APPENDIX D-1
INDUSTRIAL MONITORING IMPLEMENTATION PLAN


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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

Eighteen 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-B08-8	8	Grab[4]	Sheet flow from the loading area of Terminal 1
C-B12-9a	12	Grab[5]	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[6]	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-B08-20a	8	Grab[3]	Inlet pipe near the Terminal 1 blast fence, downstream of the Remote Fueling Facility (RFF)
C-B03-21[7]	3	Grab[3]	StormFilter effluent at west corner of Signature FBO
C-B05a-23	5a	Grab[3]	Trench drain near ASB loading/unloading area
C-B05a-24	5a	Grab[3]	Sheet flow at storm drain inlet by ASB cargo/maintenance area
C-B06-25	6	Grab[3]	Inlet pipe downstream of the BMP at Airport Fueling Operations (AFO)
			Alternate Sampling Location
C-B08-22[8]	8	Grab[3]	Sheet flow from runway area taken south of the perimeter road

Notes:

1. 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). Sampling locations C-B07-6 and C-B07-7 have been retired due to Terminal 1 Construction.

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. 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.

6. Sampling location moved back to C-B06-16a following completion of construction and closing of construction staging yard.

7. Sampling location replaced sites C-B01-11 and C-B03-12 and drains from basins 1 and 3 via a StormFilter BMP.

8. 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, 5a, 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 nine drainage areas. In Basins 3, 5, 6, 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 Tern 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, 5a, 6, 8, 12, and 15.

Basins 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), Menzies, Menzies Fuel Farm, and the Authority all operate within this drainage basin. Fuel storage and operations include the Aircraft Fuel Storage Facility (FSF), Airport Fueling Operations area (AFO), Remote Fueling Facility (RFF), two 1-million gallon aboveground storage tanks (ASTs) for jet fuel along with three more in construction, 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 are comparable for all ramp and terminal discharge points within Basins 8 and 12.

Industrial activities include:

- Aircraft taxiing, loading, fueling, deicing at Gates 1A through 14, 16, and 17 (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. 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 Planning & Environmental Affairs Department (P&EAD). The P&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 P&EAD staff or a contractor for P&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 starting with the 2015 SWMP, 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 sites 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, 5a, 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, 5a, 6, and 8
Total and Dissolved Arsenic	5, 5a, 6 (C-B06-14 and C-B06-15a only), 8 (C-B08-8 and C-B08-20a only), 12, and 15

Notes:

1. Ethylene glycol will be sampled at sites 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
Aluminum	0.75	N/A	mg/L
Iron	1.0	N/A	mg/L
Ammonia (as N)	2.14	N/A	mg/L
Arsenic	0.15	N/A	mg/L
Cadmium	0.0053	N/A	mg/L
Nickel	1.02	N/A	mg/L
Mercury	0.0014	N/A	mg/L
Silver	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.

8) 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.

9) 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.

10) 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.

11) 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.

12) 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.

13) 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.

14) 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
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	.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	SM 2340B	.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 & 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%
		4°C			50 µg/L	80-120%	±30%	±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
Polychlorinated Biphenyls (PCBs)	Glass with Teflon-liner inside the cap		7 days until extraction, 40 days after extraction	If PM >5%: Solids, EPA 8082			±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%
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%

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
Methylene Blue Active Substances (MBAS)	Glass or polyethylene	4°C	48 hours	SM 5540C	0.05 mg/L	80-120%	±20%	±20%
Ammonia-N (NH3-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	N/A	N/A	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	N/A	Visual Observations, Grab/Composite	Inlet pipe of Terminal 2 West Oil-Water Separator (OWS) at storm drain inlet	Accessible

Notes:
N/A = not applicable

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	N/A	Drainage Area	Monthly	18	Industrial Permit [1]: XI.A, IGP Factsheet II.C

Notes:

IDDE = Illicit Discharge Detection and Elimination; N/A = not applicable

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; WMA = watershed management area

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	N/A	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	N/A	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	N/A	Visual Observations/ Grab	Inlet pipe at storm drain inlet for T2W OWS	Accessible	Transient Flows
15	San Diego Bay 908.21	N/A	32.735872	-117.206794	N/A	N/A	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

Notes:
HSA = hydrologic sub area; N/A = not applicable; WMA = watershed management area

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[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-B08-8	8	Grab[4]	Sheet flow from the loading area of Terminal 1
C-B12-9a	12	Grab[5]	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[6]	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-B08-20a	8	Grab[3]	Inlet pipe near the Terminal 1 blast fence, downstream of the Remote Fueling Facility (RFF)
C-B03-21[7]	3	Grab[3]	StormFilter effluent at west corner of Signature FBO
C-B05a-23	5a	Grab[3]	Trench drain near ASB loading/unloading area
C-B05a-24	5a	Grab[3]	Sheet flow at storm drain inlet by ASB cargo/maintenance area
C-B06-25	6	Grab[3]	Inlet pipe downstream of the BMP at Airport Fueling Operations (AFO)
Alternate Sampling Location			
C-B08-22[8]	8	Grab[3]	Sheet flow from runway area taken south of the perimeter road

Notes:

1. 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). Sampling locations C-B07-6 and C-B07-7 have been retired due to Terminal 1 Construction.

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. 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.

6. Sampling location moved back to C-B06-16a following completion of construction and closing of construction staging yard.

7. Sampling location replaced sites C-B01-11 and C-B03-12 and drains from basins 1 and 3 via a StormFilter BMP.

8. 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
- Extra sample containers
- 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

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 measurable 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.
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.

MBAS = Methylene Blue Active Substance; 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 (µg/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 (µg/L)	0.5	
Dissolved Cadmium (µg/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 (µg/L)	5.8	
Dissolved Chromium III (µg/L)	NA[2]	
Dissolved Chromium VI (µg/L)	83	
Dissolved Lead (µg/L)	14	
Dissolved Nickel (µg/L)	14	
Dissolved Silver (µg/L)	2.2	
Dissolved Zinc (µg/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.

µg/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 P&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, where possible, 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, if possible, 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 2021-2022 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 2017 pollutant 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