ISRA PERFORMANCE MONITORING AND BMP MONITORING FOR THE OUTFALLS 008 AND 009 WATERSHEDS, 2012/2013 RAINY SEASON SANTA SUSANA FIELD LABORATORY VENTURA COUNTY, CALIFORNIA

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[1] The "Expert Panel" documents listed here were prepared first by Geosyntec, based on detailed discussion with and guidance from the Expert Panel, and then the drafts were reviewed, edited, and approved by the Expert Panel prior to finalizing. This process is necessary in order to accommodate the Expert Panel members' limited availability.

ABBREVIATIONS AND ACRONYMS

AILF	Area I Landfill
A2LF	Area II Landfill
AP/STP	Ash Pile and Building 515 Sewage Treatment Plant
BMP	Best Management Practice
BEF	bioaccumulation equivalency factor
Boeing	The Boeing Company
CAO	Cleanup and Abatement Order
CM	culvert modification
COC	constituent of concern
cy	cubic yards
CYN	Canyon
DTSC	Department of Toxic Substances Control
DNQ	data not qualified
DRG	Drainage
ELV	Expendable Launch Vehicle
EMPC	estimated maximum possible concentration
ENTS	Engineered Natural Treatment Systems
Expert Panel	Santa Susana Site Surface Water Expert Panel
Geosyntec	Geosyntec Consultants
H&A	Haley & Aldrich, Inc.
HDPE	high-density polyethylene
IEL	Instrument and Equipment Laboratory
ISRA	Interim Source Removal Action
LID	low impact development
LOX	liquid oxygen
MWH	MWH Americas, Inc.
NASA	National Aeronautics and Space Administration
NPDES	National Pollutant Discharge Elimination System
PSD	particle size distribution
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act

ABBREVIATIONS AND ACRONYMS (continued)

RFI	RCRA Facility Investigation
RMMP	Restoration, Mitigation, and Monitoring Plan
RWQCB	Los Angeles Regional Water Quality Control Board
SAP	sampling and analysis plan
Santa Susana Site	Santa Susana Field Laboratory
SWPPP	Stormwater Pollution Prevention Plan
SWMM	Storm Water Management Model
TEF	toxic equivalency factor
TEQ	toxic equivalency
TSS	total suspended solids
WWE	Wright Water Engineers, Inc.

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1.0 INTRODUCTION

This report summarizes the Interim Source Removal Action (ISRA) performance monitoring and potential Best Management Practices (BMP) and BMP performance monitoring (BMP monitoring) activities and results from the 2012/2013 rainy season within the Outfalls 008 and 009 watersheds at the Santa Susana Field Laboratory (Santa Susana Site), Ventura County, California. The locations of Outfalls 008 and 009 watersheds, the subject outfalls of the ISRA program and the BMP Plan, are shown in Figure 1-1. This report also includes an overall summary of ISRA performance monitoring and BMP monitoring results collected to date, an evaluation of the potential BMP sites based on subarea monitoring results, and recommendations for modifications to the ISRA performance monitoring and BMP monitoring programs.

The purpose of the ISRA and BMP programs, which are being implemented with oversight and participation of the Los Angeles Regional Water Quality Control Board (RWQCB), is to improve compliance with National Pollutant Discharge Elimination System (NPDES) permit limits at Outfalls 008 and 009 and water quality in these watersheds through the dual approach of remediation of surface soils that are above defined thresholds for NPDES constituents of concern (COCs), and through control and/or treatment of stormwater runoff from prioritized subareas, respectively. Neither of these studies is an extension of the NPDES program, and therefore data collected as part of these studies are not a measurement of NPDES compliance within the watersheds.

ISRA performance monitoring and BMP monitoring activities were conducted during the 2012/2013 rainy season by MWH Americas, Inc. (MWH) on behalf of The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA). Changes to monitoring locations and frequency for the 2012/2013 rainy season were documented in the 2012/2013 Rainy Season Sampling and Analysis Plan (SAP) Update, BMP Monitoring and ISRA Performance Monitoring Programs (2012/2013 BMP and ISRA SAP) (MWH, 2012). This document serves as an addendum to the 2011/2012 BMP and ISRA SAP (MWH, 2011b). These documents, along with the 2010/2011 BMP and ISRA Performance Monitoring SAP (MWH, 2010d) constitute the SAP for the 2012/2013 rainy season.

The 2012/2013 rainy season represents the fourth year of ISRA performance monitoring and the third year of BMP monitoring. The results and recommendations from previous rainy seasons are presented in annual reports (MWH, 2010c, MWH *et al.*, 2011, MWH *et al.*, 2012). In addition, addenda to the BMP Plan (MWH *et al.*, 2010) have been prepared subsequent to the 2010/2011 and 2011/2012 rainy season annual reports, the 2011 and 2012 BMP Plan Addendums (Geosyntec Consultants [Geosyntec] and the Santa Susana Site Surface Water

Expert Panel [Expert Panel], 2011d and 2012e). The BMP Plan addenda provide additional detail on the BMP recommendations presented in the annual reports.

This summary report was prepared for Boeing and NASA by MWH and Geosyntec with input from and in accordance with the recommendations from the Expert Panel. Below is a description of the sections and appendices included in the report.

- Section 1 presents project background information, the scope and objectives of the ISRA performance monitoring and BMP monitoring programs, an update of BMP activities, the rainfall summary for the 2012/2013 rainy season, and a summary of the Outfalls 008 and 009 NPDES sampling results for the 2012/2013 rainy season.

- Section 2 presents a summary of the ISRA performance monitoring results from the 2009/2010, 2010/2011, 2011/2012, and 2012/2013 rainy seasons, and Expert Panel's recommendations for modifications to the ISRA performance monitoring program for the 2013/2014 rainy season.

- Section 3 presents a summary of the BMP monitoring results from the 2010/2011, 2011/2012, and 2012/2013 rainy seasons and the Expert Panel's recommendations for modifications to the potential BMP subarea monitoring program for the 2013/2014 rainy season.

- Section 4 presents the updated milestone schedule.

- Appendix A provides the 2012/2013 rainy season rain event and sampling charts.

- Appendix B provides laboratory and validation reports for performance monitoring and potential BMP subarea monitoring samples collected during the 2012/2013 rainy season.

- Appendix C provides time-series and correlation charts for the performance monitoring program.

- Appendix D provides the ISRA sample splits comparison memorandum prepared by the Expert Panel.

- Appendix E provides the performance monitoring data analysis memorandum prepared by the Expert Panel.

- Appendix F provides time-series and correlation charts for the potential BMP subarea monitoring program.

- Appendix G provides the BMP site ranking analysis memorandum prepared by the Expert Panel.

1.1 ISRA PROGRAM

The ISRA program is being performed pursuant to a California Water Code Section 13304 Cleanup and Abatement Order (CAO) issued by the RWQCB dated December 3, 2008 (RWQCB, 2008). The objective of the CAO is to improve stormwater quality within the Outfalls 008 and 009 watersheds by requiring the identification and evaluation of areas of contaminated soil containing COCs that may have contributed to exceedances of NPDES permit limits and benchmarks in stormwater, and implementation of an appropriate source removal alternative (e.g., excavation and offsite disposal or constructing diversion and collection structures). Based on an evaluation of all stormwater samples collected at Outfalls 008 and 009 since August 2004, including sample data collected for monitoring before the NPDES permit limits/benchmarks were established, the following COCs have been identified for each of the outfalls; copper, lead, and dioxins at Outfall 008, and cadmium, copper, lead, mercury, and dioxins at Outfall 009. For the purpose of this report, total suspended solids (TSS) is also included as a COC for Outfalls 008 and 009, since it may be associated with the other COCs; however, TSS is not regulated at Outfall 008 or 009 by the NPDES permit. Results of samples collected at Outfalls 008 and 009 above NPDES permit limits/benchmarks since August 2004 are presented in Tables 1-1 and 1-2, respectively.

Phase I ISRA activities were completed during the early portion of the 2009/2010 rainy season and included excavation and restoration[2] at ten ISRA areas in the Outfall 008 watershed and two ISRA areas in the Outfall 009 watershed. In addition, culvert inlet upgrades were performed at 12 culvert modifications (CMs) within the Outfall 009 watershed as part of the Santa Susana Site stormwater maintenance program. Phase II ISRA activities were completed during the early portion of the 2010/2011 rainy season and included excavation and restoration at 11 ISRA areas in the Outfall 009 watershed and construction of a sedimentation basin at the B-1 area for sediment control. Phase I and Phase II ISRA implementation activities were presented in summary reports (MWH, 2010a and 2011a). Phase III ISRA activities, which include excavation and restoration at the remaining ISRA areas, began in 2011 and are scheduled to be completed in 2013. The current status of Phase III ISRA activities is presented in Section 1.2.2.

[2] Restoration involved the installation of erosion control BMPs including fiber rolls, hay bales, silt fences, and hydroseed mulch on and near the restored excavations. In addition, containerized plants (for the purpose of providing additional long-term erosion control benefit) were installed following a planting plan developed by the Expert Panel.

1.1.1 ISRA Performance Monitoring Program

ISRA performance monitoring involves the collection of stormwater samples both up- and downstream of each completed ISRA area and select CM systems to obtain water quality performance data to assess the contribution of COCs to stormwater within the Outfalls 008 and 009 watersheds following completion of remedial or CM activities. The performance data associated with the CM systems were also collected to assess the effectiveness of the CMs at promoting sediment settling and removing COCs. Performance monitoring will continue through two rainy seasons for each monitoring location; however, the actual study duration will depend on the quantity and quality of data collected at the performance monitoring locations and the associated outfall (MWH, 2010a). The overall effectiveness of the ISRA remedial activities and the CM systems will be based on compliance with the NPDES Permit at the outfall monitoring locations (MWH, 2009).

The performance monitoring inspection and sample locations from the 2012/2013 rainy season are listed in Table 1-3 and shown on Figure 1-9. A summary of the activities and results from the 2012/2013 rainy season, as well as previous rainy seasons, is provided in Section 2.0.

1.2 BMP PLAN

The BMP Plan, prepared in October 2010 pursuant to the NPDES Permit, describes the process for improving stormwater runoff quality and minimizing NPDES Permit exceedances in the Outfalls 008 and 009 watersheds at the Santa Susana Site (MWH *et al.*, 2010). The BMP Plan presents the refined strategy for the subject outfall drainages based on ongoing source removal actions (e.g., ISRAs and demolition activities), and recently obtained data/information (e.g., NPDES data, performance monitoring data, dioxins and metals stormwater background studies). The refined strategy is to target stormwater BMPs[3] at locations where either existing data and/or new data generated as part of the plan indicate that BMPs may be required, while

[3] Stormwater BMPs include source, erosion, sediment, and treatment controls. Source controls are practices that aim to reduce the quantity and improve the quality of stormwater runoff at or near the source of the COC. This may include schedules of activities (such as demolition activities and remediation activities to minimize exposure to potential runoff), structural devices (either constructed or natural), maintenance procedures, and managerial or operational practices such as removing the sources of contamination. Erosion controls (a subset of source controls) are practices that protect sediment from eroding under rainfall, flowing water and/or wind conditions. Effective erosion controls are techniques in preventing water pollution and soil loss through minimization of soil or vegetation disturbance; the use of physical barriers, such as vegetation, rock, and runoff diversions to reduce the energy of the water that is causing the erosion; and stabilization measures of disturbed areas. These measures are often implemented in conjunction with sediment controls. Sediment controls are practices designed to keep already eroded soil from discharging and causing water pollution to receiving waters. Sediment control measures are usually passive systems that rely on filtering or settling of particles from the stormwater runoff. Treatment controls are engineered systems designed to remove pollutants by gravity settling of sediments, filtration, biological uptake, media adsorption or other physical, biological or chemical processes.

considering the list of guiding principles established by the Expert Panel (MWH *et al.*, 2010). The BMP Plan also describes the types of BMPs available, grouping BMPs as either source, erosion/sediment controls, or treatment controls (e.g., the Lower Lot Biofilter), and provides the approach and criteria for identifying BMP sites and selecting the BMP type(s) for each location.

Additionally, the BMP Plan and subsequent addenda (Geosyntec and Expert Panel, 2011 and 2012e) summarize BMP activities that are planned, are underway, or have been recently completed in the Outfalls 008 and 009 watersheds, referred to as short-term activities (e.g., ISRA remediation and erosion control activities, Northern Drainage restoration activities, and several erosion and treatment control recommendations from the Expert Panel). An updated list of the short-term activities and their current status is provided in Section 1.2.2. In addition, the BMP Plan and addenda identify activities that will be performed as part of the BMP evaluation and implementation planning process at the identified potential BMP sites, referred to as long-term activities. Several long-term activities are ongoing or have been completed since submittal of the BMP Plan, including developing and implementing a potential BMP subarea monitoring program, evaluating existing surface water data, developing a prioritized ranking of sites for placing new BMPs, and developing BMP sizing criteria.

1.2.1 Potential BMP and BMP Performance Monitoring Program

The potential BMP subarea monitoring program involves the collection of stormwater samples at locations receiving runoff from potential source areas and other infrastructure (e.g., roads, buildings, parking areas) to assess the potential for contribution of COCs from potential source areas and to identify locations for new BMPs and/or treatment controls, as described in the BMP Plan (MWH *et al.*, 2010) and BMP Plan Addenda (Geosyntec and Expert Panel, 2011, 2012e), within the Outfall 008 and 009 watersheds. Potential BMP monitoring locations are performed at "planned"[4] or "potential"[5] BMP sites. Following implementation of treatment BMPs, BMP performance monitoring is conducted and stormwater samples are collected at locations up- and downstream to evaluate the performance of the BMP.

As part of the BMP monitoring program, an approach was developed by the Expert Panel for ranking the potential BMP sites to prioritize the locations based on water quality considerations.

[4] "Planned" treatment BMPs include those that are expected to be designed and constructed in 2013, irrespective of subarea monitoring results.

[5] "Potential" treatment BMPs include those that will be considered based on comparison of subarea monitoring results with onsite stormwater background concentrations and NPDES permit limits; if deemed necessary, new BMPs will be designed in late 2013 and constructed thereafter.

A letter summarizing the BMP site ranking analysis approach was submitted to the RWQCB on June 22, 2011 (Expert Panel, 2011). The BMP site ranking and selection process described in the letter is planned to occur on a yearly basis through the end of the BMP Plan coverage period, currently scheduled for 2014. In addition, the existing Santa Susana BMP sizing criteria developed by the Expert Panel is for the capture of runoff from the 1-year 24-hour design storm event or, alternatively, 90% long-term runoff volume capture (these are roughly equivalent). These criteria will be used for the sizing of new treatment controls for the BMP Plan, and will be evaluated by the Expert Panel on a site-by-site basis as individual projects are developed. Recommendations for BMP sites and modifications to the subarea monitoring program are included in Sections 3.3 and 3.4, respectively.

The BMP monitoring inspection and sample locations from the 2012/2013 rainy season are listed in Table 1-4 and shown on Figure 1-9. A summary of the BMP monitoring activities and results from the 2012/2013 rainy season, as well as previous rainy seasons, is provided in Section 3.0.

1.2.2 Short-Term BMP Activities Updates

The status as of August 2013 for the short-term BMP activities that are being performed to improve surface water quality in the Outfalls 008 and 009 watersheds is provided below. These activities are shown on Figures 1-2 through 1-8.

ISRA Activities. Phase III ISRA activities are currently in-progress and scheduled to be completed by the end of 2013. From mid-2012 through mid-2013, ISRA activities were performed at eight ISRA areas (AP/STP-1B, -1C-1, -1C-2, -1E-1, -1E-2, -1E-3, ELV-1C, and IEL-3) within the Outfall 009 watershed, resulting in approximately 4,700 cubic yards (cy, *ex situ* estimate) of soil removed. Prior to start of implementation, fiber rolls were installed at ISRA areas and active ISRA areas were covered prior to forecasted rain events with plastic secured with sandbags. Restoration at completed AP/STP ISRA areas consisted of re-contouring excavation areas, installation of fiber rolls, and application of hydroseed. Restoration at ISRA area IEL-3 consisted of backfilling the excavation area with gravel and applying hydroseed to surrounding soil areas. In addition, erosion controls were installed and maintained at completed ISRA areas and ISRA areas with remediation in progress. Phase III ISRA activities planned for the remainder of 2013 include completing six ISRA areas (AP/STP-1C-2, ELV-1C, ELV-1D, LOX-1B-1, LOX-1B-2, and LOX-1B-3) within the Outfall 009 watershed, with an estimated total volume of soil to be removed of approximately 7,000 cy (*ex situ*).

Following further evaluation of the remaining eight ISRA areas (AILF-1, AILF-2, A2LF-2A, A2LF-2B, LOX-1A, LOX-1B-4, LOX-1C, and LOX-1D) identified in the 2010 ISRA Work Plan Addendum (MWH, 2010b), remedial activities in these areas will be performed as part of the cleanup activities overseen by the Department of Toxic Substances Control (DTSC) pursuant to

the 2007 Consent Order (Boeing areas) and the 2010 Administrative Order on Consent (NASA areas). At the Area I Landfill (AILF), ISRA areas AILF-1 and AILF-2, and the Area II Landfill (A2LF), ISRA areas A2LF-2A and A2LF-2B, surface water flows are low based on the SWMM model and field observations, and sampling results downstream of the landfills are generally below NPDES permit limits. In addition, the landfills have steep slopes that are currently well vegetated and stabilization after remedial activities would be difficult. Also, runoff from the AILF has been significantly reduced by removing the B1324 asphalt parking lot, and BMPs are present between the AILF and the Northern Drainage. The primary COC at four of the LOX ISRA areas (LOX-1A, LOX-1B-4, LOX-1C, and LOX-1D) is copper and/or cadmium, which has not been detected in any Outfall 009 NPDES permit samples since 2006. However, the need for additional controls at these areas and the plan to integrate the remediation work into the DTSC-directed cleanup programs will be reevaluated based on the results from continued surface water monitoring efforts under the BMP and NPDES programs, and with the continued input of the Expert Panel.

Northern Drainage Restoration Activities. The Restoration, Mitigation, and Monitoring Plan (RMMP) finalized in October 2011 (Haley & Aldrich, Inc. [H&A], 2011) and jointly developed by Boeing, NASA, H&A, MWH, Geosyntec, Padre, and the Expert Panel presents the Phase II channel stabilization measures for the Northern Drainage. Construction of structural BMPs for channel stabilization measures began in August 2012 and was completed September 2012: these included installation of rip rap check structures, maintenance of existing rip rap structures, breaking-up of in stream boulders, installation of grouted/vegetated culvert outlet energy dissipaters, reinforcement of bank toes with vegetated rip rap, reinforcement of bank toes with fibershine, incorporating soil bioengineering by utilizing live plant staking, installation of containerized plantings, lining gullies with rip rap, stabilizing roads using geocell filled with gravel, and utilizing high-density polyethylene (HDPE) slope drains. Installation of vegetative practices and application of hydroseed was completed November 2012.

Outfall 008 BMPs. Additional BMP controls were installed within the Outfall 008 watershed in response to field observations during the 2011/2012 rainy season; the BMP controls are summarized in a memorandum (Geosyntec and Expert Panel, 2012a). Between November 2012 and February 2013, grade control structures (rip rap berms) were installed along two tributary drainages upslope of Outfall 008, the rip rap apron at Outfall 008 was restored and enhanced, hay bales and silt fences were replaced with rock filter berms, and rolling dips were installed along a steep eroding section of a monitoring well access road. During March 2013, hydroseed was applied at the restored sections of Happy Valley fire roads.

Culvert Modifications (CMs). Sediment removal was performed in October 2012 at CM-1, CM-2, CM-4, CM-8, CM-9, CM-10 and CM-11. Also, fabric covering the weir boards was

inspected and periodically replaced as needed. See below for explanation of additional work performed at CM-9.

Lower Parking Lot BMP. A treatment control BMP to control runoff from the paved, 4.5-acre soil stockpile area in the Lower Parking Lot was completed in March 2013. The BMP includes a subsurface flow equalization forebay and pump system into which stormwater runoff is directed via a curb and trench drain, a sedimentation basin, and a biofilter containing engineered treatment media. This BMP will also treat part of the first flush flows from a 23-acre developed drainage area that is upslope of the Lower Parking Lot in addition to the runoff from the paved soil stockpile area. Stormwater is directed to the subsurface forebay and is then pumped to a settling basin where sediments are allowed to settle out before the stormwater is transferred to the biofilter. The biofilter contains media through which the stormwater is filtered before discharging into the Northern Drainage north of the biofilter site via the effluent pipe. In addition, erosion control blankets, fiber rolls, rip rap, and native plantings were installed for further erosion controls in the sedimentation basin and biofilter areas and gravel was placed over the cistern area following completion of construction activities. During construction, temporary erosion controls were implemented prior to forecast rain events at active construction areas, including fiber rolls and plastic covering secured with sandbags.

Additional sandbags and fiber rolls were installed in November 2012 to address sediment observed washing out from beneath the western corner of the wooden retaining wall in the southern portion of the Lower Parking Lot area.

Site Restoration. Removal of the concrete foundation as part of the Building 1436 demolition is tentatively scheduled for Fall 2013.

Helipad. A temporary BMP was installed at the Helipad in November 2011; this BMP included two rows of sandbag berms to promote ponding and settling of water borne particulates. Infiltration holes were drilled just upstream of the sandbag berms to promote infiltration in September 2012. Between October and November 2012, the heights of the sandbag berms were raised and plastic sheeting was placed over the berms to increase the total amount of runoff being stored and infiltrated. In addition, a temporary pump and HDPE conveyance pipeline were installed at the eastern-most berm, to convey captured stormwater runoff to storage tanks at Outfall 010. Water stored at these tanks is later conveyed to Silvernale Pond for treatment. A sandbag berm was installed along the western portion of the Helipad area near ISRA area ELV-1C in October 2012 to direct stormwater runoff from this area towards the Helipad berms to the northeast. An additional two rows of sandbags were installed north of the first sandbag berm in November 2012 to provide additional stormwater runoff capture and a temporary pump was installed to convey stormwater captured behind the berms towards the Helipad berms. The system has been successful in reducing runoff and preventing discharge at Outfall 009 during small storms, as shown by a reduced sample frequency at Outfall 009 during the 2012/2013 rainy

season (3 of 9 rain events) compared to the 2011/2012 rainy season (9 of 10 rain events). This temporary system will continue operation until the asphalt is removed during planned demolition.

Downslope along Helipad Road, slope protection measures were implemented at areas of exposed soil west of the road, including jute matting, fiber rolls, and street sweeping, to address sediment being washed into the asphalt swale along Helipad Road and entering the culvert at the corner of Area II Road.

Expendable Launch Vehicle (ELV) Area. During December 2012, mulefat plants and plant debris were removed from the ELV channel, a row of sandbags and fiber rolls were installed along the edge of soils adjacent to Area II Road, and gravel was added to exposed soil areas to address sediment-laden runoff being carried down Area II Road towards CM-1.

Furthermore, construction of a treatment control BMP in the ELV area began June 2013. The ELV BMP includes removal of the existing 520-foot asphalt drainage swale south of ELV and installation of a concrete sump, sump pumps, settling tanks with tube settling plates, and a media filter at the corner of Helipad Road and Area II Road. Stormwater will be gravity driven through the tank system, starting with the settling tanks, then through the filter media tank, before discharging to a tributary that flows to Outfall 009. Construction is tentatively scheduled to be completed Fall 2013.

Liquid Oxygen (LOX) Area. HDPE slope drains and rip rap were installed at the LOX sand/gravel bag berm in September 2012, at the same time as Northern Drainage RMMP measures. In addition, hydroseed was applied to soil areas during November 2012 and worn gravel bags were replaced at the LOX berm in December 2012. Erosion and sediment controls were inspected and maintained throughout the 2012/2013 season. In addition, ISRA excavations at LOX are planned to be completed by the end of 2013 as noted above.

B-1 Area. Minor improvements and maintenance activities to enhance the performance of the existing media filter were recommended in the B-1 area by the Expert Panel as a result of the 2012 BMP site ranking analysis (Geosyntec and Expert Panel, 2012c), with a conceptual design presented in the 2012 BMP Plan Addendum (Geosyntec and Expert Panel, 2012d). In October 2012 the following improvements and maintenance activities were performed: three 18-inch curb cuts with slope protection were installed along the main entrance road (to more evenly distribute road runoff to the B-1 Media Filter), five curb cuts were installed along the existing planter curb northwest of the main entrance road (to spread this runoff over a pervious area for infiltration and evapotranspiration), additional rip rap was added to existing check dams, and containerized plants were installed along slope areas. In addition, sandbags are placed at the curb cuts prior to forecasted rain events to direct runoff along the road through the cuts to the B-1 Media Filter. During November 2012, hydroseed was applied within the drainage area.

CM-9 Area. The CM-9 area was recommended for BMP improvements by the Expert Panel as a result of the 2012 BMP site ranking analysis (Geosyntec and Expert Panel, 2012c), with a conceptual design presented in the 2012 BMP Plan Addendum (Geosyntec and Expert Panel, 2012d). Between November and December 2012, fiber rolls, jute matting, sand bags, and gravel were installed as part of slope protection measures along roadway embankments upslope and east of CM-9. Between February and March 2013, a low flow diversion structure was constructed at the culvert inlet off Area II Road consisting of a perforated pipe that extends south along the slope adjacent to CM-9 (to spread low flows evenly across the vegetated hillside) and discharges behind a riprap/gravel berm constructed south of CM-9. This berm will allow stormwater runoff to pond and encourage settling of sediment prior to reaching CM-9.

Additional Miscellaneous Erosion Control Installations. Installation and maintenance of additional erosion control BMPs (e.g., hydroseed mulch, straw wattles, culvert outlet protection, etc.) are performed continuously at the Santa Susana Site based on recommendations following routine inspections conducted per the sitewide SWPPP or individual construction SWPPPs to identify and mitigate sources of pollution to surface water. Performance of inspections prior to and during rain events to identify soil erosion features are critical in identifying BMP maintenance locations and implementing corrective actions in a timely manner to minimize the transportation of soil in surface water runoff.

1.3 2012/2013 RAINY SEASON DISCHARGE EVENT SUMMARY

The Santa Susana Site NPDES Permit definition of a discharge (rain) event is one that produces more than 0.1 inches of rainfall in a 24-hour period and must be preceded by at least 72 hours of dry weather. By this measure, nine rain events occurred at the Santa Susana Site during the 2012/2013 rainy season. The dates of each rain event and the total measured rainfall recorded at a RWQCB approved weather station within Area IV, as reported in the NPDES Discharge Monitoring Reports (Boeing, 2013a, 2013b) are provided in Table 1-5. The table also includes average rainfall intensity and maximum one-hour rainfall intensity, and a summary of sampling activities for the NPDES, ISRA performance monitoring, and BMP monitoring programs.

During the 2012/2013 rainy season, the amount of rain received (8.09 inches) was 55% below the average yearly rainfall for the region (~18 inches/year for the period between 1960 and 2006). For comparison, the previous four rainy seasons were measured at 11.10 inches in 2008/2009, 19.04 inches in 2009/2010, 23.51 inches in 2010/2011, and 11.41 inches in 2011/2012 from the Santa Susana Site rain gauge. The majority of rainfall received during the 2012/2013 rainy season (approximately 60%) occurred between November 2012 and January 2013 over the course of four multiple-day rain events; the November 14 – 18, 2012 rain event, the November 28, 2012 – December 4, 2012 rain event, the December 22 – 26, 2012 rain event,

and the January 23 – 27, 2013 rain event, which measured 0.99 inches, 1.49 inches, 1.13 inches, and 1.78 inches, respectively.

1.4 NPDES MONITORING, 2012/2013 RAINY SEASON

NPDES monitoring and sampling of Outfalls 008 and 009 conducted during the 2012/2013 rainy season was performed in accordance with the NPDES permit adopted on June 3, 2010. During the 2012/2013 rainy season, no samples were collected at Outfall 008 (no flow was recorded at Outfall 008 for the 2012/2013 rainy season) and three samples were collected at Outfall 009. The dates and associated rain event information for these samples are presented in Table 1-5. The concentrations of the outfall-specific COCs and field measurements for Outfalls 008 and 009 are presented in Tables 1-6 and 1-7, respectively[6]. During the 2012/2013 rainy season, no ISRA COCs were detected above the NPDES permit limits and there were no exceedances of other constituents above NPDES permit limits in any of the three Outfall 009 samples. The NPDES results are further discussed during the evaluation of ISRA performance monitoring and BMP monitoring results in Sections 2.0 and 3.0, respectively. A complete set of NPDES sampling results and an evaluation of the data for Outfalls 008 and 009 are presented in the NPDES Discharge Monitoring Reports (Boeing, 2013a, 2013b).

[6] Per the NPDES permit adopted on June 3, 2010, dioxins toxic equivalency (TEQ) concentrations for NPDES samples were calculated during the 2010/2011 rainy season by multiplying each congener concentration by its respective toxic equivalency factor (TEF) and bioaccumulation equivalency factor (BEF), and excluding congener data not qualified (DNQ) results. Dioxins TEQ concentrations in samples collected prior to the 2010/2011 rainy season were calculated per the previous NPDES permits by multiplying each congener concentration only by its respective TEF, excluding congener DNQ results.

2.0 ISRA PERFORMANCE MONITORING SUMMARY

The data collected during the 2012/2013 rainy season represents the fourth year of rainy season monitoring for one CM system (CM-9), which is downstream of the AILF ISRA areas (AILF-1 and AILF-2), the second year of rainy season monitoring for one Phase III ISRA area (IEL-2), and the first year of monitoring for seven Phase III ISRA areas. The performance monitoring inspection and sample locations from the 2012/2013 rainy season are listed in Table 1-3 and shown on Figure 1-9. A summary of the ISRA performance monitoring results from the 2009/2010, 2010/2011, and 2011/2012 rainy seasons is provided in Section 2.1. A summary of the results from the 2012/2013 rainy season is provided in Section 2.2. An up- and downstream evaluation of ISRA performance monitoring results collected to date and recommendations for modifications to the ISRA performance monitoring program are included in Sections 2.3 and 2.4, respectively.

2.1 PRE-2012/2013 RAINY SEASON SAMPLING SUMMARY

A summary of pre-2012/2013 ISRA performance monitoring is provided in Table 2-1 and the monitoring locations and sampling dates are shown on Figures 2-1 through 2-6. The results and recommendations from previous rainy seasons are presented in annual reports (MWH, 2010c, MWH *et al.*, 2011, MWH *et al.*, 2012). It should be noted that subsequent to submittal of the 2009/2010 rainy season report and consistent with recommendations of the RWQCB, all dioxins toxic equivalency (TEQ) concentrations were recalculated using toxic equivalency factor (TEF) and bioaccumulation equivalency factor (BEF) and validation was performed on dioxins results above the permit limit. The updated 2009/2010 rainy season performance monitoring sample results were presented in 2010/2011 rainy season report (MWH *et al.*, 2011).

Table 2-1 Pre-2012/2013 ISRA Performance Monitoring Summary

Area Monitored	Rainy Season		
	2009/2010	2010/2011	2011/2012
Phase I ISRA Areas			
OF008 ISRA areas (10)	X	X	X (Discontinued[a])
A2LF-1, -3	X	X	X (Discontinued[a])
CM Systems			
CM-1	X	X	X (Reassigned[b])
CM-9	X	X	X
CM-3, CM-8, CM-11 (Background CMs)	X	X (Discontinued[c])	--
B-1 Media Filter	--	--	X (Reassigned[b])

Table 2-1 Pre-2012/2013 ISRA Performance Monitoring Summary, continued

Area Monitored	Rainy Season		
	2009/2010	2010/2011	2011/2012
Phase II ISRA Areas			
B-1 ISRA Areas (5)	--	X	X (Discontinued[a])
CTLI-1A, -1B	--	X	X (Discontinued[a])
IEL-1	--	X	X (Discontinued[a])
AP/STP-1A,-1D,-1F	--	X	X (Discontinued[a])
Phase III ISRA Areas			
IEL-2	--	--	X
Sampling Summary	62 samples (from 28 locations)	91 samples (from 25 locations)	40 samples (from 15 locations)

NOTES

- (X) ISRA performance monitoring performed during specified rainy season.
- ([a]) ISRA performance monitoring discontinued after specified rainy season because the locations have been monitored for two or three years and sufficient data have been collected to show a general decrease in downstream results, as compared to upstream results.
- ([b]) ISRA performance monitoring reassigned to the BMP performance monitoring program.
- ([c]) ISRA performance monitoring discontinued after specified rainy season because the low concentrations of constituents in samples limits the performance evaluation of the CMs.

2.2 2012/2013 RAINY SEASON ACTIVITIES AND RESULTS

During the 2012/2013 rainy season, performance monitoring continued at the one ISRA area completed during Phase III implementation (IEL-2) and one of the CM systems (CM-9), and was initiated at the seven ISRA areas completed during Phase III implementation (AP/STP-1B, AP/STP-1C-1, AP/STP-1C-2, AP/STP-1E-1, AP/STP-1E-2, AP/STP-1E-3, and IEL-3). As noted in Table 2-1, performance monitoring was discontinued at the 22 ISRA areas completed during Phase I, including the Outfall 008 ISRA areas, and Phase II implementation as these locations had been monitored for two or three years and data collected showed no significant difference between upstream and downstream results, confirming that the implementation of the excavation and restoration activities did not introduce additional contaminants to the runoff MWH *et al*., 2012). A summary of the 2012/2013 inspection and sampling activities and results are presented below.

2.2.1 Inspection and Sampling Activities

Field inspections were conducted during all nine qualifying rain events in 2012/2013; however, stormwater runoff was observed and sampled at performance monitoring locations during two of

the nine events. Two performance samples were collected and analyzed from one location within the Outfall 009 watershed. The RWQCB collected a split sample of both performance samples. A summary of the number of primary performance monitoring samples collected during each rain event is presented in Table 1-5. The performance monitoring samples collected during the 2012/2013 rainy season, including RWQCB splits, are listed in Table 2-2. The monitoring locations and dates on which ISRA performance monitoring samples were collected are shown on Figures 2-1 through 2-6. Charts showing rainfall in inches per hour for the 2012/2013 rain events during which a performance monitoring sample was collected, along with the performance monitoring sampling times and Outfall 009 flow rates and sampling times, are included in Appendix A.

Stormwater flow was not observed at eight of the primary monitoring locations within the Outfall 009 watershed during the 2012/2013 rainy season and therefore samples could not be collected. The eight locations within the Outfall 009 watershed include upstream of AP/STP-1B/-1C-1/-1C-2/-1E-3 (three locations), downstream of all Ash Pile and Building 515 Sewage Treatment Plant (AP/STP) ISRA areas (one location), up- and downstream of IEL-2 (two locations), and up- and downstream of IEL-3 (two locations).

Field measurements of primary performance monitoring samples included turbidity, temperature, pH, and conductivity. Laboratory analysis of primary and split performance monitoring samples included NPDES COCs associated with the ISRA or CM areas and TSS, as described in the 2012/2013 Rainy Season SAP (MWH, 2012).

2.2.2 Sample Results

ISRA performance monitoring analytical results, including RWQCB split samples, field measurements, and rainfall event measurements from the 2012/2013 rainy season are presented in Table 2-3. Consistent with the approach used during previous rainy seasons, Level II validation was performed on dioxins results above the permit limit. Laboratory and validation reports for performance monitoring samples (primary and RWQCB splits) are included in Appendix B.

Performance monitoring sample results were compared to NPDES outfall results to assess whether there is a general pattern of water quality changes as runoff travels down the watersheds and to provide a context for evaluating possible contributions to NPDES samples at the outfalls. To support this evaluation, (1) time-series charts showing performance monitoring results versus sample collection date are provided in Appendix C-1 for each NPDES COC detected above the NPDES permit limit at each up- and downstream evaluation area, and (2) time-series charts showing performance monitoring and NPDES monitoring results versus sample collection date are provided in Appendix C-2 for each NPDES COC detected within each outfall. Additionally,

to assess the general understanding that the NPDES COCs are associated with soils and are mobilized by stormwater runoff when these soils are eroded and suspended in the water column, correlation charts are provided in Appendix C-3 showing performance monitoring results versus TSS for each NPDES COC detected within each outfall.

The Expert Panel also performed an evaluation of the split samples and a statistical evaluation of upstream versus downstream concentrations for the entire performance monitoring dataset. The Expert Panel's conclusions and recommendations based on this evaluation are presented in Sections 2.2.3 and 2.3, respectively.

Below is a summary of the performance monitoring and NPDES sample results, and general trends observed in the results; the summary below does not consider RWQCB split samples.

Outfall 009 Watershed Findings:

- Cadmium, copper, and mercury were not detected in ISRA performance monitoring or Outfall 009 NPDES samples at concentrations above the NPDES permit limit during the 2012/2013 rainy season. Dioxins and lead were detected above the NPDES permit limit in one performance monitoring sample (located at CM-9); however, dioxins and lead were not detected above the NPDES permit limit at Outfall 009 NPDES samples collected during the 2012/2013 rainy season.

- Performance monitoring samples collected to date show positive correlations between copper and lead concentrations and TSS concentrations, confirming the general understanding that these COCs are associated with soil particulate matter. Correlations between cadmium, mercury, and dioxins concentrations and TSS concentrations were limited by the high number of non-detect results.

2.2.3 Split Samples Evaluation

The RWQCB collected split samples of select performance monitoring samples during the rainy seasons between 2009 and 2013. Initially, RWQCB split samples were collected by filling a secondary container (the split) after filling the primary container (the sample) following the procedures specified in the SAP, which does not result in the collection of a true split. As such, a Dekaport (cone) splitter (Rickly Hydrological Company, Columbus, Ohio) was implemented during the 2010/2011 rainy season following the protocol specified in the 2010/2011 rainy season SAP and presented in a memorandum prepared by Wright Water Engineers, Inc. (WWE) and the Expert Panel (WWE and Expert Panel, 2010), with the implementation process detailed in a letter submitted to the RWQCB (Boeing, 2011). An evaluation of the split sample results was performed by the Expert Panel, with results presented in a memorandum (Geosyntec and Expert Panel, 2013a) included in Appendix D. The splitter evaluation performed by the Expert Panel in 2012 (Geosyntec and Expert Panel, 2012b) concluded that implementation of the

Dekaport splitter improved the correlation (and decreased data scatter) of split to primary sample results for the NPDES COCs evaluated, with the exception of copper. Reduced variability and scatter is consistent with other monitoring programs using the Dekaport splitter (Capel, Nacionales, and Larson, 1995); therefore, for this annual report, only samples collected after implementation of the splitter were used in evaluating the correlation between samples and splits.

Based on the evaluation, TSS results for splits were significantly higher than sample results. This difference is more pronounced at low concentrations, however, with fairly good agreement between the results from the two labs at higher concentrations. A significant difference was found between split and sample results for copper and lead, with the split results lower than sample results. Such split versus sample differences may be explained by various factors such as differences between laboratory quality assurance/quality control (QA/QC), analysis, and/or reporting practices. The differences for copper are consistent across the range of concentrations measured, suggesting that the difference is likely due to a systematic difference in measured concentration, whereas the differences for lead are more pronounced at lower concentrations.

2.3 UP- AND DOWNSTREAM EVALUATION

An evaluation of upstream versus downstream ISRA performance monitoring sample results could not be performed due to lack of observed upstream flows as a result of low rainfall experienced during the 2012/2013 rainy season.

2.4 ISRA PERFORMANCE MONITORING PROGRAM RECOMMENDATIONS

The performance monitoring program was to be performed through two rainy seasons for each monitoring location; however, the actual study duration is dependent on the quantity and quality of data collected at the performance monitoring locations and the associated outfall. The 2012/2013 rainy season was the fourth year of rainy season monitoring for CM-9, the second year of rainy season monitoring for ISRA area IEL-2, and the first year of monitoring for seven Phase III ISRA areas. Based on the data collected to date, the following recommendations for the performance monitoring program for the 2013/2014 rainy season are made:

- Continue ISRA performance monitoring at all locations, because the unusually dry 2012/2013 rainy season resulted in relatively few new data.

- Add ISRA performance monitoring locations at recently completed ISRA areas (i.e., LOX and ELV).

- Reassign downstream monitoring at CM-9 to the BMP monitoring program, where other treatment BMPs are currently being monitored (e.g., CM-1 and B-1 Media Filter).

3.0 POTENTIAL BMP AND BMP PERFORMANCE MONITORING PROGRAM

The data collected during the 2012/2013 rainy season represents the third year of BMP monitoring. The BMP monitoring inspection and sample locations from the 2012/2013 rainy season are listed in Table 1-4 and shown on Figure 1-9.

A summary of the BMP monitoring results from the 2010/2011 and 2011/2012 rainy seasons is provided in Section 3.1. A summary of the monitoring activities and results from the 2012/2013 rainy season is provided in Section 3.2. An up- and downstream evaluation of BMP performance monitoring results collected to date is included in Section 3.3. Section 3.4 and 3.5 present the results of the BMP site ranking analysis and the recommendations for modifications to the BMP monitoring program, respectively.

3.1 PRE-2012/2013 RAINY SEASON SAMPLING SUMMARY

A summary of pre-2012/2013 BMP monitoring is provided in Table 3-1 and the monitoring locations and sampling dates are shown on Figures 2-1 through 2-6.

Table 3-1 Pre-2012/2013 BMP Monitoring Summary

Area Monitored	Rainy Season	
	2010/2011	2011/2012
Outfall 008	-	-
HVS	X	X
Outfall 009	-	-
AILF/CM-9	X	X
A2LF	X	X
B-1	X	X
CM-1	X	X
ELV	X	X
Helipad	X	X
LOX	X	X
Lower Parking Lot	X	X
Background	X	X (Discontinued[a])
Sampling Summary	67 samples (from 22 locations)	88 samples (from 24 locations)

NOTES

- (X) BMP monitoring performed during specified rainy season.
- ([a]) BMP monitoring discontinued after specified rainy season because sufficient background data have been collected for the program.

Using the results of the 2010/2011 and 2011/2012 rainy seasons, the Expert Panel prioritized the potential BMP sites based on water quality considerations. The potential BMP sites were ranked based on the multi-constituent score, with the top-ranked sites recommended for consideration for new or enhanced stormwater control placement. Based on the ranking results, and utilizing best professional judgment (including consideration of information on planned ISRA, BMP, and demolition measures), new or improvements to the existing BMPs were recommended at the Helipad, ELV/CM-1, LOX, AILF, and CM-9. Conceptual designs for the BMP concepts and a proposed implementation schedule were presented in the 2011 and 2012 BMP Plan addenda (Geosyntec and Expert Panel, 2011 and 2012e). The current status of BMP activities that are being performed to improve surface water quality in the Outfalls 008 and 009 watersheds is provided in Section 1.2.2.

3.2 2012/2013 RAINY SEASON ACTIVITIES AND RESULTS

Potential BMP subarea monitoring during the 2012/2013 rainy season was performed at 17 "planned" or "potential" BMP sites. BMP performance monitoring during the 2012/2013 rainy season was performed at 12 locations that monitored four BMP sites, including CM-1, the B-1 Media Filter, LOX, and the Lower Parking Lot BMP. A summary of the 2012/2013 inspection and sampling activities and results are presented below.

3.2.1 Inspection and Sampling Activities

Field inspections were conducted during all nine qualifying rain events in 2012/2013; however, stormwater runoff was observed and sampled at BMP monitoring locations only during seven of the nine events. Fifty-three (53) BMP monitoring samples were collected and analyzed from a total of 17 locations within the Outfall 009 watershed[7]; stormwater runoff was not observed at either of the monitoring locations within the Outfall 008 watershed. Additionally, three BMP monitoring samples were collected and placed on hold within the Outfall 009 watershed. The sample collected on December 3, 2012 and placed on hold was not subsequently analyzed because a sample collected earlier in the same rain event was analyzed instead. The two samples collected on January 24, 2013 and placed on hold were associated with the Lower Lot BMP and

[7] In addition, three BMP monitoring samples were collected and placed on hold within the Outfall 009 watershed. A sample collected on December 3, 2012 was placed on hold and not subsequently analyzed, because a sample collected from the same monitoring location during the same rain event was analyzed. Two samples collected on January 24, 2013 were placed on hold and not subsequently analyzed, because the samples were collected from the Lower Parking Lot BMP prior to it being operational.

not analyzed because the BMP was not operational at the time. A summary of the number of potential BMP subarea monitoring samples collected during each rain event is presented in Table 1-5. The potential BMP subarea monitoring samples collected during the 2012/2013 rainy season are listed in Table 3-2. The monitoring locations and dates on which potential BMP subarea monitoring samples were collected are shown on Figures 2-1 through 2-6. Charts showing rainfall in inches per hour for the 2012/2013 rain events during which a potential BMP subarea monitoring sample was collected, along with the potential BMP subarea monitoring sampling times and Outfall 008 and 009 flow rates and sampling times, are included in Appendix A.

BMP monitoring samples were not collected from seven of the planned locations during the 2012/2013 rainy season, because flowing stormwater was not present during inspections. Two of the locations are within the Outfall 008 watershed and includes one location along the Happy Valley main tributary drainage (HZBMP0001) and one location along the CYN/DRG tributary drainage (HZBMP0003). The other five locations are within the Outfall 009 watershed and include locations at the LOX RFI site (LXBMP0006 – LXBMP0008) and downstream of the AP/STP ISRA areas (APBMP0001 and APBMP0002).

Field measurements of BMP monitoring samples included turbidity, temperature, pH, and conductivity. Laboratory analysis of BMP monitoring samples included total and dissolved metals, dioxins, TSS, particle size distribution (PSD), and turbidity as described in the 2012/2013 Rainy Season SAP (MWH, 2012).

3.2.2 Sample Results

BMP monitoring analytical results, including field measurements and rainfall event measurements from the 2012/2013 rainy season are presented in Table 3-3 for potential BMP subarea monitoring and in Tables 3-4a through 3-4c for Treatment BMP performance monitoring. Consistent with the approach used during previous rainy seasons, Level II validation was performed on all dioxins results. Laboratory and validation reports for potential BMP subarea monitoring samples are included in Appendix B.

BMP monitoring sample results for NPDES COCs were compared to NPDES outfall results to assess whether there is a general pattern of water quality changes as runoff travels down the watersheds and to provide a context for evaluating possible contributions to NPDES samples at the outfalls. To support this evaluation, time-series charts showing potential BMP subarea, stormwater background, and NPDES monitoring results versus sample collection date are provided in Appendix F-1 for each NPDES COC detected within each outfall. Additionally, to assess the general understanding that the NPDES COCs are associated with soils and are mobilized by stormwater runoff when these soils are eroded and suspended in the water column,

correlation charts are provided in Appendix F-2 showing potential BMP subarea monitoring results and stormwater background sample results for NPDES COCs versus TSS are provided for each NPDES COC detected within each outfall. These charts are included in Appendix F. The charts do not include results for ISRA or CM locations that were included in the complete stormwater background datasets utilized in the Expert Panel's BMP site ranking analysis presented in Section 3.3. PSD data will be summarized in the 2013 BMP Plan Addendum because the primary purpose for collecting PSD data is for use in BMP design.

Below is a summary of the potential BMP subarea monitoring, BMP performance monitoring, and NPDES sample results for the Outfall 009 NPDES COCs, and general trends observed in the results. The results for other analytes (e.g., dissolved metals) in potential BMP subarea monitoring samples were or will be used for stormwater treatability assessment, BMP design, metal particulate strength calculations, and future BMP site ranking analyses.

Outfall 008 Watershed Sample Results:

No samples were collected in the Outfall 008 watershed this year.

Outfall 009 Watershed Sample Results:

- For the 2012/2013 rainy season, cadmium and mercury were not detected in potential BMP subarea monitoring or Outfall 009 NPDES samples at concentrations above the NPDES permit limit (excludes several cadmium J-flagged results below the NPDES permit limit). Lead, copper, and/or dioxins were detected above the NPDES permit limit in 21 samples collected from eight planned or potential BMP monitoring locations within the Outfall 009 watershed, including one location downstream of a treatment BMP (B1BMP0007). For the three Outfall 009 NPDES samples, none of the ISRA COCs (cadmium, copper, lead, mercury, dioxins) were detected above the NPDES permit limit. Refer to Section 3.3 for the list of the highest ranked subareas based on the results of the Expert Panel's potential BMP subarea ranking analysis. In general, the subarea monitoring sites that receive runoff from primarily paved surfaces had the highest COC concentrations[8], a finding that is generally consistent with other stormwater studies and supports the benefits of Boeing's ongoing asphalt removal/demolition projects.

[8] As stated previously, stormwater runoff from asphalt pavement may contribute metals and dioxins concentrations that are above background due to: (1) regional atmospheric deposition (which over time builds up and more effectively washes off pavement during rain events unlike open ground areas where stormwater runoff may partially infiltrate or be sequestered by plants), (2) contributions from the asphalt emulsion and/or pavement sealant themselves, and/or (3) contributions from vehicles (e.g., brake dust, oil leaks, and exhaust particulates).

- For the 2012/2013 rainy season, cadmium and mercury were not detected in BMP performance monitoring samples at concentrations above the NPDES permit limit during the 2012/2013 rainy season (excludes several J-flagged results for cadmium below the NPDES permit limit and one J-flagged result for mercury slightly above the NPDES permit limit). Lead, copper, and/or dioxins were detected above NPDES permit limits in 17 samples collected from six BMP performance monitoring locations, including at the B-1 Media Filter (up- and downstream), CM-1 (up- and downstream), and Lower Parking Lot BMP (upstream and intermediate). For all Outfall 009 NPDES samples collected, none of the ISRA COCs (cadmium, copper, lead, mercury, dioxins) were detected above the NPDES permit limit. Potential BMP subarea monitoring and stormwater background samples collected to date show positive correlations between copper and lead concentrations and TSS concentrations, confirming the general understanding that these COCs are associated with soil particulate matter. Correlations between cadmium, mercury, and dioxins concentrations and TSS concentrations were limited by the high number of non-detect results.

3.3 UP- AND DOWNSTREAM BMP PERFORMANCE EVALUATIONS

An evaluation of upstream versus downstream BMP performance monitoring sample results was performed by the Expert Panel, with results presented in a memorandum (Geosyntec and Expert Panel, 2013b) included in Appendix E. The memorandum evaluated data collected during the 2009/2010 to 2012/2013 rainy seasons to identify if treatment BMPs are effectively reducing NPDES COCs. The evaluation used only paired data, or locations with both an upstream and downstream sample collected from the same storm event.

In general, data indicate that downstream concentrations at BMP sites tend to be lower than corresponding upstream samples, suggesting positive performance of the BMPs. The only exception to this was dioxins at CM background sites (i.e., CMs where upstream drainages are undeveloped and unimpacted and influent concentrations are generally very low and unlikely to be significantly reduced); however, the difference in upstream versus downstream concentrations for this constituent at these sites was not statistically significant. Dioxins, copper, and lead at non-background CM sites were found to have statistically significant reductions (water quality improvements) from upstream to downstream concentrations. The same was the case for TSS and lead for background CM sites (no data pairs were available for copper at background sites). The newly installed lower lot biofilter was also evaluated this year, although statistical analyses on the data pairs could not be performed since there were only data available for one storm event. However, reductions from upstream to downstream concentrations were found for all constituents from the influent to the biofilter outlet (an additional intermediate point at the sedimentation basin outlet is also monitored at this site).

The monitored performance demonstrates the benefits of the sedimentation and media treatment unit processes, as well as erosion control BMPs. The monitoring data have also been used in the subarea ranking evaluations for CM improvement consideration at locations where effluent quality remains problematic.

3.4 POTENTIAL BMP RANKING RESULTS AND RECOMMENDATIONS

Based on these analysis results, the following monitoring locations were identified as the highest ranked subareas. BMP recommendations are identified for each, where applicable. For additional discussion on each subarea, including the history of BMP improvements that have been implemented at each, see the Expert Panel's BMP ranking memo (Geosyntec and Expert Panel, 2013c), which is included as Appendix G.

In some cases, these ranking results are for datasets that reflect conditions prior to or following implementation of temporary measures or corrective actions and this is described in parentheses following the location designation (in bold). It should be noted that all 17 monitoring locations described below (the top-ranked locations with a multi-constituent ranking of fifteen or above) are located in the Outfall 009 drainage area, with none in the Outfall 008 drainage area. Water quality at background locations was generally good with no location ranked above 30.5[9], though there were several instances of concentrations greater than the NPDES permit limits at those locations. However, no flow or exceedances occurred at Outfall 008 during the current season, indicating that retention occurred within the watershed.

The following list of highest ranked subareas also contains some historic subarea monitoring sites that are discontinued or replaced by new locations. These locations are indicated by gray text and no Expert Panel recommendations are provided for these; they are included for historic tracking and comparison purposes. Finally, it should be noted that the 2012/2013 rainy season was unusually dry; therefore, there are relatively few new data this year for updating the site rankings.

(1) ILBMP0002 (road runoff to CM-9): The Expert Panel recommends ongoing maintenance of the BMPs installed this year. In addition, the filter fabric on the CM-9 weir boards should be replaced when the fabric becomes clogged or damaged. Sediment accumulation at the inlet of the CM and at the new pretreatment rock berm should continue to be monitored. Water that has

[9] Some of the sites' ranks are not expressed as whole numbers because an average of ranks is used when multiple sites are tied with the same rank.

ponded upstream of the weir board for greater than 72 hours should be noted as it may suggest that media or underdrain maintenance is needed.

(2) EVBMP0003 (CM-1 upstream west): The Expert Panel recommends CM-1 filter fabric inspection (replace when the fabric becomes clogged or damaged), monitoring of sediment accumulation in front of weir boards (removal when accumulation nears top of first weir board), and monitoring of water ponding after storms (ponding for greater than 72 hours should be noted as it may suggest that media or underdrain maintenance is needed).

(3) EVBMP0001-A (composite of Helipad Road and lower ELV ditch): Discontinued.

(4) EVBMP0002 (Helipad pre sandbag berms): The Helipad sandbag berms are expected to receive significantly more runoff once NASA's new ELV drainage routing plan is implemented; therefore the Panel recommends an evaluation of the existing pumping setup so that the frequency of discharge from the Helipad area to OF009 continues to be controlled, as feasible. The Panel also recommends continued operation of this temporary capture system or equivalent runoff capture and treatment as a temporary interim control strategy until NASA is able to remove asphalt from the Helipad area during planned demolition.

(5.5) EVBMP0005 (2012/13 ELV drainage ditch [pre-ELV-1C ISRA]): The Expert Panel recommends no new actions at this time to address runoff from this subarea beyond the currently planned (and currently under construction) stormwater treatment facility.

(5.5) A1SW0009-A (CM-9 downstream underdrain outlet, post-Building 1324 parking lot asphalt removal, pre-filter fabric over weir boards): The Panel recommends continued performance monitoring, inspection, and maintenance as necessary for this recently updated CM control.

(7) EVBMP0004 (2012/2013 Lower Helipad Road): The Expert Panel recommends no new actions at this time to address runoff from this subarea beyond the currently planned (and currently under construction) stormwater treatment facility.

(8) APBMP0001 (Ash Pile culvert inlet/road runoff): The Expert Panel recommends no new actions at this time to address runoff from this subarea because it is currently being addressed by ISRA activities.

(9) ILBMP0001 (Lower Lot 24-inch storm drain outlet): The Expert Panel recommends ongoing inspection of the low-flow diversion, comprehensive erosion controls post-building demolition, upper parking lot asphalt removal where possible, and treatment of runoff from the paved storage area near Building 1436. Treatment may be through passive Low Impact

Development (LID)-type controls, or through detention if shown to provide equivalent water quality benefit.

(10) B1BMP0004 (B-1 media filter inlet north): The Expert Panel recommends continued maintenance of the filter media bed, hillside erosion controls, pretreatment check dams, and curb cuts.

(14.5) LPBMP0001-A (Lower Parking Lot sheetflow, post-gravel bag berms): Discontinued.

(14.5) B1SW0002 (Woolsey Canyon Road runoff): Discontinued.

(14.5) B1BMP0001 (B1 media filter inlet [post-media filter installation]): Discontinued.

(14.5) LXBMP0006 (LOX east, runoff along dirt road): The Expert Panel recommends robust erosion and sediment controls during and following the ISRA soil removal work.

(14.5) LPBMP0002 (Lower parking lot influent to cistern): The Expert Panel recommends no new actions at this time to address runoff from this currently treated subarea, beyond the recently completed sedimentation and biofilter control.

(14.5) EVBMP0006 (2012/13 Area II Road near ELV ditch): The Expert Panel recommends no new actions at this time to address runoff from this subarea, because it is currently being addressed by NASA's planned stormwater treatment facility.

(14.5) B1SW0014-A (B-1 media filter effluent [pre-media filter reconstruction]): Discontinued.

(14.5) LPBMP0001 (Lower Parking Lot sheetflow, pre-gravel bag berm): Discontinued.

3.4.1 Assessment of Subarea Water Quality

The Expert Panel's "multi-constituent scores" (i.e., statistically computed values that reflect stormwater quality and area used for subarea ranking) can also be used to evaluate water quality pre- and post-modification (where "modification" is used to describe new or enhanced stormwater quality management or source control activities) at specific subareas. Table 3-5 summarizes a select subset of sites ranked in the top 15 that are associated with BMP modifications. In most cases, the site rank based on the multi-constituent score fell after the BMP was implemented, demonstrating that the BMP helped improved water quality at the site.

Table 3-5. Ranking Comparison of Top Ranked Sites Pre- vs. Post-BMP

Original Site Name [Co-location]	Original Description	Original Rank	Upgrade Implementation Date	New Description	New Rank	Upgrade Implementation Date	New Description	New Rank
EVBMP0002	Helipad	4	11/14/2011	post-sandbag berms	40	9/5/2012	post-sandbag berms raised, post-drainage holes in asphalt	34
A1SW0009	CM-9 downstream-underdrain outlet; post-Building 1324 parking lot asphalt removal, pre-filter fabric over weir boards	5.5	1/20/2012	post-filter fabric over weir boards	21			

Similarly, Table 3-6 summarizes top-ranked sites that are associated with paired influent/effluent data, demonstrating that treatment through each BMP resulted in improved water quality through lower effluent rankings (where a "lower" rank means improved water quality). For example, three influent streams within the B-1 area (ranked 10, 14.5, and 14.5) are all ranked higher than the B-1 effluent, which is ranked 35. A similar occurrence is observed for the influent/effluent ranks for CM-1, CM-9, and the Lower Parking Lot sedimentation basin and biofilter.

Table 3-6. Ranking Comparison of Top-Ranked Sites and their Pairs

BMP Area	Influent			Effluent		
	Location/ Colocation	Description	Influent Rank	Location/ Colocation	Description	Effluent Rank
CM-9	**ILBMP0002**	Road runoff to CM-9	1	A1SW0009 (-B)	CM-9 downstream-underdrain outlet (post-filter fabric over weir boards, post-AILF asphalt removal)	21
CM-1	**EVBMP0003**	CM-1 upstream west	2	A2SW0002 (-A)/ A2BMP0007	CM-1 effluent (post-filter fabric over weir boards)	41
Lower Lot Sediment Basin	**LPBMP0002[a]/ LPBMP0001/ LPBMP0001-A**	Lower Lot influent to cistern	14.5/ 14.5/ 14.5	LPBMP0004[a]	Lower Parking Lot biofilter outlet	66.5
B-1 Media Filter	**B1BMP0004/ B1SW0002/ B1BMP0001**	B-1 media filter inlet north/ Woolsey Canyon Road runoff (old north inlet)/ B-1 media filter, south inlet (old) post-media filter installation	10/ 14.5/ 14.5	B1SW0014 (-C)/ B1BMP0006	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	35
B-1 Media Filter[b]	B1BMP0003 [B1BMP0002]/ B1SW0014 (-C) [B1BMP0006]	B-1 parking lot and road runoff to culvert inlet/ B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	19/ 35	B1BMP0007	B-1 Lower Parking Lot area (vegetated area downstream of B-1 media filter effluent)	42

NOTES

- **Bolded** locations indicate that the site is ranked within the top fifteen of the multi-constituent scores.
- Gray text indicates historic subarea monitoring sites that are discontinued.
- ([a]) Based on a single influent/effluent sampling event.
- ([b]) These upstream and downstream sample locations were not top-ranked sites, however, this pair is included to more fully demonstrate water quality improvements around the B-1 area.

2012 BMP Recommendations and Status Updates

Based on the 2012 ranking results, the following recommendations were made by the Expert Panel in the 2012 Annual Report. The general locations of these recommendations are shown on Figures 3-1 and 3-2.

1. **ELV/CM-1 (NASA):** The Expert Panel's 2012 treatment system recommendations are currently being constructed (construction began in June 2013). The Panel also recommended that the upper paved ELV and Helipad areas be swept, and that regular maintenance of pumps and berms be performed. Maintenance of infiltration holes is optional since cumulative infiltration through these holes is not known.

2. **Helipad (NASA):** In 2012, the Expert Panel recommended asphalt removal and contouring. This plan is currently on hold. Additional runoff will be routed toward the Helipad from the western paved area around the ELV building. NASA's long-term plan is to remove the asphalt from the Helipad area (anticipated to occur in 2014) and then re-vegetate. The Expert Panel's existing recommendations for this area were described earlier.

3. **24-inch drain beneath Lower Lot (Boeing):** In 2012, the Expert Panel recommended biofiltration or equivalent above-ground natural treatment systems around storm drain inlets and remaining impervious areas, and post-demolition erosion controls around Building 1436 and any removed asphalt areas of the upper parking lot. The current demolition plan is for removal of Building 1436 in 2013. The Panel's 2013 recommendations for this area were described earlier.

4. **B-1 Area (Boeing):** In 2012 the Expert Panel recommended continued maintenance activities to enhance the performance of the existing media filter. Expert Panel recommendations in the 2012 report were completed in 2012. These recommendations included curb cuts along the entrance road northwest of the existing rock check dams. These curb cuts divert runoff from the pavement to the north side of the B-1 media filter,

rather than the south side, to better balance influent delivery to the two sides of the treatment system. Additional improvements installed in 2012 in this area included rock stabilization at the outlet of the curb cuts and stabilization measures (e.g., hydroseed) on denuded and exposed sloped soils.

5. **CM-9 (Boeing):** Expert Panel's 2012 recommendations for this drainage were implemented in 2012. These recommendations included erosion control measures of straw wattles and hydromulch installed on the steep roadside embankments on both sides of the Area II Road. Additional recommendations including wattles along the dirt path below and west of the former Building 1300 were installed in 2012. Recommended controls along the Area II Road included a low flow diversion to collect runoff from the Area II Road and divert these flows into a perforated pipe to distribute this runoff onto the vegetated sloped area to the south of the CM-9 location. A rock grade control structure (i.e., rock check dam) was installed in the drainage upstream of the CM-9 to provide storage volume and settle suspended sediment prior to reaching the media filter downstream. Additional recommendations installed in 2012 include replacing the filter fabric on the weir boards of the CM-9 culvert headwall.

6. **LOX Area (NASA):** In the 2012 BMP Ranking Memo, the LOX ISRA excavation was tentatively planned for 2013. Based on review of available data, the Expert Panel recommends that implementation at certain LOX ISRA areas (LOX-1A, LOX-1B-4, LOX-1C, and LOX-1D) be addressed by remedial activities to be performed under the 2010 Administrative Order on Consent (NASA areas) given the potential water quality risks that could occur as a result of these interim measures. The Expert Panel currently recommends that the sites be isolated hydrologically to the extent feasible and stabilized with vegetation and BMPs, and that monitoring in the area continue.

7. **Outfall 008:** Several improvements have been made to Outfall 008 in accordance with the *Santa Susanna Field Laboratory: Recommendations from Field Investigation of Outfall 008 Watershed* Memo (Geosyntec and Expert Panel, 2012a):

    - The temporary silt fence and straw bale road barriers were removed and replaced with rock berms.

    - The original recommendations included to extend an existing culvert standpipe to increase the inlet elevation of the standpipe and install a gravel mound around the standpipe. However, after mobilization the contractor identified that the culvert outlet was clogged with sediment and that the outlet was lower in elevation than the adjacent ground surface. The revised recommendation was to leave the

culvert as found and rely on the rock berms to treat runoff through this area as described in the above bullet.

- Gravel water bars were extended to divert flow into the vegetation to the north or south of the access road. The discharge side of the road (i.e., at the down slope outlet of the gravel water bars) was lowered in elevation to create a side drain.

- Two rock grade control structures (e.g., rip rap check structures) were installed in the eastern tributary of the Outfall 008 flume.

- The rip rap apron at the outfall flume was refreshed and loose materials were stabilized on the side of the slopes immediately upstream of the flume inlet and around the sample box. The Expert Panel recommends consideration of extending the northeast flume inlet wall to improve flow measurement accuracy and to decrease erosion potential adjacent to the monitoring location.

Although this analysis primarily focuses on the selection of potential stormwater treatment control locations, the Expert Panel continues to strongly recommend the rigorous application of erosion and sediment control practices and stream channel stabilization measures throughout the 008 and 009 watersheds, including and especially at areas where substantial soil removal may be planned at steep areas and/or in proximity to drainage courses (such as at ELV, LOX, or the A2LF ISRA areas). The Expert Panel also continues to recommend the stabilization of unpaved roads and the implementation of source controls (including source removal, such as through the ISRA and demolition programs). Culverts should also continue to be inspected for evidence of piping, not only for water quality purposes, but also for safety concerns near the roadways. Finally, it is important that routine maintenance be undertaken at all CM locations and where sedimentation basins have been constructed (e.g., above B-1).

The Expert Panel believes that new and planned activities, taken together, will improve the likelihood of NPDES compliance at Outfalls 008 and 009, based on currently available information.

3.5 POTENTIAL BMP MONITORING PROGRAM RECOMMENDATIONS

Based on the data collected for the BMP monitoring program to date, the only recommended change to the monitoring program for the 2013/2014 rainy season is discontinuing “planned” BMP monitoring locations where BMP installations are complete and replacing with up- and downstream BMP performance monitoring locations (e.g., ELV).

4.0 UPDATED MILESTONES SCHEDULE

The milestone schedule presented in the BMP Plan has been updated, and is provided below. The schedule accounts for phasing of implementation to allow completion of ongoing work within the Outfalls 008 and 009 watersheds.

2013:

August – December 2013	Complete LOX and ELV ISRA activities.
August – October 2013	Complete the ELV BMP construction and restoration activities. Conduct concrete foundation removal as part of Building 1436 demolition.
September 2013	Submit 2013 BMP Plan Addendum that identifies new stormwater controls and proposed implementation schedule.
2013/2014 Rainy Season	Collect stormwater samples (note: this is the last year of potential and planned BMP monitoring).

2014:

Summer 2014	Submit annual rainy season report and final BMP recommendations, as necessary. Submit Final BMP Plan Addendum that identifies any new stormwater controls and proposed implementation schedule, as necessary.
2014/2015 Rainy Season	Collect stormwater samples (note: this excludes potential and planned BMP monitoring).

2015:

Summer 2015	Submit final annual rainy season report and recommendation of BMP upgrades, as necessary.

5.0 REFERENCES

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TABLES

Table 1-1
Summary of NPDES Permit Limit Exceedances - Outfall 008
(Page 1 of 1)

Analyte	Units	2010 Compliance Limit	Sample Date	Result	Data Type
Copper	µg/L	14.0	2/18/2005	15	Monitoring-only
Copper	µg/L	14.0	4/13/2012	18	Compliance
Lead	µg/L	5.2	10/20/2004	9.8	Monitoring-only
Lead	µg/L	5.2	10/27/2004	9	Monitoring-only
Lead	µg/L	5.2	12/28/2004	6.4	Monitoring-only
Lead	µg/L	5.2	2/18/2005	13	Monitoring-only
Lead	µg/L	5.2	10/18/2005	120	Monitoring-only
Lead	µg/L	5.2	1/1/2006	20	Monitoring-only
Lead	µg/L	5.2	4/15/2006	18	Compliance
Lead	µg/L	5.2	1/25/2008	6.3	Benchmark
Lead	µg/L	5.2	1/18/2010	7.9	Benchmark
Lead	µg/L	5.2	2/5/2010	10	Benchmark
Lead	µg/L	5.2	2/28/2010	7.0	Benchmark
Lead	µg/L	5.2	12/19/2010	6.7	Compliance
Lead	µg/L	5.2	4/13/2012	10	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/18/2005	4.46E-08	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/28/2006	3.19E-07	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	1/18/2010	2.35E-06	Benchmark

Notes:

NPDES Permit exceedances are sample results that are greater than the NPDES limit and were collected after the discharge limit was established and before limit was updated to a benchmark (performance based) limit for the outfalls (compliance data above).

Dioxins / TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated for samples collected before July 2010 by multiplying the result of each congener by its respective World Health Organization's (1998 WHO's) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Samples collected after July 2010 are also multiplied by the Great lakes water quality initiative bioaccumulation equivalenc factor (BEF), which correspond to the differences in biological uptake from the water column for the various dioxin congeners. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Table 1-2
Summary of NPDES Permit Limit Exceedances - Outfall 009
(Page 1 of 2)

Analyte	Units	2010 Compliance Limit	Sample Date	Result	Data Type
Cadmium	µg/L	4.0	10/17/2005	9.2	Monitoring-only
Copper	µg/L	14	10/17/2005	39	Monitoring-only
Copper	µg/L	14	2/18/2006	22	Monitoring-only
Copper	µg/L	14	4/4/2006	26	Compliance
Lead	µg/L	5.2	12/28/2004	11	Monitoring-only
Lead	µg/L	5.2	2/18/2005	10	Monitoring-only
Lead	µg/L	5.2	10/17/2005	260	Monitoring-only
Lead	µg/L	5.2	2/18/2006	33	Monitoring-only
Lead	µg/L	5.2	4/4/2006	64	Compliance
Lead	µg/L	5.2	9/22/2007	8.6	Compliance
Lead	µg/L	5.2	2/3/2008	6.0	Benchmark
Lead	µg/L	5.2	12/15/2008	19	Benchmark
Lead	µg/L	5.2	2/6/2009	7.5	Benchmark
Lead	µg/L	5.2	2/13/2009	20	Benchmark
Lead	µg/L	5.2	12/7/2009	5.7	Benchmark
Lead	µg/L	5.2	1/19/2010	9.3	Benchmark
Lead	µg/L	5.2	2/28/2010	8.9	Benchmark
Lead	µg/L	5.2	10/6/2010	11	Compliance
Lead	µg/L	5.2	3/25/2012	7.2	Compliance
Mercury	µg/L	0.13	1/4/2005	0.20	Monitoring-only
Mercury	µg/L	0.13	10/17/2005	0.21	Monitoring-only
Oil & Grease	µg/L	15	1/11/2005	16	Compliance
pH	pH units	6.5 - 8.5	10/17/2005	8.80	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	1/4/2005	1.72E-06	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/18/2005	5.20E-08	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	10/17/2005	9.10E-04	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	11/9/2005	6.14E-07	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/18/2006	1.56E-05	Monitoring-only
Dioxins / TCDD TEQ	µg/L	2.80E-08	4/4/2006	1.77E-05	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/19/2007	7.64E-07	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	9/22/2007	3.13E-06	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/3/2008	3.58E-07	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	11/26/2008	3.99E-07	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	12/15/2008	1.83E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/6/2009	9.55E-07	Benchmark

Table 1-2
Summary of NPDES Permit Limit Exceedances - Outfall 009
(Page 2 of 2)

Analyte	Units	2010 Compliance Limit	Sample Date	Result	Data Type
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/13/2009	1.22E-05	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	10/14/2009	1.60E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	12/7/2009	1.10E-07	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	1/19/2010	3.43E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/5/2010	7.21E-07	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	2/28/2010	1.09E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	3/7/2010	2.90E-08	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	4/5/2010	1.58E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	4/12/2010	1.47E-06	Benchmark
Dioxins / TCDD TEQ	µg/L	2.80E-08	10/6/2010	3.90E-08	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	3/20/2011	8.26E-08	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	3/18/2012	1.61E-07	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	3/25/2012	5.62E-08	Compliance
Dioxins / TCDD TEQ	µg/L	2.80E-08	4/11/2012	3.72E-08	Compliance

Notes:

NPDES Permit exceedances are sample results that are greater than the NPDES limit and were collected after the discharge limit was established and before limit was updated to a benchmark (performance based) limit for the outfalls (compliance data above).

Dioxins / TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated for samples collected before July 2010 by multiplying the result of each congener by its respective World Health Organization's (1998 WHO's) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Samples collected after July 2010 are also multiplied by the Great lakes water quality initiative bioaccumulation equivalenc factor (BEF), which correspond to the differences in biological uptake from the water column for the various dioxin congeners. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Table 1-3
ISRA Performance Monitoring Inspection Locations and Analytical Plan
2012/2013 Rainy Season
Page 1 of 1

Object ID	Location	Purpose	Areas Monitored	Notes	Cadmium (Total Recoverable) (Method 200.8)	Copper (Total Recoverable) (Method 200.8)	Lead (Total Recoverable) (Method 200.8)	Mercury (Total Recoverable) (Method 245.1)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)
Outfall 009 Watershed										
A1SW0009	AILF	DS	AILF/CM-9	CM-9 under drain	X	X	X	X	X	X
APSW0007	AP/STP	US/BG	AP/STP-1B, -1C-1	AP/STP tributary drainage	X	X	X	X	X	X
APSW0008	AP/STP	US/BG	AP/STP-1C-1, -1C-2	Intermittent stream flow	X	X	X	X	X	X
APSW0009	AP/STP	Secondary	AP/STP-1B-, -1C-1, -1C-2	AP/STP tributary drainage	To Be Determined*					
APSW0010	AP/STP	Secondary	AP/STP-1E-1	Intermittent stream flow	To Be Determined*					
APSW0011	AP/STP	Secondary	AP/STP-1E-2	AP/STP tributary drainage	To Be Determined*					
APSW0012	AP/STP	US/BG	AP/STP-1E-3	Intermittent stream flow					X	X
APSW0013	AP/STP	DS	All AP/STP	AP/STP tributary drainage	X	X	X	X	X	X
ILSW0003	IEL	US	IEL-2	Intermittent stream flow	X		X	X		X
ILSW0004	IEL	DS	IEL-2	Intermittent stream flow	X		X	X		X
ILSW0005	IEL	US	IEL-3	Intermittent stream flow	X	X	X	X		X
ILSW0006	IEL	DS	IEL-3	Intermittent stream flow	X	X	X	X		X

Abbreviations:

DS - Downstream
US - Upstream
BG - Background Assessment
CM - Culvert Modification
X = Collect and Analyze

Notes:

* Analytical suite of secondary monitoring locations will be based on the evaluation of data from primary performance monitoring locations and only sampled as warranted by the primary data.

Table 1-4
Potential/Planned and Treatment BMP Monitoring Inspection Locations and Analytical Plan
2012/2013 Rainy Season
Page 1 of 2

Object ID	Location	Purpose	Areas Monitored	Notes	Metals (Total Recoverable) (Method 200.7/200.8)	Metals (Total Dissolved) (Method 200.7/200.8)	Cd, Cu, Pb, Hg (Total Dissolved) (Method 200.7/200.8)	Cd, Cu, Pb, Hg (Total Recoverable) (Method 200.7/200.8)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (Method ASTM D422)	Turbidity (Method 180.1)
Outfall 008 Watershed												
HZBMP0001	Happy Valley	Potential BMP Location	HVS	HVS tributary drainage	X	X			X	X	X	X
HZBMP0003	Happy Valley	Potential BMP Location	CYN, DRG	CYN/DRG tributary drainage	X	X			X	X	X	X
Outfall 009 Watershed												
A1BMP0002	AILF	Planned BMP Location	CM-9, AILF, IEL	Tributary drainage	X	X			X	X	X	X
A2BMP0001	A2LF	Potential BMP Location	A2LF	Tributary drainage, west	X	X			X	X	X	X
A2BMP0002	A2LF	Potential BMP Location	A2LF	Tributary drainage, east	X	X			X	X	X	X
A2BMP0003	A2LF, WS-13 Road	Potential BMP Location	AP/STP, ELV, A2LF	Tributary drainage	X	X			X	X	X	X
A2BMP0005	ELV	Potential BMP Location	AP/STP, ELV	Tributary drainage	X	X			X	X	X	X
A2BMP0006	CM-1	US East, Treatment BMP Performance Monitoring	CM-1	CM-1 eastern tributary drainage			X	X	X	X	X	
A2BMP0007	CM-1	DS Treatment BMP Performance Monitoring	CM-1	CM-1 culvert outlet			X	X	X	X	X	
APBMP0001	Ash Pile	Potential BMP Location	AP/STP, ELV	Area II Road asphalt swale	X	X			X	X	X	X
APBMP0002	Ash Pile	Potential BMP Location	AP/STP	Ash Pile drainage	X	X			X	X	X	X
B1BMP0003	B-1	Potential BMP Location	B-1, Upper Parking Lot	Culvert inlet	X	X			X	X	X	X
B1BMP0004	B-1	US North, Treatment BMP Performance Monitoring	B-1 Media Filter	Tributary drainage			X	X	X	X	X	
B1BMP0005	B-1	US South, Treatment BMP Performance Monitoring	B-1 Media Filter	Asphalt swale downstream of retention basin discharge			X	X	X	X	X	
B1BMP0006	B-1	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	B-1 Media Filter under drains			X	X	X	X	X	
B1BMP0007	B-1	Potential BMP Location	B-1	Tributary drainage downstream of B-1 storm drain culvert outlet	X	X			X	X	X	X
EVBMP0002	ELV, Helipad	Planned BMP Location	Helipad	Spillway inlet	X	X			X	X	X	X

Table 1-4
Potential/Planned and Treatment BMP Monitoring Inspection Locations and Analytical Plan
2012/2013 Rainy Season
Page 2 of 2

Object ID	Location	Purpose	Areas Monitored	Notes	Metals (Total Recoverable) (Method 200.7/200.8)	Metals (Total Dissolved) (Method 200.7/200.8)	Cd, Cu, Pb, Hg (Total Dissolved) (Method 200.7/200.8)	Cd, Cu, Pb, Hg (Total Recoverable) (Method 200.7/200.8)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (Method ASTM D422)	Turbidity (Method 180.1)
Outfall 009 Watershed (continued)												
EVBMP0003	CM-1	US West, Treatment BMP Performance Monitoring	CM-1, Area II Road	Sheetflow along Area II Road upstream of sandbag berm			X	X	X	X	X	
EVBMP0004	ELV	Planned BMP Location	Helipad	Helipad Road asphalt swale	X	X			X	X	X	X
EVBMP0005	ELV	Planned BMP Location	ELV	ELV culvert asphalt swale	X	X			X	X	X	X
EVBMP0006	ELV	Planned BMP Location	ELV	Flow seeping from beneath ELV asphalt swale, adjacent to Area II Road	X	X			X	X	X	X
ILBMP0001	Lower Parking Lot	Potenital BMP Location	IEL	Culvert discharge under spillway chute	X	X			X	X	X	X
ILBMP0002	AILF	US BMP Location	CM-9, IEL, Area II Road	Culvert inlet off Area II Road	X	X			X	X	X	X
LPBMP0002	Lower Parking Lot	US Treatment BMP Performance Monitoring	Lower Parking Lot BMP	Inflow to cistern; includes Lower Parking Lot sheetflow and flow diverted from IEL storm drain			X	X	X	X	X	
LPBMP0003	Lower Parking Lot	Intermediate Treatment BMP Performance Monitoring	Lower Parking Lot BMP	Discharge from Sediment Basin effluent pipe into Biofilter			X	X	X	X	X	
LPBMP0004	Lower Parking Lot	DS Treatment BMP Performance Monitoring	Lower Parking Lot BMP	Discharge from Biofilter effluent pipe			X	X	X	X	X	
LXBMP0006	LOX	Potential BMP Location	LOX	Sheetflow along dirt road	X	X			X	X	X	X
LXBMP0007	LOX	DS, BMP Performance Monitoring	LOX Sand Bag Berm and Slope Drains	Slope drain inlet, western end of sand bag berm.			X	X	X	X	X	
LXBMP0008	LOX	DS, BMP Performance Monitoring	LOX Sand Bag Berm and Slope Drains	Slope drain inlet, eastern end of sand bag berm.			X	X	X	X	X	

Abbreviations:
X = Collect and Analyze DS - Downstream US - Upstream CM - Culvert Modification

Table 1-5
2012/2013 Rain Event and Sampling Summary - Outfall 008 and 009 Watersheds
(Page 1 of 1)

Rain Event	Total Rainfall[1] (inches)	Average Rainfall Intesity[1] (inches / hour)	Maximum 1-Hour Rainfall Intensity[1] (inches / hour)	Outfall 008 Watershed					Outfall 009 Watershed				
				NPDES Samples	BMP Monitoring Samples	ISRA Performance Monitoring Samples[3]			NPDES Samples	BMP Monitoring Samples	ISRA Performance Monitoring Samples[3]		
						Analyzed	Hold	Total			Analyzed	Hold	Total
November 14 - 18, 2012	0.99	0.010	0.36	0	0	0	0	0	1	13	1	0	1
November 28 - December 4, 2012	1.49	0.011	0.12	0	0	0	0	0	0	9	0	0	0
December 12 - 18, 2012	0.68	0.005	0.07	0	0	0	0	0	0	2	0	0	0
December 22 - 26, 2012	1.13	0.013	0.18	0	0	0	0	0	0	7	0	0	0
January 23 - 27, 2013	1.78	0.020	0.18	0	0	0	0	0	1	13	1	0	1
February 8 - 9, 2013	0.12	0.008	0.07	0	0	0	0	0	0	0	0	0	0
February 19, 2013	0.25	0.025	0.09	0	0	0	0	0	0	0	0	0	0
March 7 - 8, 2013	0.87	0.041	0.23	0	0	0	0	0	1	6	0	0	0
May 6, 2013	0.48	0.040	0.16	0	0	0	0	0	0	3	0	0	0
Non Rain Event Total[2]	0.30	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	**8.09**	**--**	**--**	**0**	**0**	**0**	**0**	**0**	**3**	**53**	**2**	**0**	**2**

Notes:
[1] Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

[2] On the following 8 days, rainfall was measured but was either not considered a rain event per the NPDES Permit definition, or flow was not observed at the Outfalls: August 4, 2012, October 11, 20, 23, 2012, November 8, 2012, December 29, 30, 2012, January 6, 2012

[3] The numbers of Performance Monitoring samples shown do not include RWQCB split samples.

Table 1-6
NPDES Sample Results, Outfall 008
2012/2013 Rainy Season
Page 1 of 1

		Object Name:	N/A
		Sample Name:	N/A
		Sample Date:	N/A
		Sample Type:	N/A
		Location:	N/A
		Rain Event:	N/A
ANALYTE	**UNITS**	**NPDES Permit Limit**	
DIOXINS			**No flow was measured at Outfall 008 during the 2012/2013 rainy season**
TCDD TEQ_NoDNQ	ug/L	2.80E-08	
INORGANICS			
Copper	ug/L	14	
Copper, dissolved	ug/L	-/-	
Lead	ug/L	5.2	
Lead, dissolved	ug/L	-/-	
MISCELANEOUS			
Total Suspended Solids	mg/L	-/-	
FIELD MEASUREMENTS			
Conductivity	mS	-/-	
Temperature	deg C	-/-	
pH	SU	6.5-8.5/-	
Turbidity	NTU	-/-	
RAINFALL MEASUREMENTS			
Intensity (Ave) - Pre-Sampling	in/hr	-/-	
Intensity (Ave) - Rain Event	in/hr	-/-	
Intensity (Max) - Pre-Sampling	in/hr	-/-	
Intensity (Max) - Rain Event	in/hr	-/-	
Total - Pre-Sampling	in	-/-	
Total - Rain Event	in	-/-	
FLOW MEASUREMENTS			
Total Volume - Pre-Sampling	mil gal	-/-	
Total volume - Event	mil gal	-/-	
Peak Discharge - Pre-Sampling	cfs	-/-	
Peak Discharge - Event	cfs	-/-	
Watershed Inches - Pre-Sampling	in	-/-	
Watershed Inches - Event	in	-/-	

Notes:

Results above NPDES Permit Limit in bold and gray shading

[1] Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 1-7
NPDES Sample Results, Outfall 009
2012/2013 Rainy Season
Page 1 of 1

		Object Name: **Sample Name:** **Sample Date:**	**OUTFALL 009** **Outfall 009** **11/17/2012 - 11/18/2012**	**OUTFALL 009** **Outfall 009** **1/25/2013 - 1/26/2013**	**OUTFALL 009** **Outfall 009** **3/8/2013**
		Sample Type: **Location:** **Rain Event:**	**NPDES** **Outfall** **November 14 - 18, 2012**	**NPDES** **Outfall** **January 23 - 27, 2013**	**NPDES** **Outfall** **March 7 - 8, 2013**
ANALYTE	**UNITS**	**NPDES PERMIT LIMIT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS					
TCDD TEQ_NoDNQ	ug/L	2.80E-08	ND	2.20E-10	2.50E-10
INORGANICS					
Cadmium	ug/L	4	<0.10 *	<0.10 *	0.43 J, DX* (DNQ)
Cadmium, dissolved	ug/L	-/-	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	3.8 *	8	5.1 *
Copper, dissolved	ug/L	-/-	4.0 *	3	3.0 *
Lead	ug/L	5.2	0.56 J,DX* (DNQ)	1.7	1.5 *
Lead, dissolved	ug/L	-/-	0.29 J,DX* (DNQ)	0.47 J (DNQ)	0.35 *
Mercury	ug/L	0.13	<0.10 U	<0.10 U	<0.10 U
Mercury, dissolved	ug/L	-/-	<0.10 U	<0.10 U	<0.10 U
MISC					
Total Suspended Solids	mg/L	-/-	<10 *	<10 U	<10 *
FIELD MEASUREMENTS					
Temperature	deg C	-/-	63 *	54 *	51 *
pH	SU	6.5-8.5/-	7.6 *	6.7 *	6.7 *
RAINFALL MEASUREMENTS					
Intensity (Ave) - Pre-Sampling	in/hr	-/-	0.010	0.033	0.054
Intensity (Ave) - Rain Event	in/hr	-/-	0.010	0.020	0.041
Intensity (Max) - Pre-Sampling	in/hr	-/-	0.36	0.18	0.23
Intensity (Max) - Rain Event	in/hr	-/-	0.36	0.18	0.23
Total - Pre-Sampling	in	-/-	0.98	1.48	0.87
Total - Rain Event	in	-/-	0.99	1.78	0.87
FLOW MEASUREMENTS					
Total Volume - Pre-Sampling	mil gal	-/-	0.051775	0.04615	0.002285
Total volume - Event	mil gal	-/-	0.051775	0.24654	0.03215
Peak Discharge - Pre-Sampling	cfs	-/-	0.196	0.245	0.100
Peak Discharge - Event	cfs	-/-	0.196	0.392	0.105
Watershed Inches - Pre-Sampling	in	-/-	0.0000966	0.0000758	0.0000043
Watershed Inches - Event	in	-/-	0.0000966	0.0004600	0.0000600

Notes:

[T] Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

See Appendix B for explanation of data validation qualifiers.

Table 2-2
ISRA Performance Monitoring Sample Collection Matrix
2012/2013 Rainy Season
Page 1 of 1

Watershed	Object ID	Sample ID	Collection Date	Collection Time	Areas Monitored	Notes	Purpose	Sample Type	Cadmium (Total Recoverable) (Method 200.8)	Copper (Total Recoverable) (Method 200.8)	Lead (Total Recoverable) (Method 200.8)	Mercury (Total Recoverable) (Method 245.1)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Comments
009	A1SW0009	A1SW0009S006	11/17/12	13:00	CM-9 Media Basin	CM-9 under drain	DS	Primary	X	X	X	X	X	X	
009	A1SW0009	A1SW0009S006-RWQCB	11/17/12	13:00	CM-9 Media Basin	CM-9 under drain	DS	RWQCB Split	X	X	X	X	X	X	
009	A1SW0009	A1SW0009S007	01/24/13	10:15	CM-9 Media Basin	CM-9 under drain	DS	Primary	X	X	X	X	X	X	V1
009	A1SW0009	A1SW0009S007-RWQCB	01/24/13	10:15	CM-9 Media Basin	CM-9 under drain	DS	RWQCB Split	X	X	X	X	X	X	V1

Notes:
DS - Downstream
RWQCB - Regional Water Quality Control Board
V1 - Level II data validation performed (dioxins)
X - Sample was analyzed

OF008 Sample Totals

Primary - Collected	0
Primary - Analyzed	0
Primary - On Hold	0
RWQCB Split - Collected	0
RWQCB Split - Analyzed	0
RWQCB Split - On Hold	0
Toal Analyzed	**0**

OF009 Sample Totals

Primary - Collected	2
Primary - Analyzed	2
Primary - On Hold	0
RWQCB Split - Collected	2
RWQCB Split - Analyzed	2
RWQCB Split - On Hold	0
Toal Analyzed	**4**

Table 2-3 (CM-9)
Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name:	**A1SW0009**	**A1SW0009**	**A1SW0009**	**A1SW0009**
		Sample Name:	**A1SW0009S006**	**A1SW0009S006-RWQCB**	**A1SW0009S007**	**A1SW0009S007-RWQCB**
		Sample Date:	**11/17/2012**	**11/17/2012**	**1/24/2013**	**1/24/2013**
		Sample Type:	**Perf Mon**	**Perf Mon Split**	**Perf Mon**	**Perf Mon Split**
		Location:	**DS (CM-9, AILF)**	**DS (CM-9, AILF)**	**DS (CM-9, AILF)**	**DS (CM-9, AILF)**
		Rain Event:	**November 14 - 18, 2012**	**November 14 - 18, 2012**	**January 23 - 27, 2013**	**January 23 - 27, 2013**
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULTS**	**RESULTS**	**RESULTS**	**RESULTS**
DIOXINS						
TCDD TEQ_NoDNQ	µg/L	2.80E-08	1.80E-10 *	2.33E-08 *	**4.47E-08**	**5.88E-08**
INORGANICS						
Cadmium	µg/L	4.0	<0.20 *	0.070 J*	<0.10 *	<0.020 *
Copper	µg/L	14	9.9 *	7.1 *	5.8 MB*	4.7 *
Lead	µg/L	5.2	3.9 *	2.9 *	**19 MB*$**	**16 *$**
Mercury	µg/L	0.13	<0.10 *	<0.100 *	<0.10 IB*	<0.1 *
MISCELANEOUS						
Total Suspended Solids	mg/L	-	15 *	19.0 *	19 *	17.0 *
FIELD MEASUREMENTS						
Conductivity (Field)	mS	-	0.219 *	-	0.022 *	-
pH (Field)	pH Units	6.5 - 8.5	7.19 *	-	6.56 *	-
Temperature	°C	30	15.03 *	-	10.66 *	-
Turbidity (Field)	NTU	-	64.7 *	-	108 *	-
RAINFALL MEASUREMENTS †						
Intensity (Ave) - Pre-Sampling	in/hr	-	0.011	0.011	0.093	0.093
Intensity (Ave) - Rain Event	in/hr	-	0.010	0.010	0.020	0.020
Intensity (Max) - Pre-Sampling	in/hr	-	0.36	0.36	0.18	0.18
Intensity (Max) - Rain Event	in/hr	-	0.36	0.36	0.18	0.18
Total - Pre-Sampling	in	-	0.89	0.89	1.15	1.15
Total - Rain Event	in	-	0.99	0.99	1.78	1.78

Notes:

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold with darker shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

See Appendix B for explanation of data validation qualifiers.

Table 3-2
BMP Monitoring Sample Collection Matrix
2012/2013 Rainy Season
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Watershed	Object ID	Sample ID	Collection Date	Collection Time	Purpose	Areas Monitored	Notes	Metals (Total Recoverable) (Method 200.7/200.8)	Metals (Total Dissolved) (Method 200.7/2000.8)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (ASTMD422)	Turbidity (Method 180.1)	Copper (Total Recoverable) (Method 200.8)	Lead (Total Recoverable) (Method 200.8)	Cadmium (Total Recoverable) (Method 200.8)	Mercury (Total Recoverable) (Method 245.1)	Copper (Total Dissolved) (Method 200.8)	Lead (Total Dissolved) (Method 200.8)	Cadmium (Total Dissolved) (Method 200.8)	Mercury (Total Dissolved) (Method 245.1)	pH	Comments
009	B1BMP0003	B1BMP0003S007	11/17/12	12:30	Potential BMP Location	B-1	Culvert inlet near Upper Parking Lot	X	X	X	X	X	X										V1
009	B1BMP0004	B1BMP0004S002	11/17/12	12:00	US North, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream north			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0005	B1BMP0005S002	11/17/12	11:30	US South, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream south			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0006	B1BMP0006S001	11/17/12	11:45	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	ILBMP0001	ILBMP0001S011	11/17/12	11:00	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1
009	ILBMP0002	ILBMP0002S008	11/17/12	10:05	Planned BMP Location	CM-9	Area II Road culvert inlet	X	X	X	X	X	X										V1
009	EVBMP0003	EVBMP0003S007	11/17/12	12:30	US West, Treatment BMP Performance Monitoring	CM-1	Sheetflow along Area II Road, upstream west			X	X	X		X	X	X	X	X	X	X	X		V1
009	A2BMP0007	A2BMP0007S001	11/17/12	13:15	DS, Treatment BMP Performance Monitoring	CM-1	Downstream culvert outlet			X	X	X		X	X	X	X	X	X	X	X		V1
009	A2BMP0003	A2BMP0003S006	11/17/12	13:45	Potential BMP Location	Well 13 Road	Tributary drainage	X	X	X	X	X	X										V1
009	EVBMP0002	EVBMP0002S013	11/17/12	7:45	Planned BMP Location	Helipad	Helipad spillway	X	X	X	X	X	X										V1
009	EVBMP0004	EVBMP0004S001	11/17/12	11:00	Planned BMP Location	Helipad Road	Helipad Road asphalt swale	X	X	X	X	X	X									X	V1
009	EVBMP0005	EVBMP0005S001	11/17/12	11:05	Planned BMP Location	ELV	ELV culvert asphalt swale	X	X	X	X	X	X										V1
009	EVBMP0006	EVBMP0006S001	11/17/12	11:15	Planned BMP Location	ELV	Flow escaping from beneath ELV culvert asphalt swale	X	X	X	X	X	X										V1
009	ILBMP0001	ILBMP0001S012	11/29/12	8:40	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1
009	B1BMP0003	B1BMP0003S008	11/30/12	8:15	Potential BMP Location	B-1	Culvert inlet near Upper Parking Lot	X	X	X	X	X	X										V1
009	B1BMP0004	B1BMP0004S003	11/30/12	11:00	US North, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream north			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0005	B1BMP0005S003	11/30/12	10:30	US South, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream south			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0006	B1BMP0006S002	11/30/12	10:45	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0007	B1BMP0007S001	11/30/12	11:30	Potential BMP Location	B-1	Tributary drainage downstream of storm drain discharge	X	X	X	X	X	X										V1
009	EVBMP0002	EVBMP0002S014	11/30/12	10:00	Planned BMP Location	Helipad	Helipad spillway	X	X	X	X	X	X										V1
009	EVBMP0003	EVBMP0003S008	11/30/12	13:15	US West, Treatment BMP Performance Monitoring	CM-1	Sheetflow along Area II Road, upstream west			X	X	X		X	X	X	X	X	X	X	X		V1
009	EVBMP0004	EVBMP0004S002	11/30/12	11:20	Planned BMP Location	Helipad Road	Helipad Road asphalt swale	X	X	X	X	X	X										V1
009	ILBMP0001	ILBMP0001S013	12/03/12	9:00	Potential BMP Location	IEL	Storm drain discharge under spillway chute	H	H	H	H	H	H										H
009	B1BMP0006	B1BMP0006S003	12/18/12	8:40	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	ILBMP0001	ILBMP0001S014	12/18/12	7:30	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1

Table 3-2
BMP Monitoring Sample Collection Matrix
2012/2013 Rainy Season
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Watershed	Object ID	Sample ID	Collection Date	Collection Time	Purpose	Areas Monitored	Notes	Metals (Total Recoverable) (Method 200.7/200.8)	Metals (Total Dissolved) (Method 200.7/2000.8)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (ASTMD422)	Turbidity (Method 180.1)	Copper (Total Recoverable) (Method 200.8)	Lead (Total Recoverable) (Method 200.8)	Cadmium (Total Recoverable) (Method 200.8)	Mercury (Total Recoverable) (Method 245.1)	Copper (Total Dissolved) (Method 200.8)	Lead (Total Dissolved) (Method 200.8)	Cadmium (Total Dissolved) (Method 200.8)	Mercury (Total Dissolved) (Method 245.1)	pH	Comments
009	B1BMP0003	B1BMP0003S009	12/24/12	7:15	Potential BMP Location	B-1	Culvert inlet near Upper Parking Lot	X	X	X	X	X	X										V1
009	B1BMP0004	B1BMP0004S004	12/24/12	7:45	US North, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream north			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0005	B1BMP0005S004	12/24/12	7:30	US South, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream south			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0006	B1BMP0006S004	12/24/12	8:00	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0007	B1BMP0007S002	12/24/12	8:30	Potential BMP Location	B-1	Tributary drainage downstream storm drain discharge	X	X	X	X	X	X										V1
009	ILBMP0001	ILBMP0001S015	12/24/12	8:15	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1
009	A2BMP0007	A2BMP0007S002	12/24/12	7:25	DS, Treatment BMP Performance Monitoring	CM-1	Downstream culvert outlet			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0003	B1BMP0003S010	01/24/13	8:15	Potential BMP Location	B-1	Culvert inlet near Upper Parking Lot	X	X	X	X	X	X										V1
009	B1BMP0004	B1BMP0004S005	01/24/13	9:00	US North, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream north			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0005	B1BMP0005S005	01/24/13	8:30	US South, Treatment BMP Performance Monitoring	B-1 Media Filter	Upstream South			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0006	B1BMP0006S005	01/24/13	8:45	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	B1BMP0007	B1BMP0007S003	01/24/13	9:15	Potential BMP Location	B-1	Tributary drainage downstream of storm drain discharge	X	X	X	X	X	X										V1
009	ILBMP0001	ILBMP0001S016	01/24/13	9:30	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1
009	ILBMP0002	ILBMP0002S009	01/24/13	10:00	Planned BMP Location	CM-9	Area II Road culvert inlet	X	X	X	X	X	X										V1
009	EVBMP0002	EVBMP0002S015	01/24/13	9:45	Planned BMP Location	Helipad	Helipad Spillway	X	X	X	X	X	X										V1
009	EVBMP0004	EVBMP0004S003	01/24/13	9:15	Planned BMP Location	Helipad Road	Helipad Road asphalt swale	X	X	X	X	X	X										V1
009	EVBMP0005	EVBMP0005S002	01/24/13	8:35	Planned BMP Location	ELV	ELV culvert asphalt swale	X	X	X	X	X	X										V1
009	LPBMP0003	LPBMP0003S001	01/24/13	2:10	Intermediate, Treatment BMP Performance Monitoring	Lower Lot BMP	Sediment Basin effluent pipe (discharge from Sediment Basin to Biofilter)			H	H	H		H	H	H	H	H	H	H	H		H
009	LPBMP0004	LPBMP0004S001	01/24/13	2:18	DS, Treatment BMP Performance Monitoring	Lower Lot BMP	Biofilter effluent pipe (discharge from Biofilter)			H	H	H		H	H	H	H	H	H	H	H		H
009	EVBMP0003	EVBMP0003S009	01/25/13	10:10	US West, Treatment BMP Performance Monitoring	CM-1	Sheetflow along Area II Road, upstream west			X	X	X		X	X	X	X	X	X	X	X		V1
009	A2BMP0003	A2BMP0003S007	01/25/13	11:45	Potential BMP Location	Well 13 Road	Tributary drainage	X	X	X	X	X	X										V1
009	A2BMP0007	A2BMP0007S003	01/26/13	8:17	DS, Treatment BMP Performance Monitoring	B-1	Tributary drainage downstream of storm drain discharge			X	X	X		X	X	X	X	X	X	X	X		V1

Table 3-2
BMP Monitoring Sample Collection Matrix
2012/2013 Rainy Season
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Watershed	Object ID	Sample ID	Collection Date	Collection Time	Purpose	Areas Monitored	Notes	Metals (Total Recoverable) (Method 200.7/200.8)	Metals (Total Dissolved) (Method 200.7/2000.8)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (ASTMD422)	Turbidity (Method 180.1)	Copper (Total Recoverable) (Method 200.8)	Lead (Total Recoverable) (Method 200.8)	Cadmium (Total Recoverable) (Method 200.8)	Mercury (Total Recoverable) (Method 245.1)	Copper (Total Dissolved) (Method 200.8)	Lead (Total Dissolved) (Method 200.8)	Cadmium (Total Dissolved) (Method 200.8)	Mercury (Total Dissolved) (Method 245.1)	pH	Comments
009	B1BMP0006	B1BMP0006S006	03/08/13	8:15	DS, Treatment BMP Performance Monitoring	B-1 Media Filter	Media filter under drains			X	X	X		X	X	X	X	X	X	X	X		V1
009	ILBMP0001	ILBMP0001S017	03/08/13	8:30	Potential BMP Location	IEL	Storm drain discharge under spillway chute	X	X	X	X	X	X										V1
009	LPBMP0003	LPBMP0003S002	03/08/13	8:50	Intermediate, Treatment BMP Performance Monitoring	Lower Lot BMP	Sediment Basin effluent pipe (discharge from Sediment Basin to Biofilter)			X	X	X		X	X	X	X	X	X	X	X		V1
009	LPBMP0004	LPBMP0004S002	03/08/13	8:45	DS, Treatment BMP Performance Monitoring	Lower Lot BMP	Biofilter effluent pipe (discharge from Biofilter)			X	X	X		X	X	X	X	X	X	X	X		V1
009	A2BMP0007	A2BMP0007S004	03/08/13	8:55	DS, Treatment BMP Performance Monitoring	B-1	Tributary drainage downstream of storm drain discharge			X	X	X		X	X	X	X	X	X	X	X		V1
009	EVBMP0002	EVBMP0002S016	03/08/13	9:20	Planned BMP Location	Helipad	Helipad Spillway	X	X	X	X	X	X										V1
009	LPBMP0002	LPBMP0002S001	05/06/13	10:35	US, Treatment BMP Performance Monitoring	Lower Lot BMP	Inflow entering cistern; includes Lower Parking Lot sheetflow and flow diveretd from IEL storm drain			X	X	X		X	X	X	X	X	X	X	X		V1
009	LPBMP0003	LPBMP0003S003	05/06/13	9:45	Intermediate, Treatment BMP Performance Monitoring	Lower Lot BMP	Sediment Basin effluent pipe (discharge from Sediment Basin to Biofilter)			X	X	X		X	X	X	X	X	X	X	X		V1
009	LPBMP0004	LPBMP0004S003	05/06/13	10:00	DS, Treatment BMP Performance Monitoring	Lower Lot BMP	Biofilter effluent pipe (discharge from Biofilter)			X	X	X		X	X	X	X	X	X	X	X		V1

Notes:
H - Sample was collected and put on hold, and not analyzed
V1 - Level II validation performed (dioxins)
X - Sample was analyzed

OF008 Sample Totals

Collected	0
Analyzed	0
On Hold	0
Toal Analyzed	**0**

OF009 Sample Totals

Collected	56
Analyzed	53
On Hold	3
Toal Analyzed	**53**

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season

		Object Name Sample Name Sample Date	A2BMP0003 A2BMP0003S006 11/17/2012	B1BMP0003 B1BMP0003S007 11/17/2012	EVBMP0002 EVBMP0002S013 11/17/2012	EVBMP0004 EVBMP0004S001 11/17/2012	EVBMP0005 EVBMP0005S001 11/17/2012	EVBMP0006 EVBMP0006S001 11/17/2012
		Sample Type Location Rain Event	Potential BMP AP/STP, ELV, A2LF November 14 - 18, 2012	Potential BMP B-1 Upper Parking Lot November 14 - 18, 2012	Planned BMP Helipad November 14 - 18, 2012	Planned BMP Helipad Road November 14 - 18, 2012	Planned BMP ELV November 14 - 18, 2012	Planned BMP ELV November 14 - 18, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS								
TCDD TEQ_NoDNQ	ug/L	2.80E-08	ND	**1.72E-07**	4.80E-10	1.60E-10	**1.86E-07**	**1.65E-07**
INORGANICS								
Aluminum	ug/L	-	200 *	330 *	490 *	1900 *	640 *	3600 *
Aluminum, dissolved	ug/L	-	71 *	<40 *	<40 *	84 *	85 *	120 *
Antimony	ug/L	6.0	0.33 J,DX*	1.1 J,DX*	0.37 J,DX*	0.43 J,DX*	1.1 J,DX*	0.78 J,DX*
Antimony, dissolved	ug/L	-	0.32 J,DX*	0.87 J,DX*	0.33 J,DX*	<0.30 *	0.86 J,DX*	0.67 J,DX*
Arsenic	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Arsenic, dissolved	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Barium	mg/L	-	0.011 *	0.016 *	0.018 *	0.022 *	0.019 *	0.048 *
Barium, dissolved	mg/L	-	0.011 *	0.012 *	0.013 *	<0.0060 *	0.011 *	0.015 *
Beryllium	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Beryllium, dissolved	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Boron	mg/L	1.0	<0.020 *	<0.020 *	<0.020 *	<0.020 *	0.027 J,DX*	<0.020 *
Boron, dissolved	mg/L	-	0.024 J,DX*	<0.020 *	<0.020 *	<0.020 *	0.021 J,DX*	0.021 J,DX*
Cadmium	ug/L	4.0	<0.10 *	<0.20 *	<0.10 *	<0.10 *	0.18 J,DX*	0.47 J,DX*
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	0.10 J,DX*	0.11 J,DX*
Chromium	ug/L	-	<2.0 *	<2.0 *	<2.0 *	3.7 J,DX*	<2.0 *	6.6 *
Chromium, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	2.3 J,DX*
Cobalt, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Copper	ug/L	14	3.6 *	**17 ***	4.6 *	5.4 *	9.0 *	**15 ***
Copper, dissolved	ug/L	-	3.2 *	12 *	3.5 *	2.4 *	7.6 *	8.3 *
Iron	mg/L	-	0.22 *	0.43 *	0.61 *	2.6 *	0.85 *	5.2 *
Iron, dissolved	mg/L	-	0.081 *	0.048 *	0.040 *	0.087 *	0.11 *	0.15 *
Lead	ug/L	5.2	0.79 J,DX*	1.5 J,DX*	3.4 *	**7.3 ***	3.0 *	**12 ***
Lead, dissolved	ug/L	-	0.31 J,DX*	0.27 J,DX*	0.48 J,DX*	0.73 J,DX*	1.1 *	1.2 *
Manganese	ug/L	-	10 J,DX*	20 *	21 *	72 *	42 *	110 *
Manganese, dissolved	ug/L	-	7.4 J,DX*	13 J,DX*	<7.0 *	28 *	35 *	36 *
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Nickel	ug/L	100	2.1 J,DX*	3.7 J,DX*	2.6 J,DX*	4.0 J,DX*	3.5 J,DX*	5.6 J,DX*
Nickel, dissolved	ug/L	-	2.0 J,DX*	3.0 J,DX*	<2.0 *	<2.0 *	2.1 J,DX*	3.2 J,DX*
Selenium	ug/L	-	<0.50 *	<1.0 *	0.59 J,DX*	<0.50 *	0.55 J,DX*	0.53 J,DX*
Selenium, dissolved	ug/L	-	<0.50 *	<0.50 *	<0.50 *	<0.50 *	<0.50 *	<0.50 *
Silver	ug/L	-	<0.10 *	<0.20 *	<0.10 *	<0.10 *	<0.10 *	0.11 J,DX*
Silver, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Thallium	ug/L	2.0	<0.20 *	<0.40 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *
Thallium, dissolved	ug/L	-	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *
Vanadium	ug/L	-	<3.0 *	3.3 J,DX*	3.0 J,DX*	7.0 J,DX*	3.2 J,DX*	12 *
Vanadium, dissolved	ug/L	-	<3.0 *	3.1 J,DX*	3.1 J,DX*	<3.0 *	3.2 J,DX*	3.2 J,DX*
Zinc	ug/L	-	4.2 J,DX*	37 J,DX*	18 J,DX*	27 *	40 *	89 *
Zinc, Dissolved	ug/L	-	<4.0 *	23 *	13 J,DX*	4.7 J,DX*	25 *	21 *

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	A2BMP0003 A2BMP0003S006 11/17/2012	B1BMP0003 B1BMP0003S007 11/17/2012	EVBMP0002 EVBMP0002S013 11/17/2012	EVBMP0004 EVBMP0004S001 11/17/2012	EVBMP0005 EVBMP0005S001 11/17/2012	EVBMP0006 EVBMP0006S001 11/17/2012
		Sample Type Location Rain Event	Potential BMP AP/STP, ELV, A2LF November 14 - 18, 2012	Potential BMP B-1 Upper Parking Lot November 14 - 18, 2012	Planned BMP Helipad November 14 - 18, 2012	Planned BMP Helipad Road November 14 - 18, 2012	Planned BMP ELV November 14 - 18, 2012	Planned BMP ELV November 14 - 18, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
MISC								
Total Suspended Solids	mg/L	-	<10 *	<10 *	<10 *	20 *	41 *	200 *
Specific Conductivity (Lab)	umhos/cm	-	--	--	--	26 *	--	--
Turbidity	NTU	-	6.3 *	10 *	11 *	29 *	17 *	36 *
pH (Lab)	SU	6.5-8.5	--	--	--	6.80 QP*	--	--
FIELD MEASUREMENTS								
Conductivity (Field)	mS	-	0.056 *	0.130 *	0.036 *	NR *	0.059 *	0.051
pH (Field)	pH units	6.5-8.5	7.22 *	7.07 *	**8.88 ***	NR *	**6.23 ***	6.6
Temperature	deg c	86	14.37 *	15.43 *	12.4 *	NR *	14.74 *	14.56
Turbidity (Field)	NTU	-	16.1 *	31.4 *	14.7 *	NR *	66.3 *	112
RAINFALL								
Intensity (Ave) - Pre-Sampling	in/hr	-	0.112	0.111	0.004	0.110	0.110	0.111
Intensity (Ave) - Rain Event	in/hr	-	0.010	0.010	0.010	0.010	0.010	0.010
Intensity (Max) - Pre-Sampling	in/hr	-	0.36	0.36	0.20	0.36	0.36	0.36
Intensity (Max) - Rain Event	in/hr	-	0.36	0.36	0.36	0.36	0.36	0.36
Total - Pre-Sampling	in	-	0.94	0.88	0.28	0.79	0.80	0.81
Total - Rain Event	in	-	0.99	0.99	0.99	0.99	0.99	0.99

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	ILBMP0001 ILBMP0001S011 11/17/2012	ILBMP0002 ILBMP0002S008 11/17/2012	ILBMP0001 ILBMP0001S012 11/29/2012	B1BMP0003 B1BMP0003S008 11/30/2012	B1BMP0007 B1BMP0007S001 11/30/2012	EVBMP0002 EVBMP0002S014 11/30/2012	EVBMP0004 EVBMP0004S002 11/30/2012
		Sample Type Location Rain Event	Potential BMP IEL November 14 - 18, 2012	Planned BMP CM-9, IEL, Area II Road November 14 - 18, 2012	Potential BMP IEL November 28 - December 4, 2012	Potential BMP B-1 Upper Parking Lot November 28 - December 4, 2012	Potential BMP B-1 November 28 - December 4, 2012	Planned BMP Helipad November 28 - December 4, 2012	Planned BMP Helipad Road November 28 - December 4, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS									
TCDD TEQ_NoDNQ	ug/L	2.80E-08	**7.77E-08**	**5.56E-08**	**1.58E-07**	**8.17E-08**	2.51E-08	**9.21E-08**	1.90E-10
INORGANICS									
Aluminum	ug/L	-	3100 *	950 *	3200 *	1100 *	410 *	260 *	1800 *
Aluminum, dissolved	ug/L	-	350 *	160 *	390 *	<40 *	64 *	<40 *	97 *
Antimony	ug/L	6.0	0.82 J,DX*	0.62 J,DX*	1.5 J,DX*	1.5 J,DX*	0.61 J,DX*	0.74 J,DX*	<0.30 *
Antimony, dissolved	ug/L	-	0.62 J,DX*	0.42 J,DX*	1.2 J,DX*	0.99 J,DX*	<0.60 *	0.78 J,DX*	<0.30 *
Arsenic	ug/L	-	<7.0 *	<7.0 *	7.3 J,DX*	<7.0 *	7.1 J,DX*	<7.0 *	<7.0 *
Arsenic, dissolved	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Barium	mg/L	-	0.034 *	0.016 *	0.052 *	0.028 *	0.017 *	0.015 *	0.017 *
Barium, dissolved	mg/L	-	0.012 *	0.0073 J,DX*	0.016 *	0.011 *	0.013 *	0.013 *	<0.0060 *
Beryllium	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Beryllium, dissolved	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Boron	mg/L	1.0	<0.020 *	<0.020 *	<0.020 *	<0.020 *	0.031 J,DX*	<0.020 *	<0.020 *
Boron, dissolved	mg/L	-	<0.020 *	<0.020 *	<0.020 *	<0.020 *	0.031 J,DX*	<0.020 *	<0.020 *
Cadmium	ug/L	4.0	0.60 J,DX*	<0.10 *	1.2 J,DX*	0.11 J,DX*	<0.20 *	<0.20 *	<0.10 *
Cadmium, dissolved	ug/L	-	0.31 J,DX*	<0.10 *	0.42 J,DX*	<0.10 *	<0.20 *	<0.10 *	<0.10 *
Chromium	ug/L	-	4.5 J,DX*	2.5 J,DX*	7.3 *	2.8 J,DX*	<2.0 *	<2.0 *	3.0 J,DX*
Chromium, dissolved	ug/L	-	<2.0 *	<2.0 *	2.0 J,DX*	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Copper	ug/L	14	13 *	8.9 *	**19 ***	**18 ***	4.7 *	5.5 *	3.0 *
Copper, dissolved	ug/L	-	7.9 *	6.4 *	9.9 *	12 *	4.8 *	5.8 *	1.6 J,DX*
Iron	mg/L	-	2.9 *	0.96 *	3.9 *	1.4 *	0.36 *	0.32 *	2.1 *
Iron, dissolved	mg/L	-	0.27 *	0.13 *	0.34 *	0.055 *	0.082 *	0.039 J,DX*	0.095 *
Lead	ug/L	5.2	4.4 *	**7.3 ***	**12 ***	**6.3 ***	1.1 J,DX*	2.9 *	**6.7 ***
Lead, dissolved	ug/L	-	0.36 J,DX*	1.1 *	1.2 J,DX*	0.52 J,DX*	0.43 J,DX*	1.1 *	0.77 J,DX*
Manganese	ug/L	-	66 *	25 *	60 *	31 *	10 J,DX*	<7.0 *	31 *
Manganese, dissolved	ug/L	-	28 *	12 J,DX*	10 J,DX*	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Nickel	ug/L	100	4.5 J,DX*	2.5 J,DX*	9.5 J,DX*	3.4 J,DX*	2.2 J,DX*	2.5 J,DX*	2.7 J,DX*
Nickel, dissolved	ug/L	-	3.0 J,DX*	2.5 J,DX*	5.9 J,DX*	<2.0 *	2.7 J,DX*	2.4 J,DX*	<2.0 *
Selenium	ug/L	-	<0.50 *	<0.50 *	<1.0 *	<0.50 *	<1.0 *	<1.0 *	<0.50 *
Selenium, dissolved	ug/L	-	<0.50 *	<0.50 *	<1.0 *	<0.50 *	<1.0 *	<0.50 *	<0.50 *
Silver	ug/L	-	<0.10 *	<0.10 *	<0.20 *	0.11 J,DX*	<0.20 *	<0.20 *	<0.10 *
Silver, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.20 *	0.27 J,DX*	<0.20 *	0.24 J,DX*	<0.10 *
Thallium	ug/L	2.0	<0.20 *	<0.20 *	<0.40 *	<0.20 *	<0.40 *	<0.40 *	<0.20 *
Thallium, dissolved	ug/L	-	<0.20 *	<0.20 *	<0.40 *	<0.20 *	<0.40 *	<0.20 *	<0.20 *
Vanadium	ug/L	-	7.5 J,DX*	4.5 J,DX*	10 *	4.5 J,DX*	<3.0 *	<3.0 *	5.0 J,DX*
Vanadium, dissolved	ug/L	-	<3.0 *	3.7 J,DX*	3.9 J,DX*	<3.0 *	<3.0 *	<3.0 *	<3.0 *
Zinc	ug/L	-	210 *	50 *	300 *	46 *	19 J,DX*	23 J,DX*	16 J,DX*
Zinc, Dissolved	ug/L	-	150 *	31 *	140 *	15 J,DX*	14 J,DX*	22 *	<4.0 *

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	ILBMP0001 ILBMP0001S011 11/17/2012	ILBMP0002 ILBMP0002S008 11/17/2012	ILBMP0001 ILBMP0001S012 11/29/2012	B1BMP0003 B1BMP0003S008 11/30/2012	B1BMP0007 B1BMP0007S001 11/30/2012	EVBMP0002 EVBMP0002S014 11/30/2012	EVBMP0004 EVBMP0004S002 11/30/2012
		Sample Type Location Rain Event	Potential BMP IEL November 14 - 18, 2012	Planned BMP CM-9, IEL, Area II Road November 14 - 18, 2012	Potential BMP IEL November 28 - December 4, 2012	Potential BMP B-1 Upper Parking Lot November 28 - December 4, 2012	Potential BMP B-1 November 28 - December 4, 2012	Planned BMP Helipad November 28 - December 4, 2012	Planned BMP Helipad Road November 28 - December 4, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
MISC									
Total Suspended Solids	mg/L	-	37 *	17 *	58 *	44 *	<10 *	<10 *	41 *
Specific Conductivity (Lab)	umhos/cm	-	--	--	--	--	--	--	--
Turbidity	NTU	-	68 *	23 *	170 *	35 *	10 *	12 *	33 *
pH (Lab)	SU	6.5-8.5	--	--	--	--	--	--	--
FIELD MEASUREMENTS									
Conductivity (Field)	mS	-	0.169 *	0.873 *	0.034 *	0.130 *	0.052 *	0.06 *	0.013 *
pH (Field)	pH units	6.5-8.5	6.55 *	**4.87 ***	**5.83 ***	7.07 *	**6.42 ***	**5.54 ***	**6.13 ***
Temperature	deg c	86	15.46 *	15.14 *	10.95 *	15.43 *	15.7 *	17.33 *	20 *
Turbidity (Field)	NTU	-	145.0 *	72.1 *	425.0 *	31.4 *	26 *	36.9 *	99.5 *
RAINFALL									
Intensity (Ave) - Pre-Sampling	in/hr	-	0.110	0.110	0.022	0.024	0.024	0.023	0.024
Intensity (Ave) - Rain Event	in/hr	-	0.010	0.010	0.011	0.011	0.011	0.011	0.011
Intensity (Max) - Pre-Sampling	in/hr	-	0.36	0.36	0.10	0.12	0.12	0.12	0.12
Intensity (Max) - Rain Event	in/hr	-	0.36	0.36	0.12	0.12	0.12	0.12	0.12
Total - Pre-Sampling	in	-	0.79	0.77	0.35	0.92	1.02	0.93	1.02
Total - Rain Event	in	-	0.99	0.99	1.49	1.49	1.49	1.49	1.49

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season

		Object Name Sample Name Sample Date	ILBMP0001 ILBMP0001S014 12/18/2012	B1BMP0003 B1BMP0003S009 12/24/2012	B1BMP0007 B1BMP0007S002 12/24/2012	ILBMP0001 ILBMP0001S015 12/24/2012	B1BMP0003 B1BMP0003S010 1/24/2013	B1BMP0007 B1BMP0007S003 1/24/2013	EVBMP0002 EVBMP0002S015 1/24/2013
		Sample Type Location Rain Event	Potential BMP IEL December 12 - 18, 2012	Potential BMP B-1 Upper Parking Lot December 22 - 26, 2012	Potential BMP B-1 December 22 - 26, 2012	Potential BMP IEL December 22 - 26, 2012	Potential BMP B-1 Upper Parking Lot January 23 - 27, 2013	Potential BMP B-1 January 23 - 27, 2013	Planned BMP Helipad January 23 - 27, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS									
TCDD TEQ_NoDNQ	ug/L	2.80E-08	**9.74E-08**	**9.56E-08**	1.80E-10	**8.57E-08**	**1.65E-07**	**5.61E-08**	**1.44E-07**
INORGANICS								--	--
Aluminum	ug/L	-	3700 *	230 *	690 *	1200 *	440 *	710 *	320 *
Aluminum, dissolved	ug/L	-	120 *	<40 *	120 *	170 *	64 *	370 *	88 *
Antimony	ug/L	6.0	<1.5 *	0.88 J,DX*	<0.60 *	<0.60 *	0.32 J,DX*	0.45 J,DX*	0.59 J,DX*
Antimony, dissolved	ug/L	-	1.9 J,DX*	0.67 J,DX*	0.46 J,DX*	0.58 J,DX*	<0.30 *	<0.30 *	0.36 J,DX*
Arsenic	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Arsenic, dissolved	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Barium	mg/L	-	0.054 *	0.016 *	0.019 *	0.020 *	0.014 *	0.014 *	0.011 *
Barium, dissolved	mg/L	-	0.011 *	0.016 *	0.015 *	0.0094 J,DX*	0.0095 J,DX*	<0.0060 *	0.0061 J,DX*
Beryllium	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Beryllium, dissolved	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Boron	mg/L	1.0	<0.020 *	<0.020 *	0.022 J,DX*	<0.020 *	<0.020 *	<0.020 *	<0.020 *
Boron, dissolved	mg/L	-	<0.020 *	<0.020 *	0.020 J,DX*	<0.020 *	<0.020 *	<0.020 *	<0.020 *
Cadmium	ug/L	4.0	1.0 J,DX*	<0.20 *	<0.20 *	0.31 J,DX*	<0.10 *	<0.10 *	<0.10 *
Cadmium, dissolved	ug/L	-	0.28 J,DX*	<0.10 *	<0.10 *	0.15 J,DX*	<0.10 *	<0.10 *	<0.10 *
Chromium	ug/L	-	7.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Chromium, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Copper	ug/L	14	12 *	5.9 MB*	4.2 MB*	5.5 MB*	4.8 *	3.3 *	4.1 *
Copper, dissolved	ug/L	-	9.3 *	4.6 *	3.6 *	3.5 *	3.5 *	2.1 *	2.6 *
Iron	mg/L	-	4.0 *	0.21 *	0.62 *	1.3 *	0.46 *	0.70 *	0.34 *
Iron, dissolved	mg/L	-	0.10 *	0.039 J,DX*	0.11 *	0.090 *	0.047 *	0.17 *	0.047 *
Lead	ug/L	5.2	**10 ***	1.3 J,DX*	1.0 J,DX*	2.8 *	2.1 *	3.0 *	2.6 *
Lead, dissolved	ug/L	-	0.30 J,DX*	0.33 J,DX*	0.27 J,DX*	0.24 J,DX*	0.33 J,DX*	0.52 J,DX*	0.32 J,DX*
Manganese	ug/L	-	76 *	<7.0 *	10 J,DX*	21 *	15 J,DX*	17 J,DX*	10 J,DX*
Manganese, dissolved	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 IB*	0.11 J,DX*	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Nickel	ug/L	100	6.8 J,DX*	<2.0 *	<2.0 *	2.3 J,DX*	2.5 J,DX*	2.0 J,DX*	2.6 J,DX*
Nickel, dissolved	ug/L	-	4.0 J,DX*	<2.0 *	<2.0 *	<2.0 *	<2.0 *	2.2 J,DX*	<2.0 *
Selenium	ug/L	-	<2.5 *	<0.50 *	<0.50 *	<0.50 *	<0.50 *	0.53 J,DX*	<0.50 *
Selenium, dissolved	ug/L	-	<0.50 *	<0.50 *	<0.50 *	<0.50 *	<0.50 *	<0.50 *	0.56 J,DX*
Silver	ug/L	-	<0.50 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	0.43 J,DX*	<0.10 *
Silver, dissolved	ug/L	-	<0.10 *	0.45 J,DX*	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Thallium	ug/L	2.0	<1.0 *	<0.40 *	<0.40 *	<0.40 *	<0.20 *	<0.20 *	<0.20 *
Thallium, dissolved	ug/L	-	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.20 *
Vanadium	ug/L	-	11 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *
Vanadium, dissolved	ug/L	-	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *
Zinc	ug/L	-	210 MB*	20 *	28 *	98 *	17 J,DX*	19 J,DX*	17 J,DX*
Zinc, Dissolved	ug/L	-	83 *	14 J,DX*	19 J,DX*	62 *	10 J,DX*	9.6 J,DX*	6.0 J,DX*

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	ILBMP0001 ILBMP0001S014 12/18/2012	B1BMP0003 B1BMP0003S009 12/24/2012	B1BMP0007 B1BMP0007S002 12/24/2012	ILBMP0001 ILBMP0001S015 12/24/2012	B1BMP0003 B1BMP0003S010 1/24/2013	B1BMP0007 B1BMP0007S003 1/24/2013	EVBMP0002 EVBMP0002S015 1/24/2013
		Sample Type Location Rain Event	Potential BMP IEL December 12 - 18, 2012	Potential BMP B-1 Upper Parking Lot December 22 - 26, 2012	Potential BMP B-1 December 22 - 26, 2012	Potential BMP IEL December 22 - 26, 2012	Potential BMP B-1 Upper Parking Lot January 23 - 27, 2013	Potential BMP B-1 January 23 - 27, 2013	Planned BMP Helipad January 23 - 27, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
MISC									
Total Suspended Solids	mg/L	-	87 *	<10 *	<10 *	25 *	<10 *	16 *	<10 *
Specific Conductivity (Lab)	umhos/cm	-	--	--	--	--		--	--
Turbidity	NTU	-	140 MB*	8.1 MB*	18 MB*	32 MB*	16 MB*	29 MB*	14 MB*
pH (Lab)	SU	6.5-8.5	--	--	--	--		--	--
FIELD MEASUREMENTS									
Conductivity (Field)	mS	-	0.098 *	0.165 *	0.046 *	0.028 *	0.294 *	0.026 *	0.024 *
pH (Field)	pH units	6.5-8.5	6.59 *	**6.39 ***	6.74 *	6.82 *	**4.76 ***	**6.18 ***	**6.10 ***
Temperature	deg c	86	13.53 *	10.0 *	10.56 *	10.85 *	14.15 *	11.23 *	12.5 *
Turbidity (Field)	NTU	-	287 *	17.2 *	39.4 *	82.1 *	51.2 *	80.8 *	64.4 *
RAINFALL									
Intensity (Ave) - Pre-Sampling	in/hr	-	0.005	0.024	0.023	0.023	0.104	0.099	0.096
Intensity (Ave) - Rain Event	in/hr	-	0.005	0.013	0.013	0.013	0.020	0.020	0.020
Intensity (Max) - Pre-Sampling	in/hr	-	0.07	0.18	0.18	0.18	0.18	0.18	0.18
Intensity (Max) - Rain Event	in/hr	-	0.07	0.18	0.18	0.18	0.18	0.18	0.18
Total - Pre-Sampling	in	-	0.68	0.96	0.96	0.96	1.06	1.11	1.13
Total - Rain Event	in	-	0.68	1.13	1.13	1.13	1.78	1.78	1.78

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season

		Object Name Sample Name Sample Date	EVBMP0004 EVBMP0004S003 1/24/2013	EVBMP0005 EVBMP0005S002 1/24/2013	ILBMP0001 ILBMP0001S016 1/24/2013	ILBMP0002 ILBMP0002S009 1/24/2013	A2BMP0003 A2BMP0003S007 1/25/2013	EVBMP0002 EVBMP0002S016 3/8/2013	ILBMP0001 ILBMP0001S017 3/8/2013
		Sample Type Location Rain Event	Planned BMP Helipad Road January 23 - 27, 2013	Planned BMP ELV January 23 - 27, 2013	Potential BMP IEL January 23 - 27, 2013	Planned BMP CM-9, IEL, Area II Road January 23 - 27, 2013	Potential BMP AP/STP, ELV, A2LF January 23 - 27, 2013	Planned BMP Helipad March 7 - 8, 2013	Potential BMP IEL March 7 - 8, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS									
TCDD TEQ_NoDNQ	ug/L	2.80E-08	2.60E-10	**1.39E-07**	**1.80E-07**	**8.65E-07**	5.50E-10	8.20E-10	**3.47E-08**
INORGANICS			--	--	--	--	--		
Aluminum	ug/L	-	910 *	440 *	6800 *	2100 *	860 *	210 *	1800 *
Aluminum, dissolved	ug/L	-	110 *	190 *	590 *	270 *	90 *	<40 *	130 *
Antimony	ug/L	6.0	0.33 J,DX*	0.46 J,DX*	0.51 J,DX*	1.0 J,DX*	0.67 J,DX*	0.30 J,DX*	0.55 J,DX*
Antimony, dissolved	ug/L	-	<0.30 *	<0.30 *	<0.30 *	0.53 J,DX*	<0.60 *	0.48 J,DX*	0.51 J,DX*
Arsenic	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Arsenic, dissolved	ug/L	-	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Barium	mg/L	-	0.013 *	0.012 *	0.081 *	0.033 *	0.018 *	0.0098 J,DX*	0.036 *
Barium, dissolved	mg/L	-	<0.0060 *	0.0084 J,DX*	0.0074 J,DX*	0.0067 J,DX*	0.0092 J,DX*	0.0072 J,DX*	0.017 *
Beryllium	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Beryllium, dissolved	ug/L	-	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *	<0.90 *
Boron	mg/L	1.0	<0.020 *	<0.020 *	<0.020 *	<0.020 *	0.028 J,DX*	<0.020 *	0.023 J,DX*
Boron, dissolved	mg/L	-	<0.020 *	<0.020 *	<0.020 *	<0.020 *	0.028 J,DX*	<0.020 *	<0.020 *
Cadmium	ug/L	4.0	<0.10 *	<0.10 *	0.42 J,DX*	0.15 J,DX*	<0.20 *	<0.10 *	0.19 J,DX*
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.20 *	<0.10 *	0.10 J,DX*
Chromium	ug/L	-	<2.0 *	<2.0 *	14 *	8.0 *	<2.0 *	<2.0 *	3.8 J,DX*
Chromium, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	3.3 J,DX*	<2.0 *	<2.0 *	<2.0 *
Cobalt	ug/L	-	<2.0 *	<2.0 *	3.2 J,DX*	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Cobalt, dissolved	ug/L	-	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *	<2.0 *
Copper	ug/L	14	3.0 *	4.2 *	12 *	10 *	4.5 MB*	3.0 *	6.6 *
Copper, dissolved	ug/L	-	1.1 J,DX*	3.1 *	3.0 *	4.6 *	2.7 J,DX*	4.1 *	3.8 *
Iron	mg/L	-	1.1 *	0.40 *	9.8 *	2.3 *	1.1 *	0.23 *	2.0 *
Iron, dissolved	mg/L	-	0.070 *	0.11 *	0.31 *	0.15 *	0.077 *	0.043 *	0.13 *
Lead	ug/L	5.2	**6.8 ***	3.1 *	**11 ***	**40 ***	2.5 MB*	1.7 *	2.4 *
Lead, dissolved	ug/L	-	0.52 J,DX*	0.60 J,DX*	0.29 J,DX*	3.2 *	<0.40 *	0.32 J,DX*	0.20 J,DX*
Manganese	ug/L	-	32 *	14 J,DX*	190 *	55 *	19 J,DX*	7.3 J,DX*	45 *
Manganese, dissolved	ug/L	-	<7.0 *	<7.0 *	15 J,DX*	<7.0 *	<7.0 *	<7.0 *	<7.0 *
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Nickel	ug/L	100	2.0 J,DX*	3.1 J,DX*	8.6 J,DX*	4.3 J,DX*	<2.0 *	<2.0 *	2.7 J,DX*
Nickel, dissolved	ug/L	-	<2.0 *	2.2 J,DX*	2.2 J,DX*	2.1 J,DX*	2.3 J,DX*	2.2 J,DX*	3.0 J,DX*
Selenium	ug/L	-	<0.50 *	<0.50 *	0.66 J,DX*	<0.50 *	<1.0 *	<0.50 *	<0.50 *
Selenium, dissolved	ug/L	-	<0.50 *	<0.50 *	<0.50 *	<0.50 *	<1.0 *	<0.50 *	<0.50 *
Silver	ug/L	-	0.11 J,DX*	<0.10 *	0.26 J,DX*	<0.10 *	<0.20 *	<0.10 *	<0.10 *
Silver, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	0.45 J,DX MB*	0.61 J,DX*	0.13 J,DX*
Thallium	ug/L	2.0	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.40 *	<0.20 *	<0.20 *
Thallium, dissolved	ug/L	-	<0.20 *	<0.20 *	<0.20 *	<0.20 *	<0.40 *	<0.20 *	<0.20 *
Vanadium	ug/L	-	3.7 J,DX*	<3.0 *	20 *	6.3 J,DX*	8.0 J,DX*	<3.0 *	6.5 J,DX*
Vanadium, dissolved	ug/L	-	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	<3.0 *	3.3 J,DX*
Zinc	ug/L	-	16 J,DX*	13 J,DX*	110 *	70 *	11 J,DX*	14 J,DX*	64 *
Zinc, Dissolved	ug/L	-	<4.0 *	5.3 J,DX*	8.7 J,DX*	16 J,DX*	<8.0 *	6.3 J,DX*	21 *

Table 3-3
Potential and Planned BMP Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season

		Object Name Sample Name Sample Date	EVBMP0004 EVBMP0004S003 1/24/2013	EVBMP0005 EVBMP0005S002 1/24/2013	ILBMP0001 ILBMP0001S016 1/24/2013	ILBMP0002 ILBMP0002S009 1/24/2013	A2BMP0003 A2BMP0003S007 1/25/2013	EVBMP0002 EVBMP0002S016 3/8/2013	ILBMP0001 ILBMP0001S017 3/8/2013
		Sample Type Location Rain Event	Planned BMP Helipad Road January 23 - 27, 2013	Planned BMP ELV January 23 - 27, 2013	Potential BMP IEL January 23 - 27, 2013	Planned BMP CM-9, IEL, Area II Road January 23 - 27, 2013	Potential BMP AP/STP, ELV, A2LF January 23 - 27, 2013	Planned BMP Helipad March 7 - 8, 2013	Potential BMP IEL March 7 - 8, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
MISC									
Total Suspended Solids	mg/L	-	15 *	<10 *	180 *	36 *	27 *	11 *	23 *
Specific Conductivity (Lab)	umhos/cm	-	--	--	--	--	--	--	--
Turbidity	NTU	-	31 MB*	12 MB*	160 MB*	63 MB*	15 *	7.8 *	9.3 *
pH (Lab)	SU	6.5-8.5	--	--	--	--	--	--	--
FIELD MEASUREMENTS									
Conductivity (Field)	mS	-	0.023 *	0.178 *	0.026 *	0.017 *	0.051 *	0.041 *	0.026 *
pH (Field)	pH units	6.5-8.5	**6.00 ***	**6.10 ***	**6.33 ***	**6.48 ***	6.80 *	6.61 *	**6.33 ***
Temperature	deg c	86	13.8 *	15.0 *	11.34 *	11.24 *	12.81 *	10.8 *	11.34 *
Turbidity (Field)	NTU	-	226 *	50.4 *	509 *	196 *	54.6 *	24.3 *	509.0 *
RAINFALL									
Intensity (Ave) - Pre-Sampling	in/hr	-	0.099	0.102	0.097	0.095	0.037	0.065	0.070
Intensity (Ave) - Rain Event	in/hr	-	0.020	0.020	0.020	0.020	0.020	0.041	0.041
Intensity (Max) - Pre-Sampling	in/hr	-	0.18	0.18	0.18	0.18	0.18	0.23	0.23
Intensity (Max) - Rain Event	in/hr	-	0.18	0.18	0.18	0.18	0.18	0.23	0.23
Total - Pre-Sampling	in	-	1.11	1.08	1.12	1.14	1.39	0.87	0.87
Total - Rain Event	in	-	1.78	1.78	1.78	1.78	1.78	0.87	0.87

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-4a (B-1 Media Filter)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	B1BMP0004 B1BMP0004S002 11/17/2012	B1BMP0005 B1BMP0005S002 11/17/2012	B1BMP0006 B1BMP0006S001 11/17/2012	B1BMP0004 B1BMP0004S003 11/30/2012	B1BMP0005 B1BMP0005S003 11/30/2012	B1BMP0006 B1BMP0006S002 11/30/2012
		Sample Type Location Rain Event	Treatment BMP Perf Mon US North (B-1 Media Filter) November 14 - 18, 2012	Treatment BMP Perf Mon US South (B-1 Media Filter) November 14 - 18, 2012	Treatment BMP Perf Mon DS (B-1 Media Filter) November 14 - 18, 2012	Treatment BMP Perf Mon US North (B-1 Media Filter) November 28 - December 4, 2012	Treatment BMP Perf Mon US South (B-1 Media Filter) November 28 - December 4, 2012	Treatment BMP Perf Mon DS (B-1 Media Filter) November 28 - December 4, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS								
TCDD TEQ_NoDNQ	ug/L	2.80E-08	2.68E-08	**3.20E-07**	2.80E-08	**8.32E-08**	**1.88E-07**	**6.60E-08**
INORGANICS								
Cadmium	ug/L	4.0	<0.20 *	<0.20 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Cadmium, dissolved	ug/L	-	0.11 J,DX*	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	8.3 *	5.0 *	4.7 *	4.1 *	3.3 *	2.5 *
Copper, dissolved	ug/L	-	6.6 *	3.2 *	3.8 *	3.7 *	2.4 *	2.3 *
Lead	ug/L	5.2	3.0 *	0.56 J,DX*	1.8 *	3.3 *	0.45 J,DX*	1.1 *
Lead, dissolved	ug/L	-	0.86 J,DX*	<0.20 *	0.40 J,DX*	0.82 J,DX*	<0.20 *	0.41 J,DX*
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	**0.14 J,DX***
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 *
MISC								
Total Suspended Solids	mg/L	-	<10 *	<10 *	13 *	<10 *	<10 *	16 *
FIELD MEASUREMENTS								
Conductivity (Field)	mS	-	0.183 *	0.124 *	0.195 *	0.183 *	0.052 *	0.043 *
pH (Field)	pH units	6.5-8.5	6.58 *	6.91 *	**6.25 ***	6.58 *	**6.32 ***	**6.49 ***
Temperature	deg c	86	15.05 *	15.59 *	14.89 *	15.05 *	15.24 *	15.01 *
Turbidity (Field)	NTU	-	65.7 *	28.4 *	61.1 *	65.7 *	9.6 *	42.4 *
RAINFALL								
Intensity (Ave) - Pre-Sampling	in/hr	-	0.111	0.111	0.111	0.024	0.023	0.024
Intensity (Ave) - Rain Event	in/hr	-	0.010	0.010	0.010	0.011	0.011	0.011
Intensity (Max) - Pre-Sampling	in/hr	-	0.36	0.36	0.36	0.12	0.12	0.12
Intensity (Max) - Rain Event	in/hr	-	0.36	0.36	0.36	0.12	0.12	0.12
Total - Pre-Sampling	in	-	0.86	0.83	0.84	1.02	0.98	1.00
Total - Rain Event	in	-	0.99	0.99	0.99	1.49	1.49	1.49

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-4a (B-1 Media Filter)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	B1BMP0006 B1BMP0006S003 12/18/2012	B1BMP0004 B1BMP0004S004 12/24/2012	B1BMP0005 B1BMP0005S004 12/24/2012	B1BMP0006 B1BMP0006S004 12/24/2012
		Sample Type Location Rain Event	Treatment BMP Perf Mon DS (B-1 Media Filter) December 12 - 18, 2012	Treatment BMP Perf Mon US North (B-1 Media Filter) December 22 - December 26, 2012	Treatment BMP Perf Mon US South (B-1 Media Filter) December 22 - December 26, 2012	Treatment BMP Perf Mon DS (B-1 Media Filter) December 22 - December 26, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS						
TCDD TEQ_NoDNQ	ug/L	2.80E-08	1.90E-10	**1.90E-07**	**7.37E-07**	2.74E-08
INORGANICS						
Cadmium	ug/L	4.0	<0.10 *	0.22 J,DX*	<0.10 *	<0.10 *
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	2.4 *	6.4 MB*	2.7 MB*	2.4 MB*
Copper, dissolved	ug/L	-	8.1 *	1.8 J,DX*	1.6 J,DX*	1.5 J,DX*
Lead	ug/L	5.2	1.4 *	**6.2 ***	1.0 *	1.3 *
Lead, dissolved	ug/L	-	<0.20 *	0.20 J,DX*	<0.20 *	0.21 J,DX*
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 IB*	<0.10 *	<0.10 *	<0.10 *
MISC						
Total Suspended Solids	mg/L	-	23 *	53 *	13 *	14 *
FIELD MEASUREMENTS						
Conductivity (Field)	mS	-	0.071 *	0.028 *	0.057 *	0.029 *
pH (Field)	pH units	6.5-8.5	**6.13 ***	6.86 *	6.79 *	**6.46 ***
Temperature	deg c	86	12.32 *	10.3 *	10.8 *	9.93 *
Turbidity (Field)	NTU	-	80.9 *	95.6 *	74.6 *	70.6 *
RAINFALL						
Intensity (Ave) - Pre-Sampling	in/hr	-	0.005	0.024	0.024	0.023
Intensity (Ave) - Rain Event	in/hr	-	0.005	0.013	0.013	0.013
Intensity (Max) - Pre-Sampling	in/hr	-	0.07	0.18	0.18	0.18
Intensity (Max) - Rain Event	in/hr	-	0.07	0.18	0.18	0.18
Total - Pre-Sampling	in	-	0.68	0.96	0.96	0.96
Total - Rain Event	in	-	0.68	1.13	1.13	1.13

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and
data validation reports included in Appendix B.

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rai
based on rainfall recorded at a RWQCB-approved weather station withi

Table 3-4a (B-1 Media Filter)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season

		Object Name Sample Name Sample Date	B1BMP0004 B1BMP0004S005 1/24/2013	B1BMP0005 B1BMP0005S005 1/24/2013	B1BMP0006 B1BMP0006S005 1/24/2013	B1BMP0006 B1BMP0006S006 3/8/2013
		Sample Type Location Rain Event	Treatment BMP Perf Mon US North (B-1 Media Filter) January 23 - 27, 2013	Treatment BMP Perf Mon US South (B-1 Media Filter) January 23 - 27, 2013	Treatment BMP Perf Mon DS (B-1 Media Filter) January 23 - 27, 2013	Treatment BMP Perf Mon DS (B-1 Media Filter) March 7 - 8, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	
DIOXINS						
TCDD TEQ_NoDNQ	ug/L	2.80E-08	**2.28E-07**	**1.02E-07**	**8.68E-08**	**4.61E-08**
INORGANICS						
Cadmium	ug/L	4.0	0.11 J,DX*	<0.10 *	<0.10 *	<0.10 *
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	3.8 *	2.9 *	2.9 *	3.2 *
Copper, dissolved	ug/L	-	1.6 J,DX*	1.1 J,DX*	0.98 J,DX*	2.0 *
Lead	ug/L	5.2	**8.5 ***	1.9 *	3.0 *	2.3 *
Lead, dissolved	ug/L	-	0.58 J,DX*	<0.20 *	0.28 J,DX*	0.50 J,DX*
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *
MISC						
Total Suspended Solids	mg/L	-	16 *	14 *	18 *	41 *
FIELD MEASUREMENTS			--	--	--	
Conductivity (Field)	mS	-	0.012 *	0.087 *	0.017 *	0.029 *
pH (Field)	pH units	6.5-8.5	**6.06 ***	**5.50 ***	7.77 *	7.65 *
Temperature	deg c	86	11.19 *	12.95 *	12.49 *	13.35 *
Turbidity (Field)	NTU	-	153 *	101 *	140 *	101 *
RAINFALL						
Intensity (Ave) - Pre-Sampling	in/hr	-	0.100	0.102	0.101	0.071
Intensity (Ave) - Rain Event	in/hr	-	0.020	0.020	0.020	0.041
Intensity (Max) - Pre-Sampling	in/hr	-	0.18	0.18	0.18	0.23
Intensity (Max) - Rain Event	in/hr	-	0.18	0.18	0.18	0.23
Total - Pre-Sampling	in	-	1.10	1.08	1.09	0.87
Total - Rain Event	in	-	1.78	1.78	1.78	0.87

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and
data validation reports included in Appendix B.

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rai
based on rainfall recorded at a RWQCB-approved weather station withi

Table 3-4b (CM-1)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	EVBMP0003 EVBMP0003S007 11/17/2012	A2BMP0007 A2BMP0007S001 11/17/2012	EVBMP0003 EVBMP0003S008 11/30/2012	A2BMP0007 A2BMP0007S002 12/24/2012
		Sample Type Location Rain Event	Treatment BMP Perf Mon US West (CM-1) November 14 - 18, 2012	Treatment BMP Perf Mon DS (CM-1) November 14 - 18, 2012	Treatment BMP Perf Mon US West (CM-1) November 28 - December 4, 2012	Treatment BMP Per Mon DS (CM-1) December 22 - December 26, 2012
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS						
TCDD TEQ_NoDNQ	ug/L	2.80E-08	**1.08E-07**	**6.70E-08**	**3.80E-07**	2.60E-10
INORGANICS						
Cadmium	ug/L	4.0	0.20 J,DX*	<0.10 *	0.73 J,DX*	<0.10 *
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	12 *	6.8 *	**24 ***	1.8 J,DX*
Copper, dissolved	ug/L	-	8.4 *	4.9 *	1.8 J,DX*	1.3 J,DX*
Lead	ug/L	5.2	**6.3 ***	4.5 *	**52 ***	0.96 J,DX*
Lead, dissolved	ug/L	-	0.79 J,DX*	0.70 J,DX*	0.44 J,DX*	0.23 J,DX*
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *	<0.10 *
MISC						
Total Suspended Solids	mg/L	-	100 *	42 *	270 *	<10 *
FIELD MEASUREMENTS						
Conductivity (Field)	mS	-	0.054 *	0.046 *	0.012 *	0.163 *
pH (Field)	pH units	6.5-8.5	6.87 *	7.06 *	**6.30 ***	6.50 *
Temperature	deg c	86	15.19 *	14.05 *	20.02 *	9.99 *
Turbidity (Field)	NTU	-	135 *	107 *	777 *	30.0 *
RAINFALL						
Intensity (Ave) - Pre-Sampling	in/hr	-	0.111	0.112	0.023	0.023
Intensity (Ave) - Rain Event	in/hr	-	0.010	0.010	0.011	0.013
Intensity (Max) - Pre-Sampling	in/hr	-	0.36	0.36	0.12	0.18
Intensity (Max) - Rain Event	in/hr	-	0.36	0.36	0.12	0.18
Total - Pre-Sampling	in	-	0.88	0.91	1.02	0.96
Total - Rain Event	in	-	0.99	0.99	1.49	1.13

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-4b (CM-1)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	EVBMP0003 EVBMP0003S009 1/25/2013	A2BMP0007 A2BMP0007S003 1/26/2013	A2BMP0007 A2BMP0007S004 3/8/2013
		Sample Type Location Rain Event	Treatment BMP Perf Mon US West (CM-1) January 23 - 27, 2013	Treatment BMP Per Mon DS (CM-1) January 23 - 27, 2013	Treatment BMP Per Mon DS (CM-1) March 7 - 8, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**
DIOXINS					
TCDD TEQ_NoDNQ	ug/L	2.80E-08	**2.07E-07**	2.50E-10	3.80E-10
INORGANICS					
Cadmium	ug/L	4.0	0.18 J,DX*	0.22 J,DX*	<0.10 *
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *
Copper	ug/L	14	6.5 MB*	5.8 *	3.4 *
Copper, dissolved	ug/L	-	2.3 *	1.3 J,DX*	2.4 *
Lead	ug/L	5.2	**13 MB***	3.1 *	1.2 *
Lead, dissolved	ug/L	-	0.71 J,DX*	0.35 J,DX*	0.22 J,DX*
Mercury	ug/L	0.13	0.10 J,DX*	<0.10 *	<0.10 *
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 *
MISC					
Total Suspended Solids	mg/L	-	90 *	<10 *	<10 *
FIELD MEASUREMENTS					
Conductivity (Field)	mS	-	0.095 *	0.097 *	0.035 *
pH (Field)	pH units	6.5-8.5	**5.20 ***	6.93 *	6.53 *
Temperature	deg c	86	13.38 *	13.94 *	11.1 *
Turbidity (Field)	NTU	-	145 *	116 *	14.5 *
RAINFALL					
Intensity (Ave) - Pre-Sampling	in/hr	-	0.036	0.028	0.067
Intensity (Ave) - Rain Event	in/hr	-	0.020	0.020	0.041
Intensity (Max) - Pre-Sampling	in/hr	-	0.18	0.18	0.23
Intensity (Max) - Rain Event	in/hr	-	0.18	0.18	0.23
Total - Pre-Sampling	in	-	1.31	1.64	0.87
Total - Rain Event	in	-	1.78	1.78	0.87

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Upstream Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.

Table 3-4c (Lower Parking Lot BMP)
Treatment BMP Performance Monitoring Sample Results, Outfall 009 Watershed
2012/2013 Rainy Season
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		Object Name Sample Name Sample Date	LPBMP0003 LPBMP0003S002 3/8/2013	LPBMP0004 LPBMP0004S002 3/8/2013	LPBMP0002 LPBMP0002S001 5/6/2013	LPBMP0003 LPBMP0003S003 5/6/2013	LPBMP0004 LPBMP0004S003 5/6/2013
		Sample Type Location Rain Event	Treatment BMP Perf Mon Int (Lower Parking Lot) March 7 - 8, 2013	Treatment BMP Perf Mon DS (Lower Parking Lot) March 7 - 8, 2013	Treatment BMP Perf Mon US (Lower Parking Lot) May 6, 2013	Treatment BMP Perf Mon Int (Lower Parking Lot) May 6, 2013	Treatment BMP Perf Mon DS (Lower Parking Lot) May 6, 2013
ANALYTE	**UNITS**	**NPDES Permit Limit**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS							
TCDD TEQ_NoDNQ	ug/L	2.80E-08	1.80E-10	ND	**9.76E-08**	**5.83E-08**	3.00E-10
INORGANICS							
Cadmium	ug/L	4.0	0.14 J,DX*	<0.10 *	0.36 J,DX*	0.34 J,DX*	<0.10 *
Cadmium, dissolved	ug/L	-	<0.10 *	<0.10 *	0.25 J,DX*	0.23 J,DX*	<0.10 *
Copper	ug/L	14	12 *	6.1 *	**15 ***	14 *	6.4 *
Copper, dissolved	ug/L	-	3.0 *	1.6 J,DX*	12 *	11 *	3.5 *
Lead	ug/L	5.2	**8.5 ***	5.1 *	3.0 *	2.9 *	2.6 *
Lead, dissolved	ug/L	-	0.59 J,DX*	0.50 J,DX*	0.26 J,DX*	0.24 J,DX*	0.40 J,DX*
Mercury	ug/L	0.13	<0.10 *	<0.10 *	<0.10 *	<0.10 *	<0.10 IB*
Mercury, dissolved	ug/L	-	<0.10 *	<0.10 *	<0.10 IB*	<0.10 IB*	<0.10 IB*
MISC							
Total Suspended Solids	mg/L	-	240 *	35 *	48 *	69 *	28 *
pH (Lab)	SU	6.5-8.5	7.37 QP*	7.44 QP*			
FIELD MEASUREMENTS							
Conductivity (Field)	mS	-	0.134 *	0.617 *	0.400 *	0.231 *	0.799 *
pH (Field)	pH units	6.5-8.5	7.40 *	**6.16 ***	6.81 *	7.49 *	7.24 *
Temperature	deg c	86	12.32 *	13.15 *	18.35 *	15.37 *	16.76 *
Turbidity (Field)	NTU	-	793 *	129 *	250 *	202 *	194 *
RAINFALL							
Intensity (Ave) - Pre-Sampling	in/hr	-	0.068	0.068	0.041	0.045	0.044
Intensity (Ave) - Rain Event	in/hr	-	0.041	0.041	0.040	0.040	0.040
Intensity (Max) - Pre-Sampling	in/hr	-	0.23	0.23	0.16	0.16	0.16
Intensity (Max) - Rain Event	in/hr	-	0.23	0.23	0.16	0.16	0.16
Total - Pre-Sampling	in	-	0.87	0.87	0.48	0.48	0.48
Total - Rain Event	in	-	0.87	0.87	0.48	0.48	0.48

Notes:

NR - Not recorded; field meter not functioning properly.
* - Data not validated.

For an explanation of qualifiers, refer to laboratory and data validation reports included in Appendix B.

Upstream Sample Location
Intermediate Sample Location
Downstream Sample Location
Results above NPDES Permit Limit in bold and gray shading

† Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a RWQCB-approved weather station within Area IV.