authority Code § 9.30 (k). No person operating a Taxicab or discharging from said Taxicab any passenger for hire in front of the passenger shall accept or solicit any passenger for hire in front of said passenger until after said Taxicab has proceeded in turn through and appropriate Taxicab holding area and Taxicab loading zone as designated by the President/CEO.

L. Hold Lot and Shuttle Island Procedures

An assigned Airport customer service representative (CSR) assists with the loading of passengers at the transportation islands.

Regulation.

1. All taxicab and vehicle for hire operators shall adhere to the following procedures:

    a. Before entry onto Airport property without passengers or after discharging passengers on Airport property, the taxicab or vehicle for hire operator shall proceed to the off Airport hold lot as designated by the President/CEO and wait with the vehicle at the hold lot until an authorized officer or designee issues a time-stamped dispatch ticket and dispatches the vehicle and operator to the Airport. Picking up any passenger for hire after or while dropping off any other passenger without first proceeding through the designated hold lot and being issued a valid dispatch ticket is prohibited.

    b. All vehicle for hire operators must transit the Airport hold lot prior to entering the Airport for the purpose of picking up passengers. Operators must obtain a valid dispatch pass prior to proceeding to the Airport stand. The operator shall give the valid dispatch ticket to an authorized officer or designee on duty at the Airport before the operator is authorized to pick up or engage any passenger for hire.

    c. The vehicle for hire Airport hold lot is shared with the taxicab hold lot located at 2801 North Harbor Drive. The vehicle for hire area in the lot has two staging lanes. Shuttles will be dispatched from the hold lot based on the capacity of the transportation islands.

    d. Drivers shall wear their valid Airport-issued permit at all times while operating at the Airport and shall present the permit to the customer service representative (CSR) prior to being issued a dispatch pass.

    e. Operators shall at all times have the current tariff rates posted inside their vans that are clearly visible to passengers from the inside of the vehicle.

    f. Operators holding a valid Public Utilities Commission tour charter party (TCP) license may operate on individual charters provided there is a clearly visible sign on the front dash of the vehicle stating "Charter.” The operator shall be in possession of a complete and valid waybill in compliance with California Public Utilities Commission (CPUC) General Order 157-D, Section 3.01.

    g. Vehicle for hire operators shall not solicit business at any time while on Airport property and shall remain in their vehicle behind the steering wheel at all times while in the transportation islands, except for such time as necessary to aid their customers with baggage.

    h. Vehicle for hire operators shall display on the exterior of their vehicles the company name, passenger stage corporation (PSC) numbers, vehicle number

and company telephone number. No operator shall post any signage relating to rates of fare, servicing of hotels, military bases, off-airport parking or car rental companies, or conventions. Any operator that has a temporary service contract with a convention group may display a sign, not greater than eight inches by twelve inches (8" X 12"), with the name of the contracted group on a right side window of their vehicles. The signs may only be displayed during the service contract period and upon prior written approval of the Authority Ground Transportation Department. Any vehicle found to be in non-compliance with the signage rules will be issued an "Out of Service" notice of violation until the vehicle is brought into compliance.

i. No passengers are allowed in the Airport hold lot at any time.

j. At no time shall an operator be allowed in the Airport hold lot or shuttle islands unless operating a shuttle or with the prior permission of the Authority's Ground Transportation Department.

A violation of this regulation may constitute interference with a public agency pursuant to California Penal Code § 602.1.

k. Vehicle for hire operators shall be in compliance with California Public Utilities Commission (CPUC) General Order 158-A at all times while operating at the Airport. Any violation of the provisions of this order shall result in a suspension or revocation action of the operator.

l. Any driver found feeding birds or throwing any food or trash on the ground in the Airport hold lot will be immediately ejected from the hold lot for the remainder of the day. Any further violations will result in revocation of the driver's Airport permit.

Birds in the area of the aircraft operations present a serious safety hazard to aviation. Feeding or attracting birds in the vicinity of the AOA is a violation of federal regulations.

M. Driver's Examination

Authority Code § 9.21 (d). The President/CEO may, but is not required to, issue or reissue a Driver's Permit to a person who has successfully passed an examination as given and required by the Authority, upon payment of the appropriate fee. The President/CEO also shall have the right to reexamine persons holding a Driver's Permit at intervals that the President/CEO deems advisable. Except in the event of reissuance as provided above, each applicant for a permit required by this provision and each driver must:

(1) Be able to converse in the English language;

(2) Hold a valid and effective driver's identification card as provided by the County of San Diego Code if operating a Taxicab; and

(3) Successfully complete an approved Airport Customer Service Course.

As part of the Airport's taxicab and shuttle customer service improvement program, Airport taxicab and vehicle-for-hire drivers will be required to attend a customer service driver training course approved by the Authority. The intent of the training course is to help Airport drivers acquire the skills to become exceptional ambassadors and prepares drivers for the certification examination.

Drivers will be issued a temporary permit pending attendance of the customer service driver training course. Drivers must pass the certification examination within 60 days after issuance of a temporary permit to continue driving at the Airport. Drivers are required to attend the certification examination on the date they are assigned by their respective companies. If the driver is unable to attend on the assigned date, he or she must notify their respective company at least 24-hours in advance to schedule an alternative date for the certification examination.

Contact the Authority's Ground Transportation Department at (619) 400-2685 for more information.

N. Driver Attire and Personal Hygiene

Authority Code § 9.21 (e). All drivers of commercial ground transportation vehicles shall comply with the clothing and hygiene requirements as established by the President/CEO.

Regulations:

1. Every Driver of a commercial ground transportation vehicle at the Airport shall:

    a. Conform his/her attire to the dress code required by the respective regulatory agency for the type of vehicle operated (i.e. California Public Utilities Commission or San Diego Metropolitan Transit System); and

    b. Wear clothing that does not contain obscenities, profane language or derogatory statements.

2. Drivers not in compliance with the regulations state above may not be permitted to provide commercial transportation services at the Airport until they come into compliance.

O. Duty to Transport Passengers

Authority Code § 9.21 (f). The person operating a ground transportation service shall not refuse to transport any passenger, including baggage, requiring transportation and shall take all passengers to their requested destination using the most direct available route on all trips unless otherwise specifically requested by the passenger; provided, however, nothing herein shall require any person to provide ground transportation service contrary to any municipal or state permit or certificate regarding ground transportation or its Authority authorized permit. Furthermore, a driver is not required to transport any such passengers when: the driver has already been dispatched on another call; when such passengers appears to be under the influence of intoxicating liquor, or disorderly; or when the passenger may cause the vehicle to become damaged, stained or foul smelling.

Regulation.

1. Unless exempted by Authority Code § 9.21 (f), any driver refusing to transport a passenger or by their conduct dissuades a passenger from taking their service shall be ejected from the transportation island and be restricted from serving the Airport for the remainder of the work day.

Drivers wishing to appeal their ejection must submit a written appeal within 24 hours of receipt of the notice of violation.

P. Non-Discrimination

Authority Code § 9.21 (g). In providing ground transportation services on Airport property, no person shall discriminate against any person or class of persons by reason of sex, color, race, creed, religion, physical or mental disability, veteran status, medical condition, marital status, age, sexual orientation, pregnancy or national origin. The accommodations and services shall be made available to the public on fair and reasonable terms.

Q. Fares and Receipts

Authority Code § 9.21 (h). No driver shall collect, demand, receive or arrange for any compensation in an amount greater than that approved or allowed by the appropriate fare setting governmental agency or commission for the ground transportation service. Upon request, the driver shall give a passenger making payment a receipt showing the amount of fare paid, the driver's correct name and correct vehicle license number and Authority permit number. There shall be no fare or charge to the passenger by a Courtesy Vehicle.

R. Disabled Passenger Services

Authority Code § 9.18 (a). Every Vehicle for Hire operator shall provide in its service fleet for the Airport, at a minimum, at least one wheelchair lift-equipped vehicle. Each operator shall provide wheelchair lift-equipped vehicles according to the following schedule when adding to or replacing airport vehicles in its fleet:

(1) One to 50 authorized vehicles requires one wheelchair-lift equipped vehicle;

(2) 51 to 100 authorized vehicles requires two wheelchair-lift equipped vehicles; and

(3) Operators may subcontract to provide wheelchair-lift equipped vehicles. Operators shall obtain prior written approval from the Authority for any agreements between the operator and subcontractors providing wheelchair-lift equipped vehicles.

1. Mobility Impaired Demonstration Project

The Airport is participating in the Mobility Impaired Demonstration Project sponsored by Metropolitan Transit System (MTS). As part of the project, the Airport will allow project-permitted taxicabs ("accessible taxicabs") access to service the terminal transportation plazas.

Regulation.

a. All taxicab operators who wish to provide Airport service under the Mobility Impaired Demonstration Project shall comply with the following procedures:

    1) Taxicab operators with authorized project medallions from the Metropolitan Transit System (MTS) and a valid Airport Ground Transportation service permit may obtain special taxicab permits (up to 10% of their authorized Airport vehicles) from the Authority's Ground Transportation Department.

    2) There will be no fee for a Ground Transportation service decal during the initial project period.

    3) All taxicab operators shall provide the Airport with a copy of valid California vehicle registration and proof of liability insurance.

    4) Accessible taxicabs will not be permitted access to the off-airport taxicab holding lot.

    5) Operators of accessible taxicabs shall have a valid Airport driver's permit.

6) Operators of accessible taxicabs shall only use the designated parking area at each transportation plaza.

7) Only one accessible taxicab may park at the designated parking area at a time.

8) Operators of accessible taxicabs using the authorized parking area shall only park for a maximum of thirty (30) minutes.

9) If an accessible taxicab has not been engaged for service by a mobility-impaired passenger at the end of the standing time, the customer service representative (CSR) will direct a passenger to the taxicab.

10) If there are no taxicabs available and passengers are waiting, the CSR will direct passengers to an accessible taxicab.

11) Airport Ground Transportation service decals may be revoked at any time without cause.

S. Taxicabs and Vehicles for Hire

1. Taxicab Permit Requirement

Regulation:

a. Every taxicab operator shall possess and display a valid current City of San Diego taxicab medallion on each vehicle servicing the Airport.

2. Taxicab Driver Rules

Regulations:

a. No taxicab operator shall charge a minimum fee for credit card payment. No fee shall be charged in excess of that stated on the meter unless authorized by the Authority.

b. Every taxicab operator shall clearly display his or her driver's identification card in the vehicle driver's compartment.

c. Every taxicab driver shall wear his or her Airport driver's permit so that the permit is clearly visible, above the waist and on the outermost garments.

d. Every taxicab operator shall prominently post passenger information cards inside all of their vehicles in service so as to be clearly readable to the occupants.

e. Every taxicab driver shall remain at all times at his or her taxicab while at the cabstand except in case of emergency or personal necessity. When a fare

arrives at a taxicab, the driver must be at the vehicle or will forfeit his or her place on the taxicab stand.

f. When in the Airport hold lot, all drivers who are not at their taxicab when dispatched shall go to the end of the line.

g. Every taxicab operator dispatched from the Airport hold lot shall proceed directly to the taxicab line in the order dispatched. Operators arriving at the taxicab stand out of dispatched order will forfeit their place in line.

h. No taxicab operator shall play a radio while passengers are in the vehicle unless specifically requested to do so by the passengers. This rule shall not apply to a company two-way radio used for business purposes.

i. No driver of a taxicab shall use a cellular telephone while passengers are in the taxicab unless at the request of the passenger or in an emergency.

j. Every operator of a taxicab shall use their vehicle's heater or air conditioner upon passenger request.

Any operator who has a complaint about any ATO or customer service representative (CSR) may submit the complaint in writing to the Ground Transportation Department.

3. Spare Taxicab Use Policy

Airport taxicab operators may place a spare car into airport service as a temporary replacement for a permitted vehicle that is out of service due to mechanical problems in accordance with the Metropolitan Transit Development Board (MTDB) Spare Car Procedure.

A taxicab operator in violation of any of the following regulations shall be subject to the Administrative Penalties in Section 7.7 of these Rules and Regulations.

Authorized Airport taxicab operators having between one and five permitted vehicles may be issued a single spare vehicle decal. Authorized Airport taxicab operators may be issued an additional spare vehicle decal for every five permitted vehicles thereafter, up to a total of five spare taxicab decals.

<u>Regulations:</u>

a. Airport taxicab operators shall place spare cars into Airport service only under the following conditions:

1) Each spare car must have an Automated Vehicle Identification (AVI) transponder affixed to the vehicle;

2) A spare car may only be used for a maximum of sixty (60) days at a time;

3) The taxicab operator shall submit a written notification to the Authority of their intent to place a spare car into service. The notification should be received by the Ground Transportation Department no later than 24-hours after the vehicle is placed into service.

   Notification may be faxed to the Authority Ground Transportation Department at (619) 400-2686.

   a) the Airport decal number of the car being taken out of service, the reason for it being out of service and the location of the out of service taxicab;

   b) the estimated time the spare car will be in use;

   c) a valid certificate of insurance for the spare car must be provided with the request;

   d) a copy of the valid registration of the spare car showing the permit holder of the car being taken out of service as the registered owner of the spare car.

b. Each taxicab operator placing an out-of-service car back into service shall provide advance written notification to the Authority.

   Notification may be faxed to the Authority Ground Transportation Department at (619) 400-2686.

c. All taxicab operators shall remove any spare car from service when the car it has been replacing is placed back into Airport service.

d. No taxicab operator shall operate a spare vehicle other than on the same Airport taxi day as the vehicle it is replacing.

4. Background Check Procedures for Vehicle for Hire Drivers

a. Vehicle for hire drivers must first apply to the Airport Ground Transportation Department for a vehicle for hire driver permit, tender a check or money order in the amount of $90.00, and submit for inspection a valid California driver's license and a Department of Motor Vehicles driver record printout that is not more than thirty (30) days old.

b. Vehicle for hire drivers are fingerprinted for a background check. Processing hours are 8:30 am to 11:30 am and 1:30 p.m. to 4:00 p.m., Monday through Thursday.

c. The following items are necessary for a background check:

   1) a receipt for permit payment;

2) an original Department of Motor Vehicle (DMV) driver record printout that is dated no earlier than thirty (30) days prior to application;

3) a valid California driver's license; and

4) a birth certificate (if for a native US citizen) or approved INS documentation from the "Acceptable Identification Documents" list below.

d. The Authority Ground Transportation Department conducts a computer check and takes the driver's fingerprints for processing with the Department of Justice.

e. Vehicle for hire drivers who pass the background check process are called to pick up their Airport driver permit and driver identification card (placard) at the Ground Transportation Permitting Office during normal permitting hours. The driver placard must be clearly displayed on the vehicle dashboard when operating at the Airport. The driver permit is to be worn on the driver's person as provided for in these Rules and Regulations.

f. Drivers who fail the computer or fingerprint check are notified by the Airport Authority of any appeal options that may be available.

List of Acceptable Documents
List A
1 item from List A

Documents that Establish Both Identity and Employment Eligibility
1. U.S. Passport or U.S. Passport Card (unexpired)
2. Permanent Resident Card or Alien Registration Receipt Card with photograph (USCIS Form I-151 or I-551)
3. Unexpired foreign passport, with I-551 stamp or attached temporary I-551 printed notation on a machine readable immigrant visa
4. Unexpired Employment Authorization Document issued by USCIS that contains a photograph (USCIS Form I-766)
5. In the case of a nonimmigrant alien authorized to work for a specific employer incident to status, a foreign passport with Form I-94 or Form I-94A bearing the same name as the passport and containing an endorsement of the alien's nonimmigrant status, as long as the period of endorsement has not yet expired and the proposed employment is not in conflict with any restrictions or limitations identified on the form
6. Passport from the Federated States of Micronesia (FSM) or the Republic of the Marshall Islands (RMI) with Form I-94 or Form I-94A indication nonimmigrant admission under the Compact of Free Association between the US and the FSM or RMI.

OR (1 item from List B and 1 item from List C)

List B

Documents that Establish Identity
1. Driver's license or ID card issued by a State or outlying possession of the United States provided it contains a photograph or information such as name, date of birth, gender, height, eye color and address
2. ID card issued by Federal, State, or local government agency or entity provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address
3. School ID card with a photograph
4. Voter's registration card
5. U.S. Military card or draft record
6. Military dependent's ID card
7. U.S. Coast Guard Merchant Mariner Card
8. Native American tribal document
9. Driver's license issued by a Canadian government authority
For persons under the age of 18 who are unable to present a document listed above
1. School record or report card
2. Clinic, doctor, or hospital record
3. Day-care or nursery school record

List C

Documents that Establish Employment Eligibility
1. Social Security card issued by the Social Security Administration (other than a card stating it is not valid for employment in the United States)
2. Certification of Birth Abroad Issued by the Department of State (Form FS-545 or Form DS-1350)
3. Original or certified copy of a birth certificate issued by a State, county, municipal authority, or outlying possession of the United States bearing an official seal
4. Native American tribal document
5. U.S. Citizen ID Card (USCIS Form I-197)
6. ID Card for use of Resident Citizen in the United States (USCIS Form I-179)
7. Unexpired employment authorization document issued by the Department of Homeland Security (other than those listed under List A)

5. Vehicle Markings for Taxicabs and Vehicles for Hire

Regulations.

a. All taxicab and vehicle for hire operators shall mark and identify their Airport authorized vehicles as follows:

1) The name and vehicle number shall be permanently affixed to the vehicle.

2) No magnetic signage is allowed at any time for authorized passenger stage corporation (PSC) vehicles unless approved by authorized personnel.

3) All markings shall be in compliance with the requirements of Public Utilities Commission General Order 158, Sections 4.03 and 4.04.

Any taxicab or vehicle for hire found to be in violation of these Rules and Regulations shall be placed out of service until deemed in compliance by the Ground Transportation Department.

6. Commercial Credit Card Requirements for Taxicabs and Vehicles for Hire

Regulations:

a. All taxicab and vehicle for hire operators shall accept Visa, MasterCard and American Express credit cards from passengers departing from the Airport.

b. No taxicab or vehicle for hire operator shall set a minimum or maximum charge for any credit card transaction.

c. All taxicab and vehicle for hire operators shall provide credit card paying customers with a copy of their credit charge receipt clearly showing the amount and date of the credit charge.

d. All taxicab and vehicle for hire operators shall display Authority-issued decals announcing that passengers departing the Airport may use credit cards to pay fares and identifying the credit cards that will be accepted for payment. The required decals shall be displayed on all passenger doors, including sliding doors. The decals shall be visible from the interior and exterior of the vehicle.

The Ground Transportation Department issues the required decals to operators of permitted vehicles. No more than three decals per permitted vehicle will be issued at one time. Replacement decals will be issued on an as-needed basis.

7. Vehicle Condition of Taxicabs and Vehicles for Hire

Regulations:

a. All taxicab and vehicle for hire operators shall maintain the exterior of their vehicles such that the vehicles:

1) are free of exterior dents and damage;

2) are free of any dent, scrape or damage that is greater than three by three inches (3” X 3”) in size and greater than the thickness of a quarter in depth;

3) have clean, fresh paintjobs and clear and undamaged vehicle markings; and

4) have the same color and marking scheme for all Airport-authorized vehicles.

b. All taxicab and vehicle for hire operators shall repair any exterior vehicle damage within ten (10) days of the date of the notice of violation.

c. All taxicab and vehicle for hire operators shall maintain the interior of their vehicles such that the vehicles:

1) have seats that are clean, free of stains and wear spots;

2) have floor carpeting that is clean and free of stains or large wear spots;

3) have door handles and panels that are intact and clean;

4) are free of protruding springs, wires, cords or other sharp objects; and

5) have interior lights operating properly in standard locations.

d. All taxicab and vehicle for hire operators shall maintain their vehicles such that interior repairs reasonably match the existing interior.

T. Vehicle for Hire (PSC Shuttles) – Passenger Stage Carriers

1. Shuttle Trainee Ride-Along Policy

Regulations:

a. No vehicle for hire PSC shuttle operator shall conduct any trainee "ride-along” except under the following conditions:

1) Trainees shall ride in only one (1) vehicle during the "ride-along.”

2) Trainees shall ride for a maximum of five (5) days.

3) Trainees shall be subject to all Rules and Regulations for operators with the exception of the requirement of a driver's permit.

4) Trainees shall not assist the driver with passengers in any manner.

5) The vehicle for hire PSC shuttle operator shall contact the Ground Transportation Department before 5:00 PM the day before a trainee is to participate on a "ride-along.”

6) Vehicle for hire PSC shuttle operators shall provide the Authority with the name of the trainee and the days the trainee will be riding.

Trainees who are observed violating this policy or any Rules and Regulations will forfeit the "ride" time.

Vans with unauthorized trainees will not be dispatched from the hold lot.

U. Courtesy Vehicles (Hotel, Off-Airport Parking, Rental Car and others)

1. Rules of Operation

Authority Code § 9.21 (c).

(1) No person shall stop, park or stand any vehicle while awaiting any passenger or employment at any location on Airport property other than at an authorized stand, line or zone. Passenger pickups shall take place only at designated stands and zones after following authorized procedures as may be established by the President/CEO and within vehicle standing time limits and parking regulations. The above rules may be waived for disabled passengers.

Regulation.

a. All courtesy vehicle operators providing ground transportation services at the Airport shall comply with the following when picking up and dropping off passengers at the Airport:

   1) All courtesy vehicle operators shall only use the Transportation Plaza Courtesy Island at Terminals 1 and 2.

   2) All courtesy vehicle operators shall use the designated zone located at the Commuter Terminal.

   3) Transportation Island dwell time for courtesy vehicle operators shall be limited to active loading and unloading of passengers only. Any vehicle found in violation shall be subject to a citation as provided under Authority Code § 9.21 (c) (1).

   4) No courtesy vehicle operator shall block or obstruct traffic when loading or unloading passengers.

2. Temporary Ground Transportation Service Decals

The Authority's Ground Transportation Department provides temporary ground transportation service vehicle decals for use by Airport-permitted courtesy vehicle operators.

Regulations:

a. Courtesy vehicle operator permits may be moved from vehicle to vehicle if the vehicles conform to these Rules and Regulations.

b. All courtesy vehicle operators using temporary decals shall display such decals on the right side of the vehicle dashboard.

   Vehicles not properly displaying decals are subject to a citation.

c. All courtesy vehicle operators using any temporary decal shall submit an Airport Authority Insurance Compliance Form to the Ground Transportation Department prior to placing a temporary vehicle into service.

   The Airport Authority Insurance Compliance Form is available on the Authority's website at www.san.org. The form may be faxed to the Ground Transportation Department at (619) 400-2686 or delivered in person.

   Failure to provide this form prior to using the temporary decal may result in the revocation of the Airport ground transportation service permit.

d. All courtesy vehicle operators using temporary decals shall submit such decals for ATO inspection at any time.

e. All courtesy vehicle operators shall be issued a maximum of one temporary ground transportation service decal during any permit period. The fee for the temporary decal shall be the same as for permanent decals and valid only for that permit period.

V. Operation Rules for Charter Vehicles (Charter Party Carriers/TCP)

Regulations:

1. All charter vehicle operators providing transportation services at the Airport shall hold a valid license and charter party carrier permit issued by the California Public Utilities Commission (CPUC).

2. All charter vehicle operators shall obtain an Airport ground transportation service permit for each vehicle used to pick up passengers at the Airport prior to providing services.

3. All charter vehicle operators shall be in compliance with all California Public Utility Commission (CPUC) general orders when providing services at the Airport.

4. No charter vehicle operator shall park or leave standing any permitted vehicle in violation of Airport parking regulations. Operators who are observed parked, waiting or leaving a vehicle on the terminal curbs shall be subject to citation and/or suspension of their Airport ground transportation service permit.

Charter vehicle operators may use the "charter vehicle" parking stalls as provided in the terminal parking lots.

5. All charter vehicle operators shall comply with all lawful orders of an ATO or Harbor Police officer.

6. All charter vehicle operators shall have a valid waybill in their possession when picking up passengers and shall present said waybill upon the request of any ATO or Harbor Police officer.

W. Subcarriers of Vehicle for Hire (PSC) or Passenger Stage Carriers

Authorized Airport vehicle for hire (PSC) operators who hold a valid passenger stage corporation (PSC) license from the California Public Utilities Commission (CPUC) may use a dedicated sub-carrier with the prior approval of the Authority.

1. Approval of Sub-carriers

Regulation:

a. No sub-carrier shall receive approval except under the following conditions:

1) Every sub-carrier shall possess a valid transportation charter party (TCP) certificate from the CPUC.

2) Every vehicle for hire (PSC) prime carrier shall provide the Authority with a copy of the written agreement between the prime carrier and the sub-carrier. The agreement shall contain the sub-carrier's name, TCP number, and the services to be provided. The agreement must be approved by the Authority prior to the commencement of operations by the sub-carrier.

3) Every sub-carrier shall only provide one (1) vehicle and no more than two (2) drivers to the prime carrier.

4) Every vehicle for hire (PSC) prime carrier shall be accountable for the transportation charter parties (TCPs) operating as sub-carriers for the PSC. The TCP sub-carrier must be under the complete direction, supervision, and control of the PSC prime carrier.

2. Passenger Stage Corporation (PSC) Prime Carrier Requirements

Regulation.

a. Every passenger stage corporation (PSC) prime carrier shall:

1) maintain a list of all of its sub-carriers, identified by transportation charter party certificate (TCP) number;

2) provide the Authority with a certificate of liability insurance listing "San Diego County Regional Airport Authority" as additional insured;

3) ensure that the vehicles of all its sub-carriers are in compliance with both these Rules and Regulations and California Public Utilities Commission General Order 158-A, Part 4;

4) ensure that the operators of all its sub-carriers are in compliance with both these Rules and Regulations and California Public Utilities Commission General Order 158-A, Part 5;

5) maintain records for all its sub-carriers that are in compliance with these Rules and Regulations and California Public Utilities Commission General Order 158-A, Part 4 and Part 6, including, but not limited to, maintenance and safety of all vehicles permitted to operate at the Airport; and

6) afford Authority staff all reasonable opportunity and accommodations to enter any vehicle or facility to inspect a carrier's accounts, books, papers, and documents, or to ascertain if Authority, California Public Utilities Commission and other state regulations are being complied with and observed.

3. Requirements for a Dedicated Sub-Carrier of a Vehicle for Hire(PSC) Passenger Stage Corporation

Regulation.

a. Every dedicated sub-carrier of a vehicle for hire (PSC) passenger stage corporation (PSC) shall:

1) display the name of its passenger stage corporation (PSC) prime carrier on its vehicle in compliance with these Rules and Regulations and Public Utilities Commission General Order 158-A, Section 4.03;

2) display the identifying number assigned by the passenger stage corporation (PSC) prime carrier on its vehicle in compliance with these Rules and Regulations and California Public Utilities Commission (CPUC) General Order 158-A, Section 4.03;

3) display the prime carrier's passenger stage corporation (PSC) number on its vehicle incompliance with these Rules and Regulations and Public Utilities Commission General Order 158-A, Section 4.04. This is in addition

to the requirements to display the sub-carrier's tour charter party (TCP) number on the vehicle in compliance with Section 4.04 of California Public Utilities Commission (CPUC) General Order 157-D;

4) file with the Authority and the Public Utilities Commission the trade, business, or fictitious name of the passenger stage corporation (PSC) prime carrier in compliance with Public Utilities Commission General Order 157-D, Section 3.06;

5) display the tariffs of the passenger stage corporation (PSC) prime carrier in the vehicle in compliance with these Rules and Regulations and Public Utilities Carrier General Order 158-A;

6) keep a copy of the sub-carrier agreement in the vehicle and present it to any Authority officer or Public Utilities Commission agent upon request; and

7) provide the Authority with a certificate of liability insurance listing the "San Diego County Regional Airport Authority" and the primary carrier as additional insureds.

Any sub-carrier of a passenger Stage corporation (PSC) operator found to be in violation of these Rules and Regulations or California Public Utilities Commission Regulations shall forfeit Authority approval of the sub-carrier agreement to operate at the Airport.

Repeated violations of these Rules and Regulations by sub-carriers will result in the Passenger stage corporation (PSC) prime carrier's loss of Authority approval to have sub-carriers operating at the Airport.

X. Lost Property and Luggage

Regulations:

1. Every taxicab, vehicle for hire, charter vehicle or courtesy vehicle operator shall ensure that their passengers remove all of their belongings upon arrival at their destination.

2. Every taxicab, vehicle for hire, charter vehicle or courtesy vehicle operator who finds any passenger belongings shall immediately return them to the passenger's destination. If the driver is unable to directly return any items, the items shall immediately be taken to the Airport Lost and Found.

Operators may park curbside to turn in lost property after making contact with an ATO or by calling Airport Paging at (619) 400-2900.

For Lost and Found Office assistance call 619-400-2140 or fax 619-400-2141. The office is open from 7:00 AM until 11:00 PM, and can also be reached online at www.san.org.

These Rules and Regulations supersede Metropolitan Transit Development Board (MTDB) regulations regarding lost property where such regulations pertain to the Airport.

Y. Smoking

Regulation:

1. Every taxicab, vehicle for hire, or courtesy vehicle operator shall refrain from smoking in their vehicle at all times and prohibit their passengers from smoking while in their vehicle. “No smoking” signs shall be prominently posted in every vehicle.

Z. Ground Transportation Vehicle Conversion Incentive-Based Program

To meet certain commitments set forth in the May 5, 2008 Memorandum of Understanding with the California Attorney General pertaining to the management of greenhouse gas emissions, the Authority adopted the Ground Transportation Vehicle Conversion Incentive-Based Program (“Incentive Program”) to incentivize applicable commercial ground transportation service providers operating at the airport to convert their current vehicles to electric, alternative fuel vehicles (AFVs) or to clean air vehicles (CAVs). The goal of this Incentive Program is to convert 100% of the applicable public commercial ground transportation vehicles operating at the Airport to AFVs or CAVs by 2017.

The Incentive Program is applicable to all eligible airport-permitted commercial ground transportation operators. These ground transportation service providers include, taxicabs, Transportation Network Companies (TNCs), vehicles for hire, hotel/motel shuttles, and off-airport parking shuttles. Limousines and charter vehicles (TCP licensed only) are exempt from all airport clean air vehicle conversion objectives, plans, incentives and requirements.

The President/CEO shall have the authority to suspend or cancel the Incentive Program at any time.

1. Standardized Age Replacement

Regulations:

a. No ground transportation vehicle shall be operated at the airport where the model year of said vehicle exceeds ten (10) years old.

b. Any ground transportation vehicle with a model year between seven (7) and ten (10) years old must meet the Authority’s annual inspection requirements.

2. Hotel/Motel Shuttle Consolidation Incentive Program

If a hotel/motel elects to utilize an AFV or CAV and consolidates its shuttle services with one or more hotel or motel, the Authority will reduce the percentage of its fees as follows.

Operators	Reduction in fees and charges
2 to 3	50%
4 to 5	75%
6 plus	100%

The discounted rate would only apply to the dedicated AFVs or CAVs providing the courtesy service, not the entire fleet of vehicles owned and operated by the provider.

3. Conversion Incentives

The Authority may offer incentives or other programs to ground transportation service operators that use AFVs or CAVs. The incentives and other programs are approved by the Authority's Board of Directors. Contact the Ground Transportation Department for details.

4. Non-Conversion Fees

The Authority may levy fee increases for non-alternative fuel or non-clean air commercial vehicles operating at the airport. These fees are approved by the Authority's Board. Contact the Ground Transportation Department for details.

SECTION 6

6.0 FIRE, SAFETY AND HAZARDOUS MATERIALS

6.1 SCOPE AND APPLICABILITY

This section specifies fire prevention/protection, safety, and hazardous materials requirements at the Airport. All tenants shall conform with the codes and regulations prescribed in this section, all applicable codes, standards and recommended practices of the National Fire Protection Association (NFPA) relating to airports, all general construction fire and safety codes, and all applicable local, regional and state fire safety codes currently in existence or hereafter promulgated and not in conflict herewith. All hazardous substances at the Airport shall be managed in a manner consistent with applicable safety standards and all applicable federal, state, and local laws and regulations.

Authority Code § 8.12 (i). The enactment of this section is not intended to preempt the public health regulations contained in the City of San Diego Municipal Code, Article 5, Division 1, Sections 45.0101 through 45.0111, entitled "SMOKING PROHIBITED IN CERTAIN PUBLIC AREAS", and said Municipal Code Sections are hereby adopted and incorporated herein and shall be applicable to any airport under the jurisdiction of the Authority within the territorial limits of the County of San Diego. Every person at any said airport shall comply with the applicable provisions of said Municipal Code Sections, including subsequent amendments thereto, and every lessee of the Authority at any said airport shall post the necessary "No Smoking" signs on its leased premises as required by said Municipal Code Sections and enforce the provisions of said Municipal Code Sections.

Cross-references: See Rules and Regulations Sections 2.3 Litter and Refuse, 2.4 Pollution Prevention and Control and Dumping, and 4.3 Cleanliness. For specific procedures regarding fueling operations and spill protection, see Sections 3.4 – 3.4.8.

6.2 GENERAL SAFETY DUTIES

A. Fire Alarms

Regulations:

1. All tenants shall educate their employees, contractors, subcontractors, agents and representatives in the proper use of the Airport's fire alarm system and shall take effective measures to avoid its non-emergency activation. Willful or negligent non-emergency activation of any Airport fire alarm system shall constitute violation of the Rules & Regulations.
2. At the sole discretion of the President/CEO or his or her designee, violation of this Regulation shall result in any one or more of the following: (1) warning, suspension or revocation of a SAN ID badge, (2) termination of any Airport

agreement, (3) monetary administrative civil penalty, or (4) administrative letter of correction.

3. At the sole discretion of the President/CEO or his or her designee, a monetary administrative civil penalty for the violation of Section 6.2 (A)(2) above may be imposed as follows:

    a. First Violation – a monetary penalty of up to One Thousand Dollars ($1,000);

    b. Second Violation – a monetary penalty of up to Two Thousand Dollars ($2,000);

    c. Third Violation – a monetary penalty of up to Four Thousand Dollars ($4,000); and

    d. All subsequent Violations – a monetary penalty of up to Eight Thousand Dollars ($8,000).

B. Fire Extinguishers

Authority Code § 8.12 (g). Tenants of all hangars and buildings shall provide suitable fire extinguishers and equipment and they shall be kept in such condition as may be required by the Fire Marshall of the city in which the airport is located.

Regulations:

1. All tenants shall provide adequate, readily accessible and properly working fire extinguishers in their leased spaces. Fire extinguishers shall be maintained in good operating condition as required by the City of San Diego Fire Marshal and applicable NFPA Standards. Each fire extinguisher shall display an official inspection tag showing the date of most recent inspection. Each fire extinguisher shall display its intended fire suppression capability as required by applicable occupational safety and health standards as found in Title 8, § 6151 of the California Code of Regulations.

2. Airlines are required to provide and maintain a wheeled fire extinguisher that meets or exceeds the NFPA Standard on the ramp at each of their preferentially assigned gates. Fire Extinguishers shall be maintained in good operating condition as required by the City of San Diego Fire Marshal and applicable NFPA standards. Each fire extinguisher shall display an official inspection tag showing the date of most recent inspection. At non-preferential gates, the operating airline shall ensure that a wheeled fire extinguisher that meets or exceeds the NFPA Standard is present on the ramp. Although multiple airlines may mutually

agree which airline shall provide the extinguisher at non-preferential gates, the operating airline is ultimately responsible for ensuring the extinguisher is present and meets or exceeds the NFPA Standard prior to commencing its operations.

C. Cleanliness

Authority Code § 8.12 (f). Tenants shall maintain hangar floors, gasoline pits and trucks clean and free of excess gasoline, grease and other inflammables.

Regulations:

1. Tenants shall adhere to good housekeeping as well as Storm Water Best Management Practices as found in Appendix B of the Airport Storm Water Management Plan (SWMP). Failure to comply may result in the Authority providing cleaning services at the sole expense of the tenant.
2. Tenants shall keep the space allotted to them free from rubbish and accumulation of any material that may pose a potential hazard, including, without limitation, waste, rubbish, fuel, oil, grease and other flammable or hazardous materials.
3. Tenants shall put in place drip pans and/or other precautions in compliance with good practice recommendations of the NFPA, the Federal Aviation Administration (FAA), and/or the Authority. Such containment measures shall be monitored and cleaned regularly so as not to overflow, pose a fire hazard, or become foreign object debris (FOD).

Cross-references: See Rules and Regulations Sections 2.3 Litter and Refuse, 2.4 Pollution Prevention and Control and Dumping, 4.3 Cleanliness, and relevant portions of Section 3.

D. Safety Inspections

The City of San Diego Fire Marshall oversees all Airport operations relating to fire safety standards and methods.

Regulations:

1. All tenants of any space where a safety inspection is proposed or conducted by a representative of a governmental jurisdiction other than the Authority shall notify the Authority's Aviation Security and Public Safety Department immediately.
2. All tenants of a space where it is determined that any building, structure, equipment or vehicle within the operational control of the tenant is a hazard shall immediately take necessary corrective actions to abate or correct the

hazard. Once the condition has been abated or corrected, the tenant shall notify the Authority's Aviation Security and Public Safety Department.

Contact the Aviation Security and Public Safety Department at (619) 400-2762.

6.3 FIRE HAZARDS

Authority Code § 8.12 (a). Smoking or lighting of open flames shall be prohibited in the following locations:

(1) Areas posted with "No Smoking" signs;

(2) On ramps or aprons; and

(3) Within 50 feet of hangars, fuel trucks or fuel loading stations.

Authority Code § 7.02 (a). No person, except a peace officer or a member of the Armed Force on official duty, shall carry any weapon, explosive, or inflammable material on or about his or her person, openly or concealed, on the facilities and airports under the jurisdiction of the Authority, without the permission of the President/CEO.

A. Storage of Materials and Equipment

1. General

Authority Code § 8.12 (c). No person shall stock or store any material or equipment in such a manner as to constitute a fire hazard.

Regulation:

a. No person shall block with equipment or stock the aisle, walkway, exit or entry to any building or storage area.

2. Outdoor Storage

Regulation:

a. Every person storing material outside shall store such materials under cover. All protective covers and tarpaulins used for outdoor storage shall be made from a flame-proofed fabric or material.

3. Flammable Materials

Authority Code § 8.12 (d). Except for oil in sealed cans, no inflammable liquids or gases, including gasoline, dope, solvent and thinner, shall be stored in any hangar or building in quantities greater than one gallon; provided, however, separate buildings for such storage may be approved by the President /CEO.

Regulations:

a. Every person storing a flammable liquid shall use a spill containment pallet or similarly-functioning storage device.

b. No person shall store any flammable materials under any steps or stairway.

4. Oil-Stained Materials

Regulations:

a. Every person storing any oil-stained materials, including waste rags, shall store such materials in metal receptacles with a self-extinguishing cover. The receptacle shall be emptied and cleaned daily or more frequently if necessary.

b. Every person storing oil-stained clothes shall store such clothes in lockers constructed of metal or fire-resistant material.

B. Indoor Work Areas

Regulations:

1. No person shall conduct any work or process in which a highly-combustible material is used, including, but not limited to, doping or spray painting, other than in a designated and properly designed and ventilated room or building equipped with a proper fire suppression system. Each building used for such purposes shall conform to all applicable federal, state and local laws, regulations and ordinances. All illumination, wiring, heating, ventilating equipment, switches, outlets and fixtures shall be safe, spark-proof and vapor-proof.

2. Every person entering or working in any area where highly-combustible material is used, including, but not limited to, doping and spray painting, shall be properly trained, wear spark-proof shoes and clothing, and possess all required safety equipment.

C. Open Flames

Authority Code § 8.12 (b). No person shall start an open fire any place on the facilities and airports under the jurisdiction of the Authority without permission of the President/CEO.

1. Approval and Compliance Required

Regulations:

a. No person shall conduct or permit any open flame operation or fire of any type, including cooking grills, exposed flame heaters, candles, welding (arc or gas) or cutting blow torches, flare pots or other open flame devices on any portion of the Airport without the express prior written permission of the Airside Operations Department.

The Airside Operations Department can be reached at (619) 400-2710.

Barbecue Request Forms can be obtained from the Authority's Airside Operations Department at (619) 400-2710.

Hot Work Permits can be obtained from the Authority's Facilities Development Department at (619) 400-2595 or the Facilities Management Department at (619) 400-2725.

b. All persons engaged in any activity that is capable of providing a source of ignition, including, but not limited to, welding, cutting, grinding or soldering with a torch, shall comply with applicable California Occupational Safety and Health Act (Cal/OSHA) Title 8 requirements.

2. Aircraft Storage Areas

Regulation:

a. No person shall use any equipment employing open flames or sparks within any aircraft storage area.

3. Required Distance

Regulation:

a. No person shall create or maintain any open flames within fifty (50) feet of a hangar, fuel truck, fuel loading station, or aircraft without prior approval from the President/CEO.

4. Operations Restricted to Maintenance Areas

Regulation:

a. No person shall conduct lead or carbon burning, fusion gas or electric welding blowtorch work, reservoir repairs, engine testing, battery charging or any open flame maintenance operations outside the maintenance areas approved by the Authority.

Such operations must receive prior written approval. See Regulation 6.3.C.1.a.

5. Safety Equipment and Training

Regulation:

a. All persons conducting open flame operations shall have a sufficient fire suppression system available in the immediate vicinity and personnel adequately trained to operate such system.

Such operations must receive prior written approval. See Regulation 6.3.C.1.a.

D. Paint Spraying/Stripping, Battery Work and Doping

Regulations:

1. Every person conducting paint, varnish or lacquer spraying, battery work or doping operations shall receive prior approval from the President/CEO.
2. The arrangement, construction, ventilation and protection of spraying booths and the storing and handling of materials in connection therewith shall be in accordance with all applicable laws and regulations.
3. No person shall use dope (cellulose nitrate or cellulose acetate dissolved in volatile flammable solvents) within any hangar. The process of doping shall be conducted as set forth in the applicable NFPA Standards. All persons conducting such work shall do so only in isolated and Authority-approved areas equipped with all required safety controls. All such operations and locations shall comply with all regulations, including but not limited to local fire prevention requirements, Authority regulations, Authority storm water pollution prevention requirements, and other applicable regulations and codes.

E. Cleaning Fluids

Authority Code § 8.12 (e). No person shall use a volatile inflammable [substance] for cleaning purposes inside any hangar or building.

Regulation:

1. All persons cleaning aircraft parts and other equipment shall do so only with nonflammable cleaning agents or solvents unless unavoidable. When the use of flammable solvents cannot be avoided, only liquids having flash points in excess of 100 degrees Fahrenheit shall be used. Special precautions shall be taken to eliminate ignition sources in compliance with good practice recommendations of the NFPA.

6.4 ELECTRICAL HAZARDS

A. Portable Lighting

Regulations:

1. Every person using extension lights or portable/mobile lighting equipment in and around aircraft hangars, shops, buildings and other areas on or near combustible materials shall ensure that such equipment is explosion-proof (also known as “hazardous location lighting” and/or “intrinsically safe lights”) and approved by Underwriters Laboratories (UL).

2. All light stands, equipment and towers interfering with the visibility of the Air Traffic Control Tower (ATCT), aircraft pilots, or ground vehicle operators shall be equipped with appropriate shielding.
3. No person shall use portable lamp assemblies in any area without the proper protective guard or shield.
4. All persons using portable lights shall comply with the Authority's ramp lighting standards.

B. Cabling

Regulation:

1. All persons using power cables and cords on portable or stationary electric equipment shall ensure that such equipment uses heavy-armored rubber or similar material and provides automatic grounding through isolated integral conductors. All power cables and cords shall be arranged or taped to the floor to prevent trip hazards.

6.5 HAZARDOUS MATERIAL AND WASTE

Authority Code § 8.50 (a). All persons subject to this Code shall comply with and conform to any and all applicable federal, state and local environmental laws and regulations, including, without limitation, any federal state and local environmental laws and regulations relating to the transportation of radioactive materials.

Authority Code § 8.51 (a). No person, without prior written approval from the President/CEO, shall keep, transport, handle or store at, in or upon any of the facilities or airports under the jurisdiction of the Authority, including, without limitation, the Airport (collectively, the "Facilities"), any cargo of explosives, or other hazardous materials that are barred from loading in or for transportation by civil aircraft in the United States under regulations promulgated by the Federal Aviation Administration or the regulations of any other authorized federal, state or local agency having jurisdiction. Advance written notice of at least 24 hours shall be given to the President/CEO to permit full investigation and clearances of any operation requiring a waiver of this rule. Compliance with said regulations shall not constitute or be construed to constitute a waiver of the required notice or an implied permission to keep, transport or store such explosives or other dangerous materials at, in, or upon the Facilities.

Authority Code § 8.51 (b). No person may offer, and no person knowingly may accept, any hazardous materials for shipment at any of the Facilities without the prior written approval of the President/CEO. Any and all shipments of hazardous materials shall be handled and stored in full compliance with the current provisions of F.A.R. Paragraph 139.321. Any person who has been authorized by the President/CEO to transport hazardous materials shall have designated personnel at the Authority who are

authorized and responsible for receiving and handling such shipments in compliance with all applicable federal, state and local laws.

Authority Code § 8.51 (c). Any person engaged in the transportation of hazardous materials shall provide storage facilities which reasonably ensure against unauthorized access, exposure to persons, or damage to shipments while in or on any of the Facilities.

A. Management Plan

Regulation:

1. All persons using, generating, or storing any hazardous substance on the Airport shall first submit a detailed management plan to the Authority's Director, Environmental Affairs. The Plan shall include procedures for the use, handling, and storage of the hazardous substance, including safety procedures, safety training procedures and schedules of safety training frequency, site or facility safety features, and any other pertinent information. All persons storing hazardous substances shall provide information regarding the exact location and quantity of all hazardous substances stored to the Director, Environmental Affairs, in the format requested by the Authority, together with a Material Safety Data Sheet (MSDS) for each substance. Written approval shall be received prior to the initiation of such activities.

   The Environmental Affairs Department can be reached at (619) 400-2782.

B. Business Plan

Regulation:

1. All persons subject to California Health and Safety Code Chapter 6.95 (Hazardous Materials Release Response Plans and Inventory) and required to prepare a business plan shall notify the President/CEO and/or Director, Environmental Affairs in writing that the business is subject to Health and Safety Code Section 25503.5 and has complied with its provisions. Upon written request from the President/CEO and/or Director, Environmental Affairs, said person shall provide a copy of the Business Plan to the President/CEO and/or Director, Environmental Affairs within five (5) working days after receiving such request.

   The Environmental Affairs Department can be reached at (619) 400-2782.

C. Training

Regulation:

1. Every person conducting any activity involving hazardous materials is solely responsible for educating and training their respective employees, agents,

contractors and suppliers on the subject of hazardous substances management, handling, documentation, disposal and removal.

D. Damages Due to Non-Compliance

Regulation:

1. All fines, penalties, assessments, charges, costs, expenses and consequential damages attendant to non-compliance shall be the sole responsibility of the party found in violation and shall not become or form the basis of any reimbursement by the Authority, or any rental abatement, reductions, concessions or fee adjustments.

6.6 HANGAR SAFETY

Authority Code § 8.12 (h). Aircraft engines shall not be operated, nor shall aircraft electrical or radio equipment be operated in any hangar.

A. Motor Vehicles

Regulation:

1. No person shall operate a tractor, tug or other motor vehicle in a hangar occupied by any aircraft unless the vehicle is in compliance with applicable NFPA Standards and the exhaust system of such vehicle is protected by screens or baffles.

B. Aircraft

Regulation:

1. All persons repairing, providing maintenance to, or modifying an aircraft within a hangar shall ensure that the aircraft undergoing such operations is grounded and/or bonded in accordance with FAA and NFPA Standards and Guidelines.

C. Spills and Leaks

Regulation:

1. All maintenance and service personnel shall put in place drip pans or other precautions, in compliance with good practice recommendations of the NFPA Standards, FAA Advisory Circulars (ACs), and the Storm Water Management Plan (SWMP), Appendix B, BMP SC05, to contain any spills or leaks from aircraft or vehicles. Such containment measures shall be monitored and cleaned regularly so as not to overflow, pose a fire hazard or become foreign object debris (FOD).

   Cross reference: See Rules and Regulations Section 4.3 Cleanliness.

D. Aircraft, Ground Radar and Radio Equipment

Regulations:

1. No person shall test or operate radio transmitters or similar equipment installed in an aircraft within a hangar with dynamotors running unless all parts of the antenna system are at least one foot removed from other objects. No aircraft shall be placed at any time so that any fabric-covered surface is within one foot of an antenna system.
2. Unless an approved shielding device is used, no person shall operate or ground-test airborne radar equipment in any area on the Airport where the directional beam of high-intensity radar is within 300 feet or the low-intensity beam is within 100 feet of an aircraft fueling operation, aircraft fueling truck or flammable liquid storage facility.

SECTION 7

7.0 ADMINISTRATIVE PROCEDURES AND PENALTIES

7.1 SCOPE AND APPLICABILITY

Authority Code § 6.01. Any person subject to the Rules and Regulations who violates or fails to comply with the Rules and Regulations will be deemed to be in violation of this Code. The President/CEO may promulgate a schedule of fines and penalties for any violation of the Rules and Regulations.

These administrative penalties apply to all persons with any badging, leasehold, permit or contractual relationship with the Airport or the Authority, including, but not limited to, tenants, vendors, licensees, permittees and such persons' employees, contractors and subcontractors.

7.2 PENALTIES AND OTHER CONSEQUENCES OF VIOLATION

Regulations:

A. Unless specified otherwise, a violation of a Rule or Regulation shall result in any one or more of the following: warning, suspension or revocation of a SAN ID badge, termination of any airport agreement or Airport Ground Transportation Service Permit, loss of AOA driving privileges, monetary administrative civil penalty, administrative letter of correction, or attendance at training.

B. Repeated violations of the Rules and Regulations shall be assessed additional and/or increased penalties.

C. Unless specified otherwise, the violator of any Rule or Regulation may be assessed a civil penalty of up to $25.00 for a first offense, $50.00 for a second offense and $100 for a third offense, where the prior violation occurred within twelve (12) months of the subsequent violation. Civil penalties may be imposed in addition to any other penalty imposed by the hearing officer and/or any other right or remedy the Authority may have available by contract or applicable law.

D. Failure to pay an administrative civil penalty within thirty (30) days of its final adjudication may result in the temporary or permanent denial of access to restricted areas of the Airport, loss of permission to be on Airport property, and/or the termination or suspension of any or all rights, privileges, permits or other agreements at the Airport.

7.3 ENFORCEMENT

California Public Utilities Code § 170016 (c). A rule, regulation, or ordinance of the Authority may be enforced in an administrative action. A civil penalty may be imposed if the administrative action results in a finding that a violation has taken place.

(d). The Authority may employ necessary personnel to enforce this section.

The President/CEO may designate individuals to issue a Notice of Violation to any person who violates the Rules and Regulations or the employer of such person. Designated individuals include, but are not limited to, the Harbor Police Department, Airport Traffic Officers (ATOs), Aviation Security and Law Enforcement Manager, Emergency Preparedness and Public Safety Manager, Security and Public Safety Analyst, Airside Operations Manager, Airside Operations Duty Manager, Curfew Violation Review Board (CVRB), Environmental Affairs Manager, Senior Environmental Specialist, Associate Environmental Specialist, Assistant Environmental Specialist, Terminal Operations Manager, Terminal Operations Coordinator, Customer Service Coordinator, and Ground Transportation Manager.

7.4 NOTICE OF VIOLATION

A. When a person authorized to enforce the Rules and Regulations observes or has notice of a violation, that person shall issue to the violator a written Notice of Violation. If the violator leaves the scene or the notice otherwise cannot be issued to the violator, the Notice of Violation shall be delivered to the violator's place of employment and to the operator, if other than the employer, who has the badging, leasehold, permit or contractual relationship with the Airport or the Authority and who is responsible for control of the violator while on the Airport.

B. A copy of the Notice of Violation shall be delivered to the violator's employer and the operator who is responsible for control of the violator while on the Airport if that operator is not the violator's employer.

C. The Notice of Violation shall contain:

    1) the date, time, location and nature of the violation;

    2) the identity of the violator and, if applicable, SAN ID or permit number; and

    3) the name and identification number of the individual issuing the Notice of Violation, the names of victims and/or witnesses, and the Authority Code or Rules and Regulations section violated.

7.5 RESPONSIBILITY AND LIABILITY

Regulations:

A. Both the person violating the Rules and Regulations and the operator employing that person or responsible for control of that person while at the Airport shall be responsible for taking corrective action and payment of any imposed penalty.

B. In the case of a violation by a commercial ground transportation driver, the operator of the vehicle which the driver is using, operating or associating with at the time of the violation shall be liable for payment of the applicable penalty.

7.6 APPEALS

A. Administrative Penalties and Suspension or Revocation of SAN ID Badges and Privileges

Regulations:

1. Individuals who receive a Notice of Violation may submit a written "Letter of Explanation" to the issuing Authority Department within five (5) business days after receipt of a Notice of Violation. Within ten (10) business days after issuance of a Notice of Violation, the issuing Authority Department will do all of the following: (1) determine whether to confirm the Notice of Violation; (2) determine the administrative penalty imposed, if any; and (3) issue a decision letter with findings advising the recipient of these determinations. The Notice of Violation findings and any suspensions, revocations, or other administrative penalties may be appealed in writing to the Vice President, Operations or his/her designee within ten (10) business days of the date the decision letter is issued. Any request for appeal shall state the basis of the appeal and outline supporting facts. If an appeal is not filed within the ten (10) days, the suspension, revocation or administrative penalty shall become effective and any appeal filed thereafter may be denied.

   The Vice President, Operations or his/her designee may, without a hearing, immediately reverse an appealed suspension, revocation or administrative penalty based on the appeal, the notice of violation, and/or any other supporting documents.

2. When an appeal is timely filed, the appeal shall be assigned to the Vice President, Operations or his/her designee as a hearing officer. The matter shall be heard no later than sixty (60) calendar days from the date of receipt of the request for appeal. The hearing shall be conducted as an informal administrative proceeding with the rules of evidence relaxed from strict judicial practice; e.g., hearsay evidence may be admissible. All parties may be represented by legal counsel, witnesses shall be sworn and be subject to cross-examination, and cumulative or repetitive evidence may be excluded.

   The hearing officer may uphold the suspension, revocation or administrative penalty specified in the notice of violation or reverse or modify the decision which is the subject of the appeal, or make a different decision. The written decision of the hearing officer shall contain findings of fact and state reasons for the decision. A copy of the decision shall be sent to or personally served upon the parties within ten (10) business days of the conclusion of the hearing.

3. The decision of the hearing officer may be appealed in writing to the President/CEO within fifteen (15) business days from the date the hearing officer's decision is sent or personally served. The decision of the President/CEO shall be based on the documents considered by the hearing officer. The President/CEO may uphold the suspension, revocation or administrative penalty or reverse or modify the decision which is the subject of the appeal, or make a different decision.
4. The decision of the President/CEO shall be the final administrative remedy. There shall be no rehearing or reconsideration. The final decision shall be subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6.
5. When a timely appeal has been filed, the suspension, revocation or administrative penalty shall be stayed pending the decision(s) of the hearing officer and/ or the President/CEO. However, when, in the opinion of the Authority, there is a clear and immediate threat to public safety, the Authority may enforce a suspension or revocation prior to a hearing being held. The penalized party may then request a hearing from the Authority within ten (10) business days from the date notice that the suspension or revocation is not stayed has been sent or personally served. If no expedited hearing is requested, the appeal shall proceed in the ordinary course and the suspension or revocation shall remain in effect pending the outcome of the appeal process.

B. Suspension, Revocation and Denial of Ground Transportation Permits and Services

Authority Code § 9.22 (a) The President/CEO or his or her designee (the "President/CEO") of the San Diego County Regional Airport Authority (the "Authority") shall suspend, revoke or deny the Ground Transportation Service Permit or driver permit, as applicable, for failure to comply with any of the provisions of Sections 9.01 to 9.13, inclusive, of this Code pertaining to ground transportation services. Any such suspension or revocation shall be separate from any civil or criminal proceedings and shall not be a basis for relief of liability or responsibility pursuant to the proceedings. The action of the President/CEO shall be subject to the appeals provisions provided herein.

(b) Upon a determination by the President/CEO that a Permit Holder, operator of a vehicle or Taxicab, or applicant falls within the provisions of subsection (a) above, the Permit Holder or applicant, as the case may be, shall be notified of the suspension, revocation or denial and the manner in which such action may be appealed.

(c) The Permit Holder or applicant shall be notified that they may file a written appeal with the President/CEO. Each appeal must be perfected by a letter addressed to the President/CEO and delivered to the Authority Clerk, or postmarked with the United States Postal Service, within ten business days of the date notice of the decision of the President/CEO addressed to the party making the appeal is placed with the United States Postal Service, which letter of appeal must state that an appeal from the decision of the President/CEO is desired. If no appeal is filed within the said ten days, it shall be grounds to deny a hearing and any untimely filed appeal shall be dismissed by the Hearing Officer. A suspension or revocation shall immediately become effective if an appeal is not timely filed within the ten business days. If an appeal is timely filed, the revocation or suspension shall be stayed pending the final determination of the appeal. In the event the permit, which is the subject of the action, expires and a new permit is issued to the same operator prior to the suspension or revocation taking effect and being fully carried out, or prior to final decision on appeal, the new permit shall be issued conditioned upon and shall be subject to the pending suspension or revocation. If no appeal is taken, said new permit shall be so suspended or revoked. If on appeal and suspension or revocation is the final decision, the new permit shall be so suspended or revoked. There shall be no requirement for further notice or hearing regarding the new permit.

(d) When an appeal is timely filed, the President/CEO shall cause the appeal to be assigned to a Hearing Officer. The matter shall be heard no later than 60 calendar days from the date of the filing of the appeal. The Hearing Officer shall notify the parties in writing of the time, date and place of the hearing. The notice shall be sent to the appellant by registered or certified mail, or hand-delivery. The Hearing (the "Hearing") is an informal administrative proceeding with the rules of evidence relaxed from strict judicial practice. In that regard, hearsay evidence is admissible. All parties may be represented by legal counsel, witnesses shall be sworn and be subject to cross-examination, and cumulative or repetitive evidence should not be admitted. The Hearing Officer may subpoena witnesses and establish additional procedures within the provisions of California Government Code Sections 11507.5 through 11511 and as may be required to serve the interest of justice. The Hearing Officer may uphold the suspension, revocation or denial or reverse or modify the decision which is the subject of the appeal, or make a different decision. A copy of the decision of the Hearing Officer specifying findings of fact and reasons for the decision shall be furnished to the parties within ten business days of the conclusion of the Hearing.

(e) The final decision of the Hearing Officer shall be the final administrative remedy. There shall be no rehearing or reconsideration. The final decision shall be subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6.

(f) An exception to the hearing provisions above shall be made when, in the opinion of the Authority, there is a clear and immediate threat to the safety and protection of the public, the Authority may suspend or revoke a permit prior to a Hearing being held. The Authority shall prepare a written notice of suspension or revocation which includes a statement of the action, a concise explanation of the reasons for the action, the statutory basis relied upon for such action, and an explanation of the Permit Holder's right to request a Hearing from the Authority. Such notice shall be either sent by certified mail to the Permit Holder or be personally delivered. The Permit Holder may request a Hearing from the Authority within five business days of receipt of notification that the permit has been suspended or revoked in the manner provided above in Subsection (c). The Hearing Officer shall notify the appellant of time and place of such Hearing and the Hearing shall be conducted in the manner prescribed in this Section. The Hearing shall be held not more than 15 business days from the date of receipt of said request for Hearing. The suspension or revocation shall not be stayed during pendency of said appeal Hearing.

(g) It shall be unlawful for any person to operate any Ground Transportation Service Vehicle from a facility or airport under the Authority's jurisdiction providing any ground transportation from such facility or airport during the period of any suspension or revocation of the permit or the driver's permit.

(h) No person shall use or give permission to use any vehicle or Taxicab to provide any ground transportation service from a facility or airport under the Authority's jurisdiction during the period of any suspension or revocation of the permit.

(i) When a permit has been suspended or revoked, the operation of any vehicle or taxicab authorized by such permit shall cease.

C. Towed Vehicles

Regulations:

1. Individuals who receive a Notice of Storage may submit a written "Request for Poststorage Hearing" to the issuing Authority Department within ten (10) business days after of the date appearing on the Notice of Storage.

2. When an appeal is timely filed, the appeal shall be assigned to the Vice President, Operations, or his/her designee, as a hearing officer. The hearing officer may not be the same person who directed the storage of the vehicle. The matter shall be heard no later than forty-eight (48) hours from the date of receipt of the request for appeal, excluding weekends and holidays. The hearing shall be conducted as an informal administrative proceeding with

the rules of evidence relaxed from strict judicial practice; e.g., hearsay evidence may be admissible. All parties may be represented by legal counsel, witnesses shall be sworn and be subject to cross-examination, and cumulative or repetitive evidence may be excluded.

3. The decision of the hearing officer may be appealed in writing to the President/CEO within fifteen (15) business days from the date the hearing officer's decision is sent or personally served. The decision of the President/CEO shall be based on the documents considered by the hearing officer. The President/CEO may uphold the parking fees or reverse or modify the decision which is the subject of the appeal, or make a different decision.

4. The decision of the President/CEO shall be the final administrative remedy. There shall be no rehearing or reconsideration. The final decision shall be subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6.

7.7 SCHEDULE OF ADMINISTRATIVE PENALTIES

Section Number:	***Violation:***	***Consequences (*):***	***Authority Code Reference:***
2.2 Smoking	Smoking in Violation of California State Law	G	***Authority Code § 7.03, Authority Code § 8.12 (i).***
2.9 Obstructions and Roadway Use	Violation of Obstructions and Roadway Use provisions	G	***Authority Code § 7.12 (a, b & c).***
2.16 Restricted Areas	Improper Entrance or allowing unauthorized entrance into Restricted Area(s)	G	
2.16.3 Restricted Areas	Improper personnel escort procedures	G	
2.17.A Badges/Display of SAN Identification (ID) Badge	Failure to display or properly display SAN Identification (ID) badge	G	
2.17.D Badges/Unauthorized Uses of Badges	Use of Another Person's SAN Identification (ID) badge or permitting use of One's own SAN Identification (ID) badge by another person	R, G	
2.17.G Badges/Lost or Stolen	Lost or Stolen badge	M, G ($75 per occurrence. After third loss, badge privilege will be permanently revoked)	
2.18 Security Equipment and Directives	Unauthorized testing of checkpoint, screening or security systems	G	
2.18 Security Equipment and Directives	Failure to remain at an inadvertently activated security alarm until an authorized officer of the Authority or other security representatives arrive, determine cause of activation and verify the individual's authority to access that portion of such facilities or airports	G	***Authority Code § 7.07 (c)***
3.2.3 Airport Use Regulations			***Authority Code § 9.40***
3.2.7.C Charter Flight and Itinerant Operations	Improper vehicle escort procedures	G	
3.2.11 Maintenance and Repair of Aircraft	Cleaning, maintenance and repair of aircraft or Ground Service	G	

Section Number:	***Violation:***	***Consequences (*):***	***Authority Code Reference:***
	Equipment (GSE) without authorization and/or in unauthorized locations		
3.3.1 Air Operations Area (AOA) Driver's Permits	Driving on the Airside Operations Area (AOA) without State issued Drivers License or airport issued drivers permit	G	
3.3.4.A Vehicle Operations/Motor Vehicle and Equipment Operations around Aircraft	Failure to yield right-of-way to aircraft; driving a vehicle or equipment in front of taxiing aircraft	G	
3.3.4.A.7 Vehicle Operations/Motor Vehicle and Equipment Operations around Aircraft	Driving a vehicle or equipment across any active loading lane, that is, between the aircraft and the terminal gate or bus when passengers are being boarded or disembarking	G	
3.3.4.B Vehicle Operations/Parking	Parking violations on the Air Operations Area (AOA)	G	
3.3.4.C Vehicle Operations/Speed Limits and Operations on the Air Operations Area (AOA)	Speeding on the Air Operations Area (AOA)	G	
3.3.5 Vehicle Operations/Vehicles Operating on Movement Areas	Unauthorized vehicle operations on movement areas	R, G	
3.4.5 and 3.4.6 Fueling Operations and Fuel Service Vehicles	Violation of any fuel service vehicle provisions	G	***Authority Code § 8.11 (b, c,d & e, g, h & i), Authority Code § 8.11 (f)***
3.4.7.C Fuel Spills/Safety and Clean Up Procedures	Failure to clean-up any fuel spills or failure to follow any other fuel spill response procedures, which include making all proper notifications	G	***Authority Code § 8.11 (j)***
3.4.8.A & B Lavatory Chemical and/or Lavatory Waste Spills/Reporting and Safety and Clean Up Procedures	Failure to clean-up any lavatory chemical and/or lavatory waste spills or failure to follow any other spill response procedures, which include making all proper notifications.	G	

Section Number:	***Violation:***	***Consequences (*):***	***Authority Code Reference:***
4.2.A Conducting Business in Common Areas	Conducting business in common areas; prohibited use of premises	G	***Authority Code § 8.41 (a & b)***
4.3 Cleanliness	Trash/Foreign Object Debris (FOD), keeping leased area clean; responsibility to contain FOD	G	
4.5.B.3 Security/Construction/Perimeter Fence and Gate Security	Perimeter fence and gate security	G	
4.5.B.4 Security/Construction/Doorway Security	Doorway Security	G	
4.7 Care of Building	Care of building; windows and doors, baggage storage cases, tenant restrooms, exterior surfaces, utility systems, isolated operations (i.e. hallways, passageways, stairwells, employee ramp side restrooms, trash compactor areas etc.)	G	
4.9 Signage and Tenant Advertising	Signage and Tenant Advertising	G	
4.12 Noise	Noise; violation of any excessive noise between 10PM and 7AM or as otherwise directed by Authority tenant advisory, construction notice or other lawful instruction	G	
4.14 Electronic Equipment	Electronic equipment (Portable radios, iPods, boom boxes, etc.) playing in public spaces	G	
4.15 Queuing Lines and Stanchions	Ticket counter and gate queuing; Unauthorized queuing equipment other than typical 3-foot high chrome stanchions with black straps	G	

Section Number:	***Violation:***	***Consequences (*):***	***Authority Code Reference:***
5.4 Commercial Transportation Vehicles	Ground transportation permit required	G	***Authority Code §* 9.11(a)**
5.4 Commercial Transportation Vehicles	Permit fees (non-payment)	G	***Authority Code §* 9.12(b)**
5.4.A Commercial Transportation Vehicles	Lawful order	S, G	***Authority Code § 9.21(i)1***
5.4.A Commercial Transportation Vehicles	Authority Rules and Regulations	G	***Authority Code § 9.21(i)2***
5.4.A Commercial Transportation Vehicles	Public Utilities Commission Regulations	G	***Authority Code § 9.21(i)3***
5.4.A Commercial Transportation Vehicles	MTS regulations	G	***Authority Code § 9.21(i)3***
5.4.B.3. Commercial Transportation Vehicles	Failure to display/maintain transponder	S, G	***Authority Code § 9.12 (c)***
5.4.B.3. Commercial Transportation Vehicles	Decal/AVI transponder	G	***Authority Code §* 9.12(c)1**
5.4.B.3. Commercial Transportation Vehicles	Evade AVI readers	S, G	***Authority Code § 9.12(c)2***
5.4.B.5.C. Commercial Transportation Vehicles	Driver permit required	G	***Authority Code § 9.13 (a)***
5.4.B.6 Commercial Transportation Vehicles	Service complaints (non-compliance)	G	***Authority Code § 9.17***
5.4.E Commercial Transportation Vehicles	Notify change of address	G	***Authority Code § 9.22(j)***
5.4.F Commercial Transportation Vehicles	Insurance (failure to maintain)	S, G	***Authority Code § 9.14***
5.4.F Commercial Transportation Vehicles	Threat to the safety and protection of the public	S, G	***Authority Code § 9.22(f)***
5.4.G Commercial Transportation Vehicles	Records (failure to provide)	G	***Authority Code § 9.16***
5.4.I Commercial Transportation Vehicles	Vehicle condition (owner/driver) Minor	G	***Authority Code § 9.21(a)***
5.4.I Commercial Transportation Vehicles	Vehicle condition (owner/driver) Major	G	***Authority Code § 9.21(a)***
5.4.J Commercial Transportation Vehicles	Driver identification	G	***Authority Code § 9.21(b)***
5.4.K Commercial Transportation Vehicles	Designated Pickup Zone	G	***Authority Code §* 9.21(c)1**
5.4.K Commercial Transportation Vehicles	Must transit hold lot	G	***Authority Code § 9.21(c)4***
5.4.K Commercial Transportation Vehicles	Driver to remain at vehicle (hold lot)	G	***Authority Code § 9.21(c)6***
5.4.K Commercial Transportation Vehicles	Driver to remain in vehicle at stand	G	***Authority Code § 9.21(c)7***
Section Number:	***Violation:***	***Consequences (*):***	***Authority Code Reference:***

5.4.K Commercial Transportation Vehicles	Failure to move taxi forward	G	***Authority Code § 9.21(c)8***
5.4.K Commercial Transportation Vehicles	Soliciting by taxi or VFH driver/owner	G	***Authority Code § 9.21(c)9***
5.4.N Commercial Transportation Vehicles	Driver personal grooming	G	***Authority Code § 9.21(e)1 & 2***
5.4.N Commercial Transportation Vehicles	Driver Attire	G	***Authority Code § 9.21(e)1 &2***
5.4.O Commercial Transportation Vehicles	Duty to transport (taxi & VFH)	S, G	***Authority Code § 9.21(f)***
5.4.P Commercial Transportation Vehicles	Non-discrimination	S, G	***Authority Code § 9.21(g)***
5.4.Q Commercial Transportation Vehicles	Fares by meter or tariff, receipts	S, G	***Authority Code § 9.21(h)***
5.4.S.3 Spare Taxicab Use Policy	Violation of Spare Taxicab Use Policy	G	
5.4.S.6 Commercial Transportation Vehicles	Failure to follow Authority credit card requirements	G	
6.0 Fire, Safety and Hazardous Materials	Violation of fire prevention/protection and/or hazardous material/waste management procedures	G	***Authority Code § 7.02 (a), Authority Code § 8.12 (a), Authority Code § 8.12 (b), Authority Code § 8.12 (c), Authority Code § 8.12 (d), Authority Code § 8.12 (e), Authority Code § 8.12 (f), Authority Code § 8.12 (g), Authority Code § 8.12 (h), Authority Code § 8.12 (i), Authority Code § 8.50 (a), Authority Code § 8.51 (a), Authority Code § 8.51 (b), Authority Code § 8.51 (c),***
6.2 A Fire Alarms	Violation on non-emergency activation of an Airport fire alarm system due to negligent or willful behavior	G, M (1st violation up to $1,000; 2nd violation up to $2,000; 3rd violation up to $4,000; All subsequent violations up to $8000)	
6.2.B.2 Fire Extinguishers	Violation of duty to provide, maintain or ensure wheeled fire extinguisher at ramp	G	

*

G = warning, suspension or revocation of a SAN ID badge, termination of any airport agreement or Airport Ground Transportation Service Permit, loss of AOA driving privileges, monetary administrative civil penalty, administrative letter of correction, and/or attendance at additional training
S = mandatory suspension
R = mandatory revocation
M = monetary penalty as specified
Where two letters are listed, the first letter designates a mandatory consequence of violation. A second letter indicates additional consequences of violation applied at the discretion of the Authority.

APPENDIX G
MISCELLANEOUS SUPPORT MATERIALS


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

SITE AUDIT FORM

2018 Storm Water Quality Inspection For Industrial/Commercial/Municipal Facilities

Inspector Name: Date: Time:

Contact Information

Business Name_____

Business Type_____

Mailing Address_____

Business Telephone # _____ Business Fax # _____

On-Site Contact #1_____ Title:_____

Phone #_____ Cell Phone # _____

On-Site Contact #2_____ Title:_____

Phone #_____ Cell Phone # _____

Environ Contact _____ Title:_____

Phone #_____ Cell Phone # _____

Subtenants: □ Yes □ No If yes:

Name_____ Contact _____Phone:_____

Name_____ Contact _____Phone:_____

Vendors: □ Yes □ No If yes:

Name_____ Contact _____Phone:_____

Name_____ Contact _____Phone:_____

Facility/Operation/Site Information

Principal activity:_____

Does facility/operation have an Individual NPDES Permit? □ Yes □ No

If yes, provide WDID (Permit) #: _____

Does facility/operation maintain SWPPP and/or BMP Plan? □ Yes □ No

Does facility/operation maintain Hazmat Business Plan? □ Yes □ No

Has facility/operation conducted previous storm water monitoring/or sampling programs? □ Yes □ No

Initial Observations

Nearest MS4 conveyance inlet: Approx. distance to MS4: □ < 200 ft. □ 200 – 1000 ft. □ > 1000 ft.

Discharge observed? □ Yes □ No If yes, describe:

Additional comments:

Tenant Summary Sheet

Verify/update "Tenant Description and Primary Industrial Activities:" **Correct/Adequate** ☐

Updates, please describe:_____

_____

_____

Print Name of Facility/Operation Representative:_____

Inspector's Signature:_____ Date:_____

BMPs	N/A	Fully	Partial	Not	Comments
Storm Water Discharges					
Does storm water from this facility/operation enter the MS4?					
Does the storm water run-off from this facility/operation discharge into a wastewater treatment process or sanitary sewer or dead-end sump area with pump?					

BMPs	N/A	Fully	Partial	Not	Comments
SC01 - Non-Storm Water Management	☐ Not Applicable at this Facility/Operation				
Identify significant materials which could have the potential to discharge to storm drains.	☐ Oil and Grease ☐ Solvents ☐ Paint ☐ Deicing/Anti-Icing Fluids ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Battery Acid ☐ Fuel ☐ Pesticides/Herbicides/Fertilizers ☐ Metals ☐ Deicing/Anti-Icing Fluids ☐ Sediment ☐ Fire Fighting Foam ☐ Dumpster Wastes ☐ Landscape Wastes ☐ Floatables ☐ Lavatory Chemical Wastes ☐ Potable Water System Chemicals ☐ Rubber Particulates ☐ Other:				
SC01-01. Are the Airport Operations (619-400-2710) and the Airport Authority Environmental Affairs Department (619-400-2784) notified if there is any evidence of illicit connections or illegal discharges?					
SC01-02. Have employees, tenants and the public been educated about avoiding non-storm water discharges?					
SC01-03. Are outdoor water supplies (hose bibs) limited and posted with appropriate use signs to discourage uses that may pollute the storm drain system/receiving waters?					
SC01-04. Is the site free of evidence of illicit connections and illegal discharges?					
SC01-05. Are landscaped areas not being irrigated during a forecasted rain event or 48 hours after a rain event?					
SC01-06. Are the irrigation systems and landscaped areas being inspected on a regular basis to prevent prohibited over-irrigation and identify any leaks?					
SC01-07. Is air conditioning or refrigerator condensation being directed to landscaping, porous surface, into the sanitary sewer, or being reused?					
SC01-08. Is the satellite water-tracking system being used to irrigate landscaped areas, to apply correct levels of soil moisture, and are City water restriction guidelines being followed?					
SC01-09. Is an hand-held hose equipped with positive shutoff nozzle, hand-held water container, or timed sprinkler system being used to irrigate landscaped areas?					
SC01-10. Is over-irrigation of landscaped areas prohibited?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC02A - Outdoor Equipment Ops and Maintenance Areas ☐Not Applicable at this Facility/Operation					
Identify significant materials used at the facility/operation, associated with equipment operations and maintenance.	☐ Oil and Grease ☐ Fuel ☐ Solvents ☐ Paint ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Battery Acid ☐ Other:				
SC02A-01. Are storm drains located directly within equipment operations and maintenance areas?					
SC02A-02. Is there a designated equipment ops and maintenance area with overhead cover for pollutant sources and/or activity areas?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC02B - Aircraft, Grnd Vehicle & Eqpmnt Maintenance ☐ Not Applicable at this Facility/Operation					
Identify significant materials used at the facility/operation, associated with maintenance/repair.	☐ Oil and Grease ☐ Fuel ☐ Solvents ☐ Paint ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Battery Acid ☐ Other:				
SC02B-01. Are employees trained in safe vehicle and equipment operations and maintenance?					
SC02B-02. Are storm drains located directly within the aircraft, vehicle and equipment maintenance area?					
SC02B-03. Is there a designated aircraft, vehicle and equipment maintenance area that is either indoors or covered, bermed, enclosed, or sloped/positioned away from the MS4?					
SC02B-04. Is equipment regularly inspected and tested?					

SC02B-05. Are visual observations performed to detect fluid leaking from aircraft, vehicles, and equipment? Are drip pans put under leaks if needed?					
SC02B-06. Are aircraft vehicles and equipment maintained in good condition to prevent or correct any leakage of oil or other fluids?					
SC02B-07. Are drip pans used during maintenance?					
SC02B-08. Are drip pans or other open containers containing fluid left around? Are fluids regularly transferred for recycling or proper disposal?					
SC02B-09. Is the use of solvent minimized and less toxic solvent used whenever possible? If solvents cannot be avoided, are parts cleaned and/or drained in self-contained sinks or drum units? Are these units checked regularly for leaks?					
SC02B-10. Are mechanical parts, equipment, and vehicles waiting for repair/removal stored under cover and away from drains?					
SC02B-11. Are spill response materials stored in maintenance areas and on maintenance vehicles? Are used absorbent materials collected/removed and properly disposed of?					
SC02B-12. Are fluids and batteries removed from salvage vehicles and equipment and properly disposed of?					
SC02B-13. Are obsolete and inoperable vehicles and equipment properly disposed of?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC02C – Electric Vehicle Maintenance □ Not Applicable at this Facility/Operation					
Identify significant materials used at the facility/operation, associated with maintenance/repair.	□ Battery Acid □ Metals □ Vehicle Fluids □ Other:				
SC02C-01. Are batteries being overcharged in electric vehicles?					
SC02C-02. Are electric vehicles parked in cool and dry areas when not in use?					

SC02C-03. Are acid resistant drip pans sprinked with a battery acid neutralizing agent being used when filling or cleaning electric vehicles? Is waste being properly disposed?					
SC02C-04. Are battery acid neutralizing kits located adjacent to charging stations and are properly maintained? Is spill response material after use properly disposed of in an appropriate manner?					
SC02C-05. Are electric vehicle batteries being overfilled? (Is there staining or residue on the ground signaling spillage?)					
SC02C-06. Is maintenance on electric vehicles or batteries being filled avoided during rain events?					
SC02C-07. Are batteries being stored inside buildings in cool and dry places? Are batteries being stored on a nonreactive impervious surface with a cover if stored outside?					
SC02C-08. Are the battery case and terminals being cleaned regularly or when there is a buildup of corrosion? Is the cleaning done with a rag wetted down with a solution of water and battery acid neutralization agent? Is the wastewater being captured and disposed as hazardous waste?					
SC02C-09. Is petroleum jelly or grease being applied on battery terminals in order to slow down the corrosion process?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC03 - Aircraft, Ground Vehicle and Equipment Fueling □ Not Applicable at this Facility/Operation					
Identify significant materials used at the facility/operation, associated with vehicle and equipment fueling.	□ Fuel □ Other				
SC03-01. Is there a designated fueling area that is covered, bermed, enclosed or sloped away from the MS4?					
SC03-02. Are storm drains located directly within fueling areas?					
SC03-03. Are tanks, piping and valves labeled, regularly inspected and kept in good condition?					
SC03-04. Are absorbent booms, spill kits or vacuum equipment present in fueling areas or on fueling vehicles?					
SC03-05. Are fueling areas regularly inspected?					

SC03-06. Are major fueling operations monitored?					
SC03-07. Is secondary containment or cover used when transferring fuel from a tanker truck to a fuel tank?					
SC03-08. Are leak, overfill protection and spill prevention devices used for tanks and piping?					
SC03-09. Are automatic shut-off mechanisms used for fuel tankers and hose connections?					
SC03-10. Are fuel tanks topped off?					
SC03-11. Is access to fuel tanks and fueling vehicles restricted?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC04 - Aircraft, Grnd Vehicle and Equipment Cleaning ☐ Not Applicable at this Facility/Operation					
Identify significant materials at the facility/operation associated with vehicle and equipment cleaning.	☐ Oil and Grease ☐ Solvents ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Other:				
SC04-01. Are vehicles, equipment, and washing areas kept clean and free of waste?					
SC04-02. Are dry washing and surface preparation techniques used where feasible?					
SC04-03. Are storm drains located directly within wash areas?					
SC04-04. Are pigs and cover mats used to cover all catch basins in the surrounding area to contain the wash water during washing activities?					
SC04-05. Are all washing activities performed in a designated area that captures,filters and recycles wash water (eg at new Wash Bay)? Or is reclaimed water used and wash water diverted to a structural treatment control BMP, sanitary sewer, or dead end sump with pump?					
SC04-06. Are routine visual observations performed on washing activities and nearby storm drains to detect and prevent discharges from cleaning activities?					
SC04-07. Are excess materials such as drippings and residue removed by using vacuum methods? Are all waste materials properly disposed of?					

SC04-08. Is a hand-held hose equipped with a positive shut-off nozzle being used to wash vehicles?					
SC04-09. Are vehicles, aircraft, and equipment being washed between 4pm and 10am from November 1 to May 31 and between 6pm and 10am from June 1 to October 31?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC05 - Aircraft Deicing/Anti-Icing					☐ Not Applicable at this Facility/Operation
Identify significant materials used at the facility/operation, associated with aircraft deicing/anti-icing.	☐ Ethylene Glycol ☐ Propylene glycol ☐ Other:				
SC05-01. Are deicing/anti-icing operations performed only in designated areas that are covered, bermed, enclosed, or sloped/positioned away from the MS4?					
SC05-02. Are deicing/anti-icing operations monitored regularly to ensure quantities of fluids used are at a minimum while not jeopardizing aircraft safety and operation?					
SC05-03. Are all fluids captured or diverted to a treatment control BMP, recycling system, sanitary sewer, or dead end sump with pump?					
SC05-04. Are the designated anti-icing/deicing ramp areas cleaned following deicing/anti-icing operations with wet-type sweepers to remove and properly dispose of deicing fluids from the paved areas?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC06 - Outdoor Loading/Unloading of Materials ☐ Not Applicable at this Facility/Operation					
Identify significant materials loaded or unloaded at the facility/operation.	☐ Oil and Grease ☐ Fuel ☐ Pesticides/Herbicides/Fertilizers ☐ Solvents ☐ Cleaning Solutions ☐ Battery Acid ☐ Other:				
SC06-01. Are contractors/haulers aware of and do they adhere to BMP specifications that are relevant to the loading and unloading of materials?					
SC06-02. Are storm drains located directly within loading/unloading areas?					
SC06-03. Are loading/unloading areas graded, bermed, covered or otherwise protected to prevent contact with rainfall and storm water run-on and run-off?					
SC06-04. Is loading/unloading equipment regularly checked for leaks?					
SC06-05. Are drip pans or other containment measures used under hoses?					
SC06-06. Are loading and unloading areas kept free of spills and debris by containing and absorbing leaks during transfers and spillage from hose disconnections or cargo pallets? Is residue or debris properly disposed of?					
SC06-07. Are spill kits or other measures available to contain spills in accessible locations, near areas where spills may be likely to occur and/or to prevent tracking off-site?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC07 - Outdoor Material Storage ☐ Not Applicable at this Facility/Operation					
Identify significant materials stored outdoors at the facility/operation.	☐ Oil and Grease ☐ Solvents ☐ Paint ☐ Deicing/Anti-Icing Fluids ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Battery Acid ☐ Fuel ☐ Pesticides/Herbicides/Fertilizers ☐ Metals ☐ Deicing/Anti-Icing Fluids ☐ Sediment ☐ Fire Fighting Foam ☐ Dumpster Wastes ☐ Landscape Wastes ☐ Floatables ☐ Lavatory Chemical Wastes ☐ Potable Water System Chemicals ☐ Rubber Particulates ☐ Other:				

Identify significant materials stored indoors and used outdoors at the facility/operation.	☐ Oil and Grease ☐ Solvents ☐ Paint ☐ Deicing/Anti-Icing Fluids ☐ Cleaning Solutions ☐ Lubricants ☐ Anti freeze ☐ Battery Acid ☐ Fuel ☐ Pesticides/Herbicides/Fertilizers ☐ Metals ☐ Deicing/Anti-Icing Fluids ☐ Sediment ☐ Fire Fighting Foam ☐ Dumpster Wastes ☐ Landscape Wastes ☐ Floatables ☐ Lavatory Chemical Wastes ☐ Potable Water System Chemicals ☐ Rubber Particulates ☐ Other:				
SC07-01. Are outdoor material storage areas and equipment located directly in the path of storm drains?					
SC07-02. Do outdoor material storage areas have overhead cover and secondary containment?					
SC07-03. Are outdoor material storage areas prevented from contacting storm water run-on and run-off (e.g. by the use of berms, wood pallets etc.)?					
SC07-04. Are material stockpiles covered and contained or erosion control practices implemented at the perimeter of the site and at any inlets or catch basins to prevent the off-site transport of eroded material?					
SC07-05. Are wood products that have been treated with preservative chemicals either covered with tarps or stored indoors?					
SC07-06. Are protection guards (bollards, posts, or guardrails) installed around ASTs and piping to prevent damage from vehicles or forklifts and any subsequent release?					
SC07-07. Are regular inspections performed on tanks, storage containers, and berms to check for corrosion, structural failure, loose fittings, poor welds, leaks etc? Are repairs or replacements performed as needed?					
SC07-08. Are liquid materials in ASTs stored in double-walled, valved storage tanks or within concrete bermed secondary containment areas to provide the capacity to contain the entire volume of the single largest container with sufficient freeboard to contain precipitation? Is the area inside the curb sloped to a locked or valved drain?					
SC07-09. Is precipitation from bermed areas drained to the sanitary sewer if available or inspected and tested according to applicable regulations prior to its release to a storm drain?					
SC07-10. Is ponded storm water from bermed or containment areas properly disposed of?					
SC07-11. Does the facility/operation have and display a County Hazardous Materials Permit for hazardous materials storage?					
SC07-12. Is an accurate and up-to-date inventory maintained to record materials delivered and stored on site?					
SC07-13. Is permanent storage of equipment and materials in the bed of a truck always avoided? If temporary storage occurs, are these materials/equipment covered/contained?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC08 - Waste Handling and Disposal					□ Not Applicable at this Facility/Operation
Identify wastes stored, handled, disposed of or recycled at the facility/operation.	I □ O □ Oil and Grease I □ O □ Lubricants I □ O □ Anti freeze I □ O □ Solvents I □ O □ Cleaning Solutions I □ O □ Trash I □ O □ Other: (I=indoors; O=outdoors)				
SC08-01. Does facility/operation make efforts to reduce amount of waste generated (e.g. use only amount needed, use solvents more than once, practice good inventory control, do not over-buy, purchase long-lasting products, etc.)?					
SC08-02. Are materials recycled whenever possible?					
SC08-03. Is there a designated waste/recycling area with restricted access?					
SC08-04. Are waste/recycling areas located directly in the path of storm drains?					
SC08-05. Is there secondary containment and cover provided for wastes?					
SC08-06. Are wastes that are not contained or covered prevented from contacting storm water run-on and run-off (e.g. by use of berms)?					
SC08-07. Are all dumpsters covered and kept closed and drain holes plugged?					
SC08-08. Are waste collection and storage containers inspected frequently for leaks, spills, compromised structural integrity, and proper closure seal?					
SC08-09. Are employees trained to properly handle and dispose of waste materials?					
SC08-10. Are wastes and recyclable materials stored in appropriate containers, segregated, and properly labeled?					
SC08-11. Are wastes characterized, where appropriate, and properly disposed of?					
SC08-12. Does facility/operation make efforts to prevent overflow of waste containers by timely pickup/service and removal?					
SC08-13. Is dumpster cleaning performed in designated areas that are bermed to contain wash water? Are all collected fluids properly disposed of or discharged to the sanitary sewer?					

SC08-14. Does facility/operation track waste generated, stored, and disposed?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC09 - Building and Grounds Maintenance ☐ Not Applicable at this Facility/Operation					
Identify significant materials used in/produced by building and grounds maintenance.	☐ Oil and Grease ☐ Pesticides/Herbicides/Fertilizers ☐ Sediment ☐ Landscape Wastes ☐ Other:				
SC09-01. Have all areas of exposed soil been treated to prevent erosion (e.g. landscaped, re-vegetated, or contain erosion or sediment controls)?					
SC09-02. Are all landscaped areas being weeded by hand?					
SC09-03. Are integrated pest management methods implemented? Is the use of pesticides, herbicides, and fertilizers minimized, and are they used according to directions?					
SC09-04. Are temporary BMPs such as portable booms and vacuum trucks used to contain water from outdoor building or structure wash down activities? Is reclaimed water being used where possible, and all waste water collected and properly disposed of through a permitted connection to the sanitary sewer?					
SC09-05. Are grass trimings, leaves, sticks, or other collected vegetation composted where possible, or appropriately disposed?					
SC09-06. Are stockpiled materials placed away from watercourses and drainage inlets and bermed and covered to prevent material release, or removed at the end of the day?					
SC09-07. Is spilled fertilizer being cleaned up on sidewalks or pavement before application of irrigation water and wash water properly disposed of?					
SC09-08. Is damaged asphalt repaired when degredation is observed?					
SC09-09. Is the exposure of galvanized or rusty metal structures to rainfall reduced where possible?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC10 - Employee Training			☐ Not Applicable at this Facility/Operation		
SC10-01. Is the facility/operation SWMP/SWPPP up to date, including completion of amendment pages?					
SC10-02. Have employees and contractors been trained on storm water pollution prevention education covering all storm water issues, implementation and effectiveness of BMPs, spill prevention and cleanup, hazardous materials management, right-to-know awareness, and SWMP or SWPPP implementation?					
SC10-03. Are any additional training programs in place (e.g. Spill Plan implementation, the prohibition on cross-connections between sanitary sewers and storm drains, and contractor responsibility to comply with adopted BMPs)?					
SC10-04. Does facility/operation have the last 5 years of training records for current employees that have participated in the storm water pollution prevention education program and other related training programs?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC11 - Lavatory Service Operation			☐ Not Applicable at this Facility/Operation		
Identify significant materials at the facility/operation associated with lavatory service operations.	☐ Lavatory Chemicals ☐ Lavatory Waste ☐ Lavatory Truck Wash Water ☐ Other:				
SC11-01. Are triturator facilities covered and bermed with low roll-over type berms?					
SC11-02. Are triturator facilities located directly in the path of storm drains?					

SC11-03. Are all hoses and fittings used for transferring lavatory waste regularly inspected and all equipment kept in good condition?					
SC11-04. Are absorbent booms, spill kits, and other containment equipment present on lavatory service equipment and at the triturator facility?					
SC11-05. Are all mixing and transfers of surfactants and disinfectants performed within the covered and bermed triturator area or under a cover?					
SC11-06. Are drip pans used when draining aircraft lavatory systems? Is collected drippage immediately dumped into the bulk storage tank on the lavatory service cart or lavatory service truck?					
SC11-07. Are all spills of lavatory wastes and lavatory chemicals immediately cleaned and properly disposed of at the triturator facility?					
SC11-08. Are all hoses, valves, and equipment secured when transporting lavatory waste?					
SC11-09. Are lavatory truck cleanouts/backflushing and lavatory waste discharging to sanitary sewer connections performed ONLY at triturator facilities?					
SC11-10. Are all hoses drained completely?					
SC11-11. Does lavatory service cart or truck have spill prevention equipment installed?					
SC11-12. Do temporary sanitary facilities have secondary containment and are located away from watercourses, drainage facilities, traffic circulation, and high wind areas?					
SC11-13. Are temporary sanitary facilities regularly inspected for leaks and spills? Are temporary sanitation facilities being cleaned or replaced when necessary?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC12 - Outdoor Washdown/Sweeping,					□ Not Applicable at this Facility/Operation
SC12-01. Is sweeping and scrubbing equipment regularly inspected and maintained to ensure effectiveness at removing pollutants and to avoid leaks?					

SC12-02. Are roads, ramp areas, apron areas and if feasible, runway/taxiway areas swept regularly?					
SC12-03. Is sweeping performed during dry weather using dry sweeping techniques where feasible?					
SC12-04. Are sweepers operated at manufacturer-recommended optimal speeds?					
SC12-05. Are debris and sediment from sweeping properly disposed of?					
SC12-06. Are outdoor washdown areas bermed to contain the wash water and to prevent run-on to adjacent areas?					
SC12-07. Is the amount of water used during outdoor washdown activities minimized?					
SC12-08. Is wash water collected and filtered and reused, or discharged to the sanitary sewer system through a permitted connection at designated and approved discharge facilities (i.e. dewatering bin)?					
SC12-09. Does facility maintain records of the sweeping or scrubbing activities including the miles swept or scrubbed and the amount of waste collected?					
SC12-10. Is a water efficient filtering and recycling device used to wash sidewalks, and wash water prevented from entering the storm drain?					
SC12-11 Is reclaimed or recycled/filtered water used where possible?					
SC12-12 Are roads, ramp areas, and apron areas scrubbed on an as-needed basis?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC13 - Fire Fighting Foam Discharge	☐ Not Applicable at this Facility/Operation				
Identify significant materials at the facility/operation associated with testing fire fighting equipment.	☐ Aircraft Fire Fighting Foam ☐ Other:				
SC13-01. Are fire fighting foam discharge/testing areas located directly in the path of storm drains?					

SC13-02. Is fire fighting equipment regularly inspected and tested?					
SC13-03. Is there a designated fire fighting foam testing area that captures or diverts all foam waste to a structural treatment control, sanitary sewer, or dead end sump with pump?					
SC13-04. Are sump(s) and/or oil water separator(s) serviced regularly?					
SC13-05. Are fire fighting foam testing areas prevented from contacting storm water run-on and run-off or from reaching storm drains (e.g. by the use of berms or sandbags)?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC14 - Potable Water System Flushing					☐ Not Applicable at this Facility/Operation
Identify significant materials used at the facility/operation, associated with aircraft potable water system flushing and water truck cleaning/flushing.	☐ Purine	☐ Chlorine Bleach	☐ Other:		
SC14-01. Are the aircraft potable water system or water truck cleaning/flushing areas located directly in the path of storm drains or surface pollutants?					
SC14-02. Is there a designated cleaning/flushing area that captures or diverts all wastewater away from storm drains, or to a structural treatment control, sanitary sewer or dead end sump with pump?					
SC14-03. Are cleaning/flushing areas prevented from contacting stormwater run-on and run-off (e.g. by the use of berms)?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC15 - Runway Rubber Removal					☐ Not Applicable at this Facility/Operation
Identify significant materials generated by runway rubber removal activities.	☐ Rubber Particles	☐ Dirt Particles	☐ Other:		

SC15-01. Is the amount of water used during runway rubber removal activities minimized?					
SC15-02. Is the waste water produced from runway rubber removal activities prevented from entering the storm drainage system by immediately collecting and properly disposing of it?					
SC15-03. Are manual or mechanical cleaning methods (e.g. mechanical street sweepers) used to remove rubber particulates from the runway and adjacent paved areas following runway rubber removal activities?					
SC15-04. Are storm drain inlets, catch basins, and runway drainage areas inspected following runway rubber removal activities for any resulting debris? Is debris removed and properly disposed of?					
SC15-05. Is reclaimed water used where possible?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC16 - Parking Lots	□ Not Applicable at this Facility/Operation				
SC16-01. Are parking lots posted with “No Littering” signs and have regularly emptied and covered trash receptacles?					
SC16-02. Are all parking lot areas swept regularly and accumulated debris and sediment removed?					
SC16-03. Are sweepers operated at manufacturer-recommended optimal speeds?					
SC16-04. Is sweeping in parking lot areas performed when the number of parked vehicles is lowest to maximize areas swept?					
SC16-05. Does facility maintain records of the sweeping activities including the miles swept and the amount of waste collected?					
SC16-06. Are oily spots from parking lot surfaces cleaned with absorbent materials?					
SC16-07. Are repairs to parking lot surfaces performed during periods of dry weather?					
SC16-08. Are nearby storm drain inlets, catch basins, and manholes covered and sealed during parking lot repairs?					

SC16-09. Are drip pans and absorbent materials used to catch and collect drips and leaks from paving equipment that is not in use?					
SC16-10. Are hot bituminous materials used for parking lot repairs preheated and transferred or loaded away from storm drain inlets?					
SC16-11. Are used absorbent materials, debris, and collected drips properly disposed of?					
SC16-12. Does facility make efforts to avoid draining rooftop downspout drains onto paved parking lot surfaces?					
SC16-13. Are waste materials generated from parking lot repairs being removed by sweeping, vacuum, or other dry methods?					
SC16-14. Are waste materials and debris from parking lot repairs being stored in containers or in stockpiles with a cover and berm around them and away from storm drain inlets?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SC17 - Drainage System Maintenance			□ Not Applicable at this Facility/Operation		
SC17-01 Are storm drains stenciled with “No Dumping” messages?					
SC17-02. Does facility/operation conduct routine self-inspections of the storm water drainage system? Does the Authority inspect the entire MS4 at least annually, between the dates of May 1 and September 30?					
SC17-03. Are appropriate measures taken to prevent discharge during MS4 cleaning and maintenance?					
SC17-04. Does facility clean and maintain storm drain inlets, catch basins, pipes, and other conveyance structures before the wet season and as needed?					
SC17-05. Does facility clear open channels of accumulated litter in a timely manner?					
SC17-06. Does facility properly dispose of all accumulated sediments, contaminants, debris, and waste water from cleaning and maintenance activities?					
SC17-07. Does facility maintain records for all inspections, cleaning, and maintenance including the quantity of waste removed?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC18 - Housekeeping					☐ Not Applicable at this Facility/Operation
SC18-01. Does facility/operation regularly perform and document self-inspections and evaluations of the implemented BMPs?					
SC18-02. Is facility/operational area kept clean and orderly?					
SC18-03. Are trash receptacles covered and placed in appropriate locations?					
SC18-04. Does facility sweep all operational areas at least once per week to prevent the accumulation of sediments, debris, and contaminants?					
SC18-05. Are all debris and sediment from sweeping properly disposed of?					
SC18-06. Are significant materials stored in the appropriate containers that are properly sealed and labeled?					
SC18-07. Are significant materials stored within secondary containment?					
SC18-08. Are significant materials stored in a restricted access area?					
SC18-09. Are Material Safety Data Sheets (MSDSs) readily available for all significant materials?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC19 - Safer/Alternative Products					☐ Not Applicable at this Facility/Operation
SC19-01. Does facility/operation use alternative products that are “Regionally Accepted” and are identified as non-toxic, less toxic or biodegradable?					
SC19-02. Does facility maximize the purchase and use of products containing recycled materials?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC20 – Erodible Areas	☐ Not Applicable at this Facility/Operation				
Identify significant materials at the facility/operation associated with erodible areas.	☐ Sediments ☐ Other:				
SC20-01. Are erosion control BMPs implemented to stabilize soils?					
SC20-02. Are wind erosion control BMPs implemented to control dust?					
SC20-03. Are effective perimeter controls maintained?					
SC20-04. Are loose soils and slopes stabilized by re-vegetation or non-vegetation stabilization methods prior to a forecast storm event?					
SC20-05. Is offsite material tracking prevented?					
SC20-06. Is all stormwater diverted away from erodible materials?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
SC21 – Construction Repair/Remodel	☐ Not Applicable at this Facility/Operation				
Identify significant materials at the facility/operation associated with construction activity.	☐ Asphalt ☐ Basic Materials ☐ Concrete ☐ Construction Material ☐ Debris ☐ Floatables ☐ Fuel ☐ Metals ☐ Oil and Grease ☐ Paint ☐ Sediments ☐ Sealants ☐ Septic Wastes ☐ Solvents ☐ Suspended Soilds ☐ Trash ☐ Synthetic Organics ☐ Vehicle Fluids ☐ Other:				
SC21-01. Are outdoor repairs and construction avoided during rain events or during any period the National Weather Service is forecasting 50% chance of rain?					
SC21-02. Are inactive areas stabilized with temporary vegetation or non-vegetation stabilization methods?					
SC21-03. Are wind erosion control BMPs implemented to control dust and is traffic limited to stabilized roadways within the site where possible?					
SC21-04. Are effective perimeter and runon/runoff controls maintained?					

SC21-05. Are inlet protection BMPs effectively maintained?					
SC21-06. Is there a stabilized construction entrance to prevent tracking?					
SC21-07. Are streets or paved areas swept of any loose dirt?					
SC21-08. Are all chemicals, liquids, erodible landscape materials and fertilizers covered and contained when not in use?					
SC21-09. Is erodible landscape material application discontinued within 2 days prior to or during a forecasted rain event?					
SC21-10. Are stockpiles covered and bermed when inactive and before rain? Are plastic undersheets used when appropriate?					
SC21-11. Are waste containers covered at the end of each work day and when its raining?					
SC21-12. Are concrete washout areas in designated areas away from inlets and drainage courses? Are concrete washout areas properly constructed and maintained?					
SC21-13. Do temporary sanitation facilities have secondary containment and are located away from watercourses, drainage facilities, and traffic circulation?					
SC21-14. Is water usage minimized and reclaimed water used where possible?					
SC21-15. Are any particulate generating activities contained?					
SC21-16. Are areas designated for fueling located away from storm drains?					
Additional Comments:					

BMPs	N/A	Fully	Partial	Not	Comments
SR01 - Spill Prevention, Control and Clean up					□ Not Applicable at this Facility/Operation
SR01-01. Does facility/operation have current Spill Plan and spill prevention and response procedures?					
SR01-02. Does facility/operation post a summary of the spill plan, and spill response procedures, at key locations, identifying the spill cleanup coordinators, location of cleanup equipment, and phone numbers of regulatory agencies to be contacted in the event of a spill?					

SR01-03. Are relevant employees and contractors trained in the implementation of the Spill Plan and spill control procedures?					
SR01-04. Are leak and spill prevention devices used?					
SR01-05. Are adequate spill kits placed in appropriate locations?					
SR01-06. In the event of a spill, does facility notify Airport Operations (619-400-2710), the Airport Authority Environmental Affairs Department (619-400-2784), and any agencies or companies identified in the Spill Plan or spill prevention and response procedures?					
SR01-07. In the event of a spill or release, does facility immediately follow procedures identified in the Spill Plan or facility spill prevention and response procedures?					
SR01-08. Does facility use only dry cleaning methods?					
SR01-09. Are all used spill control and clean-up materials properly disposed of?					
SR01-10. Is waste water from washing activities captured by vacuum and properly disposed of, or diverted to a structural treatment control, sanitary sewer, or dead end sump with pump?					

Additional Comments:

BMPs	N/A	Fully	Partial	Not	Comments
TC 01 - Structural Treatment Control BMPs ☐ Not Applicable at this Facility/Operation					

Identify each structural treatment control BMP currently implemented at this facility/operation.

Detention Basin TC-22		Vegetated Buffer Strip TC-31		Infiltration Trench TC-10	
Wet Pond TC-20		Harvest and Reuse TC-12		Infiltration Basin TC-11	
Constructed Wetland TC-21		Bioretention TC-32		Water Quality Inlet TC-50	
Vegetated Swale TC-30		Media Filter TC-40		Multiple Systems TC-60	
Biotreatment MP-20		Stormwater Filter MP-40		Wet Vault MP-50	
Gravity Separator MP-51		Drain Inlet Insert MP-52			

Other					
TC01-01. Does facility regularly inspect, clean, and maintain all structural treatment control BMPs to prevent the accumulation or resuspension of oil, grease, floating debris and sediments?					
TC01-02. During cleaning operations, are all effluent valves at the treatment control device closed, all standing water properly disposed of, and all accumulated waste removed? Are oil absorbent pads in the treatment control device replaced prior to the start of the wet season and as needed?					
TC01-03. Are records for all inspections, cleaning, and maintenance of structural treatment control BMPs documented and maintained?					
TC01-04. Is an annual inventory of all structural treatment control BMPs performed?					

Additional Comments:

Photos: Y ☐ N ☐

Immediate "Action Items" Identified: Y ☐ N ☐

CASQA FORMS

Visual Observation Log - Monthly	
Date and Time of Inspection:	Report Date:
Facility Name:	
Weather	
Antecedent Conditions (last 48 hours):	Current Weather:
NSWD Observations	
Were any authorized non-stormwater discharges observed?	Yes ☐ No ☐
Were any **unauthorized** non-stormwater discharges observed?	Yes ☐ No ☐
If yes to either, identify source:	
Outdoor Industrial Equipment and Storage Area Observations	
Complete Monthly BMP Inspection Report	Yes ☐ No ☐
Drainage Area 1:	Were any deficiencies or any other potential source of industrial pollutants observed? Yes ☐ No ☐
Drainage Area 2:	Were any deficiencies or any other potential source of industrial pollutants observed? Yes ☐ No ☐
Drainage Area 3:	Were any deficiencies or any other potential source of industrial pollutants observed? Yes ☐ No ☐
If yes to any, describe:	
Exception Documentation (explanation required if inspection could not be conducted).	
Inspector Information	
Inspector Name:	Inspector Title:
Signature:	Date:

Visual Observation Log – Sampling Events			
Date and Time of Inspection:			Report Date:
Facility Name:			
Weather			
Antecedent Conditions (last 48 hours):			Weather:
Precipitation Total:			Predicted % chance of rain:
Estimate storm beginning: _____ (date and time)	Estimate storm duration:_____ (hours)	Estimate time since last storm: _____ (days or hours)	Rain gauge reading: _____ (inches)
Sampling Event Observations			
Observations: If yes identify location and observe drainage area to identify probable cause			
Odors	Yes ☐	No ☐	
Floating material	Yes ☐	No ☐	
Suspended Material	Yes ☐	No ☐	
Sheen	Yes ☐	No ☐	
Discolorations	Yes ☐	No ☐	
Turbidity	Yes ☐	No ☐	
NSWD Observations			
Were any authorized non-stormwater discharges observed?		Yes ☐	No ☐
Were any **unauthorized** non-stormwater discharges observed?		Yes ☐	No ☐
If yes to either, identify source			
Drainage Area Observations			
Drainage Area		**Deficiencies Noted**	

Exception Documentation (explanation required if inspection could not be conducted).	
Inspector Information	
Inspector Name:	Inspector Title:
Signature:	Date:

Sampling Log		
Facility Name:	Date:	Time Start:
Sampler Name:		

Field Meter Calibration
pH Meter ID No./Description: Calibration Date/Time:

Field pH Measurements		
Discharge Location Identifier	pH	Time

Samples Collected		
Discharge Location Identifier	Constituent	Time
	Oil and Grease	
	Total Suspended Solids	

Additional Sampling Notes:
Time End:

COUNTY OF SAN DIEGO
WATERSHED PROTECTION PROGRAM

DEPARTMENT OF PUBLIC WORKS
5510 OVERLAND AVE., SUITE 410
SAN DIEGO, CA 92123

MS4 Outfall Visual Observation Field Datasheet

New Site? ☐ Yes ☐ No ☐ **Source Investigation Follow-up for**_____

General Site Description

Site ID				**Site Type**		**Sample Event ID**	
Location						**Sample Event Type**	
Date		**Time**		**Latitude**	° N (NAD83)	**HU**	
Staff		**TB Guide**		**Longitude**	° W (NAD83)	**HSA**	

Historical Outfall Dry Weather Flow Info: ☐ Unknown ☐ Persistent ☐ Transient ☐ Dry

Conveyance (Check one only) ☐ Concrete Channel ☐ Natural Creek ☐ Earthen Channel ☐ Manhole ☐ Outfall ☐ Other_____

Flow Status ☐ Flowing ☐ Ponded ☐ Tidal ☐ Dry

Flow Reaches Receiving Water? ☐ Yes ☐ No

Non-Stormwater Flow Source? Yes No Unknown

Evidence of Obvious IC/ID?* Odor Color High Flow

***Requires immediate follow-up**

Outfall Structural Condition
☐ Normal
☐ Damaged
☐ Scour Pond
☐ Blockage

Potential Source ☐ Ground Water ☐ Irrigation Runoff ☐ Permitted Discharge ☐ Vehicle Washing ☐ Power Washing ☐ Pool/Spa Discharge ☐ Water Line Break Unknown Tidal Other_____

Was Flow Source Eliminated? Yes No

Notes:_____

_____

Weather ☐ Clear ☐ Partly Cloudy ☐ Overcast ☐ Fog

Last Rain ☐ > 72 hours ☐ < 72 hours but ≤ 0.1"

Tide ☐ N/A ☐ Low ☐ Incoming ☐ High ☐ Outgoing Tide Height_____ft.

Observations

Odor	☐ None	☐ Sewage	☐ Sulfides	☐ Petroleum	☐ Manure	☐ Other
Color	☐ None	☐ Yellow	☐ Brown (Silty)	☐ White (Milky)	☐ Gray	☐ Other
Clarity	☐ Clear	☐ Cloudy(<4" vis)	☐ Murky(>4" vis)			☐ Other
Floatables	☐ None	☐ Trash	☐ Bubbles/Foam	☐ Sheen ☐ Algae	☐ Biofilm	☐ Other
Deposit	☐ None	☐ Coarse Particulate	☐ Fine Particulate	☐ Stains/Minerals	☐ Oily Deposit	☐ Other
Vegetation	☐ None	☐ Limited	☐ Normal	☐ Excessive		☐ Other
Biology	☐ None	☐ Insects ☐ Algae	☐ Snails	☐ Fish ☐ Birds	☐ Cray Fish	☐ Other

MS4 Outfall Flow Estimate

Width		ft
Depth		ft
Velocity		ft/sec
Length of Ponded Area		ft

Flowing Pipe Diameter _____ft. Depth_____ft. Velocity_____ft/sec
Bottle Fill Volume_____ml Time to Fill_____seconds
Leaf Float Distance_____ft. Time_____seconds

Estimated Flow Rate _____ ☐ cfs ☐ gpm

Trash Present? ☐ Yes ☐ No **Trash Assessment** ☐ High (>400 pieces) ☐ Medium (50 to 400 pieces) ☐ Low (<50 pieces)
Evidence of Illegal Dumping ☐ Yes ☐ No **Evidence of Illegal Connection** ☐ Yes ☐ No
Accessibility ☐ Easy ☐ Moderate ☐ Difficult ☐ Critical Habitat

Comments:_____

COUNTY OF SAN DIEGO
WATERSHED PROTECTION PROGRAM

DEPARTMENT OF PUBLIC WORKS
5510 OVERLAND AVE., SUITE 410
SAN DIEGO, CA 92123

Site Type: VOM (Visual Outfall Monitoring) – For sites that are within the visual outfall monitoring program.
A, B, C, D… (Source Investigation) – For locations that are aimed at source follow-up investigations.

Sample Event Type: Visual Observation
Confirmation
Source Investigation
Duplicate
Blank
Lab Standard

Watersheds

Hydro. Unit	Watershed
902	Santa Margarita River
903	San Luis Rey River
904	Carlsbad Management Area
905	San Dieguito River
906	Los Penasquitos
907	San Diego River
908	Pueblo San Diego
909	Sweetwater River
910	Otay River
911	Tijuana River

EXAMPLE
SIERRA LAB CHAIN OF CUSTODY

SIERRA ANALYTICAL
TEL: 949 • 348 • 9389
FAX: 949 • 348 • 9115
26052 Merit Circle • Suite 105 • Laguna Hills, CA • 92653

CHAIN OF CUSTODY RECORD

Date:_____/_____/_____ **Page: _____ of _____**

Lab Work Order No.: _____

Client:
Client Address:

Client Project ID:

Client Tel. No.:
Client Fax. No.:
Client Proj. Mgr.:

Turn Around Time Requested:
☐ Immediate ☐ 24 Hour
☐ 48 Hour ☐ 72 Hour
☐ 4 Day ☐ 5 Day
☐ Normal ☐ Mobile

Analyses Requested

Geotracker EDD Info:

Client LOGCODE

Site Global ID

Client Sample ID.	Sierra No.	Date	Time	Matrix	Preservative	Container Type	No. of Containers	Field Point Names / Comments

1 Sampler Signature: _____ Shipped Via: _____
Printed Name: _____ (Carrier/Waybill No.) _____

Total Number of Containers Submitted to Laboratory

Sample Disposal:
☐ **Return to Client**
☐ **Lab Disposal ***
☐ **Archive ____ mos.**
☐ **Other _____**

2 Relinquished By: _____ Date: _____ Received By: _____ Date: _____
Company: _____ Time: _____ Company: _____ Time: _____

3 Relinquished By: _____ Date: _____ Received By: _____ Date: _____
Company: _____ Time: _____ Company: _____ Time: _____

4 Relinquished By: _____ Date: _____ Received By: _____ Date: _____
Company: _____ Time: _____ Company: _____ Time: _____

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under SIERRA's Terms and Conditions, unless otherwise agreed upon in writing between SIERRA and CLIENT.
*** - Samples determined to be hazardous by SIERRA will be returned to CLIENT.**

Total Number of Containers Received by Laboratory

Special Instructions:

FOR LABORATORY USE ONLY - Sample Receipt Conditions:
☐ Intact ☐ Chilled - Temp (°C) _____
☐ Sample Seals ☐ Preservatives - Verified By _____
☐ Properly Labelled ☐ Other _____
☐ Appropriate Sample Container ☐ Storage Location _____

APPENDIX H
MUNICIPAL PERMIT


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

Please visit the State of California San Diego Regional Water Quality Control Board website for the San Diego Region – Phase I Municipal Stormwater Permit, Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100

https://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-1118_AmendedOrder_R9-2013-0001_COMPLETE.pdf

APPENDIX I
INDUSTRIAL GENERAL PERMIT


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

Please visit the California State Water Resources Control Board website for the Statewide General Permit for Storm Water Discharges Associated with Industrial Activities, Order No. 2014-0057-DWQ (Industrial General Permit)

https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/industrial/2014indgenpermit/wqo2014_0057_dwq_revmar2015.pdf

APPENDIX J
FOD MANAGEMENT PLAN


SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

FOREIGN OBJECT DEBRIS (FOD)

MANAGEMENT PLAN

San Diego County Regional Airport Authority (SDCRAA)

2018

TASK	**NAME**	**DATE**
Prepared By:	Katie Altobello-Czescik	
FOD Program POC	Katie Altobello-Czescik	
Management Approval:	Richard Gilb	9/14/18

EFFECTIVITY: Release Date: **9/14/18**

San Diego County Regional Airport Authority Airside

Table of Contents

1.0 OBJECTIVE AND SCOPE:

This document details the policies that the **San Diego County Regional Airport Authority** (SDCRAA) has put in place to ensure FOD-free operations at the San Diego International Airport (SAN). The plan also outlines the practices implemented by the Airport Authority and its tenants, contractors, and subcontractors to effectively prevent and manage foreign object debris (FOD).

While FOD is significant airfield concern, this plan applies to all airside and landside areas, such as parking lots, roadways, structures and landscaped areas at San Diego International Airport.

1.1. FOD Prevention Area:

The entire AOA at SAN is deemed a FOD Prevention Area and FOD Prevention stickers are placed on most doors that provide access to the airside and on the FOD Cans at each of the gates. If required, temporary FOD Prevention Areas can be established or existing FOD Prevention Area controls may change. See Section 9 for FOD Prevention Area signage and map of FOD prevention Area (or Airport Campus)

2.0 FOD PROGRAM DEFINITIONS AND ACRONYMS:

2.1 Definitions

a. Air Operations Area (AOA): the area of the Airport situated within the perimeter fence line which is used primarily for aircraft parking, taxiing, refueling, landing, take off and surface maneuvering, including the aprons, ramps, taxiways and aircraft movement areas. The AOA is generally referred to as the airfield.

b. Aircraft Movement Areas: areas of the airport which are normally under the control of the air traffic control tower (ATCT) by reason of their function to support the landing, take-off and ground maneuvering of aircraft, including the runways, taxiways, safety areas, and instrument landing system (ILS) critical areas.

c. Airside: the area of an airport that is within its passport, customs control, and security checks, the side of the airport terminal from which aircraft can be observed. This area is accessible only to airport personnel and passengers holding valid boarding cards for imminent travel. It is also known as the sterile area.

d. Apron: the defined area of the airport intended to accommodate aircraft for the purposes of loading or unloading passengers or cargo, refueling, parking or maintenance. Also referred to as the “Ramp.”

e. The Authority: the San Diego County Regional Airport Authority (SDCRAA).

f. Best Management Practices: storm water management practices employed to prevent or reduce storm water and surface water pollution, including, without limitation, the use of tarps or covers for the outdoor storage of materials, the use of spill-containment pallets for the storage of liquids, and the prompt cleanup of spills.

g. Clean as you go: a cleaning strategy used to reduce risk of FOD that involves taking opportunities to clean continually throughout the working day and making cleaning part of your daily routine to ensure spaces are FOD-free.

h. Foreign Object Debris (FOD) “Foreign object debris”: any type of debris on aircraft ramps, aprons or aircraft movement areas, including, without limitation, nuts, bolts, paper, plastic, cardboard, cans, rocks, baggage pieces and parts (Source: SDCRAA Rules and Regulations); Any object, live or not, located in an inappropriate location in the airport environment that has the capacity to injure airport or air carrier personnel and damage aircraft (Source: FAA Circular 150/5210-24).

i. Foreign Object Debris (FOD) Damage: Any damage attributed to a foreign object that can be expressed in physical or economic terms which may or may not downgrade the product’s safety or performance characteristics. NOTE: For the purposes of this document, and to reduce confusion and ensure consistency in language and terminology, “FOD” will only refer to the phrase “foreign object debris.”

j. FOD-Prevention Area: areas that are particularly sensitive to FOD generally including hangars, runways, and areas where aircraft and equipment are repaired.

k. FOD Sweep: a formal activity that involves personnel servicing FOD sensitive areas, picking up any trash and/or debris using sweeper machinery to clean up.

l. FOD Walk or Walk Down: a formal, or informal, activity that involves personnel walking FOD sensitive areas, picking up any trash or debris. Personnel physically walk through a FOD Prevention Area (often side-by-side or shoulder-to-shoulder) to inspect the area cleanliness and remove loose or unwanted items.

m. Ground Support Equipment (GSE): vehicles and equipment approved and used on the aircraft aprons or parking areas in support of airport operations.

n. Hazard: A condition, object or activity with the potential for causing damage, loss, or injury.

o. Local Management: designated managerial positions within organizations operating on the airport including Authority tenants, contractors, sub-tenants, sub-contractors, and vendors.

p. FOD Incident: an incident caused by FOD that results in damage to personnel, equipment, or infrastructure.

q. Non-movement Areas: areas at the Airport that are used for the parking of aircraft that are not under the direct control of the ATCT, which generally includes the aprons and ramps.

r. Operators: Personnel or companies operating at San Diego International Airport including employees of the Airport Authority and its tenants, contractors, and subcontractors. Any person holding any right to use the Airport terminal buildings or airfield under any type of agreement with the Authority and the agents, employees, contractors and subcontractors of such person, including, but is not limited to, airlines, licensees, permittees, and badge holders.

s. Ramp(s): the areas where aircraft are parked, unloaded, loaded, refueled or boarded.

t. Sterile Area: portions of the airport defined in the airport security program that provides passengers access to boarding aircraft and to which the access generally is controlled by the Transportation Security Administration (TSA), an aircraft operator, or a foreign air carrier. Also referred to as the airside.

u. Storm Water Management Plan: the written plan prepared by the Authority that outlines a comprehensive program to reduce and eliminate pollutants from entering the storm drain system and receiving waters (that is, San Diego Bay). The SWMP describes potential pollutant sources at the Airport and the management programs in place or required for use to reduce or eliminate impacts to storm water or receiving water quality. Also known as the "SAN Storm Water Management Plan."

2.2 Acronyms

- AOA-AIR OPERATIONS AREA
- ATCT-AIR TRAFFIC CONTROL TOWER
- BMP-BEST MANAGEMENT PRACTICE
- FAA- THE FEDERAL AVIATION ADMINISTRATION
- FOD-FOREIGN OBJECT DEBRIS
- GSE-GROUND SUPPORT EQUIPMENT
- HPD-HARBOR POLICE DEPARMENT
- ILS-INSTRUMENT LANDING SYSTEM
- ISWEBE- INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES PLAN
- MSP-MISCELLANEOUS SMALL PARTS
- SAN-SAN DIEGO INTERNATIONAL AIRPORT
- SDCRAA-SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY
- SDIA-SAN DIEGO INTERNATIONAL AIRPORT
- SWMP-STORM WATER MANAGEMENT PLAN
- TSA-THE TRANSPORTATION SECURITY ADMINISTRATION
- TIF-TOOL INVENTORY VERIFICATION FORM

3.0 REGULATIONS AND GUIDANCE:

The presence of FOD on an airport's air operations area (AOA) poses a significant threat to the safety of air travel, personnel on the airfield, and the natural environment. FOD damage to aircraft, ground support equipment, and airport infrastructure can increase the cost of operation and maintenance. FOD also has the potential to damage aircraft during critical phases of flight, which can lead to catastrophic loss of life and aircraft. FOD hazards can be reduced, however, through the implementation of a FOD management program and the effective use of FOD detection and removal equipment. The following sections highlight general requirements for FOD prevention at San Diego International Airport.

FOD is everyone's responsibility. This message is an integral part of FOD Prevention at San Diego International Airport (SDIA).

3.1 Reference Documents:

The **SDCRAA** FOD Management Plan is designed to address FOD concerns outlined in the following documents:

- Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5210-24 Airport Foreign Object Debris (FOD) Management
- San Diego County Regional Airport Authority Code
- San Diego International Airport Rules and Regulations
- San Diego County Regional Airport Authority Stormwater Management Plan
- San Diego County Regional Airport Authority Standard Contract Specifications and Conditions for construction
- State of California "Trash Amendments"-2015 updates to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and the Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE Plan)

3.2 Statutes and Regulations:

SDCRAA statutes (codes), rules and regulations, and policies are designed to ensure safe and efficient operations at SAN. Authority Code, Rules and Regulations, Plans, Lease and Contract govern the general conduct of Authority employees, tenants, commercial users, contractors, passengers, and the public.

3.2.1 SDCRAA Code

The SDCRAA Code contains administrative and regulatory ordinances applicable to acts of omission and commission on airport property as adopted by the Board of the San Diego County Regional Airport Authority. The following Codes apply to FOD prevention and management:

Article 7 – Safety and Security, Part 7.4- Airport Facilities, Section 7.41 – Rubbish & Waste Disposal, Regulated

(a) It shall be unlawful for any person to dump any material or throw garbage, offal, rubbish, litter, sewage, refuse or foreign material of any kind upon any lot, tract of land, street, alley, lane, court, sidewalk or place under the jurisdiction of the San Diego County Regional Airport Authority (the "Authority") without the written permission of the Authority's Executive Director or his or her designee (the "Executive Director").

(b) It shall be unlawful for any occupant, lessee, tenant or licensee of any premises within said area to place, or allow to be placed, or allow to remain on any premises within said area such garbage, offal, rubbish, litter, sewage, refuse or foreign material of any kind without the written permission of the Executive Director.

Article 8- General Operations, Part 8.2 Authority Facilities, Section 8.20- Animals

(d) No person shall feed or perform any other act to encourage the congregation of birds or other animals on any facility or airport under the jurisdiction of the Authority

3.2.2 SDCRAA Rules and Regulations

SDCRAA Rules and Regulations govern the general conduct of tenants, employees, and commercial users of SAN. FOD is defined in the Rules and Regulations as "any type of debris on aircraft ramps, aprons or aircraft movement areas; includes, without limitation, nuts, bolts, plastic, cans, rocks, baggage pieces and parts." Specific rules and regulations relevant to FOD include:

Section 3.2 Aeronautical Operations on the Air Operations Area (AOA),

3.2.1 General Rules

L. Minimizing Bird-Strike Potential

1. All persons conducting any activity on the AOA shall ensure that:

a. There is no bird-feeding activity;

b. Unsecured trash bags containing foodstuffs are not to be left on the ramp or AOA;

c. Food containers, whether full, empty or nearly empty, are not discarded on the ramp, in baggage carts, on flatbed vehicles or on other uncovered vehicles; and

d. The lids of all dumpsters and trash containers are closed when not actually being loaded or unloaded.

3.2.5 Ground Operations

A. Ramp Operations

2. Every tenant shall police and keep their ramp areas clean and free of all debris.
a. All tenants shall provide clearly marked FOD containers for collecting material that is picked up from the aprons. Containers shall be present in sufficient quantities to facilitate disposal of picked up materials. Containers shall have a cover and be small enough to be easily emptied, but heavy enough to resist spillage and will be placed in such a location so that they are not impacted by aircraft jet blast.

b. All tenants shall empty their FOD containers on a scheduled basis and as necessary.

c. All tenants shall ensure that outside trash containers (e.g., cans, dumpsters and compactors) are covered, checked frequently, and emptied as necessary to prevent spillover of trash.

Section 3.4 Fueling Operations and Spill Protection on the Air Operations Area (AOA)

3.4.9 Foreign Object Debris (FOD)
A. General Regulations:

1. Every person with access to the air operations area (AOA) shall keep the aprons, ramps and grounds of the Airport free of all FOD.

2. Every tenant providing a trash container at the Airport (e.g., cans, dumpsters, compactors) shall ensure that the container is covered, checked frequently, and emptied as necessary to prevent spillover of trash.

3. No person shall establish a break area (tables, chairs, trash can, etc.) on the ramp without prior approval from the Airport Authority. Unauthorized break areas on the ramp will be removed by the Authority.

B. Foreign Object Debris (FOD) Containers Regulations:

1. Every tenant on the AOA shall provide and maintain clearly marked and covered FOD containers for the deposit of materials picked up from the aprons and other areas of the Airport.

2. Every tenant providing and maintaining one or more FOD containers shall empty such containers on a scheduled basis and as necessary.

Section 5.4 Commercial Transportation Vehicles

L. Hold Lot and Shuttle Island Procedures

1. All taxicab and vehicle for hire operators shall adhere to the following procedures:

l. Any driver found feeding birds or throwing any food or trash on the ground in the Airport hold lot will be immediately ejected from the hold lot for the remainder of the day. Any further violations will result in revocation of the driver's Airport permit.

Birds in the area of the aircraft operations present a serious safety hazard to aviation. Feeding or attracting birds in the vicinity of the AOA is a violation of federal regulations.

3.2.3 SDCRAA's Stormwater Management Plan

SDCRAA's Storm Water Management Plan (SWMP) requires all tenants to address FOD as soon as it is observed and to implement weekly sweeping. Best management practices in the SWMP relevant to FOD include:

- SC12-02: Roads, ramp areas, apron areas, and, if feasible, runway/taxiway areas should be swept on a regular basis.
- SC12-05: Debris and sediment from sweeping should be disposed of properly.
- SC18-02: The facility/operation should be kept clean and orderly.
- SC18-04: Sweep all facility and operation areas at least once per week to prevent the accumulation of sediments, debris, and contaminants.

3.2.4 SDCRAA Contract Language

SDCRAA contracts include language to require appropriate FOD prevention and management. Contract language requires compliance with the SDCRAA code, rules and regulations, and Storm Water Management Plan. Construction contractors are required to prevent the generation of materials that can become FOD on Authority property. Construction project specifications for Capital Improvement Projects require contractors to clean up construction sites through regular progress cleaning, site inspections, and final cleaning. Contract provisions for Capital Improvement Projects include Special Condition Section 1D-33 Cleaning Up, which states:

> Contractor shall provide the necessary personnel, equipment, and materials needed to maintain the specified standard of cleanliness. Conduct daily inspection to verify that requirements of cleanliness are being met.
>
> The Airport Authority reserves the right to withhold approval of payment requests for failure on the part of the Contractor to regularly clean the project in conformance with the requirements of this Article. The Airport Authority also reserves the right to clean any work areas that have not been acceptably cleaned by the Contractor and charge the Contractor for the Airport Authority's cleaning costs.

3.2.5. State of California Trash Amendments

SDCRAA must comply with the **State of California's Trash Amendments**. Officially referred to as Amendment Part 1 Trash Provision of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE Plan), these amendments prohibit trash from entering waterways via the stormwater conveyance system. In response to the Trash Amendments, the Authority has increased street sweeping, launched education programs on trash/litter/FOD, and installed devices on storm drains to help prevent these materials from entering the storm drain system. The Authority's FOD management program helps ensure compliance with the Trash Amendments.

4.0 FOD PREVENTION TRAINING:

All personnel with access to FOD Prevention Areas should receive FOD Prevention training. Local management is responsible for ensuring that all employees working within affected areas/functions are aware of FOD policies and best practices. The focus of training is that "FOD is everyone's responsibility."

4.1 SDCRAA Employee & Visitor Requirements:

Employees of SDCRAA are required to complete the following training, as appropriate:

- Annual Sustainability Training – Information regarding FOD is disseminated annually as part of the mandatory Environmental Stewardship Training that Authority employees take. The training

highlights FOD hazards and best management practices—including preventing FOD in the first place.
- SDIA Non-movement area driving course – highlights FOD hazards and best management practices and is mandatory for all employees with driving privileges on the airfield.

Authority airside visitors being escorted through FOD prone areas must also be made aware of FOD and FOD prevention requirements. Authority employees responsible for escorting visitors determine the level of training required, but should at least review:

- Overview of the FOD management program at SAN
- The impact of FOD on the safety of personnel and airline passengers
- Causes and principal contributing factors of FOD
- The consequences of ignoring FOD
- FOD prevention and management practices, including clean-as-you-go work habits, and the general cleanliness and inspection standards on the AOA

4.2 Tenant, Contractor, Subcontractor, & Visitor Requirements:

FOD Prevention training is required at SAN for all personnel with access to the AOA, including tenants, contractors, subcontractors, vendors, etc. The responsibility for this training belongs to local management. Each individual with access to the AOA, whether staff for airline operations, aircraft maintenance, catering, cabin cleaning, baggage and cargo handling, waste disposal, fueling, etc., should understand their role in the prevention of FOD. Airside visitors being escorted through FOD prone areas must also be made aware of FOD and FOD prevention requirements. Local management determines the level of training required for their own employees and visitors, but such training must include at minimum the following:

- Overview of the FOD management program at SAN
- The impact of FOD on the safety of personnel and airline passengers
- Causes and principal contributing factors of FOD
- The consequences of ignoring FOD
- FOD prevention and management practices, including clean-as-you-go work habits, and the general cleanliness and inspection standards on the AOA

The Authority's FOD Manager will provide current information and assist with training relating to FOD issues relevant to the specific operation of the airport to both Authority employees and local management of personnel with access to the AOA. Local management is responsible for training its own employees and guests on a recurrent schedule and maintaining a documented process to ensure participation in the training.

5.0 PRACTICES

5.1 FOD Prevention Program Awareness

A successful FOD prevention program is one that everyone is aware of. Organizational communication, led by the Authority's Planning and Environmental Affairs Department, is performed annually and as needed to relevant staff, tenants, and contractors. Examples of organizational communication include FOD seminars, FOD letters, notices and bulletins, FOD bulletin boards, presentations, and Tenant Information Notices.

5.2 Housekeeping

"Good Housekeeping" is a Best Management Practice (BMP) that helps to eliminate the potential for pollutants, like trash and debris, to enter the airport's storm water collection system. Areas that are kept clean and well-maintained are less likely to generate FOD. Good Housekeeping should be conducted on a daily basis and includes:

- Performing regular inspections work areas and activities
- Keeping facility and operation areas clean and orderly
- Placing trash receptacles that have covers in appropriate locations
- Sweeping facility and operation areas at least once per week to prevent the accumulation of trash, debris, sediment, and contaminants.
- Properly disposing of all trash, debris, and sediment from sweeping.

5.3 "Clean As You Go":

"Clean As You Go" is an aerospace industry standard routine for cleaning up work areas prior to, during and after work efforts. It is the continuous practice of debris removal and surface cleanliness during maintenance or any operation involving hardware, equipment or tools. The "clean as you go" routine prevents accumulation of FOD, and thus greatly decreases the potential for FOD related injury and damage.

The following are good clean-as-you-go practices, and should be applied on an everyday basis:

- Clean up the immediate and surrounding areas when work cannot continue.
- Clean up the area when work effort is complete.
- Clean up the apron area between aircraft arrival and departure.
- Clean up any generated debris that has the potential to migrate to an out of sight or inaccessible area.
- Clean up debris that has the potential to cause damage to hardware, equipment, or infrastructure.
- Clean up the area prior to a work shift change or unplanned delay.

Similar to Good Housekeeping, the "Clean As You Go" routine provides a clean, organized, and professional working environment for personnel, while simultaneously preventing the generation of FOD.

5.4 FOD Containers:

To assist with the proper disposal and containment of FOD on the airfield, large, covered “FOD Cans” (trash cans) are installed at each gate and serviced multiple times throughout the day by the Authority’s janitorial contractor.

5.5 Authority Airside Operations and Terminal Operations Efforts:

The Authority’s Airside and Terminal Operations Department performs routine FOD inspections of the airside and adjacent areas at least once a day. This department can remove FOD from the airfield and also can communicate FOD issues to operators.

5.6 FOD Walks / Walk Downs / Sweeps:

A FOD walk, or walk down, is a formal, or informal, activity that involves personnel walking FOD prevention areas, picking up any trash or debris. Personnel physically walk through a FOD Prevention Area (often side-by-side or shoulder-to-shoulder) to inspect the area cleanliness and remove loose or unwanted items. Areas or items of concern are recorded to ensure follow-up corrective action. A FOD Sweep is a similar activity but involves the use of sweeper machinery to achieve the same goals. At SAN, both the Authority and its tenants perform these activities on either a scheduled or as–needed basis, as outlined below. Findings from FOD walks and sweeps are shared with airline managers and other airfield tenants at the monthly Lindbergh Airport Managers Committee meeting and Safety and Security Committee meeting.

5.6.1 Authority FOD Walks and Sweeps

In addition to cleaning-as-we-go, the Authority has scheduled FOD prevention and removal including:

- Monthly Ramp Walks: The Authority organizes monthly “ramp” walks where Authority employees, tenant employees, and contractor employees join together to perform a FOD walk of the gate areas. These ramp walks also serve as an opportunity for appropriate staff to perform safety, stormwater, or operations inspections.

- Scheduled sweeping: Sweeping equipment and scheduling is managed by the Authority’s Facilities Management Department. SDCRAA owns and operates two sweepers, one equipped with a large magnet, that sweep throughout the Airport campus—including FOD Prevention Areas. Depending on the specific location, sweeper frequency varies between nightly, monthly, or quarterly.

5.6.2 Non-Authority FOD Walks and Sweeps

Airline (Tenant) scheduled FOD management is unique to each organization. Per Airport Authority Rules and Regulations and Code, these stakeholders are required to police and keep their ramp areas clean and free of all debris. Most airlines strive to check the ramps for FOD pre-arrival and post departure of each aircraft through the work of their ramp employees. Some airlines also perform daily FOD walks with managers and supervisors in addition to implementing the clean-as–you-go method. Some airlines own

and operate their own sweeper machines and pressure washers while others use manual methods to remove FOD from the Airside.

Ground Handler (Tenant / Subtenants / Subcontractors) scheduled FOD management is unique to each organization. Per Airport Authority Rules and Regulations and Code, these stakeholders are required to police and keep their ramp areas clean and free of all debris. Most ground handlers strive to participate in mandatory FOD walks before each aircraft arrives and departs. Additionally, all ground handlers are expected to implement weekly sweeping. Groups perform weekly FOD walks when they move out their equipment from the building prior these sweeping activities.

The Airport's janitorial provider also assists in FOD management at the Airport. A designated janitorial employee services all the FOD Cans daily throughout the gate areas while also manually sweeping the areas within 10 feet from the building.

5.7 Personal Attire and Personal Items:

Proper work attire and control of personal items are essential to preventing FOD. Each individual with access to the AOA must secure personal attire and personal items to prevent them from becoming FOD. As noted above, the Authority's Rules and Regulations requires that all persons conducting any activity on the AOA shall ensure that unsecured trash bags containing foodstuff or food containers, whether full, empty or nearly empty, are not left on or discarded on the ramp, in baggage carts, on flatbed vehicles, or on other uncovered vehicles.

5.8 Tool Accountability & Control

Tools in FOD Prevention Areas should be traceable to their owner and/or their storage locations. Tool accountability/control systems may vary throughout the Airport campus as influenced by tenants, contractors, usage, and area requirements. Individual tenants and subtenants, contractors and subcontractors, and vendors may have their own internal tool accountability systems but must ensure compliance with Authority procedures as well. Local management decides which method(s) are most appropriate based on the standard work performed to ensure that tools do not pose a FOD threat.

At SAN, a good example of internal tool accountability and control comes from the Facilities Management Department. The Authority's Facilities Maintenance Department is responsible for tools that enter and exit the Airside. Within the Department, each one of the maintenance shops and each employee has their own tool inventories. These inventories include information on the manufacturer, model number, and description of each tool in order to enhance accountability of all Facilities Maintenance tool users. The Facilities Management Department has also implemented a "Rules for Tools" policy for all tools used by the Department. These Rules are signed by each employee and include measures to increase accountability, prevent tool loss, and inherently prevent FOD incidents. FOD related items from the Rules for Tools include:

1. Airport Authority employees shall be able to show possession of issued tools when requested.
2. Employees shall immediately report to their Lead any loss of tools or equipment.

3. Shop and shift Leads shall conduct a Quarterly personal tool inventory of 25% of staff to ensure proper control and care of issued tools.

4. Shop and shift Leads shall conduct an Annual inventory of their community tools.

5. Leads shall keep records of personal and community tools on file.

Contractors are also required to follow proper procedures for tool use at SAN. All contractors fill out the "Tool Inventory Verification Form (TIF)" in order to work in sterile areas or on the airfield and submit them to the appropriate Authority Department. The TIF includes information regarding the worker, their duration on the Airside, and description of the tool. All sharp, pointed, or bladed objects or tools, including, but not limited to, knives, screwdrivers, hammers, chisels, scissors, carpet cutters, nail guns, etc. must be properly verified by Airport Authority personnel. The TIF assists with security risks but also helps prevent tools from being left in any sterile areas or on the Airside and posing a FOD risk. The Authority's Aviation Security and Public Safety team also manages a Tool Inventory Program to prevent tools from being left in the Sterile Areas and prevent security risks. While this program does not extend to tools that enter the Airside, it does create a system that prevents tools from entering it.

Stakeholders that are interested in examples and descriptions of tool accountability/control systems can reference Section 9 of this plan for a list of tool accountability tactics.

5.9 Miscellaneous Small Parts (MSP) and Consumables:

All miscellaneous small parts (MSP) and consumables that are utilized on a day-to-day basis should be controlled, maintained and disposed of in accordance with local management direction. These items should be stored and transported in sealable containers to prevent them from becoming loose items and ultimately FOD.

5.10 Wildlife Hazard Management and Bird Abatement Program:

The definition of FOD includes live animals. As such, the Authority implements both a Wildlife Hazard Management Plan and a Bird Abatement Program. The Authority uses multiple effective and humane methods to deter birds and other animals from entering the airfield and jeopardizing the safety of aircraft and passengers. The Authority's Wildlife Hazard Management Plan and the Bird Abatement Program outline methods to modify the airport environment to discourage wildlife from inhabiting the airport. These methods include selecting and maintaining landscape plants that limit sources of food and nesting habitat for wildlife, eliminating sources of standing water, and limiting the number and variety of trees around the airport. To prevent birds, in particular, from becoming FOD, the Authority has installed bird deterrents around much of the airport campus, including fine wire, netting, and small "spikes" in potential perching or nesting areas. The Authority's Bird Abatement Program also uses horns, sirens, and pyrotechnics to disperse birds that pose a risk to aviation safety.

6.0 SDCRAA FOD MANAGER:

The Authority is responsible for designating a staff member to oversee the airport's FOD programs and issues. This designated individual is responsible for managing FOD related reports, recommendations, and issues. The FOD manager regularly communicates the status of the FOD program to Authority staff and local management and ensures that lessons learned from FOD incidents are distributed widely. An open line of communication is always available between the FOD Manager and the airport tenants.

The Authority's FOD Manager develops and implements plans and programs to prevent, detect, and remove FOD from the airport and prevent pollution. Responsibilities of the FOD manager include:

- Review and assess the airport's FOD management program and make necessary revisions.
- Conduct scheduled and unscheduled evaluations/inspections of work areas to assess the effectiveness of the FOD management program.
- Evaluate the amount and kind of foreign objects found and how they were found (e.g. during bi-annual FOD characterization studies).
- Assure that FOD incidents are thoroughly investigated, and that adequate corrective actions are implemented.
- Notify affected contractor/tenant organizations and personnel of unique FOD prevention requirements.
- Develop and disseminate special FOD prevention instructions, as necessary.
- Assist as necessary or as requested in the development of FOD prevention training for Authority staff, as well as airport tenants and contractors.
- Assure that written procedures provide for adequate records attesting to the status and adequacy of the FOD management program.
- Assure FOD Management Program awareness throughout the airport.

6.1 FOD Program Surveys:

The Authority's Planning and Environmental Affairs Department is responsible for maintaining an effective FOD Management Program with the assistance and guidance from relevant stakeholders. In order to ensure compliance with FOD related regulations and requirements, informal audits, or surveys of internal groups or local management may be conducted. If needed, adjustments or changes may be required to improve FOD prevention practices and the program's overall effectiveness.

6.1.1 FOD Characterization:

As part of the Authority's FOD Management program, the Authority evaluates the FOD discovered during the monthly ramp walk twice a year. Objects found during walk downs are categorized to assist with data analysis using guidance from the FAA Circular and the FOD Control Corporation. Categorization of FOD types helps to identify trends and aid in the development of FOD and pollution prevention processes. An

example of the FOD Characterization tally sheet and categorization tables are included in Section 9 of this plan.

7.0 REPORTING AND RECORDS:

7.1 Incident Reporting:

While local management may have their own internal procedures for reporting FOD incidents, there are times that incident reports must be generated by the Airport Authority or Harbor Police Department (HPD). All FOD incidents that result in Authority-property damage or personnel injury, must be reported to and investigated by the Authority's Air Operations Department and Harbor Police Department. If an incident results in injury to personnel, or damage to airport infrastructure, aircraft, or ground support equipment, the Harbor Police Department must be notified immediately.

Local management is responsible for coordinating with Air Ops and/or Harbor Police Department to process an incident report. The initial report does not require cause and corrective action information, but should inform the appropriate parties that an incident has occurred. Air Ops and/or HPD will process the report and provide a copy to the Authority's FOD Manager.

The Authority's FOD Manager will review the incident report and investigate the incident, as necessary, to obtain the following information, to the extent practicable:

- How the FOD object was detected
- Date and time of FOD detection and retrieval
- Description of FOD retrieved (category, size, color), and/or image (if available)
- Location of FOD incident
- Name of personnel detecting FOD incident and contact information for local management
- Possible source of FOD
- Airport operations and weather data during the FOD detection event
- What corrective action, if any yet, have been taken

The FOD Manager will work with local management to identify and implement any necessary corrective action relative to FOD prevention. Information relative to the incident should be collected and recorded within 2 weeks of the incidents occurrence.

The Airport Authority's Planning and Environmental Affairs Department will maintain documentation of FOD related incidents and corrective actions. This documentation may be helpful in identifying trends, repeats, and unusual conditions and provide qualitative data for evaluating the need for changes to the FOD Management Plan.

7.2 Records Retention:

The Airport Authority maintains documentation on FOD incident reports, results of FOD characterization studies and findings, surveys, and other FOD management program data for a minimum of 2 years.

8.0 FOD PROGRAM POINTS OF CONTACT:

The following person(s) and organizations have been identified as local points of contact for FOD related issues at San Diego International Airport.

- **Airport Authority FOD Program POC: Katherine Altobello-Czescik**
  - Planning and Environmental Affairs Department
  - Office: 619-400-2763
  - Cell: 619-455-8007

- **Airport Authority Environmental Affairs Manager: Richard Gilb**
  - Planning and Environmental Affairs Department
  - Office: 619-400-2790
  - Cell: 619-985-5491

- **Airport Authority Communications Center**
  - 619-400-2710

- **Harbor Police Department**
  - 619-686-8000

9.0 FIGURES AND TABLES

9.1 FOD Prevention Area Map/Floor Plan

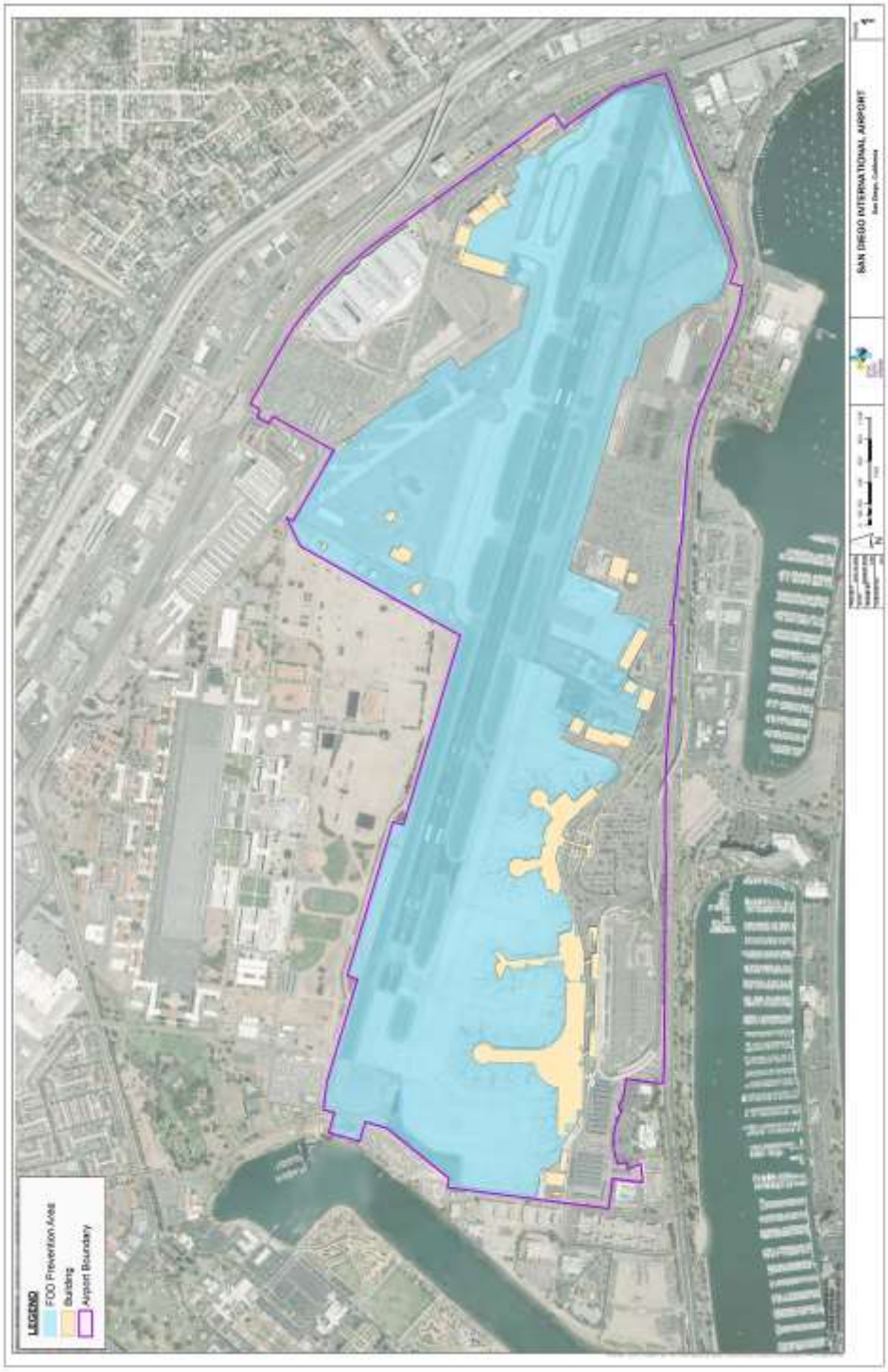

Figure 1

9.2 FOD Prevention Area Signs

Below is an example of the signage found across the airport campus—specifically in FOD prevention areas. These stickers can be found on doors, walls, and FOD trash containers throughout the airside and entrances to the airfield.

Figure 2

9.3 FOD Evaluation Tools: Count Form and Characterization Tables

In order to understand the type of FOD present at SAN, the team uses the following table to count FOD items found during walks or studies. The ranking is based off the top quantity of the FOD items present.

Rank	FOD Item	Quantity
1	Paper scraps	
2	Earplugs	
3	Squishy Plastic Scraps	
4	Metal scraps	
5	Hard plastic scraps	
6	Napkins	
7	Wood Scraps	
8	Gloves (disposable)	
9	Plastic Box Straps	
10	Zip Ties (plastic)	
11	Straws (plastic)	
12	Rubber Scraps	
13	Zipper Pulls	
14	Miscellaneous	
15	Concrete pieces	
16	Personal items (misc.)	
17	Luggage parts (plastic)	
18	Luggage straps (cloth)	
19	Bolts	
20	Washers	
21	Lids (plastic)	
22	Bottle Caps (plastic)	
23	Clothing	
24	Bottles (Plastic)	
25	Nuts	
26	Screws	
27	Cups (paper)	
28	Luggage tags	
29	Organics	
30	Locks	
31	Pens	
32	Cups (plastic)	
33	Batons	
34	Pins	
35	Cloth scraps	
36	Glasses (pieces)	
	Total	

Table 1

In order to categorize the FOD, the team uses the Federal Aviation Administration's Advisory Circular on Airport FOD Management (AC No: 150/5210-24) and the FOD Control Corporation's guidelines. In order to capture all items found at SAN, the Authority adds certain FOD items are into the existing descriptions. The results are recorded into the following categories:

FOD Characterization: FAA Circular Categories				
Type of FOD	**FAA Description**	**Added Items**	**Quantity**	
Aircraft and Engine Fasteners	Nuts, bolts, washers, safety wire	Screws		
Aircraft Parts	Fuel caps, landing gear fragments, oil sticks, metal sheets, trapdoors, tire fragments			
Mechanics' tools				
Catering Supplies		Straws, cups, napkins, lids, cups		
Flight Line Items	Personnel badges, pens, pencils, luggage tags, soda cans	earplugs, gloves, personal items, bottle caps, clothing, bottles, batons, pins, glasses		
Apron Items	Paper and Plastic debris, debris from catering and freight pallets, luggage parts, ramp equipment debris	squishy plastic scraps, hard plastic scraps, metal scraps, wood scraps, plastic box straps, zip ties, miscellaneous, cloth scraps		
Runway and taxiway materials	Concrete and asphalt chunks, rubber joint materials, paint chips			
Construction Debris	Pieces of wood, stones, fasteners, misc. metal objects			
Natural Materials	plant fragments, wildlife, volcanic ash			
				Total

Table 2

FOD Characterization: FOD Control Corporation				
Type of FOD	**FCC Description**	**Added Items**	**Quantity**	
Miscellaneous Small Parts (Type 1)	Nuts, bolts, washers	Screws		
Consumables (Type 2)	Cotton swabs, cable tie wraps, cheese cloth, safety wire	Earplugs, napkins, gloves, straws, lids, bottle caps, bottles, cups, organics		
Tools (Type 3)	Pliers, wire cutters, mirrors, hammers, probes, broken tools			
Personal Items (Type 4)	Pins, pens, badges, glasses, rings, folders, clothing	Batons		
General Debris (Type 5)	Cloth, metal, plastic, or paper pieces or scraps	wood scraps, plastic box straps, zip ties, luggage parts, miscellaneous, concrete		
				Total

Table 3

9.4 Tool Accountability

For those interested in proper tool management, there are a variety of ways to promote tool accountability and tool-related FOD prevention. Some strategies are listed below:

Tool Accountability Strategy	Description
Etching	A tool accountability system whereby the tool is engraved, leaving a permanent mark or design. Serial numbers, barcodes, or other marks can be etched into the tool so that it can be identified as belonging to a specific location or tool box.
Color Coding	A tool accountability system in which a color scheme is used to identify where a tool belongs. Colors are usually apparent on the tool handle or have been attached to the tool in the form of a tag or adhesive.
Tool Chits	A tool accountability system in which tool users are assigned tokens, or "chits", that must be physically left in place of the tool when it is removed from storage. The tool chit often has the borrower's name, identification number, and/or picture on it.
Contents Inventory Sheet	A basic tool accountability system whereby a list of all items kept within a storage location are recorded. The list may include details such as make, model number, quantity, etc… At the end of a specified time period, the items physically remaining in the storage location will be compared to the contents inventory sheet to determine if any items are missing.
Tool Check-out/check in sheet	A basic tool accountability system whereby a record of all tool movements from or to a storage location are recorded. Records may include details such as who is removing/returning the tool and where/why it was used. At the end of a specified time period, the sheet should be reviewed for items that have not been returned to the storage location and are not currently accounted for.
Automated Dispensing Units (ADUs)	A tool accountability system in which tools are stored in a vending machine that automatically tracks the issuance/return of tools by weight, barcode scanning, or other means. ADUs are often paired with software solutions that can supply reports on tool usage, inventory levels, and more.
Electronic Chip Encoding	A tool accountability system that uses radio frequency identification (RFID) technology to uniquely tag and identify a tool.
Shadow Board / Shadow Box	A tool accountability system that provides a visual reference for the contents belonging to a storage location. Items are outlined (shadow board) or their footprint is engraved (shadow box) in a specific storage location. The footprint or outline is referred to as the item's shadow.

Table 4