APPENDIX F

EXPERT PANEL'S BMP SITE RANKING ANALYSIS MEMORANDUM

2014/2015 RAINY SEASON

SANTA SUSANA SITE WATERSHED 008 AND 009 BMP SUBAREA RANKING ANALYSIS

August 2015

Santa Susana Field Laboratory

Surface Water Expert Panel

Geosyntec Consultants

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ATTACHMENTS

TECHNICAL APPENDIX

LIST OF ACRONYMS

BEF	Bioaccumulation equivalency factors
BMP	Best management practice
Cd	Cadmium
CM	Culvert modification
COC	Constituent of concern
CV	Coefficient of variation
Cu	Copper
CWB	California Water Board
Det	Detected
DNQ	Detected not quantified
ISRA	Interim Source Removal Action
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/L	milligram per liter
ND	Not detected
NPDES	National Pollutant Discharge Elimination System
Pb	Lead
PL	Permit limit
PS	Particulate strength
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigations
RWQCB	Regional Water Quality Control Board
SSFL	Santa Susana Field Laboratory
SW	Stormwater
Tc	Time of concentration
TCDD	Tetrachlorodibenzo-*p*-dioxin
TEQ	Toxic equivalence
TSS	Total suspended solids
USEPA	U.S. Environmental Protection Agency

EXECUTIVE SUMMARY

The 2010 Engineered Natural Treatment Systems (ENTS) and Expert Panel Workplan for SSFL Outfalls 008 and 009 (Outfall 008/009 BMP Work Plan) identifies an annual process for the Surface Water Expert Panel (Panel) to evaluate subareas within the Outfall 008 and 009 watersheds for potential implementation of new Best Management Practices (BMPs). These BMPs may include source controls (such as removal of impacted surface soils), erosion and sediment controls (such as straw wattles and hydromulch), instream measures (such as bank stabilization and grade control structures), and/or structural treatment controls (such as sediment basins and media filters, and biofilters). The purpose of any new proposed BMPs would be to improve National Pollutant Discharge Elimination System (NPDES) permit compliance at Outfalls 008 and 009 (Order No. R4-2010-0090)[1]. A new NPDES Permit became effective on April 1, 2015 (Order No. R4-2015-033), which will continue to regulate stormwater discharges at the SSFL NPDES outfalls. The 2015 Permit also includes a requirement to develop a Site-wide Expert Panel Work Plan which will replace the Outfall 008/009 BMP Work Plan.

The purpose of this subarea ranking analysis is to rank subareas within Boeing's and NASA's 008 and 009 watersheds for potential implementation of new or enhanced stormwater controls and to evaluate existing measures, based on the most current available data and subarea specific considerations. The Expert Panel's recommended approach to this task is to rank potential BMP subarea monitoring locations based on the results of water quality sample comparisons between (a) stormwater concentrations and permit limits, and (b) subarea stormwater particulate strengths[2] and background stormwater particulate strengths. A statistical methodology was developed to rank the subareas based on these comparison results, while accounting for the number of useable data available at each subarea as well as number of data observations that fall above these thresholds (i.e., reflecting statistical confidence in how frequently each subarea will exceed the comparison thresholds). This methodology relied on "weighting factors" that are calculated for each COC for each subarea. In the end, the pollutant-specific weighting factors were summed to produce a multi-constituent score to allow for relative ranking amongst the potential BMP subareas. This approach was presented at the California Stormwater Quality Association (CASQA) conference in 2011 and published in Stormwater Magazine in 2013.

The data included in this analysis fell into the following categories and periods of record:

[1] Outfall 009 had five NPDES exceedances in three of five NPDES-sampled events this year; however, total rainfall was only 11.12 inches (58 percent of average annual rainfall [18.4 inches]). November 30 - December 4, 2014 produced 3.20 inches, and December 15-17, 2014 produced 2.62 inches. No daily rain totals exceeded the 1-year, 24-hour design storm depth (2.5 inches). Outfall 008 was sampled during one event and no exceedances were noted.

[2] Particulate strength is determined by taking the total concentrations of the compound minus its dissolved concentrations and dividing by the total suspended solids. It then provides a measure of the mass of particulate form of the compound per mass of suspended sediment. These values are very useful in identifying erosion and other sources of the particulate-bound constituents in the runoff.

1) Interim Source Removal Action (ISRA) and culvert modification (CM) performance monitoring data (2009-2015),

2) NPDES outfall monitoring data (2004-2015), and

3) Potential BMP subarea monitoring data (2010-2015).

Where available, data from co-located ISRA subareas were combined with data from BMP subareas in order to provide a more robust dataset at potential BMP locations. The exact periods of record varied by dataset and by sample subarea but were all-inclusive since the beginning of the monitoring program. This ranking evaluation occurs annually during the term of the 008/009 BMP Work Plan (i.e., through 2015); the first was presented by the Expert Panel and Geosyntec in September, 2011, therefore this is the fourth, and last, of four annual BMP data analysis and recommendation reports. BMP performance and some BMP subarea monitoring will continue for at least one more season to verify performance for newly implemented controls and to check future conditions at locations with high scores but few data; however, these results will not be incorporated into a future BMP data analysis and recommendation report under the 2010 Outfall 008/009 BMP Work Plan.

This year, as in previous years, the Expert Panel has overseen and reviewed the BMP ranking analysis, and evaluated the results to make new BMP recommendations. Initial analysis results were presented to the Expert Panel on June 25, 2015 during a site visit, and discussed again during a call on July 17, 2015. The Panel received the draft ranking memo on July 24, 2015 and the revised draft on August 7, 2015.

Subarea Specific Evaluation of Top-Ranked Subareas

Based on these analysis results, the following monitoring locations were identified as the highest ranked subareas, with multi-constituent scores ranging from 0.42 to 0.97 out of a maximum score of 1.0 (see Table ES-1[3]). Scores closer to 1.0 indicate the monitoring locations with poorer historic water quality. Table ES-1 is limited to the top-ranked subareas discussed below; a complete summary table is provided in the main report as Table 9. Besides the multi-constituent scores, the following list is also of significance because it includes:

- Only three of the top twenty monitoring locations (APBMP0001-A, ILBMP0001, and B1BMP0003) are either active (i.e., not discontinued[4]) or are not upstream of an existing BMP (i.e., without downstream stormwater treatment); recommendations for these three sites are provide later in this summary;

[3] Subarea monitoring locations with zero samples could not have scores calculated and are not included in Table ES-1.

[4] No site was discontinued if it had water quality issues. Sites were typically discontinued due to reclassification due to upstream BMP implementation, if they were redundant, or when the required ISRA monitoring period ended.

- Two (ILBMP0002 and EVBMP0003) of the seven subareas (ILBMP0002, EVBMP0003, A1SW0002-A, B1BMP0005, EVBMP0001-A, HZBMP0001, and Outfall 009) where 2,3,7,8-TCDD[5] was detected (but not quantified) in the 2012/2013 rainy season (2,3,7,8-TCDD was not detected in any samples collected during the 2013/2014 or 2014/2015 rainy seasons);
- The top nine highest ranked monitoring locations for dioxins; and
- The top six highest ranked monitoring locations for metals.

In some cases, these results 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 top 20 monitoring locations described below are located in the 009 drainage area, with none in the 008 drainage area. Only one event produced observable runoff and was sampled at Outfall 008 during the current season, for which there were no exceedances, indicating that retention occurred within the watershed during the small storms observed.

Water quality at stormwater background locations was generally good with no location ranked above 36, though there were several instances of concentrations greater than NPDES permit limits at those locations.

A detailed discussion of each of the top 20 ranked monitoring locations is provided in Section 7 of this report.

[5] 2,3,7,8-TCDD is a congener that potentially indicates unweathered anthropogenic dioxin contamination.

Table ES-1. Subareas Ranked by Multi-Constituent Score

Rank			Multi-Constituent Score	BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Number of Events Sampled		Upstream of Existing Treatment BMP	Both the NPDES permit limit and 95th percentile background particulate strength threshold exceeded for any one COC	Site Status		
Overall	From Maximum Metal Weighting	From Maximum Dioxin Weighting						2009-2015	2014/2015			Being Addressed; no Further Action Required[1]	Targeted for Current Control	Unaddressed
1	1	5	0.97	ILBMP0002	Outfall 009	Road runoff to CM-9, before treatment	2.5	13	3	X	X	X		
2	2	1	0.97	EVBMP0003 (A2SW0001)	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	13.3	18	0	X	X	X		
3	15.5	7	0.66	EVBMP0002	Outfall 009	Helipad (pre-sandbag berms) - OLD	4.1	6	0	X	X		X	
4.5	19	6	0.63	EVBMP0005	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	11.0	2	0	X	X	X		
4.5	4	22.5	0.63	A1SW0009-A	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	1	0		X	X		
6	3	34	0.62	EVBMP0004	Outfall 009	2012/2013 Lower Helipad Road	1.8	3	0	X	X	X		
7.5	5.5	22.5	0.60	APBMP0001-A	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.20	2	1		X			X[2]
7.5	5.5	22.5	0.60	APBMP0001	Outfall 009	Area II Road runoff, pre-ELV stormwater improvements - OLD	32.9	2	0		X	X		
9	24	3	0.58	LPBMP0001-A	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	5.1	6	0	X	X	X		
10	25	8	0.53	ILBMP0001	Outfall 009	Lower parking lot 24" stormdrain bypass	23.0	23	5		X		X	
11	15.5	13	0.51	A1SW0009-B	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	6	0		X	X		
14.5	29.5	9	0.50	EVBMP0003-A	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	2.3	3	1	X	X	X		
14.5	10.5	22.5	0.50	LPBMP0001	Outfall 009	Lower Lot sheetflow (pre-gravel bag berms) - OLD	5.1	2	0	X		X		
14.5	10.5	22.5	0.50	B1SW0014-A	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	4.7	1	0			X		
14.5	10.5	22.5	0.50	EVBMP0006	Outfall 009	2012/2013 Area II Road near ELV ditch	11.0	1	0	X	X	X		
14.5	10.5	22.5	0.50	B1SW0002	Outfall 009	Woolsey Canyon Road Runoff, before treatment	1.3	2	0	X	X	X		
14.5	51	2	0.50	B1BMP0004 (B1BMP0004-5, B1SW0015)	Outfall 009	B-1 media filter inlet north, before treatment	3.7	16	4	X	X	X		
18	59	4	0.49	B1BMP0003 (B1BMP0002)	Outfall 009	B-1 parking lot / road runoff to culvert inlet	5.2	21	3		X			X[3]
19	10.5	34	0.42	B1BMP0001 (B1SW0010)	Outfall 009	B-1 media filter inlet (pre-media filter installation)	4.5	3	0	X		X		
20	19	22	0.40	LXBMP0002	Outfall 009	LOX mid - OLD	1.5	2	0	X		X		

Notes

(1) The site is either upstream of an existing BMP or a BMP is planned for this area. However, the relative sizing of each BMP varies; therefore, the percent of stormwater runoff captured and treated also varies and the Panel will further evaluate this at locations where capture is less than desired.

(2) Stormwater runoff from APBMP0001-A is "unaddressed" because this small drainage area is in the middle of several other treated drainage areas and this flows directly into a road culvert without opportunity for treatment.

(3) Stormwater runoff from B1BMP0003 is "unaddressed" because it flows directly to the Northern Drainage and the Panel has yet to provide a BMP recommendation for this site.

- The rounding of weights may account for similar weights being ranked differently.
- Approximate drainage areas based on the cumulative drainage area of the SWMM catchment in which the monitoring location is located.
- Gray text indicates historic subarea monitoring locations that are discontinued.
- "OLD" in the location description means that the location is now sampled under a new suffix (-A, -B, etc.) due to a change in the upstream watershed, typically BMP implementation.

Table ES-2 summarizes the key locations that have both an influent and effluent paired location, which includes some of the locations ranked in the top 20 from the multi-constituent ranking analysis. This comparison demonstrates that treatment through the BMPs resulted in improved water quality. For example, two influent streams within the B-1 area (ranked 14.5 and 31) are both ranked higher than the B-1 effluent, which is ranked 42. A similar occurrence is observed for the influent/effluent ranks for CM-1, CM-9, the ELV stormwater treatment BMP, and the lower parking lot sedimentation basin and biofilter. B-1 parking lot and road runoff have been included to more fully describe improvements in the vegetated area downstream of the B-1 media filter B-1 area. EVBMP0007 (influent to ELV stormwater treatment BMP) and EVBMP0008 (effluent from ELV stormwater treatment BMP) also illustrate a water quality improvement between influent and effluent.

Table ES-2. Ranking Comparison of Influent and Effluent Pairs (all active monitoring sites)

BMP Area	Influent Monitoring Location			Effluent Monitoring Location			Rank Change
	Monitoring Location	Description	Influent Rank	Monitoring Location	Description	Effluent Rank	
CM-9	**ILBMP0002**	Road runoff to CM-9	1	A1SW0009-C (A1BMP0003)	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	43	-42
CM-1	**EVBMP0003-A (A2SW0001)**	CM-1 upstream west	14.5	A2SW0002-A (A2BMP0007)	CM-1 effluent (post-filter fabric over weir boards)	49	-34.5
B-1 Media Filter	**B1BMP0004 (B1SW0015, B1BMP0004-5)**	B-1 media filter inlet north	14.5	B1SW0014-C (B1BMP0006)	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	42	-27.5
	B1BMP0005 (B1SW0013, B1SW0011, B1BMP0004-5)	B-1 media filter inlet south	31				-11
Lower Lot Sediment Basin and Biofilter	LPBMP0002	Lower parking lot influent to cistern	22	LPBMP0003	Lower parking lot sediment basin outlet	34	-12
				LPBMP0004	Lower parking lot biofilter outlet	58	-36
Vegetated Area D/S of B-1 Media Filter	**B1BMP0003 (B1BMP0002)**	B-1 parking lot / road runoff to culvert inlet	18	B1BMP0007	B-1, vegetated channel	39	-21
	B1SW0014-C (B1BMP0006)	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	42				3
ELV Stormwater Treatment	EVBMP0007	Influent to ELV stormwater treatment BMP	23.5	EVBMP0009	Influent to ELV media filter, before treatment	25.5	-2

BMP				EVBMP0008	Effluent from ELV stormwater treatment BMP	50.5	-27

Notes

- **Bolded** locations indicate that the monitoring location is ranked within the top 20 of the multi-constituent table (Table ES-1).
- Gray text indicates historic subarea monitoring locations that are discontinued.

BMP Recommendations and Status Updates on 2014 Recommendations

The following area summaries provide a status update on the Expert Panel's 2014 BMP recommendations, as well as new additional recommendations for 2015.

1. **ELV Area:** The ELV stormwater treatment BMP[6] was installed in November of 2013 and three samples have been collected to date. Last year, the Expert Panel recommended continued inspection and maintenance of the ELV stormwater treatment BMP, robust erosion control improvements along the ELV channel, and that stormwater samples be collected at the mid-point, between the sedimentation tanks and the media filter tank. The Panel has no new recommendations this year, beyond continued inspections and maintenance, as the ELV stormwater treatment BMP is showing a water quality improvement (based on the limited number of samples collected).

2. **CM-9 (Boeing):** Last year the Panel recommended ongoing maintenance of previously installed BMPs as well as replacement of the filter fabric on the CM-9 weir boards when the fabric became clogged or damaged; monitoring of sediment accumulation at the inlet of the CM and at the new pretreatment rock berm; observation of the duration of water ponding upstream of the weir boards (ponding for greater than 72 hours may suggest that media or underdrain maintenance is needed); and continued performance monitoring, inspection, and maintenance of the underdrain outlets and sedimentation areas, such as in accordance with sedimentation basin maintenance guidance from the CASQA Construction Handbook. All of these recommendations were implemented in the 2014/2015 rainy season. This year the Expert Panel recommends continued implementation of these inspection and maintenance recommendations.

3. **CM-1 (NASA):** In February of 2015, the sandbag berm near CM-1 west was raised and recovered with filter fabric material; no samples have been collected since this improvement. Last year the Expert Panel recommended continued inspection and maintenance of CM-1. The Panel continues to make this recommendation, in addition to potentially increasing the CM-1 capacity by raising the overflow weir or expanding/enhancing the media bed, as deemed feasible. The

[6] Designed to meet the design storm requirements.

Panel also recommends that the influent and effluent samples be collected as close temporally together as possible, particularly during the same storm event.

4. **Helipad (NASA):** The sandbag berms were kept in operation during the 2014/2015 season. Last year, the Panel recommended continued operation of this temporary pumping system or equivalent runoff capture and treatment as a temporary interim control strategy until NASA was able to remove asphalt from the Helipad area during planned demolition; this recommendation still stands as the asphalt has not yet been removed and is not expected to be removed until the soil remediation is completed. Last year the Expert Panel also recommended that ponded water be pumped out of the sump area and the storm drain inlet "plug" under Helipad Road be removed when either 1) Outfall 009 is flowing or 2) the sump is overflowing onto Helipad road. The plug was not removed for any events in the 2014/2015 monitoring season. This year, the Panel continues this recommendation and also recommends that representative runoff from the Helipad be collected for analyses at either 1) the slope drain where the plug is located, or 2) where runoff flows into the Helipad road culvert (which would overflow the ELV stormwater treatment BMP and discharge directly into the creek). The Panel also recommends continued inspection and maintenance of the helipad sandbag berms and any future BMPs. The storage volumes behind the sandbag berms is approximately equivalent to runoff volumes from a quarter inch event.

5. **Lower Lot:** Last year, the Panel recommended that the monitoring program be modified such that the sample at LPBMP0003 be collected from the sediment basin outlet structure using a sample pole, that field observations be recorded when biofilter effluent samples are collected during periods of overflow, and that effluent samples be collected from the underdrain outlet within the biofilter outlet structure. The Panel also recommended review of the cistern pump programming to prevent future overflows of the biofilter; this review was completed. In December of 2014, detention bioswales were constructed in the upper portion of the drainage area tributary to the Lower Lot diversion structure. This delayed the runoff volume to the Lower Lot Biofilter[7] and increased the total volume treated by the biofilter. Additionally, an analysis of the feasibility and benefit of raising the weir height to further increase the percent capture is currently underway. Preliminary results suggest that raising the 2-inch weir by 6-inches (to an 8-inch height) would achieve a 0% bypass of the low flow diversion for the 1-year, 24-hour design storm for the combined upper and lower drainage areas. The Panel also recommends continued inspection, maintenance, and monitoring of the Lower Lot Biofilter system, specifically to prevent underflow.

6. **B1436 Detention Bioswales:** Construction of the detention bioswales[8] near former Building 1436 was completed in December of 2014. Although no stormwater influent samples (due to

[7] Designed to meet the design storm requirements.
[8] Designed to meet the design storm requirements.

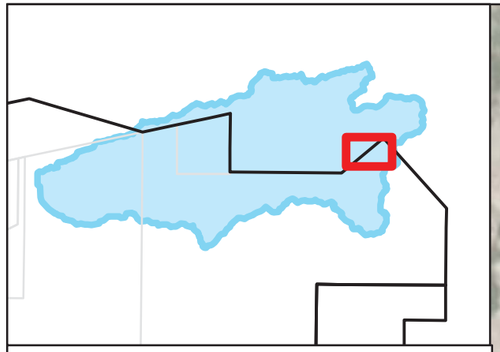
lack of observable flow) and only one effluent sample (due to complications accessing the underdrains, which are currently being resolved) were collected in the 2014/2015 rainy season, observations indicated that surface water runoff was effectively being diverted into the rip rap area as designed. The Expert Panel recommends continued inspection and maintenance of these BMPs as the vegetation becomes established, as well as review of future influent and effluent monitoring data collected during the upcoming rainy season. The Expert Panel also recommends that sampling at the detention bioswales be prioritized in this next rainy season.

7. **Upper Lot (Boeing)**: The Expert Panel recommends new stormwater capture above the culvert inlet at B1BPM0003. This could occur in a temporary form like sand bag berms that are currently found at the Helipad .
8. **All BMPs:** The Expert Panel continues to recommend that all BMPs be regularly inspected and maintained to allow for proper function and treatment of runoff.
9. **Northern Drainage:** Due to the continuation of exceedances at Outfall 009 despite demonstrated water quality improvement at the individual BMPs, the Expert Panel recommends that potential opportunities for in-stream improvements within the Northern Drainage be considered to the extent allowed by existing jurisdictional permits. An analysis of lead and dioxin sediment monitoring data within the Northern Drainage is currently under review in order to assess area for effective BMP placement. The Expert Panel has once again determined that, for a variety of reasons, it would not be feasible to build a dam near the outfall and pump to a mechanical treatment system, such as Silvernale.
10. **Roadside Opportunities:** Due to the continuation of exceedances at Outfall 009 despite demonstrated water quality improvement at the individual BMPs, the Expert Panel plans to comprehensively evaluate potential road runoff capture/treatment opportunities and implement any feasible projects that are identified. Specifically, this recommendation is also intended to address the ranking results at APBMP0001-A (ranked 7.5) as well as B1BMP0003 (ranked 18), which are both reflective of direct runoff from paved surfaces. The Panel suggests that these improvements be coupled with planned road improvements per the transportation plan, if the timeline allows for such coordination without delaying BMP implementation.
11. **Special Studies:** The Panel recommends that certain special studies be initiated to further assess sources of the continued exceedances at Outfall 009. Special studies may include: road runoff tests, street sweeping tests, pavement analyses, and wet/dry atmospheric deposition studies.
12. **BMP Monitoring Program:** This year the Panel recommends additional monitoring locations specific to characterizing road runoff (or other previously unmonitored potential source areas). Lastly, it is recommended that monitoring at existing or potential BMP locations continue if the locations were ranked in the top 20 in 2014/2015, or if insufficient data exist (e.g. APBMP0001).

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. 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 (or seepage along the outside of the culvert), 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 NPDES compliance at Outfalls 008 and 009 at discharges under and up to the Panel's proposed design storm flows.



BMP Activities:
- Inspections were performed on this area as part of the ISRA SWPPP.
- Prior to each forecasted rain event, sandbags were placed at the curb cuts to help divert stormwater runoff towards the cuts (they were removed when it was not raining to prevent them from being run over and worn down).
- Accumulated vegtation and debris were also cleared away from behind the pretreatment check dams

Recommendations:
- Continued inspection and maintenance of the B1 media filter and adjacent BMPs.

BGBMP0005
Sage Ranch near entrance
n = 1 (0)
Multi-Rank = 75.5

B1SW0002
Woolsey Canyon
Road Runoff, before treatment
n = 2 (0)
Multi-Rank = 14.5

B1BMP0004 (B1BMP0004-5, B1SW0015)
Media filter inlet north, before treatment
n = 16 (4)
Multi-Rank = 14.5

B1SW0014-A
Media filter effluent
(pre-media filter reconstruction) - OLD
n = 1 (0)
Multi-Rank = 14.5

B1
Media
Filter

B1BMP0001 (B1SW0010)
Media filter inlet (pre-media filter installation)
n = 3 (0)
Multi-Rank = 19

Detention
Basin

B1BMP0007
Vegetated channel
n = 9 (5)
Multi-Rank = 39

B1BMP0003 (B1BMP0002)
Parking lot / road runoff to culvert inlet
n = 21 (3)
Multi-Rank = 18

N

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- Conveyance Pipeline
- Culvert
- Drainage
- Completed ISRA Areas
- BMPs
- Property Boundary
- Drainage Area (Approx)
- RFI Site Boundary

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 35 70 140
Feet

Figure ES-1: B1 Area

Santa Susana Field Laboratory
Ventura County, CA

August 2015

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Geosyntec consultants

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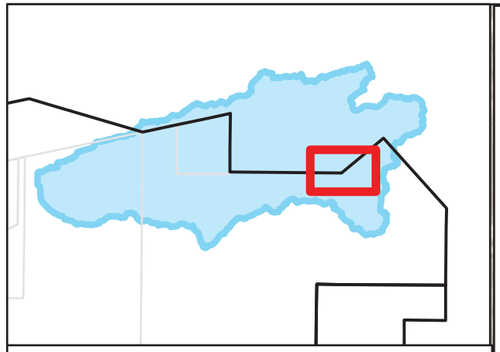

BMP Activities:
- Construction of detention bioswales was completed in December of 2014
- Hydraulic modeling of the low flow diversion, cistern, trench drain, and 24-inch storm drain outlet was conducted after the last wet season event of 2014/2015. A calibrated model has estimated approximately 40% capture at the low flow diversion since completion of the detention bioswales.

Recommendations:
- Review feasibility of raising the height of the low flow diversion weir in order to further increase the percent capture.
- Continued inspection, maintenance, and monitoring of the lower lot treatment system

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- Bioswale
- BMPs
- Completed ISRA Areas
- Asphalt Removal
- Culvert
- Property Boundary
- RFI Site Boundary
- Drainage Area (Approx.)

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 50 100 200
Feet

Figure ES-2: Lower Lot

Santa Susana Field Laboratory
Ventura County, CA

August 2015

N

LPBMP0004
Lower parking lot biofilter outlet
n = 8 (5)
Multi-Rank = 58

Biofilter

LPBMP0003
Lower parking lot sediment basin outlet, before treatment
n = 7 (5)
Multi-Rank = 33

Sedimentation Basin

ILBMP0001
Lower parking lot 24" stormdrain bypass
n = 23 (5)
Multi-Rank = 10

Asphalt Removal

Asphalt Removal

LPBMP0001, -A
Lower lot sheetflow (pre-gravel bag berms) - OLD, Lower lot sheetflow (post-gravel bag berms)
n = 2 (0), 6(0)
Multi-Rank = 14.5, 9

LPBMP0002
Lower parking lot influent to cistern, before treatment
n = 7 (5)
Multi-Rank = 22

Bioswale

Bioswale

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Geosyntec consultants

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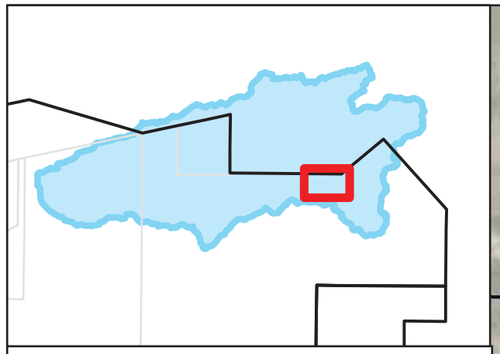

Recommendations:
- Replace filter fabric on the CM-9 weir boards when the fabric becomes clogged or damaged
- Remove sediment accumulation at the inlet of the culvert modification and at the pretreatement rock berm
- Note any water ponded upstream of the weir board for greater than 72 hours as it may suggest that media or underdrain maintenance is needed
- Continue inspection and maintenance of BMPs

N

Asphalt Removal

A1SW0009-A, -B, -C (A1BMP0003)
Downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards)-OLD,
Downstream-underdrain outlet (post-filter fabric over weir boards, post-A1LF asphalt removal) - OLD,
Downstream-underdrain outlet (post-perforated pipe and upper basin installed)
n = 1 (0), 6 (0), 4 (3)
Multi-Rank = 4.5, 11, 43

Area II Road

CM-9

ILBMP0002
Road runoff to CM-9, before treatment
n = 13 (3)
Multi-Rank = 1

Perforated Pipe

Rock Berm

A1BMP0002 (A1SW0004),
A1BMP0002-A (A1SW0004-A)
Upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD,
Upstream toward A1LF (post-A1LF asphalt removal), before treatment
n=16 (0), 6 (2)
Multi-Rank = 65, 28.5

Asphalt Removal

Asphalt Removal

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- BMPs
- Completed ISRA Areas
- Former Planned ISRA Areas
- Drainage Area (Approx.)
- Drainage
- Property Boundary
- RFI Site Boundary
- Asphalt Removal

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 35 70 140
Feet

Figure ES-3: CM-9 Area

Santa Susana Field Laboratory
Ventura County, CA

August 2015

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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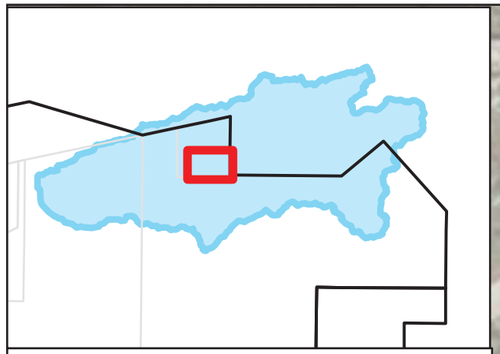

Recommendations:
- Continued inspection and maintenance of the LOX BMPs

N

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- BMPs
- Completed ISRA Areas
- Former Planned ISRA Areas
- Drainage
- Property Boundary
- RFI Site Boundary

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 35 70 140
Feet

LXBMP0006 (LXSW0010)
LOX east, runoff along dirt road
n = 3 (2)
Multi-Rank = 45.5

LXBMP0002
LOX mid - OLD
n = 2 (0)
Multi-Rank = 20

LXBMP0007 (LXSW0007)
LOX, inlet to western slope drain
n = 0 (0)

LXBMP0008 (LXSW0008)
LOX, inlet to central slope drain
n = 0 (0)

LXBMP0009 (LXSW0009)
LOX, inlet to eastern slope drain
n = 3 (2)
Multi-Rank = 75.5

Slope Drain

Slope Drain

Slope Drain

Slope Drain

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Figure ES-4: LOX Area

Santa Susana Field Laboratory
Ventura County, CA

August 2015

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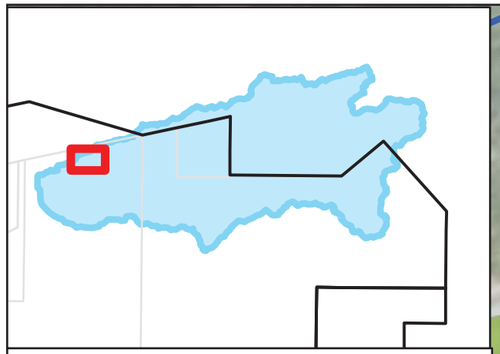

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- BMPs
- Former Planned ISRA Areas
- Completed ISRA Areas
- Drainage
- Culvert
- Property Boundary
- RFI Site Boundary
- Drainage Area (Approx.)

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 25 50 100 Feet

Figure ES-5: Helipad Area

Santa Susana Field Laboratory
Ventura County, CA

August 2015

EVBMP0002, -A
Helipad (pre-sandbag berms) - OLD,
Helipad (post-sandbag berms) - OLD
n = 6 (0), 5(0)
Multi-Rank = 3, 47

Sandbag Berms

Sandbag Berms

Helipad Road

Activities:
- The sandbag berms and pumps were kept in operation during the 2014/2015 season.

Recommendations:
- Continued operation of temporary capture system or equivalent runoff capture and treatment as a temporary control strategy until NASA is able to remove asphalt from the Helipad area during the planned demolition.
- Ponded water should be pumped out of the sump area and the storm drain inlet "plug" under Helipad Road should be removed when either 1) Outfall 009 is flowing or 2) the sump is overflowing onto Helipad Road.
- Continued inspection and maintenance of the Helipad sandbag berms and any future BMPs.

N

Geosyntec consultants

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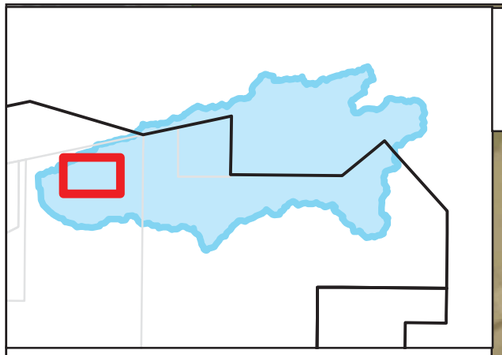

Recommendations:
- Continued inspection and maintenance of all BMPs
- Evaluate potential to expand CM-1 media bed footprint or raise weir height

N

EVBMP0003 (A2SW0001); -A
CM-1 upstream west, pre-ELV improvements, before treatment - OLD;
CM-1 upstream west, post-ELV improvements, before treatment
n = 18 (0); 3(1)
Multi-Rank = 2; 14.5

A2SW0002-A (A2BMP0007)
Effluent (post-filter fabric over weir boards)
n = 22 (1)
Multi-Rank = 49

EVBMP0005
2012-2013 ELV drainage ditch
(pre-ELV-1C ISRA) - OLD
n = 2 (0)
Multi-Rank = 4.5

EVBMP0004
2012-2013 Lower Helipad Road
n = 3 (0)
Multi-Rank = 6

CM-1

Sump

ELV channel

Influent

ELV Treatment System

Effluent

BGBMP0001 (A2BMP0006, A2SW0007)
Upstream east tributary, before treatment
n = 4 (0)
Multi-Rank = 56

APBMP0001; -A
Ashpile culvert/inlet road runoff, pre-ELV improvements - OLD;
Area II road runoff, post-ELV stormwater improvements
n = 2 (0); 2 (1)
Multi-Rank = 7.5; 7.5

EVBMP0006
2012-2013 Area II Road near ELV ditch
n = 1 (0)
Multi-Rank = 14.5

Legend

- Top 20 Active Stormwater Monitoring Location
- Top 20 Discontinued Stormwater Monitoring Location
- Other Location
- Background Location
- BMPs
- Completed ISRA Areas
- Former Planned ISRA Areas
- Drainage Area (Approx.)
- Drainage
- Property Boundary
- RFI Site Boundary
- Culvert

Location Labels:
ID
Description
n = total samples (2014-2015 samples)
Multi-Consituent Rank = x

0 45 90 180 Feet

Figure ES-6: ELV/CM-1 Area

Santa Susana Field Laboratory
Ventura County, CA

August 2015

Geosyntec consultants

Date: 8/5/2015, Path: P:\GIS\Projects\Boeing\SSFL\2015 SB0363\VES maps mxd files-2015\2015 Priority Sites-ELV.mxd, User: JPanthail

1. INTRODUCTION

The purpose of this analysis is to rank subareas in the Santa Susana Field Laboratory (SSFL) Outfall 008 and 009 watersheds for potential implementation of new or enhanced stormwater controls[9], to improve National Pollutant Discharge Elimination System (NPDES) permit compliance at Outfalls 008 and 009. The SSFL Stormwater Expert Panel's (Panel's) recommended approach[10] is to:

1. Compare potential BMP subarea[11] monitoring results with subarea-specific stormwater background[12] data and NPDES permit limits;

2. Determine pollutant-specific "weighting factors" for each potential BMP subarea monitoring location based on this comparison (using a statistical methodology that accounts for sample size and number of results that are above both of these thresholds), with the highest weighting factors assigned to subareas that most frequently exceed both of these thresholds;

3. Determine multi-constituent ranking "scores" for each subarea based on the pollutant-specific weighting factors; and

4. Rank the potential best management practices (BMPs) monitoring subareas based on these multi-constituent ranking scores.

[9] For the purpose of this report, the overarching term "stormwater controls" will be used to describe the standard suite of passive control practices, including erosion controls, sediment controls, and treatment controls. For detailed definitions or examples of erosion and sediment controls, see the CASQA Construction BMP Handbook at http://www.cabmphandbooks.com; for a detailed definition or examples of treatment controls, see the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures at http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010final/Ventura_TGM%2011-4-10.pdf. The more general term, "Best Management Practice" (or BMP), is used in this report as a synonym for "stormwater control" but is used only for referencing the "potential BMP subarea monitoring locations," or monitoring locations where new stormwater controls are being contemplated based on a review of available monitoring results.

[10] The recommended approach outlined herein was developed jointly by the SSFL Stormwater Expert Panel and Geosyntec Consultants, with review from The Boeing Company, NASA, and the Los Angeles Regional Water Quality Control Board.

[11] "Potential BMP subarea monitoring locations" are defined here as drainage areas with an outlet location for stormwater runoff sampling, and including land uses that include ISRA, RCRA Facility Investigation (RFI), and/or developed areas (i.e., subareas containing buildings, asphalt parking lots, roads, etc.) so that impacted runoff quality might be expected and/or treatment BMPs might be necessary, pending an evaluation of the monitoring results.

[12] "Stormwater background monitoring locations" are defined here as locations in these watersheds that generally represent stormwater runoff from unimpacted areas, or areas that do not include ISRA, RFI, or significant development, thereby representing subarea-specific background (or reference) stormwater quality.

This general approach is summarized in the flow chart included as Attachment 1. SSFL stormwater background concentrations are established based on data from Interim Source Removal Action (ISRA) performance and potential BMP subarea monitoring locations that represent runoff from drainage areas with minimal to no RCRA Facility Investigations (RFI), ISRA, or developed (i.e., roof or pavement) areas. The selection of potential BMP subarea monitoring locations is described in the December 16, 2010 sampling recommendations memo from the Expert Panel and Geosyntec (Geosyntec, 2010). Although this analysis is based on concentrations and does not account for pollutant load or watershed size, monitoring locations were selected based on the goal of capturing runoff from nearly all known areas of potential anthropogenic pollutant sources within these two watersheds. In cases where the drainage areas are small, they generally include mostly paved surfaces so that runoff volumes are still significant.

The Outfall 008 and 009 watershed monitoring locations used for this BMP evaluation are shown in Table 1. The locations of the monitoring subareas listed in Table 1 are shown in the Attachment 2 map. In Table 1, each subarea is listed with its category (or data type), watershed, co-location (i.e., an alternate subarea identifier for the same location), a location description, and approximate drainage area. Potential BMP subareas include the letters "BMP" in the subarea identifier, while ISRA performance monitoring locations include the letters "SW" in the subarea identifier. At the Expert Panel's recommendation, some ISRA and Culvert Modification (CM) performance monitoring locations are included here for BMP siting consideration, to verify/test the performance of some stormwater controls, and to verify that runoff from below an ISRA area is comparable to the runoff from above the ISRA area. NPDES compliance monitoring outfalls 008 and 009 were also included here for comparison and method testing purposes. The data summarized and their periods of record in this report are as follows:

- ISRA performance monitoring data: 12/2009 – 3/2015
- Culvert modification (CM) performance monitoring data: 12/2009 – 3/2015
- NPDES outfall monitoring data: 10/2004 – 3/2015
- Potential and active BMP subarea monitoring data: 12/2010 – 5/2015

The number of sampling event results currently available for each of the BMP subarea monitoring locations is based on one to twenty-three storms sampled depending on the location – this program has been in place since late December 2010, and subareas on Sage Ranch property were not sampled until March 2011. In comparison, the ISRA performance monitoring program has been in place for nearly six rainy seasons[13] (2009/2010, 2010/2011, 2011/2012, 2012/2013, 2013/2014, and 2014/2015), so these monitoring subareas have more stormwater sample event results available. As such, where available,

[13] Measured precipitation varied by rainy season, with 19.04 inches recorded over 2009/2010, 23.38 inches recorded over 2010/2011, 11.41 inches recorded over 2011/2012, 8.09 inches recorded over 2012/2013, 6.07 inches recorded over 2013/2014, and 12.10 inches recorded over 2014/2015.

data from co-located ISRA subareas were combined with data from BMP subareas in order to provide a more robust dataset at potential BMP locations. Additionally, the number of samples collected from subareas within the 008 watershed (up to 33 samples depending on parameter) is considerably fewer than the number of samples collected in the 009 watershed (up to 74 samples depending on parameter) due in part to fewer events with sufficient runoff to enable sampling. The smaller frequency of runoff in the 008 watershed is likely due to the absence of directly connected impervious areas and hardened conveyance systems (e.g., paved roads, inlets, storm drains, and lined channels). As a result, there are currently significant limitations to the available stormwater background and potential BMP subarea monitoring datasets; consequently, only a limited number of stormwater control recommendations can be made based on available data for the Outfall 008 watershed.

All stormwater sampling data reported here were provided by MWH or Hayley Aldrich and select analytes were validated by qualified lab quality review professionals[14]. All TCDD TEQ results include Bioaccumulation Equivalency Factors (BEFs), consistent with NPDES reporting requirements (see Appendix A of the 2012 BMP Subarea Ranking Analysis memo for more information on the effects of BEFs on calculated TEQ results). For all parameters, lab results that are estimated (or "J-flagged," or results that are above the detection limit but below the reporting limit) are included in the analysis since it is the Expert Panel's view that statistical confidence in these individual results is greater than confidence in the sample summary statistics due to the limited number of data available for many locations (and it is these summary statistics that serve as the basis for the Expert Panel's BMP recommendations).

[14] Data validation is the process of evaluating data for program, method and laboratory quality control compliance, and will determine the validity and usability of the data. A Level II validation was performed on all dioxins results for the BMP monitoring program and for dioxins results above the permit limit for the performance monitoring program. In addition, validation was performed to investigate anomalous results at a Level II and validation was performed to investigate the performance of the Dekaport Cone Splitter at a Level IV. A Level II validation involves a review of field methods and a high level review of laboratory methods. The primary purpose of performing a Level II validation on the dioxin results was to address blank contamination and estimated maximum possible concentration (EMPC) values. An EMPC value is assigned to a dioxin isomer when a peak is within the retention time window of a target dioxin or furan isomer; however, at least one of the identification criteria from the method was not met for that peak. Therefore this peak cannot be positively identified as a dioxin or furan. The Level II validation process would evaluate the EMPC values and revise these values to non-detects at either the level of interference or the reporting limit, whichever is higher. A Level IV validation is a definitive evaluation of the data and involves a very detailed review of the field and laboratory processes including the raw data files used to identify and quantitate dioxins and furan. This level of validation requires the validator to reproduce a percentage of the result from the raw data files to ensure that systemic errors or errors of omission or transcription errors are not present in the final reported data.

Although this analysis discusses current treatment controls and focuses on the identification of subareas that may require new treatment controls, 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. The Panel also continues to recommend the stabilization of roadways and the implementation of source controls, including source removal, such as through the successful ongoing ISRA program.

This analysis follows prior reports prepared by the Panel on dioxins and metals stormwater background sources at the SSFL (SSFL Stormwater Expert Panel, 2010; SSFL Stormwater Expert Panel, 2009), and is based on the October 2011 BMP Plan for the Outfall 008 and 009 Watersheds (MWH et al., 2011). This analysis is the most refined of several generations of alternatives that were iteratively developed and tested by the Expert Panel and Geosyntec for the selection of potential BMP locations.

Table 1. SSFL 008 and 009 Watershed BMP Evaluation Monitoring Subareas (See Attachment 2 for Location Map)[1]

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
A1BMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	A1LF downstream, before treatment	1.2	2011-2012 rainy season: Discontinued based on results from the 2010-2011 rainy season below NPDES permit limits. Replaced by A1BMP0002 (co-located with A1SW0004) further downstream.
A1BMP0002 (A1SW0004)	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	6.3	2012-2013 rainy season: Discontinued A1SW0004 as it had been monitored for three rainy seasons under the ISRA performance monitoring program. Continued monitoring at co-located BMP monitoring location A1BMP0002.
A1BMP0002-A (A1SW0004-A)	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	6.3	*See description A1BMP0002/A1SW0004.*
A1SW0002	Existing BMP Performance	Background	Outfall 009	Background - CM-8 upstream, before treatment	2.5	2011-2012 rainy season: Discontinued A1SW0002 due to the low concentrations observed in results from the previous rainy season.
A1SW0003	Existing BMP Performance	BMP Subarea	Outfall 009	CM-8 downstream (pre-filter fabric over weir boards) - OLD	2.5	2011-2012 rainy season: Discontinued A1SW0003 due to the low concentrations observed in results from the previous rainy season.
A1SW0003-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-8 downstream (post-filter fabric over weir boards)	2.5	*See description for A1SW0003.*
A1SW0005	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream (pre-filter fabric over weir boards) - OLD	16.4	2011-2012 rainy season: A1SW0005 was replaced with A1SW0009, in order to monitor discharge from the CM-9 underdrains as the downstream monitoring point.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
A1SW0005-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream (post-filter fabric over weir boards)	16.4	*See description for A1SW0005.*
A1SW0006	Existing BMP Performance	Background	Outfall 009	Background - CM-11 upstream, before treatment	8.3	2011-2012 rainy season: Discontinued A1SW0006 due to the low concentrations observed in results from the previous rainy season.
A1SW0007	Existing BMP Performance	BMP Subarea	Outfall 009	CM-11 downstream (pre-filter fabric over weir boards) - OLD	8.3	2011-2012 rainy season: Discontinued A1SW0007 due to the low concentrations observed in results from the previous rainy season.
A1SW0007-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-11 downstream (post-filter fabric over weir boards)	8.3	*See description for A1SW0007.*
A1SW0009	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream-underdrain outlet (pre-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	2013-2014 rainy season: Discontinued ISRA performance monitoring at A1SW0009 and was replaced by BMP monitoring location A1BMP0003.
A1SW0009-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	*See description for A1SW0009.*
A1SW0009-B	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	*See description for A1SW0009.*

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
A1SW0009-C (A1BMP0003)	Existing BMP Performance	BMP Subarea	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	9.9	*See description for A1SW0009.*
A2BMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	A2LF northeast	2.3	n/a
A2BMP0002	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	A2LF road runoff	3.6	n/a
A2BMP0003	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Tributary drainage u/s of ND confluence	100	2014-2015 rainy season: Discontinued A2BMP003 as the location had been monitored for three years and sufficient data had been collected.
A2BMP0004	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Tributary drainage ds of Helipad culvert outlet	4.2	2012-2013 rainy season: Discontinued A2BMP0004 as it was determined the upstream Helipad monitoring location (EVBMP0002) provided sufficient data.
A2BMP0005	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Tributary drainage u/s of CM-1 confluence	35.0	2014-2015 rainy season: Discontinued A2BMP005 as the location had been monitored for three years and sufficient data had been collected.
A2SW0002	Existing BMP Performance	BMP Subarea	Outfall 009	CM-1 effluent (pre-filter fabric over weir boards) - OLD	52.8	2012-2013 rainy season: Discontinued ISRA performance monitoring at A2SW0002 as it had been monitored for three years. Monitoring continued at co-located BMP monitoring location A2BMP0007.
A2SW0002-A (A2BMP0007)	Existing BMP Performance	BMP Subarea	Outfall 009	CM-1 effluent (post-filter fabric over weir boards)	52.8	*See description for A2SW0002.*

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
A2SW0003	ISRA Performance	Background	Outfall 009	A2LF-1 upstream	432	2012-2013 rainy season: Discontinued ISRA performance monitoring at A2LF-1 locations as they had been monitored for three years.
A2SW0004	ISRA Performance	BMP Subarea	Outfall 009	A2LF-1 downstream	432	2012-2013 rainy season: Discontinued ISRA performance monitoring at A2LF-1 locations as they had been monitored for three years.
APBMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Area II road runoff, pre-ELV stormwater improvements - OLD	32.9	n/a
APBMP0001-A	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.20	n/a
APSW0001	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1A upstream	NA	2012-2013 rainy season: Discontinued ISRA performance monitoring at APSW0001 as it had been monitored for two years.
APSW0002	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1A downstream	NA	2012-2013 rainy season: Discontinued ISRA performance monitoring at APSW0002 as it had been monitored for two years.
APSW0003	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1D upstream	NA	2012-2013 rainy season: Discontinued ISRA performance monitoring at APSW0003 as it had been monitored for two years.
APSW0004	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1D downstream	NA	2012-2013 rainy season: Discontinued ISRA performance monitoring at APSW0004 as it had been monitored for two years.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
APSW0005	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1F upstream	0.70	2012-2013 rainy season: Discontinued ISRA performance monitoring at APSW0005 as it had been monitored for two years.
APSW0006	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1F (pre-ISRA excavation) - OLD	0.60	2011-2012 rainy season: Discontinued APSW0006 as monitoring at APSW0013 was considered sufficient for downstream monitoring.
APSW0006-A	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1F (post-ISRA excavation)	0.60	*See description for APSW0006.*
APSW0007	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1B upstream	NA	n/a
APSW0008	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1C-2 upstream	NA	n/a
APSW0009	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1ABC downstream	NA	n/a
APSW0011	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1ABCD downstream	1.8	n/a
APSW0012	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1E-3 upstream	1.6	n/a
APSW0013 (APBMP0002)	ISRA Performance	BMP Subarea	Outfall 009	AP downstream	34.0	2013-2014 rainy season: Discontinued co-located monitoring locations APSW0013/APBMP0002 following installation of the ELV Treatment BMP and was replaced by APSW0014.
APSW0014	ISRA Performance	BMP Subarea	Outfall 009	AP/STP-1ABCDE downstream	32.3	n/a
B1BMP0001 (B1SW0010)	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	B-1 media filter inlet (pre-media filter installation)	4.5	2011-2012 rainy season: Co-located monitoring locations B1SW0010/B1BMP0001 was replaced with B1SW0014, following installation of the B-1 Media Filter.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
B1BMP0001-A (B1SW0010-A)	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter inlet (post-media filter installation), before treatment	4.5	*See description for B1BMP0001.*
B1BMP0003 (B1BMP0002)	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 parking lot / road runoff to culvert inlet	5.2	2011-2012 rainy season: B1BMP0002 was replaced with monitoring location B1BMP0003, following the installation of the B-1 Retention Basin.
B1BMP0004 (B1BMP0004-5, B1SW0015)	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter inlet north, before treatment	3.7	2012-2013 rainy season: Discontinued ISRA performance monitoring at B1SW0015 as it had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1BMP0005 (B1BMP0004-5, B1SW0011, B1SW0013)	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter inlet south, before treatment	0.80	- 2011-2012 rainy season: B1SW0011 was replaced with B1SW0013, following the reconfiguration of the B-1 Retention Basin discharge pipe. 2012-2013 rainy season: Discontinued ISRA performance monitoring at B1SW0013 as that location had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1BMP0007	Existing BMP Performance	BMP Subarea	Outfall 009	B-1, vegetated channel	47.7	n/a
B1SW0002	ISRA Performance	BMP Subarea	Outfall 009	Woolsey Canyon Road Runoff, before treatment	1.3	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
B1SW0003	ISRA Performance	Background	Outfall 009	B-1 upstream	NA/small	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0004	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (pre-ISRA excavation) - OLD	0.08	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0004-A	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (post-ISRA excavation)	0.08	*See description for B1SW0004.*
B1SW0005	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (pre-ISRA excavation) - OLD	0.10	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0005-A	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (post-ISRA excavation)	0.10	*See description for B1SW0005.*
B1SW0006	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (pre-ISRA excavation) - OLD	0.54	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0006-A	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream (post-ISRA excavation)	0.54	*See description for B1SW0006.*

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
B1SW0007	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream	0.75	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0008	ISRA Performance	BMP Subarea	Outfall 009	B-1 upstream	0.79	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0009	ISRA Performance	BMP Subarea	Outfall 009	B-1 downstream	0.84	2012-2013 rainy season: Discontinued ISRA performance monitoring at B-1 Area locations as they had been monitored for two years and sufficient data had been collected to show a general decrease in downstream results.
B1SW0012	ISRA Performance	BMP Subarea	Outfall 009	B-1 north road runoff, before treatment	0.05	2011-2012 rainy season: Discontinued B1SW0012 as this location was slightly upstream of B1SW002 and it was determined that only one monitoring location was needed.
B1SW0014	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 culvert effluent (no media filter) - OLD	4.7	2012-2013 rainy season: B1SW0014 was replaced by monitoring location B1BMP0006.
B1SW0014-A	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	4.7	*See description for B1SW0014.*
B1SW0014-B	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter effluent (post-media filter reconstruction) - OLD	4.7	*See description for B1SW0014.*

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
B1SW0014-C (B1BMP0006)	Existing BMP Performance	BMP Subarea	Outfall 009	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	3.6	*See description for B1SW0014.*
BGBMP0001 (A2BMP0006, A2SW0007)	Existing BMP Performance	Background	Outfall 009	Background - CM-1 upstream east tributary, before treatment	41.1	- 2011-2012 rainy season: Discontinued BGBMP0001 based on a review of results from the previous rainy season for background monitoring locations on Sage Ranch and finding these to be sufficient data for the program. 2012-2013 rainy season: Discontinued A2SW0007 as it had been monitored for two years and sufficient data had been collected. Monitoring continued at co-located BMP monitoring location A2BMP0006.
BGBMP0002 (LXSW0003)	Existing BMP Performance	Background	Outfall 009	Background - CM-3 upstream, before treatment	17.2	- 2011-2012 rainy season: Discontinued LXSW0003 due to the low concentrations observed in results from the previous rainy season. Monitoring continued at BGBMP0002 as a background location. 2012-2013 rainy season: Discontinued BGBMP0002 as sufficient data had been collected at all remaining background locations.
BGBMP0003	Subarea for BMP Siting Analysis	Background	Outfall 009	Background - Sage Ranch near LOX	23.6	2012-2013 rainy season: Monitoring at all remaining background locations was discontinued as sufficient data had been collected.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
BGBMP0004	Subarea for BMP Siting Analysis	Background	Outfall 009	Background - Sage Ranch near CM-5	81.4	2012-2013 rainy season: Monitoring at all remaining background locations was discontinued as sufficient data had been collected.
BGBMP0005	Subarea for BMP Siting Analysis	Background	Outfall 009	Background - Sage Ranch near entrance	25.0	2012-2013 rainy season: Monitoring at all remaining background locations was discontinued as sufficient data had been collected.
BGBMP0006 (A2SW0006)	Existing BMP Performance	BMP Subarea	Outfall 009	Background - CM-1 upstream east tributary (ponded footprint), before treatment	41.1	During the 2010-2011 rainy season, co-located monitoring location A2SW0006/BGBMP0006 was observed to be in ponded water. These monitoring locations were discontinued and replaced by A2SW0007/BGBMP0001 added further upstream.
BGBMP0007 (LXSW0001)	Existing BMP Performance	Background	Outfall 009	Background - CM-3 upstream, before treatment	17.2	During the 2010-2011 rainy season, co-located monitoring locations LXSW0001/BGBMP0007 were observed to be in ponded water. These monitoring locations were discontinued and replaced by LXSW0003/BGBMP0002 added further upstream.
EVBMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	ELV culvert inlet (helipad road gutter, overflow from ELV treatment BMP sediment basin) - OLD	1.8	EVBMP001 was discontinued at the start of the 2012-2013 rainy season and was replaced by monitoring locations EVBMP0004 and EVBMP0005. Location was re-instated at the start of the 2013-2014 rainy season to monitor overflow from the ELV Treatment BMP retention basin during extended rain events.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
EVBMP0001-A	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	15.4	n/a
EVBMP0002	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Helipad (pre-sandbag berms) - OLD	4.1	n/a
EVBMP0002-A	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Helipad (post-sandbag berms) - OLD	9.2	n/a
EVBMP0002-B	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	9.2	n/a
EVBMP0003 (A2SW0001)	Existing BMP Performance	BMP Subarea	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	13.3	2012-2013 rainy season: Discontinued ISRA performance monitoring at A2SW0001 as it had been monitored for three years. Monitoring continued at co-located BMP monitoring location EVBMP0003.
EVBMP0003-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	2.3	n/a
EVBMP0004	Existing BMP Performance	BMP Subarea	Outfall 009	2012/2013 Lower Helipad Road	1.8	2013-2014 rainy season: Discontinued EVBMP0004 following installation of the ELV Treatment BMP.
EVBMP0005	Existing BMP Performance	BMP Subarea	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	11.0	2013-2014 rainy season: Discontinued EVBMP0005 following installation of the ELV Treatment BMP.
EVBMP0005-A	Existing BMP Performance	BMP Subarea	Outfall 009	2012/2013 ELV drainage ditch (post-ELV-1C ISRA)	11.0	*See description for EVBMP0005.*
EVBMP0006	Existing BMP Performance	BMP Subarea	Outfall 009	2012/2013 Area II Road near ELV ditch	11.0	2013-2014 rainy season: Discontinued EVBMP0006 following installation of the ELV Treatment BMP.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
EVBMP0007	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Influent to ELV sedimentation, before treatment	55.3	n/a
EVBMP0008	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Effluent from ELV stormwater treatment BMP	55.3	n/a
EVBMP0009	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Influent to ELV media filter, before treatment	55.3	n/a
HZBMP0001 (HZSW0007)	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream (pre-improvements) - OLD	21.4	- 2012-2013 rainy season: Discontinued HZSW0007 as all OF008 ISRA performance monitoring locations had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results. Monitoring continued at the co-located BMP monitoring location HZBMP0001. 2014-2015 rainy season: Discontinued HZBMP0001 as the location had been monitored for four years.
HZBMP0001-A	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream (post-improvements)	20.4	*See description for HZBMP0001.*

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	- Reason for Discontinuation
HZBMP0002 (HZSW0004)	ISRA Performance	BMP Subarea	Outfall 008	DRG downstream	23.2	- 2011-2012 rainy season: Discontinued HZBMP0002. Location monitored the CYN/DRG drainage along with HZBMP0003. Results for the 2010-2011 rainy season for both locations were below NPDES permit limits, therefore it was determined that only one location was needed to monitor this drainage. Monitoring continued at the ISRA performance monitoring location HZSW0004. 2012-2013 rainy season: Discontinued HZSW0004 as all OF008 ISRA performance monitoring locations had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZBMP0003 (HZSW0003)	ISRA Performance	BMP Subarea	Outfall 008	DRG downstream (furthest downstream)	29.6	- 2012-2013 rainy season: Discontinued HZSW0003 as all OF008 ISRA performance monitoring locations had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results. Monitoring continued at the co-located BMP monitoring location HZBMP0003. 2014-2015 rainy season: Discontinued HZBMP0003 as the location had been monitored for four years.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
HZSW0001	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	<29.0	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0002	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	<29.0	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0005	ISRA Performance	BMP Subarea	Outfall 008	DRG upstream	21.0	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0006	ISRA Performance	Background	Outfall 008	CYN upstream	NA/small	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0008	ISRA Performance	Background	Outfall 008	Background - Happy Valley upstream	NA/small	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
HZSW0009	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	0.20	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0010	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	2.2	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0011	ISRA Performance	Background	Outfall 008	Background - Happy Valley upstream	0.10	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0012	ISRA Performance	Background	Outfall 008	Background - Happy Valley upstream	0.40	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0013	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	0.30	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
HZSW0014	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley upstream	0.10	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0015	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	0.40	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0016	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	4.8	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0018	ISRA Performance	BMP Subarea	Outfall 008	Happy Valley downstream	1.4	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
HZSW0019	ISRA Performance	BMP Subarea	Outfall 008	CYN downstream	2.6	2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	- Reason for Discontinuation
HZSW0020 (HZSW0017)	ISRA Performance	Background	Outfall 008	Background - Happy Valley upstream	0.20	- 2011-2012 rainy season: HZSW0017 was replaced by HZSW0020 which was placed upstream of a disturbed soil area and silt fence. 2012-2013 rainy season: Discontinued monitoring at all OF008 ISRA performance monitoring locations as they had been monitored for three years and sufficient data had been collected to show a general decrease in downstream results.
ILBMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Lower parking lot 24" stormdrain bypass	23.0	n/a
ILBMP0002	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Road runoff to CM-9, before treatment	2.5	n/a
ILBMP0003	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	A1LF parking lot - OLD	9.5	2011-2012 rainy season: Discontinued ILBMP0003 based on results from the previous rainy season below the NPDES permit limits and was replaced with A1BMP002 (co-located with A1SW004) further upstream.
ILBMP0007	Existing BMP Performance	BMP Subarea	Outfall 009	NE Detention Bioswale Effluent	3.7	n/a
ILSW0001	ISRA Performance	BMP Subarea	Outfall 009	IEL-3 upstream	0.10	2012-2013 rainy season: Discontinued ISRA performance monitoring at IEL-1 as it had been monitored for two years.
ILSW0002	ISRA Performance	BMP Subarea	Outfall 009	IEL-3 downstream (pre-ISRA excavation) - OLD	0.20	2012-2013 rainy season: Discontinued ISRA performance monitoring at IEL-1 as it had been monitored for two years.
ILSW0002-A	ISRA Performance	BMP Subarea	Outfall 009	IEL-1 downstream (post-ISRA excavation)	0.20	*See description for ILSW0002.*
ILSW0003	ISRA Performance	BMP Subarea	Outfall 009	IEL-2 upstream	2.4	n/a

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
ILSW0004	ISRA Performance	BMP Subarea	Outfall 009	IEL-2 downstream (pre-ISRA excavation) - OLD	2.8	n/a
ILSW0004-A	ISRA Performance	BMP Subarea	Outfall 009	IEL-2 downstream (post-ISRA excavation)	2.8	n/a
ILSW0005	ISRA Performance	BMP Subarea	Outfall 009	IEL-3 upstream	0.40	n/a
ILSW0006	ISRA Performance	BMP Subarea	Outfall 009	IEL-3 downstream (pre-ISRA excavation) - OLD	0.40	n/a
ILSW0006-A	ISRA Performance	BMP Subarea	Outfall 009	IEL-3 downstream (post-ISRA excavation)	0.40	n/a
ILSW0007	ISRA Performance	BMP Subarea	Outfall 009	IEL-2 upstream (2014/2015 season)	0.40	n/a
ILSW0008	ISRA Performance	BMP Subarea	Outfall 009	IEL-2 downstream (2014/2015 season)	0.40	n/a
LFSW0001	ISRA Performance	Background	Outfall 009	CTLI upstream	NA/small	2012-2013 rainy season: Discontinued ISRA performance monitoring at CTLI as it had been monitored for two years.
LFSW0002	ISRA Performance	BMP Subarea	Outfall 009	CTLI downstream (pre-ISRA excavation) - OLD	5.1	2012-2013 rainy season: Discontinued ISRA performance monitoring at CTLI as it had been monitored for two years.
LFSW0002-A	ISRA Performance	BMP Subarea	Outfall 009	CTLI downstream (post-ISRA excavation)	5.1	*See description for LFSW0002.*
LPBMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Lower Lot sheetflow (pre-gravel bag berms) - OLD	5.1	2012-2013 rainy season: Discontinued LPBMP0001 following the installation of the Lower Parking Lot BMP.
LPBMP0001-A	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	5.1	*See description for LPBMP0001.*
LPBMP0002	Existing BMP Performance	BMP Subarea	Outfall 009	Lower parking lot influent to cistern, before treatment	4.2	n/a

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
LPBMP0003	Existing BMP Performance	BMP Subarea	Outfall 009	Lower parking lot sediment basin outlet, before treatment	4.2	n/a
LPBMP0004	Existing BMP Performance	BMP Subarea	Outfall 009	Lower parking lot biofilter outlet	4.4	n/a
LXBMP0001	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX west - OLD	1.5	2011-2012 rainy season: LXBMP0001 was replaced by monitoring location LXBMP0004, following installation of the LOX sandbag berm.
LXBMP0002	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX mid - OLD	1.5	2011-2012 rainy season: LXBMP0002 was replaced by monitoring location LXBMP0005, following installation of the LOX sandbag berm.
LXBMP0003	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX east tributary - OLD	0.40	2011-2012 rainy season: LXBMP0003 was replaced by monitoring location LXBMP0006, following installation of the LOX sandbag berm.
LXBMP0004	Existing BMP Performance	BMP Subarea	Outfall 009	LOX southwest downstream of sandbag berm	10.6	2012-2013 rainy season: LXBMP0004 was discontinued and replaced by LXBMP0007 following the installation of the slope drains at the LOX sandbag berm.
LXBMP0005	Existing BMP Performance	BMP Subarea	Outfall 009	LOX southeast downstream of sandbag berm	2.5	2012-2013 rainy season: LXBMP0005 was discontinued and replaced by LXBMP0008 following installation of the slope drains at the LOX sandbag berm.
LXBMP0006 (LXSW0010)	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX east, runoff along dirt road	0.43	n/a
LXBMP0007 (LXSW0007)	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX, inlet to western slope drain	9.8	n/a
LXBMP0008 (LXSW0008)	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX, inlet to central slope drain	0.50	n/a

Site Identifier (and Co-location)	Subcategory	Prioritization Category	Watershed	Description	Approximate Upstream Drainage Area (ac)	Reason for Discontinuation
LXBMP0009 (LXSW0009)	Subarea for BMP Siting Analysis	BMP Subarea	Outfall 009	LOX, inlet to eastern slope drain	0.60	n/a
LXSW0002	Existing BMP Performance	BMP Subarea	Outfall 009	CM-3 downstream (pre-filter fabric over weir boards) - OLD	17.2	2011-2012 rainy season: Discontinued LXSW0002 due to the low concentrations observed in results from the previous rainy season.
LXSW0002-A	Existing BMP Performance	BMP Subarea	Outfall 009	CM-3 downstream (post-filter fabric over weir boards)	17.2	*See description for LXSW0002.*
Outfall 008	NPDES	NPDES	Outfall 008	NPDES Outfall 008	62.0	n/a
Outfall 009	NPDES	NPDES	Outfall 009	NPDES Outfall 009	536	n/a

Notes

- Gray text indicates historic subarea monitoring locations that have been discontinued.
- ([1]) Locations with zero samples collected are excluded from this table.
- (*) NPDES outfall monitoring data are included in this analysis for comparison and method testing purposes only. New stormwater controls are not being contemplated at these locations.

2. DATA SUMMARY

Table 2A summarizes the various monitoring locations that were selected to be representative of stormwater background runoff quality because they represent locations that are not expected to be impacted by historic or ongoing subarea activities. Due to the varying objectives of each of the monitoring programs, not all constituents of concern (COCs) were sampled at all subareas. For this BMP subarea ranking analysis, the COCs are defined as total suspended solids (TSS), cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg), TCDD TEQ, and 2,3,7,8-TCDD because these constituents have periodically been measured at concentrations above the current NPDES permit limits at the 008 and 009 monitoring stations, with the exception of TSS and 2,3,7,8-TCDD which are without permit limits but are included here as alternative indicators of COC generation. The number of samples for each COC at each stormwater background subarea is summarized in Table 2A. These samples were collected for all events that occurred when flow was observed; few samples were collected due to little flow at many locations because of the unusually dry 2014/2015 season[15]. Also, at the request of the Panel, all but one background location has been discontinued as of this monitoring season. Table 2B provides a similar summary for the locations where control practice needs are being evaluated. A map that shows the locations of the stormwater monitoring subareas is included as Attachment 2.

[15] Average rainfall at SSFL was 18.4 inches between 1960-2006. In contrast, 11.12 inches of total rainfall has been recorded to-date in the 2014/15 rainy reason.

Table 2A. Stormwater background locations and number of sample results for indicated parameters

SW Background Location (Co-location)	Description	Number of Sample Results for Indicated Parameters						
		TSS	Cd	Cu	Pb	Hg	TCDD TEQ	2,3,7,8-TCDD
A1SW0002	Background - CM-8 upstream, before treatment	10	0	0	10	0	0	0
A1SW0006	Background - CM-11 upstream, before treatment	12	0	0	0	0	12	12
BGBMP0001 (A2BMP0006, A2SW0007)	Background - CM-1 upstream east tributary, before treatment	4	4	4	4	4	4	4
BGBMP0002 (LXSW0003)	Background - CM-3 upstream, before treatment	4	3	4	4	4	4	4
BGBMP0003	Background - Sage Ranch near LOX	5	5	5	5	5	5	5
BGBMP0004	Background - Sage Ranch near CM-5	3	3	3	3	3	3	3
BGBMP0005	Background - Sage Ranch near entrance	1	1	1	1	1	1	1
BGBMP0007 (LXSW0001)	Background - CM-3 upstream, before treatment	7	6	7	7	7	7	7
HZSW0008	Background - Happy Valley upstream	1	0	0	1	0	1	1
HZSW0011	Background - Happy Valley upstream	2	0	2	0	0	2	2
HZSW0012	Background - Happy Valley upstream	1	0	0	1	0	0	0
HZSW0020 (HZSW0017)	Background - Happy Valley upstream	2	0	0	2	0	2	2
Total		52	22	26	38	24	41	41

Notes

- Gray text indicates historic subarea monitoring locations that are discontinued.
- Stormwater background locations with zero samples collected are excluded from this table.

Table 2B. Locations where control practices are being evaluated and number of sample results for indicated parameters

Location (Co-location)	Description	Number of Sample Results for Indicated Parameters						
		TSS	Cd	Cu	Pb	Hg	TCDD TEQ	2,3,7,8-TCDD
A1BMP0001	A1LF downstream, before treatment	5	5	5	5	4	5	5
A1BMP0002 (A1SW0004)	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	16	15	16	16	16	8	8
A1BMP0002-A (A1SW0004-A)	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	6	6	6	6	6	5	5
A1SW0003	CM-8 downstream (pre-filter fabric over weir boards) - OLD	10	0	0	10	0	0	0
A1SW0005	CM-9 downstream (pre-filter fabric over weir boards) - OLD	10	10	10	10	10	5	5
A1SW0007	CM-11 downstream (pre-filter fabric over weir boards) - OLD	12	0	0	0	0	12	12
A1SW0009-A	CM-9 downstream-underdrain outlet	1	1	1	1	1	1	1

Location (Co-location)	Description	Number of Sample Results for Indicated Parameters						
		TSS	Cd	Cu	Pb	Hg	TCDD TEQ	2,3,7,8-TCDD
	(post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD							
A1SW0009-B	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	6	6	6	6	6	5	5
A1SW0009-C (A1BMP0003)	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	4	4	4	4	4	4	4
A2BMP0002	A2LF road runoff	1	1	1	1	1	1	1
A2BMP0003	Tributary drainage u/s of ND confluence	8	8	8	8	8	8	8
A2BMP0004	Tributary drainage ds of Helipad culvert outlet	3	3	3	3	3	3	3
A2BMP0005	Tributary drainage u/s of CM-1 confluence	4	4	4	4	4	4	4
A2SW0002	CM-1 effluent (pre-filter fabric over weir boards) - OLD	16	0	0	16	0	16	16
A2SW0002-A (A2BMP0007)	CM-1 effluent (post-filter fabric over weir boards)	10	6	6	10	6	10	10
APBMP0001	Area II road runoff, pre-ELV stormwater improvements - OLD	2	2	2	2	2	2	2
APBMP0001-A	Area II Road runoff, post-ELV stormwater improvements	2	2	2	2	1	2	2
APSW0014	AP/STP-1ABCDE downstream	2	2	2	2	2	2	2
B1BMP0001 (B1SW0010)	B-1 media filter inlet (pre-media filter installation)	3	2	3	3	3	3	3
B1BMP0003 (B1BMP0002)	B-1 parking lot / road runoff to culvert inlet	21	21	21	21	21	21	21
B1BMP0004 (B1BMP0004-5, B1SW0015)	B-1 media filter inlet north, before treatment	16	16	16	16	16	16	16
B1BMP0005 (B1BMP0004-5, B1SW0011, B1SW0013)	B-1 media filter inlet south, before treatment	21	21	21	21	21	21	21
B1BMP0007	B-1, vegetated channel	9	9	9	9	9	9	9
B1SW0002	Woolsey Canyon Road Runoff, before treatment	2	2	2	2	2	2	2
B1SW0008	B-1 upstream	2	2	0	0	0	2	2
B1SW0014-A	B-1 media filter effluent (pre-media filter reconstruction) - OLD	1	1	1	1	1	1	1
B1SW0014-B	B-1 media filter effluent (post-media filter reconstruction) - OLD	4	4	4	4	4	3	3

Location (Co-location)	Description	Number of Sample Results for Indicated Parameters						
		TSS	Cd	Cu	Pb	Hg	TCDD TEQ	2,3,7,8-TCDD
B1SW0014-C (B1BMP0006)	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	13	13	13	13	13	13	13
BGBMP0006 (A2SW0006)	Background - CM-1 upstream east tributary (ponded footprint), before treatment	7	1	1	7	1	7	7
EVBMP0001-A	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	10	10	10	10	10	10	10
EVBMP0002	Helipad (pre-sandbag berms) - OLD	6	6	6	6	6	6	6
EVBMP0002-A	Helipad (post-sandbag berms) - OLD	5	5	5	5	5	5	5
EVBMP0002-B	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	5	5	5	5	5	5	5
EVBMP0003 (A2SW0001)	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	18	9	9	18	9	18	18
EVBMP0003-A	CM-1 upstream west, post-ELV improvements, before treatment	3	3	3	3	3	3	3
EVBMP0004	2012/2013 Lower Helipad Road	3	3	3	3	3	3	3
EVBMP0005	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	2	2	2	2	2	2	2
EVBMP0006	2012/2013 Area II Road near ELV ditch	1	1	1	1	1	1	1
EVBMP0007	Influent to ELV sedimentation, before treatment	3	3	3	3	3	3	3
EVBMP0008	Effluent from ELV stormwater treatment BMP	3	3	3	3	3	3	3
EVBMP0009	Influent to ELV media filter, before treatment	2	2	2	2	2	2	2
HZBMP0001 (HZSW0007)	Happy Valley downstream (pre-improvements) - OLD	13	6	13	13	6	12	12
HZBMP0002 (HZSW0004)	DRG downstream	4	4	4	4	4	4	4
HZBMP0003 (HZSW0003)	DRG downstream (furthest downstream)	15	7	15	15	7	15	15
HZSW0005	DRG upstream	1	0	0	0	0	1	1
HZSW0014	Happy Valley upstream	3	0	3	3	0	0	0
ILBMP0001	Lower parking lot 24" stormdrain bypass	23	23	23	23	23	23	23
ILBMP0002	Road runoff to CM-9, before treatment	13	13	13	13	13	13	13
ILBMP0003	A1LF parking lot - OLD	4	4	4	3	4	4	4
ILBMP0007	NE detention bioswale effluent	1	1	1	1	1	1	1
ILSW0003	IEL-2 upstream	2	2	0	2	2	0	0
ILSW0004-A	IEL-2 downstream (post-ISRA excavation)	1	1	0	1	1	0	0
ILSW0007	IEL-2 upstream (2014/2015 season)	1	1	0	1	1	0	0
ILSW0008	IEL-2 downstream (2014/2015 season)	1	1	0	1	1	0	0
LFSW0002-A	CTLI downstream (post-ISRA excavation)	3	0	3	3	0	3	3

Location (Co-location)	Description	Number of Sample Results for Indicated Parameters						
		TSS	Cd	Cu	Pb	Hg	TCDD TEQ	2,3,7,8-TCDD
LPBMP0001	Lower Lot sheetflow (pre-gravel bag berms) - OLD	2	2	2	2	2	2	2
LPBMP0001-A	Lower Lot sheetflow (post-gravel bag berms)	6	6	6	6	6	6	6
LPBMP0002	Lower parking lot influent to cistern, before treatment	7	7	7	7	7	7	7
LPBMP0003	Lower parking lot sediment basin outlet, before treatment	7	7	7	7	7	7	7
LPBMP0004	Lower parking lot biofilter outlet	8	8	8	8	8	8	8
LXBMP0002	LOX mid - OLD	2	2	2	2	2	2	2
LXBMP0003	LOX east tributary - OLD	6	6	6	6	6	6	6
LXBMP0004	LOX southwest downstream of sandbag berm	5	5	5	5	5	5	5
LXBMP0005	LOX southeast downstream of sandbag berm	5	5	5	5	5	5	5
LXBMP0006 (LXSW0010)	LOX east, runoff along dirt road	3	3	3	3	3	3	2
LXBMP0009 (LXSW0009)	LOX, inlet to eastern slope drain	2	3	3	3	3	2	2
LXSW0002	CM-3 downstream (pre-filter fabric over weir boards) - OLD	9	8	9	9	9	9	8

Notes

- Gray text indicates historic subarea monitoring locations that are discontinued.
- Locations where control practices are being evaluated where zero samples have been collected are excluded from this table.

Table 3A summarizes the total samples, non-detects (NDs), and J-flagged (DNQ) numbers of observations, along with the minimum, median, and maximum concentration values for each of the COCs for the complete combined stormwater background dataset. TSS values are summarized by watershed as well as combined for both watersheds. All stormwater background mercury and 2,3,7,8-TCDD results are ND. Stormwater background concentration values for COCs that are higher than current permit limits (which apply only at the NPDES compliance outfalls) are highlighted in yellow. These results confirm previous observations by the Expert Panel and others regarding natural background stormwater quality at the SSFL that occasionally exceeds NPDES permit limits for some metals (including copper and lead) as well as TCDD TEQ (although the Permit limit is technically applicable to TCDD TEQ, excluding DNQ congener results). Table 3B provides a similar summary for all locations combined where control practices are being evaluated as well as for Outfalls 008 and 009 data.

Table 3A. Stormwater background samples (all subareas combined) – Concentrations (mg/L for TSS, µg/L otherwise)

COC	# Samples	# NDs	# DNQ	Min	Median	95th Percentile	Max	Permit Limit for OF008 & OF009	% Samples Exceeding Permit Limit
TSS - 008	6	0	3	2	17.5	74	76	NA	NA
TSS - 009	46	6	29	1	7	75	750	NA	NA
TSS	52	6	32	1	7	79	750	NA	NA
Cadmium	22	21	22	0.1	0.1	0.2	0.2	4	0%
Copper	26	0	11	1	2.35	7.3	19	13	4%
Lead	38	5	24	0.2	0.77	14.3	64	5.2	21%
Mercury	24	24	24	0.1	0.1	0.1	0.1	0.13	0%
TCDD TEQ[a]	41	12	41	5.7E-12	1.0E-10	3.3E-07	6.6E-07	2.8E-08	17%
2,3,7,8-TCDD	41	41	41	5.0E-08	8.8E-07	4.7E-06	5.4E-06	NA	NA

Notes

- (a) Permit limit applies to TCDD TEQ (no DNQ), while this comparison is made with TCDD TEQ (DNQ included).
- No substitution assumptions were made in the attempt to quantify NDs. For example, "< 0.20" refers to a non-detect with a detection limit of 0.20 µg/L.
- RWQCB split sample results excluded.
- All data from 'PS_Trigger_Analysis.xlsx'.
- Highlighted values exceed the permit limit for that COC.
- J flagged/DNQ results are included for all COCs.
- With the exception of cadmium, which had all ND or J-flagged/estimated results, assumptions regarding the treatment of J-flag (or DNQ) results do not impact the 95th percentile stormwater background thresholds for any COC.
- Metals results shown here are for the total form only, consistent with the permit limits.

Table 3B. Locations where control practices are being evaluated (all subareas combined) – Concentrations (mg/L for TSS, µg/L otherwise)

COC	# Samples	# NDs	# DNQ	Min	Median	95th Percentile	Max	Permit Limit for OF008 & OF009	% Samples Exceeding Permit Limit [b]
TSS - 008	36	6	14	1	17	390	840	NA	NA
TSS - 009	389	33	99	0.7	21	280	1800	NA	NA
TSS	425	39	113	0.7	21	296	1800	NA	NA
Cadmium	344	204	274	0.1	0.2	0.7	1.4	4	0%
Copper	361	0	24	0.6	5.3	21	86	13	14%
Lead	410	31	97	0.1	2.7	21.6	82	5.2	28%
Mercury	343	324	275	0.0453	0.1	0.13	1.7	0.13	5%
TCDD TEQ[a]	390	27	390	4.0E-12	1.0E-07	1.7E-05	4.0E-04	2.8E-08	62%
2,3,7,8-TCDD	388	378	324	2.0E-08	1.4E-06	7.0E-06	2.2E-05	NA	NA

Notes

- (a) Permit limit applies to TCDD TEQ (no DNQ), while this comparison is made with TCDD TEQ.
- (b) The percent of samples exceeding the permit limit was calculated by dividing the sum of concentration results greater than the permit limit by the sum of all sampled results for each COC. If non-detect results (reported equal to the DL) are greater than the permit limit, they are included in this calculation.
- No substitution assumptions were made in the attempt to quantify NDs. For example, "< 0.20" refers to a non-detect with a detection limit of 0.20 µg/L.
- RWQCB split sample results excluded.
- NA = No permit limit is defined for the given COC.
- All data from 'PS_Trigger_Analysis.xlsx'.
- Highlighted values exceed the permit limit for that COC.
- J flagged/DNQ results are included for all COCs.
- With the exception of cadmium, which had all ND or J-flagged/estimated results, assumptions regarding the treatment of J-flag (or DNQ) results do not impact the 95th percentile stormwater background thresholds for any COC.
- Metals results shown here are for the total form only, consistent with the permit limits.

3. STORMWATER BACKGROUND SAMPLE DATA SUMMARY – PARTICULATE STRENGTH

Particulate strength (PS) is a means to normalize stormwater pollutant concentrations by TSS and also indicate the treatability of the constituents. Normalizing pollutant concentrations by TSS is helpful for evaluating locations that have high COC concentrations in the runoff as a result of high TSS concentrations[16]. This is especially true for the COCs that are highly associated with particulates and are not found in significant quantities in dissolved forms. This normalization with TSS was performed here to help identify critical COC source areas that may otherwise have mass discharges diluted by large flows. PS is computed as total COC concentration minus dissolved COC concentration divided by TSS concentration, or the estimated particulate COC mass per mass of suspended solids. PS values have been previously used by the Expert Panel to assess sources of metals in SSFL NPDES outfall compliance monitoring data (SSFL Stormwater Expert Panel, 2009).

Calculations of PS are complicated by the fact that some of the dissolved metal data are not available (e.g., for ISRA samples since this monitoring program does not include analyses for dissolved metals); therefore procedures were established to make assumptions in lieu of missing information. These procedures also address situations where total, dissolved, or TSS results are not detected (ND, below the detection limit as reported by the analytical laboratory). The procedure used to calculate PS is described in Section 3 of the 2012 BMP Subarea Ranking Analysis memo (Santa Susana Site Surface Water Expert Panel and Geosyntec Consultants, 2012).

Dissolved metals were only analyzed at 6 of the 12 sampled stormwater background monitoring locations. Four of the remaining six locations are ISRA performance (upstream) sample locations. Therefore, to obtain PS estimates for the ISRA stormwater background locations, dissolved concentrations were estimated by assuming that dissolved fractions (i.e., percentage of the total metal concentration) for each sample was equal to the average dissolved fraction at Outfalls 008 or 009. Dissolved concentrations were then estimated for ISRA stormwater background subareas based on the watershed in which each subarea is located. This methodology was not necessary for the stormwater background subareas, since dissolved metal measurements were available for those locations.

Only samples at Outfalls 008 and 009, where both the total and dissolved concentrations were detectable, were used to determine the average dissolved fractions. These average dissolved fractions used in the PS calculations are shown in Table 4. TCDD TEQ and 2,3,7,8-TCDD are assumed to have a dissolved fraction of zero because of their extremely low solubility and high affinity for solids. Dissolved cadmium was detected once at a single sampling event in the Outfall 008 watershed. At the recommendation of the Expert Panel, the average dissolved fraction of cadmium in the Outfall 008

[16] By applying particulate strengths, the Panel is not suggesting that stormwater at SSFL be regulated using such metrics, but rather the Panel is recommending the use of this solely as a diagnostic metric for the identification of source areas and for the ranking of potential BMP monitoring subareas for placement of new stormwater controls.

watershed was computed using the detection limits of the total cadmium analyses as a conservative estimate for dissolved cadmium.

Table 4. Average dissolved fraction of COCs based on all available monitoring data in defined watershed; used in determination of particulate strength when dissolved COC not measured (e.g., ISRA and CM performance monitoring datasets)

COC	Outfall 008			Outfall 009		
	% Dissolved	# Samples	CV	% Dissolved	# Samples	CV
Copper	55	33	0.49	60	294	0.41
Lead	19	14	0.94	17	209	0.83
Cadmium	40	21	N/A	56	35	0.43

Notes

- CV = Coefficient of variation
- # samples = samples with both total and dissolved detected and total > dissolved (results with total < dissolved were excluded from the analysis)
- Only one sample in the Outfall 008 watershed was analyzed for dissolved cadmium as of May 2013. Dissolved fraction was estimated based on the detection limits of the total cadmium analyses.

Stormwater background sample PS estimates were computed for the COCs using the method described above. Results are shown in Table 5 for all stormwater background data combined. The 95th percentile and maximum values are generally unaffected by the ND or missing dissolved data assumptions that were made for the PS estimates.

Table 5. Stormwater background results - particulate strength (mg/kg)

COC	# PS results	# NDs	Min	Median	95th Percentile	Max
Cadmium	22	21	ND	ND	ND	10
Copper	20	0	18	83	350	670
Lead	36	5	ND	70	240	342
Mercury	24	24	ND	ND	ND	ND
TCDD TEQ	41	12	ND	5.7E-08	2.9E-05	3.5E-05
TCDD TEQ_NoDNQ	41	35	ND	ND	1.0E-08	1.9E-08
2,3,7,8-TCDD	41	41	ND	ND	ND	ND

Notes

- Cells with ND refer to values based on total concentration non-detect results.
- RWQCB split sample results excluded
- All data from 'PS_Trigger_Analysis.xlsx'
- # NDs reflect the number of non-detects in the total concentration.
- Particulate strength computation: PS = (Total concentration – Dissolved concentration) / Total Suspended Solids
- Five copper samples were reported as having dissolved concentrations greater than total concentrations. These samples were omitted from the analysis.
- One lead sample was reported as having dissolved concentrations greater than total concentrations. This sample was omitted from the analysis.

4. DATA SUMMARY CHARTS

To allow for a visual and probabilistic comparison of the available stormwater sampling data, Figures 2 through 7 show probability plots of the COCs at locations grouped into the following categories:

- Stormwater background
- Potential BMP subarea
- Outfall 008 (for comparison)
- Outfall 009 (for comparison)

Previous version of this analysis separated Outfall 008 and 009 results into pre-2009 and post-2009 datasets. Pre-2009 results represent grab samples and post-2009 results represent flow-weighted composite samples. However, recent statistical tests performed on these data showed no statistically significant difference between datasets, and as such, these data have been presented as a single series for each outfall.

The x-axes show COC concentrations or PS and the y-axes show the probability of non-exceedance (or probability that values are below) the given x-axis values. The Cunnane equation (Helsel and Hirsch, 1992) was used to compute the plotting positions, and a best-fit line (assuming a lognormal distribution) is shown for the stormwater background data. Note that non-detect results were included in computing the plotting positions, but are not actually plotted (the other data observations are offset in their plotting position to appropriately consider the non-detect data in order to accurately estimate probability values). In general, these plots show that stormwater background concentrations frequently exceed[17] NPDES permit limits for lead (~18% probability) and TCDD TEQ (~18% probability, although this estimated probability is zero when DNQ results are excluded), and infrequently for copper (~1% probability), but do not exceed the NPDES permit limits for cadmium. The 2,3,7,8-TCDD charts show very few data points because this congener is so rarely detected. Also, most of these 2,3,7,8-TCDD detections are lab estimates (i.e., DNQ) and not quantified at high reliability values. 2,3,7,8-TCDD was also never detected in a stormwater background sample. Furthermore, dioxin congener DNQ results are included for this analysis in contrast to NPDES reporting practice which does not include DNQs, therefore the NPDES outfall results that are shown above the permit limit here do not reflect past NPDES exceedances at concentrations shown.

Figure 1 provides a key for the COC probability charts. The yellow-orange area includes observations that were less than background conditions, but still exceeded the permit limits. The blue area includes

[17] The term “exceed” is being used here as a statistical term only of the likely probability of occurrence. It is only accurate if the data perfectly matched the statistical distribution, which is rare. It indicates values that are greater than a given threshold. It is not intended to have regulatory or non-compliance implications. This is particularly true for TCDD TEQ data which include DNQ results here for statistical analysis purposes, in contrast to NPDES compliance assessment procedures, which require greater reliability for reporting and do not include DNQ results.

observations that were less than both the stormwater background best-fit line and the permit limit. The red area includes data that exceeded both the stormwater background conditions and permit limits, while the purple area includes observations that exceeded the stormwater background conditions but not the permit limits. Fundamentally, the question is which subareas most likely contribute to downstream permit limit exceedances as a result of elevated COC concentrations that are most likely due to particulate strengths that are above subarea-specific background levels? These subareas will be identified by potential BMP subarea stormwater sampling results that fall to the right of the Permit limit in the concentration chart (red and orange areas) **and** fall to the right of the stormwater background best-fit line on the particulate strength chart (in the purple and red areas), or in other words, those samples and subareas which may contribute to downstream permit limit exceedances but their elevated COC concentrations are most likely due to particulate strengths that are above subarea-specific stormwater background levels. As will be discussed later in this report, the subareas with data that fall within the red area will receive the highest scores for prioritizing subareas for new or enhanced stormwater controls. Depending on the results for other COCs at an evaluation location, data within the purple and yellow-orange areas may also become a factor in prioritizing potential BMP subareas.

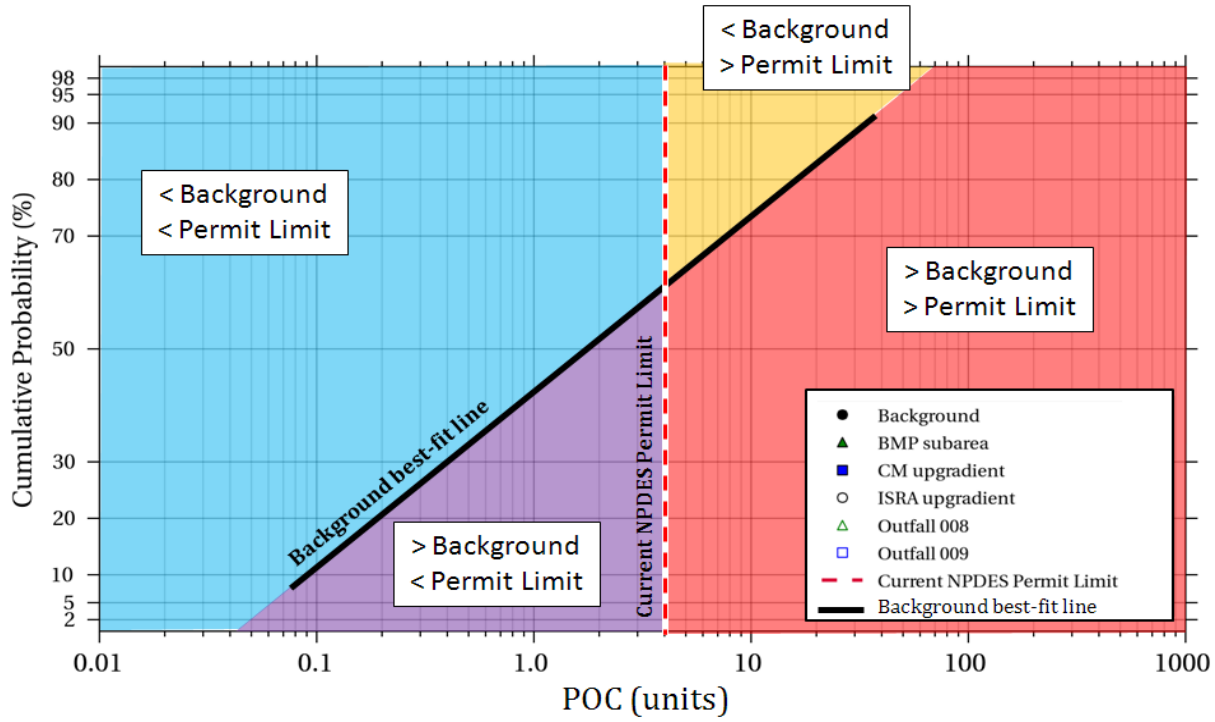

Figure 1. Probability plot key

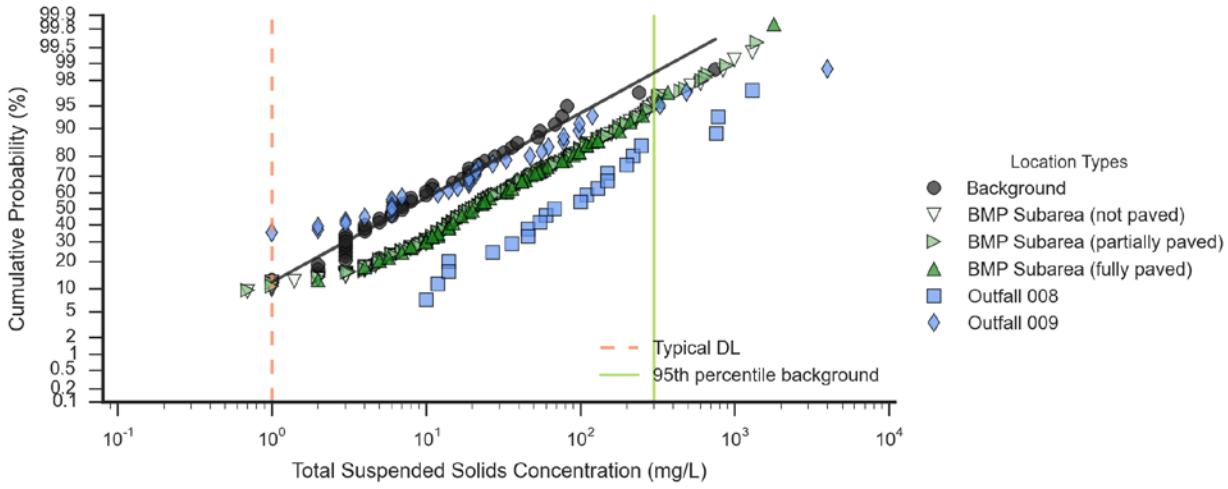

Figure 2. Probability plot for TSS concentrations[18]

[18] Note: Following the 2005 wildfire, an uncharacteristically high TSS value (4000 mg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown near the upper right corner of Figure 2.

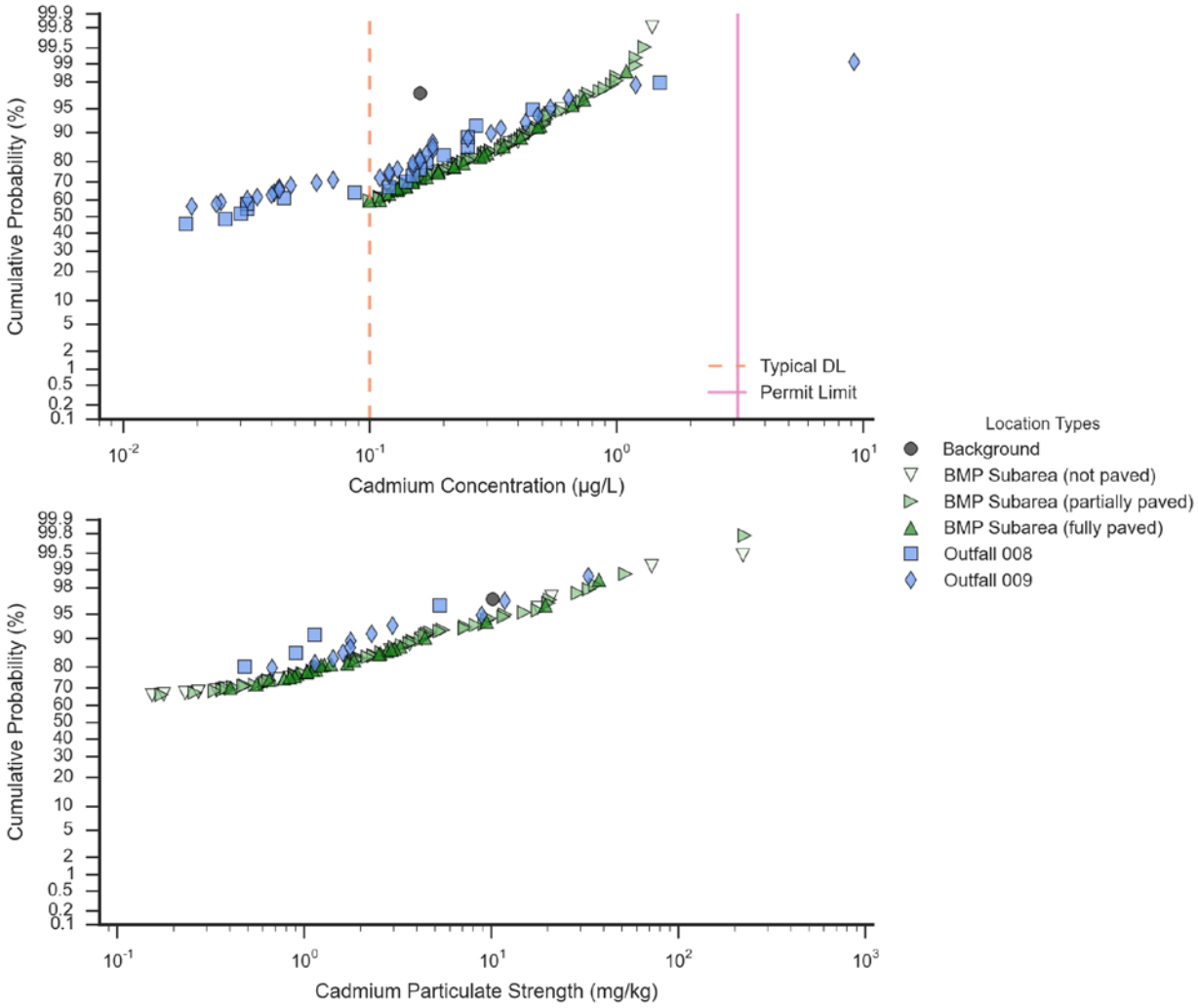

Figure 3. Probability plots for cadmium concentrations and particulate strengths[19, 20]

[19] Following the 2005 wildfires, an uncharacteristically high cadmium concentration (9.2 µg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown in the upper right corner of the concentration plot in Figure 3.
[20] A background best-fit line was not provided for total cadmium due to the limited number of detected results.

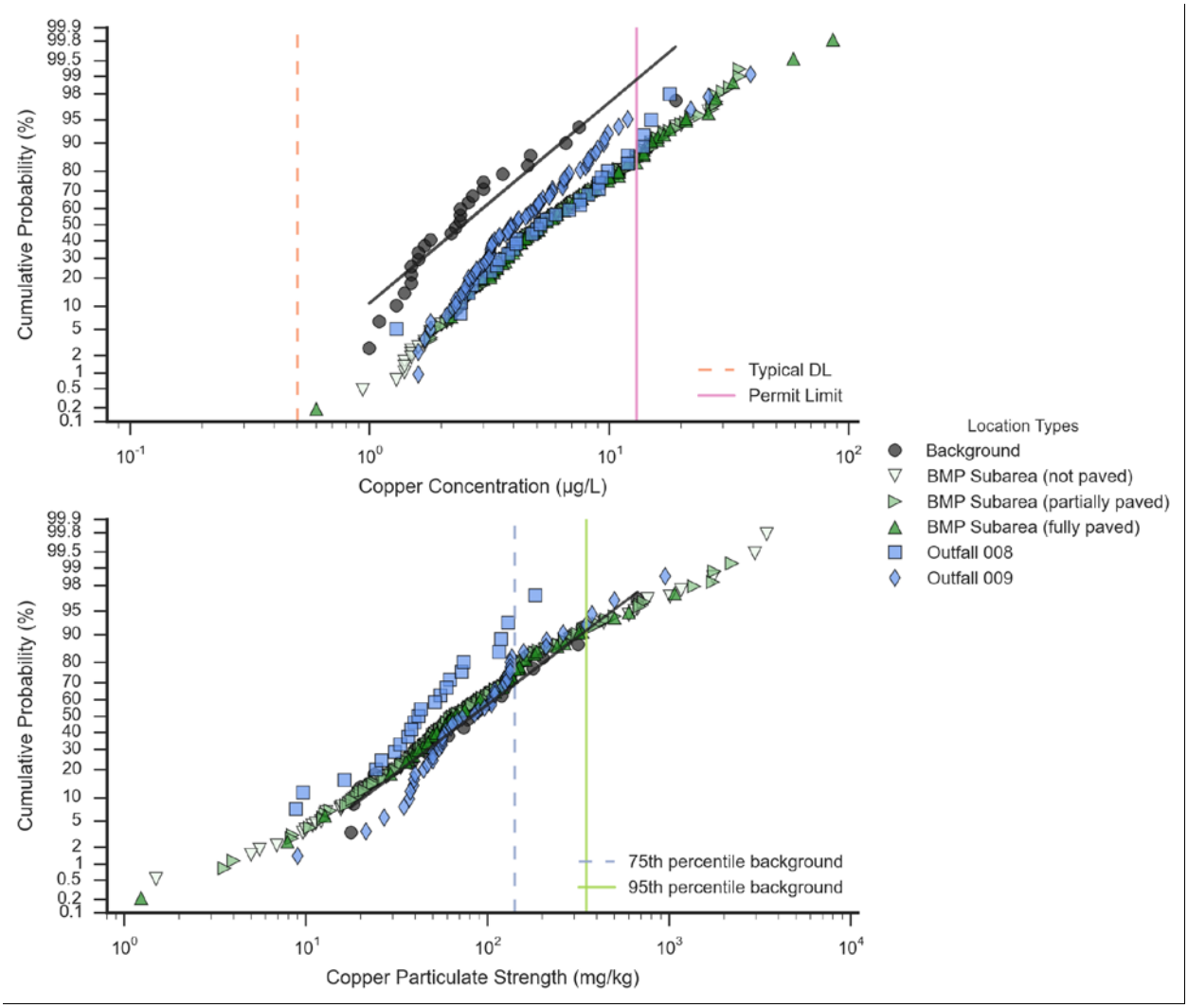

Figure 4. Probability plots for copper concentrations and particulate strengths[21]

[21] Following the 2005 wildfires, an uncharacteristically high copper concentration (39 µg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown near the upper right corner of the concentration plot in Figure 4.

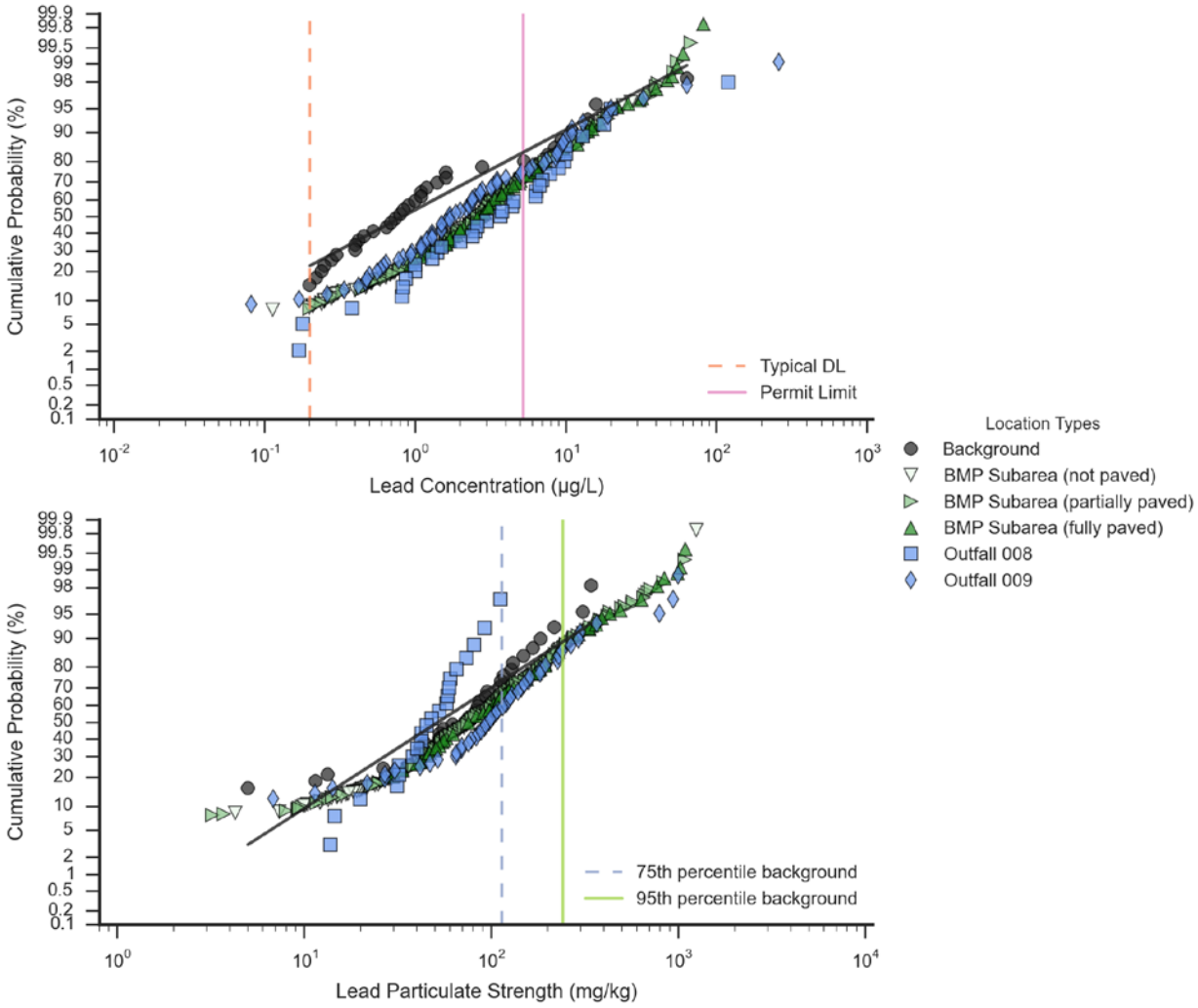

Figure 5. Probability plots for lead concentrations and particulate strengths[22]

[22] Following the 2005 wildfires, an uncharacteristically high lead concentration (260 µg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown near the upper right corner of the concentration plot in Figure 5.

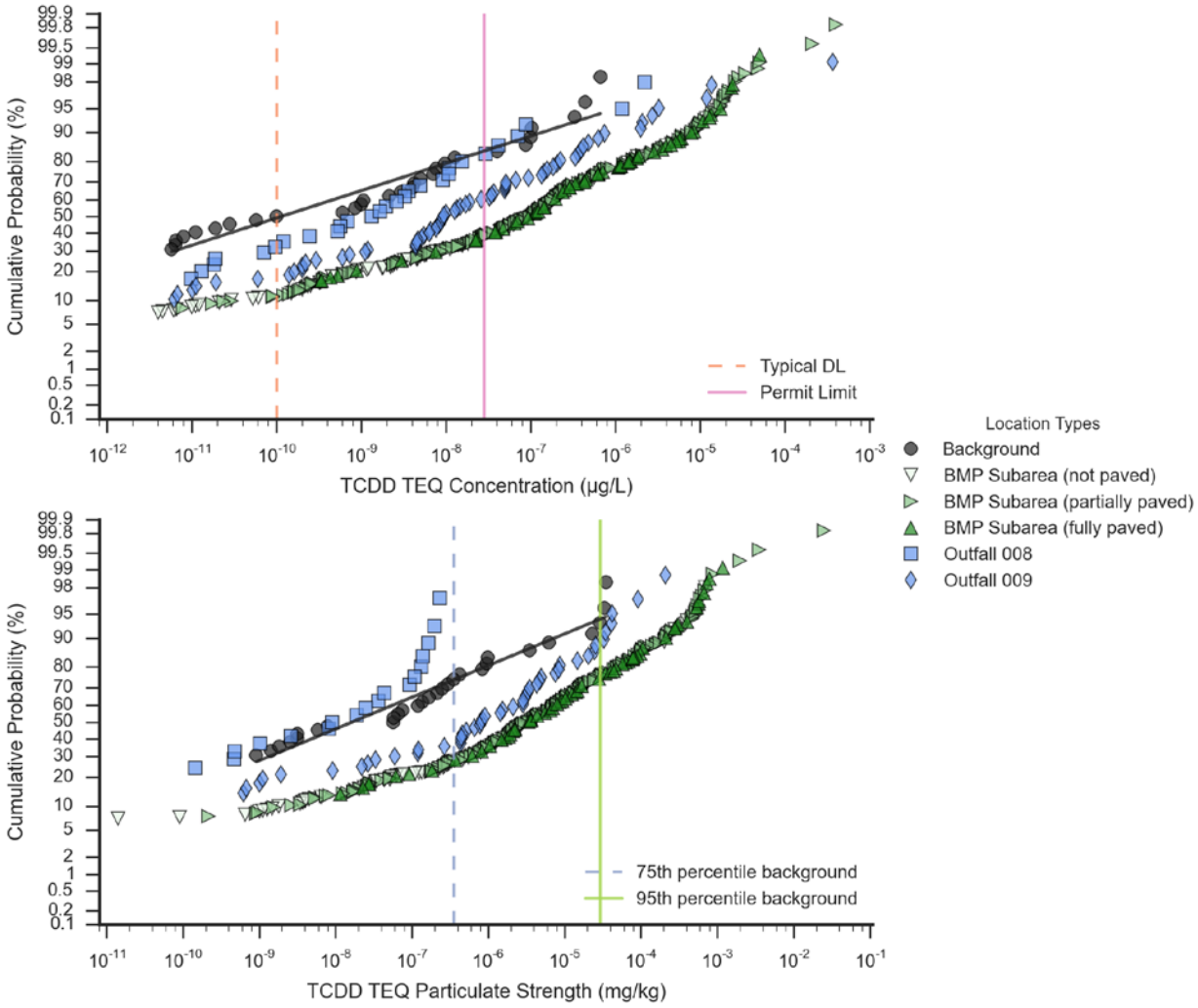

Figure 6. Probability plots for TCDD TEQ concentrations and particulate strengths[23]

[23] Following the 2005 wildfires, an uncharacteristically high TCDD TEQ concentration (3.6×10^{-4} µg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown in the upper right corner of the concentration plot in Figure 6.

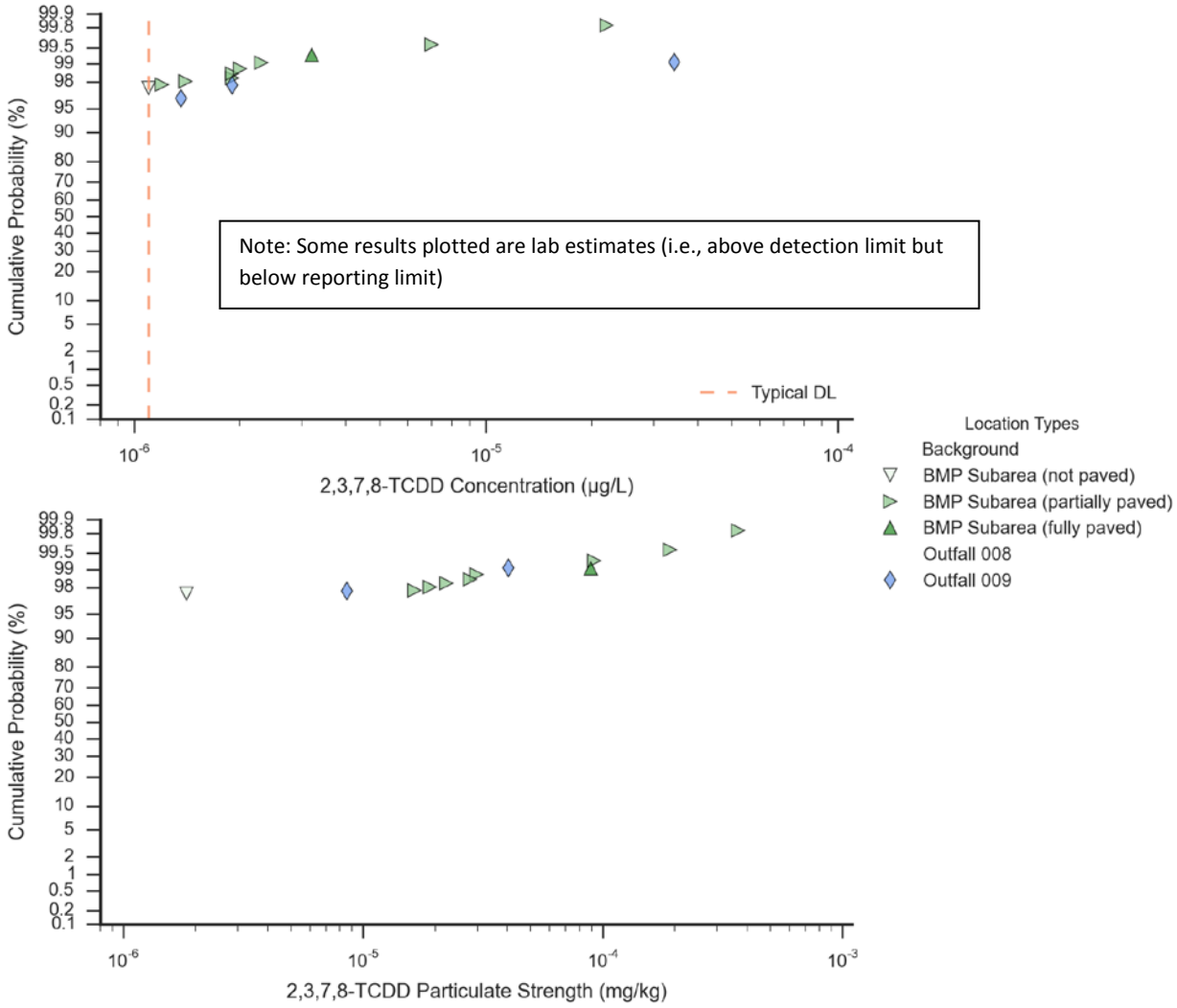

Figure 7. Probability plots for 2,3,7,8-TCDD concentrations and particulate strengths[24]

[24] Following the 2005 wildfires, an uncharacteristically high 2,3,7,8-TCDD concentration (3.4×10^{-5} µg/L) was measured at Outfall 009 on 10/17/2005. This data point is shown in the upper right corner of the concentration plot in Figure 7.

5. SUBAREA RANKING ANALYSIS

Subareas were ranked based on the results of comparisons between (a) stormwater concentrations and permit limits, and (b) stormwater particulate strengths and stormwater background particulate strengths to identify potential stormwater control locations. A statistical methodology was developed to rank the subareas based on these comparison results, while accounting for the number of useable data available at each subarea as well as number of data observations that fall above these thresholds (i.e., reflecting statistical confidence in how frequently each subarea will exceed the comparison thresholds). This methodology relies on "weighting factors" that are calculated for each COC for each subarea. The potential BMP subareas have been weighted based on general guidelines for small sample sets. The weighting methodology is described in more detail in Section 5 of the 2012 BMP Subarea Ranking Analysis Memo (Santa Susana Site Surface Water Expert Panel and Geosyntec Consultants, 2012).

In the end, the pollutant-specific weighting factors are summed to produce a multi-constituent score to allow for relative ranking amongst the potential BMP subareas. The highest ranked subareas are then recommended for consideration for new or enhanced stormwater control placement. In the case of ties, the average of the ranks is assigned to both subareas. Results for each BMP subarea and background monitoring subarea are summarized in Tables 6, 7, and 8 (subareas are organized by weight, ranked highest to lowest).

Table 6. Metals Weighting Factor Results, by Subarea

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Metal Weight
1	**ILBMP0002**	Outfall 009	Road runoff to CM-9, before treatment	0.98
2	**EVBMP0003** (A2SW0001)	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	0.93
3	**EVBMP0004**	Outfall 009	2012/2013 Lower Helipad Road	0.89
4	**A1SW0009-A**	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.75
5.5	**APBMP0001-A**	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.69
5.5	**APBMP0001**	Outfall 009	Area II Road runoff, pre-ELV stormwater improvements - OLD	0.69
10.5	**EVBMP0006**	Outfall 009	2012/2013 Area II Road near ELV ditch	0.50
10.5	B1SW0014-A	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	0.50
10.5	**B1SW0002**	Outfall 009	Woolsey Canyon Road Runoff, before treatment	0.50
10.5	HZSW0020 (HZSW0017)	Outfall 008	Background - Happy Valley upstream	0.50
10.5	**B1BMP0001** (B1SW0010)	Outfall 009	B-1 media filter inlet (pre-media filter installation)	0.50

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Metal Weight
10.5	LPBMP0001	Outfall 009	Lower Lot sheetflow (pre-gravel bag berms) - OLD	0.50
10.5	A1BMP0001	Outfall 009	A1LF downstream, before treatment	0.50
10.5	LXBMP0004	Outfall 009	LOX southwest downstream of sandbag berm	0.50
15.5	**EVBMP0002**	Outfall 009	Helipad (pre-sandbag berms) - OLD	0.39
15.5	**A1SW0009-B**	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.39
19	EVBMP0005	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	0.31
19	APSW0014	Outfall 009	AP/STP-1ABCDE downstream	0.31
19	EVBMP0009	Outfall 009	Influent to ELV media filter, before treatment	0.31
19	LXBMP0002	Outfall 009	LOX mid - OLD	0.31
19	HZSW0011	Outfall 008	Background - Happy Valley upstream	0.31
22	A1BMP0002-A (A1SW0004-A)	Outfall 009	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	0.23
23	EVBMP0007	Outfall 009	Influent to ELV sedimentation, before treatment	0.19
24	**LPBMP0001-A**	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	0.17
25	**ILBMP0001**	Outfall 009	Lower parking lot 24" stormdrain bypass	0.15
29.5	A2BMP0004	Outfall 009	Tributary drainage ds of Helipad culvert outlet	0.11
29.5	LXBMP0006 (LXSW0010)	Outfall 009	LOX east, runoff along dirt road	0.11
29.5	BGBMP0004	Outfall 009	Background - Sage Ranch near CM-5	0.11
29.5	BGBMP0002 (LXSW0003)	Outfall 009	Background - CM-3 upstream, before treatment	0.11
29.5	LFSW0002-A	Outfall 009	CTLI downstream (post-ISRA excavation)	0.11
29.5	EVBMP0003-A	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	0.11
29.5	A1SW0009-C (A1BMP0003)	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	0.11
29.5	HZBMP0002 (HZSW0004)	Outfall 008	DRG downstream	0.11
34	LPBMP0002	Outfall 009	Lower parking lot influent to cistern, before treatment	0.09
35	LXBMP0005	Outfall 009	LOX southeast downstream of sandbag berm	0.05
37	BGBMP0001 (A2BMP0006, A2SW0007)	Outfall 009	Background - CM-1 upstream east tributary, before treatment	0.04
37	A2BMP0005	Outfall 009	Tributary drainage u/s of CM-1 confluence	0.04
37	B1SW0014-B	Outfall 009	B-1 media filter effluent (post-media filter reconstruction) - OLD	0.04
40	LXBMP0003	Outfall 009	LOX east tributary - OLD	0.03
40	**BGBMP0006** (A2SW0006)	Outfall 009	Background - CM-1 upstream east tributary (ponded footprint), before treatment	0.03
40	LPBMP0003	Outfall 009	Lower parking lot sediment basin outlet, before treatment	0.03

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Metal Weight
42	**EVBMP0001-A**	Outfall 009	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	0.02
43	**HZBMP0001** (HZSW0007)	Outfall 008	Happy Valley downstream (pre-improvements) - OLD	0.02
44	**A2SW0002**	Outfall 009	CM-1 effluent (pre-filter fabric over weir boards) - OLD	0.01
46.5	EVBMP0002-B	Outfall 009	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	0.01
46.5	EVBMP0002-A	Outfall 009	Helipad (post-sandbag berms) - OLD	0.01
46.5	**BGBMP0007** (LXSW0001)	Outfall 009	Background - CM-3 upstream, before treatment	0.01
46.5	**A2SW0002-A** (A2BMP0007)	Outfall 009	CM-1 effluent (post-filter fabric over weir boards)	0.01
49	**A1SW0002**	Outfall 009	Background - CM-8 upstream, before treatment	0.01
50	LXSW0002	Outfall 009	CM-3 downstream (pre-filter fabric over weir boards) - OLD	0.00
51	**B1BMP0004** (B1BMP0004-5, B1SW0015)	Outfall 009	B-1 media filter inlet north, before treatment	0.00
52.5	**LPBMP0004**	Outfall 009	Lower parking lot biofilter outlet	0.00
52.5	A2BMP0003	Outfall 009	Tributary drainage u/s of ND confluence	0.00
54.5	**A1SW0003**	Outfall 009	CM-8 downstream (pre-filter fabric over weir boards) - OLD	0.00
54.5	**A1SW0005**	Outfall 009	CM-9 downstream (pre-filter fabric over weir boards) - OLD	0.00
56	**A1BMP0002** (A1SW0004)	Outfall 009	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	0.00
57	**HZBMP0003** (HZSW0003)	Outfall 008	DRG downstream (furthest downstream)	0.00
58	Outfall 008**	Outfall 008	NPDES Outfall 008	0.00
59	**B1BMP0003** (B1BMP0002)	Outfall 009	B-1 parking lot / road runoff to culvert inlet	0.00
60	B1SW0014-C (B1BMP0006)	Outfall 009	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	0.00
61	**B1BMP0005** (B1BMP0004-5, B1SW0011, B1SW0013)	Outfall 009	B-1 media filter inlet south, before treatment	0.00
62	**Outfall 009****	Outfall 009	NPDES Outfall 009	0.00
72	**ILBMP0003**	Outfall 009	A1LF parking lot - OLD	0.00
72	EVBMP0008	Outfall 009	Effluent from ELV stormwater treatment BMP	0.00
72	LXBMP0009 (LXSW0009)	Outfall 009	LOX, inlet to eastern slope drain	0.00
72	BGBMP0005	Outfall 009	Background - Sage Ranch near entrance	0.00
72	BGBMP0003	Outfall 009	Background - Sage Ranch near LOX	0.00
72	HZSW0005	Outfall 008	DRG upstream	0.00
72	HZSW0008	Outfall 008	Background - Happy Valley upstream	0.00

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Metal Weight
72	A1SW0006	Outfall 009	Background - CM-11 upstream, before treatment	0.00
72	ILBMP0007	Outfall 009	NE Detention Bioswale Effluent	0.00
72	B1SW0008	Outfall 009	B-1 upstream	0.00
72	A2BMP0002	Outfall 009	A2LF road runoff	0.00
72	HZSW0012	Outfall 008	Background - Happy Valley upstream	0.00
72	HZSW0014	Outfall 008	Happy Valley upstream	0.00
72	B1BMP0007	Outfall 009	B-1, vegetated channel	0.00
72	ILSW0008	Outfall 009	IEL-2 downstream (2014/2015 season)	0.00
72	ILSW0007	Outfall 009	IEL-2 upstream (2014/2015 season)	0.00
72	ILSW0004-A	Outfall 009	IEL-2 downstream (post-ISRA excavation)	0.00
72	A1SW0007	Outfall 009	CM-11 downstream (pre-filter fabric over weir boards) - OLD	0.00
72	ILSW0003	Outfall 009	IEL-2 upstream	0.00

Notes

- Potential BMP subareas sorted by maximum weight for the COC group, computed as described in Section 5.
- (**)NPDES outfalls are included for comparison and method testing purposes only; stormwater controls are not being contemplated at these locations.
- The rounding of weights may account for similar weights being ranked differently.
- **Bolded** locations indicate that both the metals NPDES permit limit and 95th percentile background particulate strength threshold were exceeded (for at least one metals COC).
- Gray text indicates historic subarea monitoring locations that are discontinued.
- Monitoring locations with zero samples collected are excluded from this table.

Table 7. Dioxins Weighting Factor Results, by Subarea

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Dioxin Weight
1	**EVBMP0003** (A2SW0001)	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	1.00
2	**B1BMP0004** (B1BMP0004-5, B1SW0015)	Outfall 009	B-1 media filter inlet north, before treatment	1.00
3	**LPBMP0001-A**	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	0.98
4	**B1BMP0003** (B1BMP0002)	Outfall 009	B-1 parking lot / road runoff to culvert inlet	0.98
5	**ILBMP0002**	Outfall 009	Road runoff to CM-9, before treatment	0.96
6	**EVBMP0005**	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	0.94
7	**EVBMP0002**	Outfall 009	Helipad (pre-sandbag berms) - OLD	0.93
8	**ILBMP0001**	Outfall 009	Lower parking lot 24" stormdrain bypass	0.91
9	**EVBMP0003-A**	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	0.89
10	**B1SW0008**	Outfall 009	B-1 upstream	0.69
11	**A2BMP0005**	Outfall 009	Tributary drainage u/s of CM-1 confluence	0.64
12	**A1SW0009-B**	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.63
13	**LPBMP0002**	Outfall 009	Lower parking lot influent to cistern, before treatment	0.61
14	**EVBMP0001-A**	Outfall 009	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	0.59
15	**B1BMP0005** (B1BMP0004-5, B1SW0011, B1SW0013)	Outfall 009	B-1 media filter inlet south, before treatment	0.56
22	ILBMP0007	Outfall 009	NE detention bioswale effluent	0.87
22	**LFSW0002-A**	Outfall 009	CTLI downstream (post-ISRA excavation)	0.50
22	LPBMP0001	Outfall 009	Lower Lot sheetflow (pre-gravel bag berms) - OLD	0.50
22	B1SW0014-B	Outfall 009	B-1 media filter effluent (post-media filter reconstruction) - OLD	0.50
22	B1SW0014-A	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	0.50
22	**B1SW0002**	Outfall 009	Woolsey Canyon Road Runoff, before treatment	0.50
22	EVBMP0006	Outfall 009	2012/2013 Area II Road near ELV ditch	0.50
22	**EVBMP0007**	Outfall 009	Influent to ELV sedimentation, before treatment	0.50

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Dioxin Weight
22	A1SW0009-A	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.50
22	APBMP0001-A	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.50
22	APBMP0001	Outfall 009	Area II Road runoff, pre-ELV stormwater improvements - OLD	0.50
22	LXBMP0002	Outfall 009	LOX mid - OLD	0.50
22	**LPBMP0003**	Outfall 009	Lower parking lot sediment basin outlet, before treatment	0.50
29	**A2SW0002**	Outfall 009	CM-1 effluent (pre-filter fabric over weir boards) - OLD	0.43
30	**B1BMP0007**	Outfall 009	B1, vegetated channel	0.41
31.5	**A1BMP0002-A** (A1SW0004-A)	Outfall 009	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	0.38
31.5	**EVBMP0002-B**	Outfall 009	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	0.38
34	B1BMP0001 (B1SW0010)	Outfall 009	B-1 media filter inlet (pre-media filter installation)	0.34
34	A2BMP0004	Outfall 009	Tributary drainage ds of Helipad culvert outlet	0.34
34	**EVBMP0004**	Outfall 009	2012/2013 Lower Helipad Road	0.34
36.5	EVBMP0009	Outfall 009	Influent to ELV media filter, before treatment	0.31
36.5	APSW0014	Outfall 009	AP/STP-1ABCDE downstream	0.31
38	**B1SW0014-C** (B1BMP0006)	Outfall 009	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	0.28
39.5	EVBMP0002-A	Outfall 009	Helipad (post-sandbag berms) - OLD	0.17
39.5	**LXBMP0005**	Outfall 009	LOX southeast downstream of sandbag berm	0.17
41	A1SW0009-C (A1BMP0003)	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	0.14
42	**A2SW0002-A** (A2BMP0007)	Outfall 009	CM-1 effluent (post-filter fabric over weir boards)	0.13
44	BGBMP0004	Outfall 009	Background - Sage Ranch near CM-5	0.11
44	EVBMP0008	Outfall 009	Effluent from ELV stormwater treatment BMP	0.11
44	LXBMP0006 (LXSW0010)	Outfall 009	LOX east, runoff along dirt road	0.11
46	**A2BMP0003**	Outfall 009	Tributary drainage u/s of ND confluence	0.11
47	LXBMP0003	Outfall 009	LOX east tributary - OLD	0.07
48.5	**A1BMP0001**	Outfall 009	A1LF downstream, before treatment	0.05

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Dioxin Weight
48.5	**A1SW0005**	Outfall 009	CM-9 downstream (pre-filter fabric over weir boards) - OLD	0.05
50	BGBMP0002 (LXSW0003)	Outfall 009	Background - CM-3 upstream, before treatment	0.04
51	**BGBMP0006** (A2SW0006)	Outfall 009	Background - CM-1 upstream east tributary (ponded footprint), before treatment	0.03
52.5	**A1SW0007**	Outfall 009	CM-11 downstream (pre-filter fabric over weir boards) - OLD	0.01
52.5	**A1SW0006**	Outfall 009	Background - CM-11 upstream, before treatment	0.01
54	LPBMP0004	Outfall 009	Lower parking lot biofilter outlet	0.01
55.5	BGBMP0003	Outfall 009	Background - Sage Ranch near LOX	0.01
55.5	LXBMP0004	Outfall 009	LOX southwest downstream of sandbag berm	0.01
57	**LXSW0002**	Outfall 009	CM-3 downstream (pre-filter fabric over weir boards) - OLD	0.00
58	A1BMP0002 (A1SW0004)	Outfall 009	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	0.00
59	**HZBMP0003** (HZSW0003)	Outfall 008	DRG downstream (furthest downstream)	0.00
60	HZBMP0001 (HZSW0007)	Outfall 008	Happy Valley downstream (pre-improvements) - OLD	0.00
61	**Outfall 009****	Outfall 009	NPDES Outfall 009	0.00
62	Outfall 008**	Outfall 008	NPDES Outfall 008	0.00
72	BGBMP0001 (A2BMP0006, A2SW0007)	Outfall 009	Background - CM-1 upstream east tributary, before treatment	0.00
72	A1SW0002	Outfall 009	Background - CM-8 upstream, before treatment	0.00
72	LXBMP0009 (LXSW0009)	Outfall 009	LOX, inlet to eastern slope drain	0.00
72	A2BMP0002	Outfall 009	A2LF road runoff	0.00
72	A1SW0003	Outfall 009	CM-8 downstream (pre-filter fabric over weir boards) - OLD	0.00
72	BGBMP0007 (LXSW0001)	Outfall 009	Background - CM-3 upstream, before treatment	0.00
72	ILSW0004-A	Outfall 009	IEL-2 downstream (post-ISRA excavation)	0.00
72	ILSW0003	Outfall 009	IEL-2 upstream	0.00
72	ILBMP0003	Outfall 009	A1LF parking lot - OLD	0.00
72	BGBMP0005	Outfall 009	Background - Sage Ranch near entrance	0.00
72	HZSW0020 (HZSW0017)	Outfall 008	Background - Happy Valley upstream	0.00
72	HZSW0014	Outfall 008	Happy Valley upstream	0.00
72	HZSW0012	Outfall 008	Background - Happy Valley upstream	0.00
72	HZSW0011	Outfall 008	Background - Happy Valley upstream	0.00

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	Maximum Dioxin Weight
72	HZSW0008	Outfall 008	Background - Happy Valley upstream	0.00
72	HZSW0005	Outfall 008	DRG upstream	0.00
72	HZBMP0002 (HZSW0004)	Outfall 008	DRG downstream	0.00
72	ILSW0008	Outfall 009	IEL-2 downstream (2014/2015 season)	0.00
72	ILSW0007	Outfall 009	IEL-2 upstream (2014/2015 season)	0.00

Notes

- Potential BMP subareas sorted by maximum weight for the COC group, computed as described in Section 5.
- (**)NPDES outfalls are included for comparison and method testing purposes only; stormwater controls are not being contemplated at these locations.
- The rounding of weights may account for similar weights being ranked differently.
- **Bolded** locations indicate that both the dioxins NPDES permit limit and 95th percentile background particulate strength threshold were exceeded (for at least one dioxin COC).
- Gray text indicates historic subarea monitoring locations that are discontinued.
- Locations with zero samples collected are excluded from this table.

Table 8. TSS Weighting Factor Results, by Subarea

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	TSS Weight
1	LXBMP0004	Outfall 009	LOX southwest downstream of sandbag berm	0.97
2	B1BMP0001 (B1SW0010)	Outfall 009	B-1 media filter inlet (pre-media filter installation)	0.87
3	APBMP0001-A	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.75
12.5	LXBMP0003	Outfall 009	LOX east tributary - OLD	0.50
12.5	LFSW0002-A	Outfall 009	CTLI downstream (post-ISRA excavation)	0.50
12.5	LPBMP0001	Outfall 009	Lower Lot sheetflow (pre-gravel bag berms) - OLD	0.50
12.5	EVBMP0006	Outfall 009	2012/2013 Area II Road near ELV ditch	0.50
12.5	A2BMP0004	Outfall 009	Tributary drainage ds of Helipad culvert outlet	0.50
12.5	LXBMP0002	Outfall 009	LOX mid - OLD	0.50
12.5	APSW0014	Outfall 009	AP/STP-1ABCDE downstream	0.50
12.5	B1SW0014-A	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	0.50
12.5	LXBMP0005	Outfall 009	LOX southeast downstream of sandbag berm	0.50
12.5	LXBMP0006 (LXSW0010)	Outfall 009	LOX east, runoff along dirt road	0.50
12.5	HZSW0020 (HZSW0017)	Outfall 008	Background - Happy Valley upstream	0.50
12.5	BGBMP0004	Outfall 009	Background - Sage Ranch near CM-5	0.50
12.5	HZBMP0001 (HZSW0007)	Outfall 008	Happy Valley downstream (pre-improvements) - OLD	0.50
12.5	ILSW0004-A	Outfall 009	IEL-2 downstream (post-ISRA excavation)	0.50
12.5	LPBMP0003	Outfall 009	Lower parking lot sediment basin outlet, before treatment	0.50
12.5	ILSW0003	Outfall 009	IEL-2 upstream	0.50
12.5	B1SW0008	Outfall 009	B-1 upstream	0.50
12.5	B1SW0002	Outfall 009	Woolsey Canyon Road Runoff, before treatment	0.50
22	Outfall 008**	Outfall 008	NPDES Outfall 008	0.50
24	A1SW0009-B	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.34
24	LPBMP0001-A	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	0.34
24	A1BMP0002-A (A1SW0004-A)	Outfall 009	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	0.34
27	A2BMP0005	Outfall 009	Tributary drainage u/s of CM-1 confluence	0.31
27	A1SW0009-C (A1BMP0003)	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	0.31
27	BGBMP0002 (LXSW0003)	Outfall 009	Background - CM-3 upstream, before treatment	0.31

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	TSS Weight
29	EVBMP0003 (A2SW0001)	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	0.24
30	LPBMP0002	Outfall 009	Lower parking lot influent to cistern, before treatment	0.23
31	EVBMP0001-A	Outfall 009	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	0.17
32	A2BMP0003	Outfall 009	Tributary drainage u/s of ND confluence	0.14
33	ILBMP0002	Outfall 009	Road runoff to CM-9, before treatment	0.13
34	EVBMP0002	Outfall 009	Helipad (pre-sandbag berms) - OLD	0.11
35	BGBMP0006 (A2SW0006)	Outfall 009	Background - CM-1 upstream east tributary (ponded footprint), before treatment	0.06
36	A1SW0005	Outfall 009	CM-9 downstream (pre-filter fabric over weir boards) - OLD	0.05
37	LPBMP0004	Outfall 009	Lower parking lot biofilter outlet	0.04
38	B1BMP0003 (B1BMP0002)	Outfall 009	B-1 parking lot / road runoff to culvert inlet	0.04
39	A1BMP0002 (A1SW0004)	Outfall 009	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	0.04
40.5	HZBMP0003 (HZSW0003)	Outfall 008	DRG downstream (furthest downstream)	0.02
40.5	LXSW0002	Outfall 009	CM-3 downstream (pre-filter fabric over weir boards) - OLD	0.02
42	ILBMP0001	Outfall 009	Lower parking lot 24" stormdrain bypass	0.02
43	B1BMP0004 (B1BMP0004-5, B1SW0015)	Outfall 009	B-1 media filter inlet north, before treatment	0.01
44.5	A2SW0002-A (A2BMP0007)	Outfall 009	CM-1 effluent (post-filter fabric over weir boards)	0.01
44.5	A1SW0002	Outfall 009	Background - CM-8 upstream, before treatment	0.01
46	B1BMP0005 (B1BMP0004-5, B1SW0011, B1SW0013)	Outfall 009	B-1 media filter inlet south, before treatment	0.00
47	A2SW0002	Outfall 009	CM-1 effluent (pre-filter fabric over weir boards) - OLD	0.00
48	Outfall 009**	Outfall 009	NPDES Outfall 009	0.00
65	ILBMP0007	Outfall 009	NE Detention Bioswale Effluent	0.00
65	ILSW0007	Outfall 009	IEL-2 upstream (2014/2015 season)	0.00
65	ILSW0008	Outfall 009	IEL-2 downstream (2014/2015 season)	0.00
65	HZSW0014	Outfall 008	Happy Valley upstream	0.00
65	LXBMP0009 (LXSW0009)	Outfall 009	LOX, inlet to eastern slope drain	0.00
65	ILBMP0003	Outfall 009	A1LF parking lot - OLD	0.00
65	HZSW0012	Outfall 008	Background - Happy Valley upstream	0.00
65	A1BMP0001	Outfall 009	A1LF downstream, before treatment	0.00

Rank	Potential BMP Subarea (Co-location)	Watershed	Description	TSS Weight
65	HZSW0008	Outfall 008	Background - Happy Valley upstream	0.00
65	A1SW0003	Outfall 009	CM-8 downstream (pre-filter fabric over weir boards) - OLD	0.00
65	A1SW0006	Outfall 009	Background - CM-11 upstream, before treatment	0.00
65	A1SW0007	Outfall 009	CM-11 downstream (pre-filter fabric over weir boards) - OLD	0.00
65	A1SW0009-A	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	0.00
65	A2BMP0002	Outfall 009	A2LF road runoff	0.00
65	APBMP0001	Outfall 009	Area II Road runoff, pre-ELV stormwater improvements - OLD	0.00
65	B1BMP0007	Outfall 009	B1, vegetated channel	0.00
65	B1SW0014-B	Outfall 009	B-1 media filter effluent (post-media filter reconstruction) - OLD	0.00
65	B1SW0014-C (B1BMP0006)	Outfall 009	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	0.00
65	BGBMP0001 (A2BMP0006, A2SW0007)	Outfall 009	Background - CM-1 upstream east tributary, before treatment	0.00
65	HZSW0011	Outfall 008	Background - Happy Valley upstream	0.00
65	BGBMP0003	Outfall 009	Background - Sage Ranch near LOX	0.00
65	BGBMP0007 (LXSW0001)	Outfall 009	Background - CM-3 upstream, before treatment	0.00
65	EVBMP0002-A	Outfall 009	Helipad (post-sandbag berms) - OLD	0.00
65	EVBMP0003-A	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	0.00
65	EVBMP0004	Outfall 009	2012/2013 Lower Helipad Road	0.00
65	EVBMP0005	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	0.00
65	EVBMP0007	Outfall 009	Influent to ELV sedimentation, before treatment	0.00
65	EVBMP0008	Outfall 009	Effluent from ELV stormwater treatment BMP	0.00
65	EVBMP0009	Outfall 009	Influent to ELV media filter, before treatment	0.00
65	HZBMP0002 (HZSW0004)	Outfall 008	DRG downstream	0.00
65	HZSW0005	Outfall 008	DRG upstream	0.00
65	BGBMP0005	Outfall 009	Background - Sage Ranch near entrance	0.00
65	EVBMP0002-B	Outfall 009	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	0.00

Notes

- (**)NPDES outfalls are included for comparison and method testing purposes only, stormwater controls are not being contemplated at these locations.
- The rounding of weights may account for similar weights being ranked differently.
- Gray text indicates historic subarea monitoring locations that are discontinued.
- Locations with zero samples collected are excluded from this table.

A "multi-constituent" score was then calculated for each potential BMP subarea monitoring location by taking the arithmetic mean of the maximum metals and the maximum dioxins weighting factor values (Table 9). These two pollutant category values were weighted equally for the multi-constituent score based on their very roughly comparable relative exceedance probabilities at Outfalls 008 and 009 -- the dioxins (TCDD TEQ) permit limit exceedance probability is approximately 18% at Outfall 008 and approximately 40% at Outfall 009, while the lead (most problematic metal) permit limit exceedance probability is approximately 40% at Outfall 008 and approximately 25% at Outfall 009. 2,3,7,8-TCDD was not detected in the 2014/2015 rainy season at any of the sampled locations.

A complete summary of the weights computed by potential BMP subarea monitoring location (including number of samples, number of NDs, median, maximum, comparison to background percentiles, weight, and rank) is included as Appendix A. For purposes of comparison, the Permit limit for TCDD TEQ has also been applied to 2,3,7,8-TCDD results.

Table 9. Subareas Ranked by Multi-Constituent Score

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
1	**ILBMP0002**	Outfall 009	Road runoff to CM-9, before treatment	2.5	0.97	1	5	13	3
2	**EVBMP0003 (A2SW0001)**	Outfall 009	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	13.3	0.97	2	1	18	0
3	**EVBMP0002**	Outfall 009	Helipad (pre-sandbag berms) - OLD	4.1	0.66	15.5	7	6	0
4.5	EVBMP0005	Outfall 009	2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD	11.0	0.63	19	6	2	0
4.5	A1SW0009-A	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	0.63	4	22.5	1	0
6	EVBMP0004	Outfall 009	2012/2013 Lower Helipad Road	1.8	0.62	3	34	3	0
7.5	**APBMP0001-A**	Outfall 009	Area II Road runoff, post-ELV stormwater improvements	0.20	0.60	5.5	22.5	2	1
7.5	**APBMP0001**	Outfall 009	Area II Road runoff, pre-ELV stormwater improvements - OLD	32.9	0.60	5.5	22.5	2	0
9	LPBMP0001-A	Outfall 009	Lower Lot sheetflow (post-gravel bag berms)	5.1	0.58	24	3	6	0
10	**ILBMP0001**	Outfall 009	Lower parking lot 24" stormdrain bypass	23.0	0.53	25	8	23	5
11	A1SW0009-B	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	16.4	0.51	15.5	13	6	0
14.5	**EVBMP0003-A**	Outfall 009	CM-1 upstream west, post-ELV improvements, before treatment	2.3	0.50	29.5	9	3	1
14.5	LPBMP0001	Outfall 009	Lower Lot sheetflow (pre-gravel bag	5.1	0.50	10.5	22.5	2	0

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
			berms) - OLD						
14.5	B1SW0014-A	Outfall 009	B-1 media filter effluent (pre-media filter reconstruction) - OLD	4.7	0.50	10.5	22.5	1	0
14.5	EVBMP0006	Outfall 009	2012/2013 Area II Road near ELV ditch	11.0	0.50	10.5	22.5	1	0
14.5	B1SW0002	Outfall 009	Woolsey Canyon Road Runoff, before treatment	1.3	0.50	10.5	22.5	2	0
14.5	**B1BMP0004 (B1BMP0004-5,** B1SW0015**)**	Outfall 009	B-1 media filter inlet north, before treatment	3.7	0.50	51	2	16	4
18	**B1BMP0003** (B1BMP0002)	Outfall 009	B-1 parking lot / road runoff to culvert inlet	5.2	0.49	59	4	21	3
19	B1BMP0001 (B1SW0010)	Outfall 009	B-1 media filter inlet (pre-media filter installation)	4.5	0.42	10.5	34	3	0
20	LXBMP0002	Outfall 009	LOX mid - OLD	1.5	0.40	19	22	2	0
21	**LPBMP0002**	Outfall 009	Lower parking lot influent to cistern, before treatment	4.2	0.35	34	14	7	5
22.5	**EVBMP0007**	Outfall 009	Influent to ELV sedimentation, before treatment	55.3	0.35	23	22.5	3	2
22.5	B1SW0008	Outfall 009	B-1 upstream	0.79	0.35	72	11	2	0
24	**A2BMP0005**	Outfall 009	Tributary drainage u/s of CM-1 confluence	35.0	0.34	37	12	4	0
25.5	APSW0014	Outfall 009	AP/STP-1ABCDE downstream	32.3	0.31	19	36.5	2	1
25.5	EVBMP0009	Outfall 009	Influent to ELV media filter, before treatment	55.3	0.31	19	36.5	2	2
27.5	LFSW0002-A	Outfall 009	CTLI downstream (post-ISRA excavation)	5.1	0.31	29.5	22.5	3	0
27.5	**A1BMP0002-A** (A1SW0004-A)	Outfall 009	CM-9 upstream toward A1LF (post-A1LF asphalt removal), before treatment	6.3	0.31	22	31.5	6	2

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
29	**EVBMP0001-A**	Outfall 009	ELV culvert inlet (helipad road and ELV ditch, overflow from ELV treatment BMP sediment basin, composite)	55.3	0.30	42	15	10	0
30	**B1BMP0005 (B1BMP0004-5, B1SW0011, B1SW0013)**	Outfall 009	B-1 media filter inlet south, before treatment	0.80	0.28	61	16	21	5
31	**A1BMP0001**	Outfall 009	A1LF downstream, before treatment	1.2	0.28	10.5	48.5	5	0
32	B1SW0014-B	Outfall 009	B-1 media filter effluent (post-media filter reconstruction) - OLD	4.7	0.27	37	22.5	4	0
33	**LPBMP0003**	Outfall 009	Lower parking lot sediment basin outlet, before treatment	4.2	0.27	40	22.5	7	5
34	LXBMP0004	Outfall 009	LOX southwest downstream of sandbag berm	10.6	0.26	10.5	55.5	5	0
35.5	HZSW0020 (HZSW0017)	Outfall 008	Background - Happy Valley upstream	0.20	0.25	10.5	72	2	0
35.5	ILBMP0007	Outfall 009	NE detention bioswale effluent	3.7	0.25	72	22	1	1
37	A2BMP0004	Outfall 009	Tributary drainage ds of Helipad culvert outlet	4.2	0.23	29.5	34	3	0
38	**A2SW0002**	Outfall 009	CM-1 effluent (pre-filter fabric over weir boards) - OLD	52.8	0.22	44	29	16	0
39	**B1BMP0007**	Outfall 009	B-1, vegetated channel	47.7	0.20	72	30	9	5
40	**EVBMP0002-B**	Outfall 009	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	9.2	0.20	46.5	31.5	5	0
41	HZSW0011	Outfall 008	Background - Happy Valley upstream	0.10	0.16	19	72	2	0
42	**B1SW0014-C (B1BMP0006)**	Outfall 009	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	3.6	0.14	60	38	13	5
43	A1SW0009-C (A1BMP0003)	Outfall 009	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-	9.9	0.13	29.5	41	4	3

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
			perforated pipe and rip-rap berm)						
44	**LXBMP0005**	Outfall 009	LOX southeast downstream of sandbag berm	2.5	0.11	35	39.5	5	0
45.5	LXBMP0006 (LXSW0010)	Outfall 009	LOX east, runoff along dirt road	0.43	0.11	29.5	44	3	2
45.5	BGBMP0004	Outfall 009	Background - Sage Ranch near CM-5	81.4	0.11	29.5	44	3	0
47	EVBMP0002-A	Outfall 009	Helipad (post-sandbag berms) - OLD	9.2	0.09	46.5	39.5	5	0
48	BGBMP0002 (LXSW0003)	Outfall 009	Background - CM-3 upstream, before treatment	17.2	0.08	29.5	50	4	0
49	**A2SW0002-A (A2BMP0007)**	Outfall 009	CM-1 effluent (post-filter fabric over weir boards)	52.8	0.07	46.5	42	10	1
50.5	EVBMP0008	Outfall 009	Effluent from ELV stormwater treatment BMP	55.3	0.06	72	44	3	2
50.5	HZBMP0002 (HZSW0004)	Outfall 008	DRG downstream	23.2	0.06	29.5	72	4	0
52	**A2BMP0003**	Outfall 009	Tributary drainage u/s of ND confluence	100	0.05	52.5	46	8	0
53	**LXBMP0003**	Outfall 009	LOX east tributary - OLD	0.40	0.05	40	47	6	0
54	**BGBMP0006 (A2SW0006)**	Outfall 009	Background - CM-1 upstream east tributary (ponded footprint), before treatment	41.1	0.03	40	51	7	0
55	**A1SW0005**	Outfall 009	CM-9 downstream (pre-filter fabric over weir boards) - OLD	16.4	0.03	54.5	48.5	10	0
56	BGBMP0001 (A2BMP0006, A2SW0007)	Outfall 009	Background - CM-1 upstream east tributary, before treatment	41.1	0.02	37	72	4	0
57	**HZBMP0001 (HZSW0007)**	Outfall 008	Happy Valley downstream (pre-improvements) - OLD	21.4	0.01	43	60	13	0
58	**LPBMP0004**	Outfall 009	Lower parking lot biofilter outlet	4.4	0.01	52.5	54	8	5
59.5	**A1SW0006**	Outfall 009	Background - CM-11 upstream,	8.3	0.01	72	52.5	12	0

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
			before treatment						
59.5	A1SW0007	Outfall 009	CM-11 downstream (pre-filter fabric over weir boards) - OLD	8.3	0.01	72	52.5	12	0
61.5	BGBMP0003	Outfall 009	Background - Sage Ranch near LOX	23.6	0.01	72	55.5	5	0
61.5	BGBMP0007 (LXSW0001)	Outfall 009	Background - CM-3 upstream, before treatment	17.2	0.01	46.5	72	7	0
63	LXSW0002	Outfall 009	CM-3 downstream (pre-filter fabric over weir boards) - OLD	17.2	0.00	50	57	9	0
64	A1SW0002	Outfall 009	Background - CM-8 upstream, before treatment	2.5	0.00	49	72	10	0
65	**A1BMP0002 (A1SW0004)**	Outfall 009	CM-9 upstream toward A1LF (pre-A1LF asphalt removal), before treatment - OLD	6.3	0.00	56	58	16	0
66	A1SW0003	Outfall 009	CM-8 downstream (pre-filter fabric over weir boards) - OLD	2.5	0.00	54.5	72	10	0
67	HZBMP0003 (HZSW0003)	Outfall 008	DRG downstream (furthest downstream)	29.6	0.00	57	59	15	0
68	Outfall 008**	Outfall 008	NPDES Outfall 008	62.0	0.00	58	62	34	1
69	**Outfall 009****	Outfall 009	NPDES Outfall 009	536	0.00	62	61	74	3
75.5	HZSW0008	Outfall 008	Background - Happy Valley upstream	NA/small	0.00	72	72	1	0
75.5	BGBMP0005	Outfall 009	Background - Sage Ranch near entrance	25.0	0.00	72	72	1	0
75.5	LXBMP0009 (LXSW0009)	Outfall 009	LOX, inlet to eastern slope drain	0.60	0.00	72	72	3	2
75.5	ILBMP0003	Outfall 009	A1LF parking lot - OLD	9.5	0.00	72	72	4	0
75.5	A2BMP0002	Outfall 009	A2LF road runoff	3.6	0.00	72	72	1	0
75.5	HZSW0012	Outfall 008	Background - Happy Valley upstream	0.40	0.00	72	72	1	0
75.5	HZSW0014	Outfall 008	Happy Valley upstream	0.10	0.00	72	72	3	0
75.5	ILSW0008	Outfall 009	IEL-2 downstream (2014/2015 season)	0.40	0.00	72	72	1	1

Rank	Potential BMP Subarea (Co-locations)	Watershed	Description	Approximate Upgradient Drainage Area (ac)	Multi-Constituent Score	Rank from Maximum Metal Weighting	Rank from Maximum Dioxin Weighting	Number of Events Sampled	Number of Events Sampled in 2014/2015
75.5	ILSW0007	Outfall 009	IEL-2 upstream (2014/2015 season)	0.40	0.00	72	72	1	1
75.5	ILSW0004-A	Outfall 009	IEL-2 downstream (post-ISRA excavation)	2.8	0.00	72	72	1	0
75.5	HZSW0005	Outfall 008	DRG upstream	21.0	0.00	72	72	1	0
75.5	ILSW0003	Outfall 009	IEL-2 upstream	2.4	0.00	72	72	2	0

Notes

- Potential BMP subareas sorted by multi-constituent score, computed as described in Section 5.
- (**) NPDES outfalls are included for comparison and method testing purposes only, stormwater controls are not being contemplated at these locations.
- The rounding of weights may account for similar weights being ranked differently.
- Approximate drainage areas based on the cumulative drainage area of the SWMM catchment in which the monitoring location is located (Geosyntec, 2011). At locations where the monitoring point is upstream of the catchment outfall a "<" sign is used.
- **Bolded** locations indicate that both the NPDES permit limit and 95th percentile background particulate strength threshold were exceeded for any one COC.
- Gray text indicates historic subarea monitoring locations that are discontinued.
- "OLD" in the location description means that the location is now sampled under a new suffix (-A, -B, etc.) due to a change in the upstream watershed, typically BMP implementation.

6. RESULTS DISCUSSION

- Dioxins (TCDD TEQ) and lead are the COCs most frequently responsible for producing high dioxins and metals weighting factors, respectively. In the 2014/2015 monitoring season, Permit limit exceedances were only observed at Outfall 009 for these same parameters (TCDD TEQ, no DNQ and lead).
- Table 10 summarizes the key locations that have both an influent and effluent paired location, which includes some of the locations ranked in the top 20 from the multi-constituent ranking analysis. This comparison demonstrates that treatment through the BMPs resulted in improved water quality. For example, two influent streams within the B-1 area (ranked 14.5 and 31) are both ranked higher than the B-1 effluent, which is ranked 42. A similar occurrence is observed for the influent/effluent ranks for CM-1, CM-9, the ELV stormwater treatment BMP, and the lower parking lot sedimentation basin and biofilter. B-1 parking lot and road runoff have been included to more fully describe improvements in the vegetated area downstream of the B-1 media filter B-1 area.
- 2,3,7,8-TCDD was not detected in any samples during the 2014/2015 monitoring season.
- Table 11 summarizes a select subset of locations ranked in the top 20 that are associated with BMP modifications. In most cases, the location rank based on the multi-constituent score fell after the BMP was implemented, demonstrating that BMP implementation has generally resulted in improved water quality.
- Similarly to last year, all CM effluent monitoring locations are ranked lower than (i.e., better water quality) or equal to their most impacted influent streams (i.e., where two influent streams enter a CM, the effluent ranking is lower than or equal to that of the poorer quality influent), indicating that the CMs are performing well. This finding is consistent with the conclusions of the statistical analysis of influent/effluent data in the 2012 Performance Evaluation Memorandum (Geosyntec and Expert Panel, 2012). This finding is also consistent with the fact that, as part of the intended maintenance program, Boeing has removed substantial quantities of sediment that have accumulated in the CMs illustrating continued CM functionality and pollutant removal. However, this finding may also be associated with dilution by the less impacted influent stream.
- The most highly ranked subareas for TSS include LOX southwest, downstream of the sandbag berm (LXBMP0004), B-1 media filter inlet, pre-media filter reconstruction (B1BMP0001 [B1SW0010]), and Area II Road runoff, post-ELV stormwater improvements (APBMP0001-A). Panel-recommended maintenance structures were installed at the LOX area in 2012 as part of the Northern Drainage RMMP. These BMPs included sand bag diversion berm, slope drains to convey flow from the sandbag berms into the Northern Drainage, and rock stabilization at eroded channels and gullies. Minor repairs have been made to the LOX area maintenance structures following completion of the Northern Drainage RMMP including repairing split sand bags at the LOX area. Monitoring location B1BMP0001 is an old influent site to the B-1 media

filter at the south inlet and B1SW0014-C is the effluent monitoring point to B1BMP0001, showing an improvement in TSS ranking through the media filter.

- Most of the top 12 ranked subareas represent drainage areas with either full or mixed runoff contributions from paved surfaces (mostly parking lots and roads). This may indicate that elevated COC concentrations in the 009 watershed may be derived from asphalt itself, or from atmospheric deposition (which occurs relatively evenly across the site) onto directly connected impervious surfaces (e.g., asphalt) which are more efficient at washing off and transporting contaminants than pervious surfaces.

- The top 20-ranked subareas based on the multi-constituent score include thirteen subareas on Boeing property – B1BMP0004 (the B-1 media filter inlet north, before treatment), ILBMP0001 (Lower Lot 24" stormdrain outlet), ILBMP0002 (road runoff to CM-9), A1SW0009-B (CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD), LPBMP0001 and LPBMP0001-A (Lower Lot sheetflow (pre- and post-gravel bag berms)), B1SW0002 (Woolsey Canyon Road runoff, before treatment), B1BMP0001 (B-1 media filter inlet (pre-media filter installation)), A1SW0009-A (CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD), EVBMP0003 and EVBMP0003-A (CM-1 upstream west, pre- and post-ELV improvements, before treatment), B1SW0014-A (B-1 media filter effluent (pre-media filter reconstruction – OLD), and B1BMP0003 (B-1 parking lot/road runoff to culvert inlet). These sites already have robust treatment controls (in the case of ILBMP0001, this is treatment of low flows only; and B1BMP0003 is treated in the downstream vegetated channel). Of these subareas, EVBMP0003 is ranked highest for dioxins.

- Seven subareas in the top 20-ranked subareas are located on NASA property and include EVBMP0002 (Helipad (pre-sandbag berms) - OLD), EVBMP0005 (2012/2013 ELV drainage ditch (pre-ELV-1C ISRA) - OLD), EVBMP0004 (2012/2013 Lower Helipad Road), APBMP0001 and APBMP0001-A (Area II Road runoff, pre- and post-ELV stormwater improvements, respectively), EVBMP0006 (2012/2013 Area II Road near ELV ditch), and LXBMP0002 (LOX mid – OLD). None of these sites are upstream of an existing treatment BMP with the exception of LXBMP0002. EVBMP0004 and EVBMP0005 were discontinued upon the startup of the ELV stormwater treatment BMP. Across all seven monitoring locations, EVBMP0005 was ranked highest for dioxins.

- As shown in Figure 2, channel processes appear to be a significant source of TSS for Watershed 008 (based on observations from previous years) and less so for Watershed 009, where outfall TSS concentrations are near background. Northern Drainage improvements and stabilization measures are expected to continue providing a water quality benefit to these channels, particularly if the upcoming winter is wetter and helps channel vegetation to grow.

- While the analysis approach is concentration based rather than load based, because such a large percentage of the watersheds (and of the watersheds developed or known impacted areas) are

represented by the monitoring locations, the approach roughly addresses load reduction aspects, noting that actual runoff coefficients do vary between subareas.

Table 10. Ranking Comparison of Top Ranked Monitoring Locations and their Pairs

BMP Area	Influent Monitoring Location			Effluent Monitoring Location			Rank Change
	Monitoring Location	Description	Influent Rank	Monitoring Location	Description	Effluent Rank	
CM-9	**ILBMP0002**	Road runoff to CM-9	1	A1SW0009-C (A1BMP0003)	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	43	-42
CM-1	**EVBMP0003-A (A2SW0001)**	CM-1 upstream west	14.5	A2SW0002-A (A2BMP0007)	CM-1 effluent (post-filter fabric over weir boards)	49	-34.5
B-1 Media Filter	**B1BMP0004 (B1SW0015, B1BMP0004-5)**	B-1 media filter inlet north	14.5	B1SW0014-C (B1BMP0006)	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	42	-27.5
	B1BMP0005 (B1SW0013, B1SW0011, B1BMP0004-5)	B-1 media filter inlet south	31				-11
Lower Lot Sediment Basin	LPBMP0002	Lower parking lot influent to cistern	22	LPBMP0003	Lower parking lot sediment basin outlet	34	-12
				LPBMP0004	Lower parking lot biofilter outlet	58	-36
Vegetated Area D/S of B-1 Media Filter	**B1BMP0003 (B1BMP0002)**	B-1 parking lot / road runoff to culvert inlet	18	B1BMP0007	B1, vegetated channel	39	-21
B-1 Media Filter	B1SW0014-C (B1BMP0006)	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	42				3
ELV stormwater Treatment BMP	EVBMP0007	Influent to ELV stormwater treatment BMP	23.5	EVBMP0009	Influent to ELV media filter, before treatment	25.5	-2
				EVBMP0008	Effluent from ELV stormwater treatment BMP	50.5	-27

Notes

- **Bolded** locations indicate that the monitoring location is ranked within the top 20 of the multi-constituent table (Table ES-1).
- Gray text indicates historic subarea monitoring locations that are discontinued.

Table 11. Ranking Comparison of Top Ranked Monitoring Locations Pre- vs. Post-BMP

Original Location Name	Description	Pre-BMP Rank	Suffix	Implementation Date	Description	Post-BMP Rank 1	Suffix	Implementation Date	Description	Post-BMP Rank 2	Suffix	Implementation Date	Description	Current BMP Rank
B1SW0014 (B1BMP0006)	B-1 culvert effluent (no media filter) – OLD	N/A[1]	**-A**	9/1/2011[2]	B-1 media filter effluent (pre-media filter reconstruction) - OLD	14.5	-B	12/16/2011	B-1 media filter effluent (post-media filter reconstruction) - OLD	33	-C	11/2/2012	B-1 media filter effluent (post-media filter reconstruction, post-curb cuts)	42
A1SW0009	CM-9 downstream-underdrain outlet (pre-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	N/A[1]	**-A**	9/1/2012[2]	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	4.5	**-B**	1/20/2012	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD	11	-C	3/1/2013	CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, post-perforated pipe and rip-rap berm)	43
EVBMP0002	Helipad (pre-sandbag berms) - OLD	3	-A	11/14/2011	Helipad (post-sandbag berms) - OLD	47	-B	9/5/2012	Helipad (post-sandbag berms raised, post-drainage holes in asphalt)	40	N/A			
LPBMP0001	Lower Lot sheetflow (pre-gravel bag berms) - OLD	14.5	**-A**	9/26/2011	Lower Lot sheetflow (post-gravel bag berms)	9	N/A							
APBMP0001	Area II Road runoff, pre-ELV stormwater improvements - OLD	7.5	**-A**	11/7/2013	Area II Road runoff, post-ELV stormwater improvements	7.5	N/A							
EVBMP0003 (A2SW0001)	CM-1 upstream west, pre-ELV improvements, before treatment - OLD	2	**-A**	11/1/2013	CM-1 upstream west, post-ELV improvements, before treatment	14.5	N/A							

Notes

- ([1]) "N/A" means there were no samples collected at this location under the specified name designation and therefore the monitoring location is not ranked.
- ([2]) Dates of 9/1/20XX assume work completed in the summer, prior to the start of the rainy season, but are not confirmed.
- **Bold** locations are ranked in the top 20 of the multi-constituent table (Table 9).
- Gray text indicates historic subarea monitoring locations that are discontinued.

7. BMP RECOMMENDATIONS

Subarea Specific Evaluation of Top Ranked Subarea

Based on these analysis results, the following monitoring locations were identified as the highest ranked[25] subareas, with multi-constituent scores ranging from 0.42 to 0.97 out of a maximum score of 1.0 (see Table 9[26]). Scores closer to 1.0 indicate monitoring locations with poorer historic water quality. Besides their multi-constituent scores, the following list is also of significance because it includes:

- Only three of the top twenty monitoring locations (APBMP0001-A, ILBMP0001, and B1BMP0003) are either active (i.e., not discontinued[27]) or are not upstream of an existing BMP (i.e., without downstream stormwater treatment); recommendations for these three sites are provide later in this summary;
- Two (ILBMP0002 and EVBMP0003) of the seven subareas (ILBMP0002, EVBMP0003, A1SW0002-A, B1BMP0005, EVBMP0001-A, HZBMP0001, and Outfall 009) where 2,3,7,8-TCDD[28] was detected (but not quantified) in the 2012/2013 rainy season (2,3,7,8-TCDD was not detected in any samples collected during the 2013/2014 or 2014/2015 rainy seasons);
- The top nine highest ranked monitoring locations for dioxins; and
- The top six highest ranked monitoring locations for metals.

In some cases, these results reflect conditions prior to or following implementation of temporary measures or corrective actions and this is described in parentheses following the location designation. It should be noted that all top 20 monitoring locations described below are located in the Outfall 009 drainage area, with none in the Outfall 008 drainage area. Only one event produced observable runoff and was sampled at Outfall 008 during the current season, for which there were no exceedances, indicating that retention occurred within the watershed during the small storms observed.

Water quality at stormwater background locations was generally good with no location ranked above 36, though there were several instances of concentrations greater than NPDES permit limits at those locations.

The following list of highest ranked subareas contains some historic subarea monitoring locations that are discontinued, indicated by gray text, and no Expert Panel recommendations are provided for these. Monitoring locations were discontinued for a number of reasons, including location improvements,

[25] In the case of ties, the average rank was assigned to both subareas.
[26] Subareas with zero samples have been excluded from Table 9.
[27] No site was discontinued if it had water quality issues. Sites were typically discontinued due to reclassification due to upstream BMP implementation, if they were redundant, or when the required ISRA monitoring period ended.
[28] 2,3,7,8-TCDD is a congener that potentially indicates unweathered anthropogenic dioxin contamination.

changes in treatment type, and planned end of monitoring activities. It should also be noted that the 2014/2015 season was unusually dry[29]; therefore, there are relatively few new data this year for updating the location rankings. Recommendations for specific site areas are summarized after the discussion of individual site results.

1. ILBMP0002 (road runoff to CM-9, before treatment): This subarea reflects runoff from a 2.5 acre drainage area including paved road and undeveloped hillsides. Based on 13 events, this subarea is ranked 1st overall (multi-constituent score = 0.97), 5th for dioxins, 1st for metals, and 33 for TSS. ILBMP0002 drains to CM-9, which filters runoff through a horizontal media bed (sizing is currently estimated to achieve 10% long-term average runoff volume capture[30]). The other influent stream to CM-9, monitored at A1BMP0002, is ranked 65th overall, 58th for dioxins, 56th for metals, and 39th for TSS. The effluent from CM-9 (A1SW0009-C (A1BMP0003)) is ranked 43rd overall, 41st for dioxins, 29.5th for metals, and 27th for TSS, which reflects a notable improvement in water quality compared to the upstream, untreated runoff from both ILBMP0002 and A1BMP0002, showing that the improvements are not due to dilution alone.

2. EVBMP0003 (A2SW0001) (CM-1 upstream west, pre-ELV improvements, before treatment - OLD): This monitoring subarea reflects runoff from 13.3 acres of paved road and undeveloped hillside, temporally reflecting stormwater sampling results before the ELV stormwater treatment BMP was constructed. Based on 18 events (zero events in 2014/2015 as those results are represented by EVBMP0003-A), this subarea ranks 2nd overall (multi-constituent score = 0.97), 1st for dioxins, 2nd for metals, and 29th for TSS. CM-1, to which EVBMP0003 drains, is an existing CM that treats runoff from a 53 acre subwatershed (sizing is estimated to achieve around 7% long-term runoff volume capture under current conditions, with the new ELV stormwater treatment BMP in place). Based on twenty-two events, the CM-1 effluent subarea (A2SW0002-A) is ranked 49th overall (multi-constituent score = 0.07), ranked 42nd for dioxins, 46.5th for metals, and 44.5th for TSS. The ELV area previously drained to EVBMP0003 and CM-1 due to an existing degraded asphalt channel below the ELV hillside that diverted a portion of this runoff onto the Area II Road and to EVBMP0003. This channel was improved and a stormwater treatment BMP was installed before the start of the 2013/2014 rainy season.

3. EVBMP0002 (Helipad pre sandbag berms- OLD): This subarea reflects runoff from 4.1 acres of the paved Helipad area, pre-sandbag berms raised and pre-drainage holes in asphalt). Based on six events, this subarea was ranked 3rd overall (multi-constituent score = 0.66), 7th for dioxins, 15.5 for metals, and 34 for TSS. This monitoring location has since been improved (EVBMP0002-B). The improved location ranks 40th overall (multi-constituent score = 0.20), 31.5th for dioxins, 46.5th for

[29] Average rainfall at SSFL was 18.4 inches between 1960-2006. In contrast, 12.10 inches of total rainfall has been recorded to-date in the 2014/15 rainy season.

[30] Overflows also get partial sedimentation through temporary ponding behind weir boards.

metals, and 65th for TSS. The improvements caused runoff from this area (EVBMP0002-B) to drain via overland flow through a series of temporary BMPs prior to being discharged via a paved asphalt channel on the east end of the Helipad. The BMPs include two raised sandbag berms that collect and retain the runoff (this is a small amount of the total annual runoff volume). Captured runoff currently is pumped to the Silvernale treatment facility. Runoff capture efficiency decreased in 2013/2014 since a larger area is now draining toward these berms as a result of recent drainage modifications at the ELV area. Currently the storage volume behind the berms is expected to equate to approximately a 0.6 inch rainfall event, given the larger drainage area.

4.5. EVBMP0005 (2012/2013 ELV drainage ditch (pre-ELV-1C ISRA- OLD)): This monitoring point was discontinued after the installation of the ELV stormwater treatment BMP before the start of the 2013/2014 rainy season. This monitoring location reflected 11 acres of ELV hillside runoff from the ELV asphalt swale prior to ISRA removal, which was substantially completed by March, 2013. There are no post-ISRA data for this location. Based on two events in 2013/2014, the pre-ISRA subarea is ranked 4.5 overall (multi-constituent score = 0.63), 6th for dioxins, 19th for metals, and tied for 65th (last) for TSS. Runoff from the upgradient ELV paved areas is now diverted to the Helipad, and ELV hillside runoff is now treated through the ELV stormwater treatment BMP.

4.5. A1SW0009-A (CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, pre-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD): Monitoring in this subarea, added during the 2012-13 rainy season and discontinued during the 2013/2014 rainy season, reflects treated runoff (estimated at 10% capture[31]) from a 16.4 acres drainage area, consisting of road runoff (ILBMP0002), a stabilized dirt road, rocky hillsides, and the AILF. Based on one event, this subarea is ranked 4.5 overall (multi-constituent score = 0.63), 22.5th for dioxins, 4th for metals, and tied for 65th (last) for TSS. In January of 2012, filter fabric was installed over the weir boards to reduce and filter seepage flows. In March of 2013, perforated flow spreader pipe and the upper basin were installed. Based on ten events following these improvements, this subarea (now named A1SW0009-C) is ranked 43rd overall, 41st for dioxins, 29.5th for metals, and 27 for TSS. There have been four samples collected since the most recent BMP improvements completed in March, 2013.

6. EVBMP0004 (2012/2013 Lower Helipad Road): This discontinued monitoring location was added during the 2012/2013 rainy season and reflects flow from the 1.8 acre paved Area II (NASA) Helipad Road. The monitoring location was discontinued after the ELV media filter system was installed to treat runoff from this area, among others. Based on three events, this subarea is ranked 6th overall (multi-constituent score = 0.62), 34th for dioxins, 3rd for metals, and 65th (last) for TSS.

7.5. APBMP0001-A (Area II Road runoff, post-ELV stormwater improvements): This Area II (NASA) subarea is very small, and primarily reflects runoff from a short section of the Area II Road. This road runoff drains under the Area II Road to the tributary eventually meeting the Northern Drainage. Based on three events, one of which taken in the 2014/2015 rainy season, this subarea is

[31] Overflows also get partial treatment by sedimentation through temporary ponding behind weir boards.

ranked 7.5 overall (multi-constituent score = 0.60), 21.5 for dioxins, 5.5 for metals, and 3rd for TSS. This same subarea, prior to the installation of the media filter system, is referred to as APBMP0001 and is ranked 7.5 overall (multi-constituent score = 0.60), 21.5 for dioxins, 5.5 for metals, and 63.5 for TSS, with zero samples taken in 2014/2015.

7.5. APBMP0001 (Area II Road runoff, pre-ELV stormwater improvements - OLD): This Area II (NASA) subarea represented runoff from 32.9 acres, including several flat ISRA areas distributed throughout a relatively flat drainage area, as well as road runoff. Based on two events, this subarea is ranked 7.5 overall (multi-constituent score = 0.60), 22.5th for dioxins, 5.5th for metals, and 3rd for TSS. Both samples were collected after the ISRA areas had been partially excavated and covered with plastic.

9. LPBMP0001-A (Lower Lot sheetflow, post-gravel bag berms): This discontinued monitoring subarea, which has been replaced by the cistern influent sample at LPBMP0002 (ranked 21 overall), reflects runoff from 5.1 acres of mostly paved parking and road areas, after the gravel bag berms were installed in September of 2011 to slow runoff and allow for some detention. Soil management and contractor staging activities are also planned to occur here, but were not present during the period reflected by this dataset. Based on six events, LPBMP0001-A is ranked 9th overall (multi-constituent score = 0.58), 3rd for dioxins, 24th for metals, and 24th for TSS. The same subarea, based on two events prior to the installation of the gravel bag berms (LPBMP0001), is ranked 14.5 overall (multi-constituent score = 0.50), 22.5th for dioxins, 10.5th for metals, and 12.5th for TSS.

10. ILBMP0001 (Lower Lot 24" stormdrain bypass): This monitoring subarea reflects flow from 23 acres of paved parking areas, building rooftops, paved storage areas, and undeveloped hillsides. Runoff from these areas is conveyed by a storm drain collection system to a 24-inch storm drain located beneath the Lower Parking Lot. This storm drain discharges via a concrete outlet spillway to the Northern Drainage on Sage Ranch property. Based on twenty-three events, this subarea is ranked 10th overall (multi-constituent score = 0.53), 8th for dioxins, 25th for metals, and 42 for TSS. A portion of this flow (approximately 30-40% long-term average runoff volume capture) is treated through the lower lot biofilter. Building 1436 was demolished in 2014, and has resulted in the removal of approximately one acre of impervious area; the demolition footprint was covered with erosion controls, such as wattles and hydroseed. Two detention bioswales were also constructed in November and December of 2014 to detain runoff from this area before releasing it to the Lower Lot cistern for treatment through the biofilter.

11. A1SW0009-B (CM-9 downstream-underdrain outlet (post-A1LF asphalt removal, post-filter fabric over weir boards, pre-perforated pipe and rip-rap berm) - OLD): Monitoring in this subarea, added during the 2011-12 rainy season and discontinued during the 2012/2013 rainy season, reflects treated runoff (estimated at 10% capture[32]) from a 16.4 acres drainage area, consisting of road runoff (ILBMP0002), a stabilized dirt road, rocky hillsides, and the AILF. Based on six events,

[32] Overflows also get partial treatment by sedimentation through temporary ponding behind weir boards.

this subarea is ranked 11 overall (multi-constituent score = 0.51), 13th for dioxins, 15.5th for metals, and 24th for TSS. In January of 2012, filter fabric was installed over the weir boards to reduce and filter seepage flows. In March of 2013, perforated flow spreader pipe and the upper basin were installed. Based on ten events following these improvements, this subarea (now named A1SW0009-C) is ranked 43rd overall, 41st for dioxins, 29.5th for metals, and 27th for TSS. There have been four samples collected since the most recent BMP improvements completed in March, 2013.

14.5. EVBMP0006 (2012/2013 Area II Road near ELV ditch): This discontinued monitoring subarea was added during the 2012/2013 rainy season but discontinued after installation of the stormwater treatment BMP. This monitoring location reflects runoff from approximately 11 acres of Area II Road to the west of the intersection with Helipad Road. Based on one event, this subarea is ranked 14.5 overall (multi-constituent score = 0.50), 22.5th for dioxins, 10.5 for metals, and 12.5 for TSS. Runoff from this area drains along the north edge of the Area II Road toward CM-1.

14.5 EVBMP0003-A (CM-1 upstream west, post-ELV improvements, before treatment): This monitoring subarea reflects runoff from 2.3 acres of paved road and undeveloped hillside. Based on 3 events (1 event in 2014/2015), this subarea ranks 14.5 overall (multi-constituent score = 0.50), 9th for dioxins, 29.5th for metals, and 65th (last) for TSS. CM-1, to which EVBMP0003-A drains, is an existing CM that also treats runoff from a 53 acre undisturbed subwatershed (sizing is estimated to achieve around 7% long-term runoff volume capture under current conditions, with the new ELV stormwater treatment BMP in place). Based on twenty-two events, the CM-1 effluent subarea (A2SW0002-A) is ranked 46 overall (multi-constituent score = 0.07), ranked 42nd for dioxins, 46.5th for metals, and 44.5th for TSS. The ELV area previously drained to EVBMP0003 and CM-1 due to an existing degraded asphalt channel below the ELV hillside that diverted a portion of this runoff onto the Area II Road and to EVBMP0003. This channel was improved and a stormwater treatment BMP was installed before the start of the 2013/2014 rainy season, thus decreasing the drainage area tributary to EVBMP0003.

14.5. LPBMP0001 (Lower Lot sheetflow, pre-gravel bag berms- OLD): This discontinued subarea, which has been replaced by the monitoring at the trench drain of the new sedimentation basin and biofilter (LPBMP0002), reflects runoff from 5.1 acres of mostly paved parking and road areas, before the gravel bag berms were installed in September of 2011 to slow runoff and allow for some detention (see LPBMP0001-A discussion above). Based on two events, this subarea ranked 14.5 overall, (multi-constituent score = 0.50), 22.5th for dioxins, 10.5th for metals, and 12.5 for TSS. This area is now being treated with a sedimentation basin and biofilter BMP.

14.5. B1BMP0004 (B1BMP0004-5, B1SW0005) (B-1 media filter inlet north, before treatment): This monitoring subarea reflects runoff from approximately 3.7 acres of paved road and post-ISRA restored hillside. Based on sixteen events, this subarea is ranked 14.5 overall (multi-constituent score = 0.50), 2nd for dioxins, 51st for metals, and 43rd for TSS. This subarea drains to a series of rock check dams and the B-1 media filter which, after filtering runoff, discharges to a natural vegetated drainage across the main entrance at Facility Road. In 2012, hillside erosion controls were improved

and curb cuts were added to even the distribution of inflows to the B-1 media filter on the south and north sides. Based on six events, the B-1 media filter effluent (B1SW0014-C) is ranked 42nd overall (multi-constituent score = 0.14), 38th for dioxins, 60th for metals, and 65th (last) for TSS.

14.5. B1SW0002 (Woolsey Canyon Road runoff, before treatment): This discontinued monitoring subarea, which has been replaced by sampling location B1BMP0004, reflects overland and shallow concentrated runoff from approximately 1.3 acres of mostly paved road at the intersection of Facility Road and Woolsey Canyon Road. Based on two events, this subarea is ranked 14.5 overall (multi-constituent score = 0.50), 22.5th for dioxins, 10.5th for metals, and 12.5th for TSS. This area drains toward the north inlet of the B-1 media filter along an earthen channel with rip rap check structures.

14.5. B1SW0014-A (B-1 media filter effluent, pre-media filter reconstruction- OLD): This discontinued subarea reflects 4.7 acres of treated stormwater runoff from Facility Road that discharged through the originally constructed B-1 media filter. This sampling location was discontinued after the B-1 media filter was reconstructed with a new underdrain system in December of 2011. Based on one event, this subarea is ranked 14.5 overall (multi-constituent score = 0.50), 22.5th for dioxins, 10.5th for metals, and 12.5th for TSS. This area contributing to this former sampling location was also improved through the addition of improved hillside erosion controls and curb cuts, which occurred in December of 2011, respectively. Based on thirteen events, this subarea (now named B1SW0014-C) is now ranked 42nd overall, 38th for dioxins, 60th for metals, and 65th (last) for TSS but has been discontinued and replaced with location B1BMP0006, which reflects effluent from the reconstructed B-1 media filter.

18. B1BMP0003 (B1BMP0002) (B-1 parking lot/ road runoff to culvert inlet): This monitoring subarea reflects runoff from the B-1 parking lot with a drainage area of 5.2 acres. This flow enters a culvert and then a vegetated channel where it comingles with treated B-1 flows. Based on twenty-one events, this subarea is ranked 18th overall (multi-constituent score = 0.49), 4th for dioxins, 59th for metals, and 38th for TSS. As discussed later in this memo, the monitoring station downstream of this point demonstrates water quality improvement through the vegetated channel.

19. B1BMP0001 (B1SW0010) (B-1 media filter inlet [post-media filter installation]): This discontinued monitoring subarea, which has been replaced by sampling location B1BMP0005, reflects runoff from approximately 4.5 acres of stormwater influent to the B-1 media filter. This subarea represents untreated stormwater before being treated through the media bed and then discharged by the media bed. Based on three events, this subarea is ranked 19th overall (multi-constituent score = 0.42), 34th for dioxins, 10.5th for metals, and 2nd for TSS. The TSS ranking increased from 4th in 2013/2014.

20. LXBMP0002 (LOX mid – OLD): This is discontinued monitoring subarea reflects road runoff from approximately 1.5 acres within the RFI site boundary. Based on two previous events, this subarea is ranked 20th overall (multi-constituent score = 0.40), 13th for dioxins, 19th for metals, and 12.5 for TSS.

BMP Recommendations and Status Updates on 2014 Recommendations

The following area summaries provide a status update on the Expert Panel's 2014 BMP recommendations, as well as new additional recommendations for 2015.

1. **ELV Area:** The ELV stormwater treatment BMP[33] was installed in November of 2013 and three samples have been collected to date. Last year, the Expert Panel recommended continued inspection and maintenance of the ELV stormwater treatment BMP, robust erosion control improvements along the ELV channel, and that stormwater samples be collected at the mid-point, between the sedimentation tanks and the media filter tank. The Panel has no new recommendations this year, beyond continued inspections and maintenance, as the ELV stormwater treatment BMP is showing a water quality improvement (based on the limited number of samples collected).

2. **CM-9 (Boeing):** Last year the Panel recommended ongoing maintenance of previously installed BMPs as well as replacement of the filter fabric on the CM-9 weir boards when the fabric became clogged or damaged; monitoring of sediment accumulation at the inlet of the CM and at the new pretreatment rock berm; observation of the duration of water ponding upstream of the weir boards (ponding for greater than 72 hours may suggest that media or underdrain maintenance is needed); and continued performance monitoring, inspection, and maintenance of the underdrain outlets and sedimentation areas, such as in accordance with sedimentation basin maintenance guidance from the CASQA Construction Handbook. All of these recommendations were implemented in the 2014/2015 rainy season. This year the Expert Panel recommends continued implementation of these inspection and maintenance recommendations.

3. **CM-1 (NASA):** In February of 2015, the sandbag berm near CM-1 west was raised and recovered with filter fabric material; no samples have been collected since this improvement. Last year the Expert Panel recommended continued inspection and maintenance of CM-1. The Panel continues to make this recommendation, in addition to potentially increasing the CM-1 capacity by raising the overflow weir or expanding/enhancing the media bed, as deemed feasible. The Panel also recommends that the influent and effluent samples be collected as close temporally together as possible, particularly during the same storm event.

4. **Helipad (NASA):** The sandbag berms were kept in operation during the 2014/2015 season. Last year, the Panel recommended continued operation of this temporary pumping system or equivalent runoff capture and treatment as a temporary interim control strategy until NASA was able to remove asphalt from the Helipad area during planned demolition; this recommendation still stands as the asphalt has not yet been removed and is not expected to be removed until the

[33] Designed to meet the design storm requirements.

soil remediation is completed. Last year the Expert Panel also recommended that ponded water be pumped out of the sump area and the storm drain inlet "plug" under Helipad Road be removed when either 1) Outfall 009 is flowing or 2) the sump is overflowing onto Helipad road. The plug was not removed for any events in the 2014/2015 monitoring season. This year, the Panel continues this recommendation and also recommends that representative runoff from the Helipad be collected for analyses at either 1) the slope drain where the plug is located, or 2) where runoff flows into the Helipad road culvert (which would overflow the ELV stormwater treatment BMP and discharge directly into the creek). The Panel also recommends continued inspection and maintenance of the helipad sandbag berms and any future BMPs. The storage volumes behind the sandbag berms is approximately equivalent to runoff volumes from a quarter inch event.

5. **Lower Lot:** Last year, the Panel recommended that the monitoring program be modified such that the sample at LPBMP0003 be collected from the sediment basin outlet structure using a sample pole, that field observations be recorded when biofilter effluent samples are collected during periods of overflow, and that effluent samples be collected from the underdrain outlet within the biofilter outlet structure. The Panel also recommended review of the cistern pump programming to prevent future overflows of the biofilter; this review was completed. In December of 2014, detention bioswales were constructed in the upper portion of the drainage area tributary to the Lower Lot diversion structure. This delayed the runoff volume to the Lower Lot Biofilter[34] and increased the total volume treated by the biofilter. Additionally, an analysis of the feasibility and benefit of raising the weir height to further increase the percent capture is currently underway. Preliminary results suggest that raising the 2-inch weir by 6-inches (to an 8-inch height) would achieve a 0% bypass of the low flow diversion for the 1-year, 24-hour design storm for the combined upper and lower drainage areas. The Panel also recommends continued inspection, maintenance, and monitoring of the Lower Lot Biofilter system, specifically to prevent underflow.

6. **B1436 Detention Bioswales:** Construction of the detention bioswales[35] near former Building 1436 was completed in December of 2014. Although no stormwater influent samples (due to lack of observable flow) and only one effluent sample (due to complications accessing the underdrains, which are currently being resolved) were collected in the 2014/2015 rainy season, observations indicated that surface water runoff was effectively being diverted into the rip rap area as designed. The Expert Panel recommends continued inspection and maintenance of these BMPs as the vegetation becomes established, as well as review of future influent and effluent monitoring data collected during the upcoming rainy season. The Expert Panel also recommends that sampling at the detention bioswales be prioritized in this next rainy season.

[34] Designed to meet the design storm requirements.
[35] Designed to meet the design storm requirements.

7. **Upper Lot (Boeing)**: The Expert Panel recommends new stormwater capture above the culvert inlet at B1BPM0003. This could occur in a temporary form like sand bag berms that are currently found at the Helipad.

8. **All BMPs:** The Expert Panel continues to recommend that all BMPs be regularly inspected and maintained to allow for proper function and treatment of runoff.

9. **Northern Drainage:** Due to the continuation of exceedances at Outfall 009 despite demonstrated water quality improvement at the individual BMPs, the Expert Panel recommends that potential opportunities for in-stream improvements within the Northern Drainage be considered to the extent allowed by existing jurisdictional permits. An analysis of lead and dioxin sediment monitoring data within the Northern Drainage is currently under review in order to assess area for effective BMP placement. The Expert Panel has once again determined that, for a variety of reasons, it would not be feasible to build a dam near the outfall and pump to a mechanical treatment system, such as Silvernale.

10. **Roadside Opportunities:** Due to the continuation of exceedances at Outfall 009 despite demonstrated water quality improvement at the individual BMPs and the presence of roads and other paved areas in most of the highly ranked subareas, the Expert Panel plans to comprehensively evaluate potential road runoff capture/treatment opportunities and implement any feasible projects that are identified. Specifically, this recommendation is also intended to address the ranking results at APBMP0001-A (ranked 7.5) as well as B1BMP0003 (ranked 18), which are both reflective of direct runoff from paved surfaces. The Panel suggests that these improvements be coupled with planned road improvements per the transportation plan, if the timeline allows for such coordination without delaying BMP implementation.

13. **Special Studies:** The Expert Panel wishes to further investigate the source of persistent NPDES exceedances of dioxins and lead in stormwater at OF009, and has identified the following study questions as the basis for new sampling studies that are recommended for the 2015/16 rainy season.

    1. **Question:** Where (spacially) within the 009 watershed are dioxins and lead in stormwater predominantly coming from?

    Suggested approach to answer question: Conduct water sampling along the Northern Drainage, including above the main confluence near OF009, and below/above A2LF, LOX, and the Lower Lot areas.

    2. **Question:** Given that the 009 subareas (most of which are highly paved) have consistently higher stormwater concentrations of dioxins and lead than both the outfall and the stormwater background sites, what are the predominant pollutant sources to these areas (e.g., pavement material itself, vehicles, atmospheric deposition)?

    Suggested approach to answer question: Conduct stormwater sampling from representative areas with newly resurfaced asphalt (e.g., north end of upper parking lot near site entrance),

low traffic (e.g., helipad), and high traffic (e.g., lower parking lot, upper parking lot near former Building 1436, top of Woolsey Canyon Road near site entrance). This can be done through analysis of existing, active subarea monitoring sites (i.e., no new subarea monitoring is needed). Also perform atmospheric deposition sampling and hand vacuum sampling of solids from these areas, and analyze these solids for dioxins and lead, to distinguish solids concentration differences between vehicle-traveled areas and pure atmospheric deposition areas. Similarly, with respect to treated wood poles as a potential source, collect soil samples near poles and analyze for dioxins and lead.

11. **BMP Monitoring Program:** This year the Panel recommends additional monitoring locations specific to characterizing road runoff (or other previously unmonitored potential source areas. Lastly, it is recommended that monitoring at existing or potential BMP locations continue if the locations were ranked in the top 20 in 2014/2015, or if insufficient data exist (e.g. APBMP0001).

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. 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 (or seepage along the outside of the culvert), 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 B1).

The Expert Panel believes that new and planned activities, taken together, will improve NPDES compliance at Outfalls 008 and 009 at discharges under and up to the Panel's proposed design storm flows.

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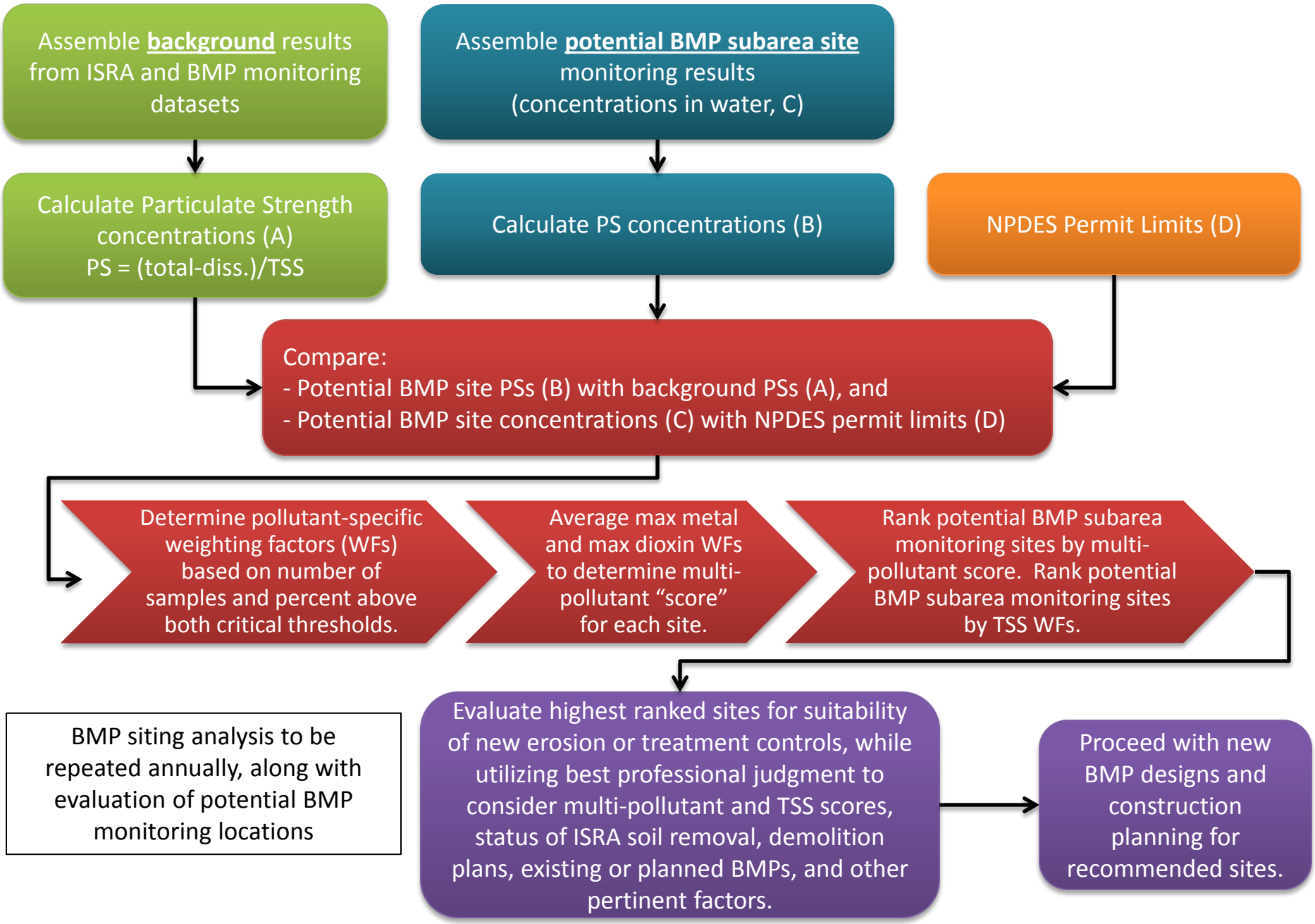
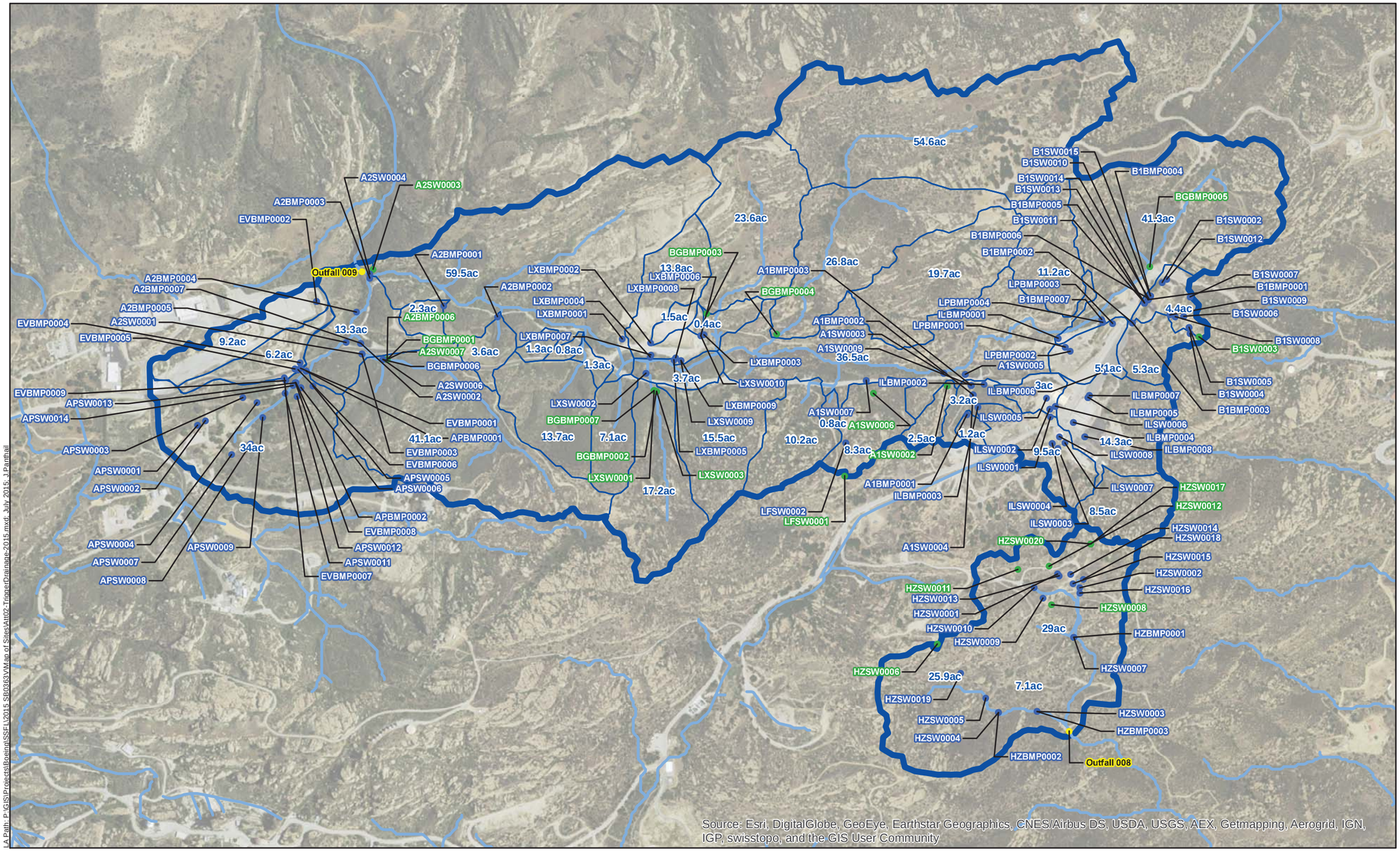
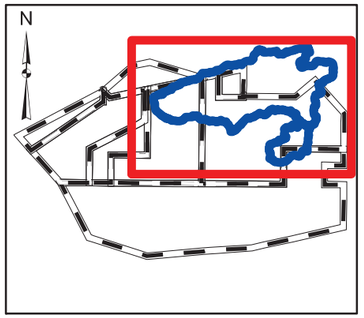
Attachment 1. Summary Flowchart for BMP Site Ranking Analysis Approach







N

Legend

- BMP Subarea
- Background
- NPDES
- Streams
- Outfall watershed boundary

Site Legend

Potential BMP subarea site

Stormwater background site

Outfalls

870 435 0 870

Feet

ATTACHMENT 2

Locations Used in Site Ranking Analsysis Outfall 008/009 Watersheds

Santa Susana Field Laboratory
Ventura County, CA

Los Angeles, CA	August 2015

Notes:
1) NPDES outfalls are included for comparison and method testing purposes only. Stormwater controls are not being contemplated at these locations.

LA Path: P:\GIS\Projects\Boeing\SSFL\2015 SB0363\MXD of Sites\AH02-TrippierDrainage-2015.mxd, July 2015, J.Panthali

Technical Appendix A

Summary of Results by Subarea

Note: All median and maximum values in µg/L except TSS, which is in mg/L.

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
A1BMP0001	1	**Cadmium**	5	--	0.480	0.510	0	5	--	20.6	226	5	0.50	no
	2	**TCDD TEQ**	5	--	8.80e-10	5.62e-07	1	5	--	4.00e-08	5.6E-04	1	0.05	yes
	4.5	**2,3,7,8-TCDD**	5	5	<2.30e-06	<4.40e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	5	--	4.20	5.30	0	3	--	117	300	0	0	no
	4.5	**Lead**	5	2	0.280	2.50	0	5	2	>36.7	102	0	0	no
	4.5	**Total Suspended Solids**	5	--	11.0	22.0	0	0	--	--	--	0	0	no
A1BMP0002	1	**Total Suspended Solids**	16	3	10.5	320	4	0	--	--	--	0	0.04	no
	2	**TCDD TEQ**	8	--	1.33e-08	2.43e-07	2	8	--	2.57e-06	>2.09e-5	0	2.1E-03	no
	3	**Copper**	16	--	4.40	20.0	2	15	--	173	>2,220	4	4.4E-04	yes
	4	**Cadmium**	15	--	0.250	0.960	0	1	--	1.11	1.11	1	2.6E-04	no
	5	**Lead**	16	3	0.795	11.0	3	16	3	92.9	264	1	9.7E-06	yes
	6	**2,3,7,8-TCDD**	8	8	<7.00e-07	<3.60e-06	0	8	8	<1.00e-12	<1.00e-12	0	0	no
A1BMP0002-A	1	**TCDD TEQ**	5	1	7.68e-08	1.81e-06	3	5	1	2.56e-07	3.9E-04	1	0.38	yes
	2	**Total Suspended Solids**	6	--	18.1	320	2	0	--	--	--	0	0.34	no
	3	**Copper**	6	--	9.35	15.0	2	1	--	38.3	38.3	0	0.23	no
	4	**Cadmium**	6	2	0.395	1.40	0	6	2	2.48	222	4	0.19	no
	5.5	**2,3,7,8-TCDD**	5	5	<2.14e-06	<4.70e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Lead**	6	3	<0.690	15.0	1	6	3	<14.0	45.7	0	0	no
A1SW0002	1	**Total Suspended Solids**	10	1	3.00	82.0	1	0	--	--	--	0	0.01	no
	2	**Lead**	10	1	0.580	11.0	3	10	1	114	308	1	5.9E-03	yes
	4.5	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
A1SW0003	1	**Lead**	10	2	0.285	7.00	1	10	2	175	258	2	1.3E-03	yes
	4	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Total Suspended Solids**	10	2	5.50	33.0	0	0	--	--	--	0	0	no
A1SW0005	1.5	**TCDD TEQ**	5	--	5.50e-09	4.46e-08	1	5	--	1.18e-06	>4.46e-5	1	0.05	yes
	1.5	**Total Suspended Solids**	10	1	11.5	100	2	0	--	--	--	0	0.05	no
	3	**Lead**	10	1	0.605	15.0	2	10	1	80.6	>275	1	1.3E-03	yes
	4	**Copper**	10	--	4.30	11.0	0	9	--	99.7	>1,740	2	3.6E-04	no
	5.5	**2,3,7,8-TCDD**	5	5	<6.50e-07	<3.80e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	10	2	0.130	0.430	0	3	2	<1.00e-12	9.51	1	0	no
A1SW0006	1	**TCDD TEQ**	12	2	5.93e-09	6.61e-07	4	12	2	8.98e-07	3.5E-05	2	0.01	yes
	4	**2,3,7,8-TCDD**	12	12	<5.40e-07	<2.80e-06	0	12	12	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Lead**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Total Suspended Solids**	12	2	3.50	19.0	0	0	--	--	--	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
A1SW0007	1	**TCDD TEQ**	12	--	4.51e-09	1.38e-06	4	12	--	3.00e-06	6.9E-04	2	0.01	yes
	4	**2,3,7,8-TCDD**	12	12	<6.90e-07	<1.80e-5	0	12	12	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Lead**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Total Suspended Solids**	12	3	2.50	24.0	0	0	--	--	--	0	0	no
A1SW0009-A	1	**Lead**	1	--	9.10	9.10	1	1	--	689	689	1	0.75	yes
	2	**TCDD TEQ**	1	--	1.80e-07	1.80e-07	1	1	--	1.6E-05	1.6E-05	0	0.50	no
	4.5	**2,3,7,8-TCDD**	1	1	<2.60e-06	<2.60e-06	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	1	1	<0.100	<0.100	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	1	--	7.90	7.90	0	1	--	290	290	0	0	no
	4.5	**Total Suspended Solids**	1	--	11.0	11.0	0	0	--	--	--	0	0	no
A1SW0009-B	1	**TCDD TEQ**	5	--	1.84e-07	3.21e-06	5	5	--	2.91e-06	1.7E-04	1	0.63	yes
	2	**Lead**	6	--	12.1	36.0	4	6	--	132	833	1	0.39	yes
	3	**Total Suspended Solids**	6	--	33.5	450	2	0	--	--	--	0	0.34	no
	5	**2,3,7,8-TCDD**	5	5	<9.20e-07	<8.50e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	6	4	<0.200	0.390	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	6	--	7.95	22.0	1	6	--	87.4	267	0	0	no
A1SW0009-C	1	**Total Suspended Solids**	4	--	7.60	180	1	0	--	--	--	0	0.31	no
	2	**TCDD TEQ**	4	1	1.05e-07	5.78e-07	2	4	1	1.86e-06	2.1E-05	0	0.14	no
	3	**Copper**	4	--	6.70	16.0	1	2	--	88.8	115	0	0.11	no
	4	**Lead**	4	1	1.62	12.0	1	4	1	74.7	163	0	0.04	no
	5.5	**2,3,7,8-TCDD**	4	4	<3.18e-06	<1.13e-5	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	4	4	<0.250	<0.500	0	4	4	<1.00e-12	<1.00e-12	0	0	no
A2BMP0002	3.5	**2,3,7,8-TCDD**	1	1	<3.40e-06	<3.40e-06	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	1	1	<0.100	<0.100	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Copper**	1	--	2.40	2.40	0	1	--	133	133	0	0	no
	3.5	**Lead**	1	--	0.290	0.290	0	1	--	>30.0	>30.0	0	0	no
	3.5	**TCDD TEQ**	1	--	1.10e-11	1.10e-11	0	1	--	3.67e-09	3.67e-09	0	0	no
	3.5	**Total Suspended Solids**	1	--	3.00	3.00	0	0	--	--	--	0	0	no
A2BMP0003	1	**Total Suspended Solids**	8	1	15.5	1,400	2	0	--	--	--	0	0.14	no
	2	**TCDD TEQ**	8	1	6.82e-08	9.64e-06	4	8	1	8.04e-07	8.7E-04	1	0.11	yes
	3.5	**Cadmium**	8	6	<0.200	1.00	0	8	6	<1.00e-12	>0.643	2	2.1E-03	no
	3.5	**Lead**	8	--	1.38	68.0	2	8	--	61.7	>122	0	2.1E-03	no
	5.5	**2,3,7,8-TCDD**	8	8	<1.30e-06	<2.90e-06	0	8	8	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Copper**	8	--	3.55	28.0	1	5	--	23.1	66.7	0	0	no
A2BMP0004	1	**Total Suspended Solids**	3	--	31.0	130	1	0	--	--	--	0	0.50	no
	2	**TCDD TEQ**	3	--	5.71e-08	7.16e-07	2	3	--	1.84e-06	5.51e-06	0	0.34	no
	3.5	**Cadmium**	3	2	<0.100	0.160	0	3	2	<1.00e-12	>0.546	1	0.11	no
	3.5	**Lead**	3	--	4.20	10.0	1	3	--	75.2	121	0	0.11	no
	5.5	**2,3,7,8-TCDD**	3	3	<1.40e-06	<2.10e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Copper**	3	--	6.70	7.80	0	3	--	47.7	161	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
A2BMP0005	1	**TCDD TEQ**	4	--	3.30e-07	1.9E-05	4	4	--	4.86e-06	2.2E-04	1	0.64	yes
	2	**Total Suspended Solids**	4	--	66.5	86.0	1	0	--	--	--	0	0.31	no
	3.5	**Cadmium**	4	3	<0.250	<0.250	0	4	3	<1.00e-12	>0.619	1	0.04	no
	3.5	**Lead**	4	--	4.45	11.0	1	4	--	58.3	119	0	0.04	no
	5.5	**2,3,7,8-TCDD**	4	4	<1.60e-06	<2.73e-06	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Copper**	4	--	4.90	8.70	0	4	--	38.0	50.0	0	0	no
A2SW0002	1	**TCDD TEQ**	16	--	7.20e-08	1.0E-05	10	16	--	6.94e-06	5.1E-04	5	0.43	yes
	2	**Lead**	16	4	1.50	39.0	4	16	4	173	>1,080	5	0.01	yes
	3	**Total Suspended Solids**	16	3	8.50	610	1	0	--	--	--	0	2.6E-04	no
	4	**2,3,7,8-TCDD**	16	15	<1.10e-06	<4.00e-06	0	16	15	<1.00e-12	3.0E-05	1	7.7E-09	no
	5.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	5.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
A2SW0002-A	1	**TCDD TEQ**	10	--	5.05e-08	4.8E-05	5	10	--	4.06e-06	6.4E-04	2	0.13	yes
	2.5	**Copper**	6	--	3.72	6.80	0	5	--	>100	>450	1	0.01	no
	2.5	**Total Suspended Solids**	10	3	11.0	76.0	1	0	--	--	--	0	0.01	no
	4	**Lead**	10	--	3.15	14.0	2	10	--	179	333	2	5.9E-03	yes
	5	**2,3,7,8-TCDD**	10	9	<1.69e-06	<7.60e-06	0	10	9	<1.00e-12	9.2E-05	1	2.0E-05	no
	6	**Cadmium**	6	5	<0.128	<0.250	0	6	5	<1.00e-12	>9.76	1	0	no
APBMP0001	1	**Lead**	2	--	18.8	31.0	2	2	--	370	635	1	0.69	yes
	2.5	**Cadmium**	2	--	0.210	0.300	0	2	--	1.85	>2.77	2	0.50	no
	2.5	**TCDD TEQ**	2	--	5.23e-07	6.28e-07	2	2	--	9.77e-06	1.1E-05	0	0.50	no
	5	**2,3,7,8-TCDD**	2	2	<9.80e-07	<9.80e-07	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	2	--	6.60	9.90	0	2	--	45.9	62.5	0	0	no
	5	**Total Suspended Solids**	2	--	53.0	58.0	0	0	--	--	--	0	0	no
APBMP0001-A	1	**Total Suspended Solids**	2	--	166	254	2	0	--	--	--	0	0.75	no
	2.5	**Copper**	2	--	51.0	86.0	2	2	--	566	1,070	1	0.69	yes
	2.5	**Lead**	2	--	37.5	60.0	2	2	--	411	773	1	0.69	yes
	4	**TCDD TEQ**	2	--	5.62e-07	1.08e-06	2	2	--	7.08e-06	1.4E-05	0	0.50	no
	5	**Cadmium**	2	1	<0.664	<1.30	0	2	1	<1.16	1.16	1	0.31	no
	6	**2,3,7,8-TCDD**	2	2	<3.23e-06	<3.23e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
APSW0014	1	**Total Suspended Solids**	2	--	58.5	82.0	1	0	--	--	--	0	0.50	no
	2.5	**Lead**	2	--	5.75	7.29	1	2	--	87.0	100.0	0	0.31	no
	2.5	**TCDD TEQ**	2	--	2.80e-07	5.54e-07	1	2	--	7.95e-06	1.6E-05	0	0.31	no
	5	**2,3,7,8-TCDD**	2	2	<4.34e-06	<4.34e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	2	1	<0.703	0.703	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	2	--	9.64	11.0	0	2	--	84.0	127	0	0	no
B1BMP0001	1	**Total Suspended Solids**	3	--	270	650	3	0	--	--	--	0	0.87	no
	2.5	**Cadmium**	2	--	0.355	0.540	0	2	--	0.653	>0.887	2	0.50	no
	2.5	**Lead**	3	--	11.0	15.0	3	3	--	31.2	53.2	0	0.50	no
	4.5	**Copper**	3	--	16.0	27.0	2	3	--	22.8	49.6	0	0.34	no
	4.5	**TCDD TEQ**	3	--	4.83e-08	6.83e-07	2	3	--	1.79e-07	1.05e-06	0	0.34	no
	6	**2,3,7,8-TCDD**	3	3	<3.20e-06	<8.80e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
B1BMP0003	1	**TCDD TEQ**	21	1	7.12e-07	1.4E-05	17	21	1	1.7E-05	5.6E-04	10	0.98	yes
	2	**Total Suspended Solids**	21	4	33.0	110	6	0	--	--	--	0	0.04	no
	3	**Cadmium**	21	14	<0.250	<0.500	0	21	14	<1.00e-12	>3.27	7	7.5E-06	no
	4	**Copper**	21	--	6.70	21.0	5	20	--	82.4	>500	1	2.4E-06	yes
	5	**Lead**	21	1	2.70	7.30	5	21	1	>54.7	>177	0	2.2E-07	no
	6	**2,3,7,8-TCDD**	21	21	<1.20e-06	<6.30e-06	0	21	21	<1.00e-12	<1.00e-12	0	0	no
B1BMP0004	1	**TCDD TEQ**	16	--	4.00e-07	4.0E-04	15	16	--	2.8E-05	0.0250	8	1.00	yes
	2	**Total Suspended Solids**	16	2	24.0	170	3	0	--	--	--	0	0.01	no
	3	**Lead**	16	--	3.90	9.60	5	16	--	123	495	3	3.5E-03	yes
	4	**Cadmium**	16	9	<0.500	<0.500	0	15	9	<1.00e-12	>3.80	6	4.4E-04	no
	5.5	**2,3,7,8-TCDD**	16	16	<2.30e-06	<1.00e-5	0	16	16	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Copper**	16	--	4.65	9.00	0	16	--	69.0	>170	0	0	no
B1BMP0005	1	**TCDD TEQ**	21	1	2.01e-07	2.6E-05	13	21	1	1.6E-05	>1.98e-3	8	0.56	yes
	2	**Total Suspended Solids**	21	2	23.0	170	4	0	--	--	--	0	3.6E-03	no
	3	**Cadmium**	21	15	<0.250	<0.250	0	20	15	<1.00e-12	>3.80	5	3.9E-07	no
	4.5	**2,3,7,8-TCDD**	21	19	<2.29e-06	<1.00e-5	0	21	19	<1.00e-12	>1.90e-4	2	2.1E-10	no
	4.5	**Copper**	21	--	3.60	35.0	1	21	--	58.2	694	1	2.1E-10	yes
	6	**Lead**	21	--	1.30	9.60	1	21	--	>37.5	196	0	9.8E-12	no
B1BMP0007	1	**TCDD TEQ**	9	--	1.07e-07	1.24e-06	7	9	--	>2.67e-06	3.8E-05	1	0.41	yes
	4	**2,3,7,8-TCDD**	9	9	<1.82e-06	<4.53e-06	0	9	9	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	9	9	<0.250	<0.500	0	9	9	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	9	--	4.20	9.10	0	8	--	59.3	90.7	0	0	no
	4	**Lead**	9	--	1.70	3.80	0	9	--	>67.0	155	0	0	no
	4	**Total Suspended Solids**	9	2	33.0	43.0	0	0	--	--	--	0	0	no
B1SW0002	2	**Lead**	2	--	6.80	12.0	1	2	--	212	333	1	0.50	yes
	2	**TCDD TEQ**	2	1	<2.34e-5	2.3E-05	1	2	1	<0.000213	2.1E-04	1	0.50	yes
	2	**Total Suspended Solids**	2	--	57.0	110	1	0	--	--	--	0	0.50	no
	5	**2,3,7,8-TCDD**	2	2	<8.00e-06	<8.00e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	2	--	0.170	0.240	0	0	--	--	--	0	0	no
	5	**Copper**	2	--	6.65	10.0	0	2	--	185	334	0	0	no
B1SW0008	1	**TCDD TEQ**	2	--	8.28e-06	1.6E-05	2	2	--	1.4E-04	2.8E-04	1	0.69	yes
	2	**Total Suspended Solids**	2	--	168	280	1	0	--	--	--	0	0.50	no
	4.5	**2,3,7,8-TCDD**	2	2	<9.80e-07	<9.80e-07	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	2	1	<0.220	<0.500	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**Lead**	0	--	--	--	0	0	--	--	--	0	0	no
B1SW0014-A	2	**Lead**	1	--	6.90	6.90	1	1	--	71.9	71.9	0	0.50	no
	2	**TCDD TEQ**	1	--	2.64e-07	2.64e-07	1	1	--	3.30e-06	3.30e-06	0	0.50	no
	2	**Total Suspended Solids**	1	--	80.0	80.0	1	0	--	--	--	0	0.50	no
	5	**2,3,7,8-TCDD**	1	1	<1.90e-06	<1.90e-06	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	1	1	<0.100	<0.100	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	1	--	5.90	5.90	0	1	--	29.8	29.8	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
B1SW0014-B	1	**TCDD TEQ**	3	--	3.05e-07	5.89e-07	3	3	--	1.1E-05	2.2E-05	0	0.50	no
	2	**Lead**	4	--	2.70	6.70	1	4	--	66.2	78.6	0	0.04	no
	4.5	**2,3,7,8-TCDD**	3	3	<3.90e-06	<5.10e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	4	4	<0.100	<0.200	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	4	--	3.75	4.10	0	4	--	42.3	54.4	0	0	no
	4.5	**Total Suspended Solids**	4	--	36.5	71.0	0	0	--	--	--	0	0	no
B1SW0014-C	1	**TCDD TEQ**	13	--	5.71e-08	1.76e-06	8	13	--	4.39e-06	1.0E-04	3	0.28	yes
	2	**Copper**	13	--	2.90	4.70	0	11	--	60.0	408	1	1.5E-06	no
	4.5	**2,3,7,8-TCDD**	13	13	<8.00e-07	<7.62e-06	0	13	13	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	13	13	<0.250	<0.500	0	13	13	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Lead**	13	--	1.40	3.00	0	13	--	>58.0	>167	0	0	no
	4.5	**Total Suspended Solids**	13	--	15.0	41.0	0	0	--	--	--	0	0	no
BGBMP0001	1	**Cadmium**	4	3	<0.100	0.160	0	4	3	<1.00e-12	>10.1	1	0.04	no
	4	**2,3,7,8-TCDD**	4	4	<8.70e-07	<2.10e-06	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	4	--	2.45	3.60	0	3	--	100.0	314	0	0	no
	4	**Lead**	4	1	0.590	0.800	0	4	1	68.2	>112	0	0	no
	4	**TCDD TEQ**	4	2	<6.40e-12	<1.00e-10	0	4	2	<9.14e-10	>7.90e-09	0	0	no
	4	**Total Suspended Solids**	4	1	5.50	8.00	0	0	--	--	--	0	0	no
BGBMP0002	1	**Total Suspended Solids**	4	--	20.5	750	1	0	--	--	--	0	0.31	no
	2	**Copper**	4	--	1.60	19.0	1	2	--	31.0	38.2	0	0.11	no
	3	**Lead**	4	--	1.30	64.0	1	3	--	>53.0	85.0	0	0.06	no
	4	**TCDD TEQ**	4	2	<6.00e-10	1.02e-07	1	4	2	<1.20e-07	1.36e-07	0	0.04	no
	5.5	**2,3,7,8-TCDD**	4	4	<1.80e-06	<3.40e-06	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	3	3	<0.100	<0.200	0	3	3	<1.00e-12	<1.00e-12	0	0	no
BGBMP0003	1	**TCDD TEQ**	5	3	<1.00e-10	3.32e-07	1	5	3	<1.00e-12	6.26e-06	0	0.01	no
	4	**2,3,7,8-TCDD**	5	5	<1.90e-06	<4.70e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	5	5	<0.100	<0.200	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	5	--	3.00	4.70	0	4	--	86.4	125	0	0	no
	4	**Lead**	5	1	0.690	2.80	0	5	1	>44.0	94.0	0	0	no
	4	**Total Suspended Solids**	5	2	5.00	53.0	0	0	--	--	--	0	0	no
BGBMP0004	1	**Total Suspended Solids**	3	--	17.0	240	1	0	--	--	--	0	0.50	no
	2.5	**Lead**	3	1	0.910	7.60	1	3	1	>26.4	38.8	0	0.11	no
	2.5	**TCDD TEQ**	3	--	1.00e-10	4.01e-08	1	3	--	5.88e-09	1.67e-07	0	0.11	no
	5	**2,3,7,8-TCDD**	3	3	<1.00e-06	<4.00e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	3	3	<0.100	<0.200	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	3	--	2.40	6.60	0	2	--	32.7	47.1	0	0	no
BGBMP0005	3.5	**2,3,7,8-TCDD**	1	1	<3.90e-06	<3.90e-06	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	1	1	<0.100	<0.100	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Copper**	1	--	2.40	2.40	0	0	--	--	--	0	0	no
	3.5	**Lead**	1	--	0.840	0.840	0	0	--	--	--	0	0	no
	3.5	**TCDD TEQ**	1	--	2.80e-11	2.80e-11	0	1	--	2.55e-09	2.55e-09	0	0	no
	3.5	**Total Suspended Solids**	1	--	11.0	11.0	0	0	--	--	--	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
BGBMP0006	1	**Total Suspended Solids**	7	1	3.00	250	1	0	--	--	--	0	0.06	no
	2.5	**Lead**	7	1	1.50	17.0	1	7	1	86.1	>1,250	2	0.03	yes
	2.5	**TCDD TEQ**	7	--	1.56e-08	2.45e-07	2	7	--	2.33e-06	>0.000245	1	0.03	yes
	5	**2,3,7,8-TCDD**	7	7	<6.20e-07	<1.80e-06	0	7	7	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	1	1	<0.100	<0.100	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	1	--	2.90	2.90	0	1	--	5.56	5.56	0	0	no
BGBMP0007	1	**Lead**	7	--	1.00	16.0	1	7	--	83.3	342	1	0.01	yes
	4	**2,3,7,8-TCDD**	7	7	<8.10e-07	<5.40e-06	0	7	7	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	6	6	<0.100	<0.100	0	6	6	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	7	--	1.50	7.50	0	7	--	77.7	>333	0	0	no
	4	**TCDD TEQ**	7	3	1.10e-11	9.64e-09	0	7	3	1.83e-09	3.54e-07	0	0	no
	4	**Total Suspended Solids**	7	--	7.00	39.0	0	0	--	--	--	0	0	no
EVBMP0001-A	1	**TCDD TEQ**	10	1	1.39e-07	2.1E-04	7	10	1	6.61e-06	3.5E-03	3	0.59	yes
	2	**Total Suspended Solids**	10	--	42.0	480	3	0	--	--	--	0	0.17	no
	3	**Lead**	10	1	3.65	41.0	4	10	1	98.8	320	1	0.02	yes
	4	**Cadmium**	10	7	<0.250	0.410	0	10	7	<1.00e-12	>0.646	3	1.3E-03	no
	5	**Copper**	10	--	3.65	15.0	1	7	--	27.1	60.0	0	1.4E-04	no
	6	**2,3,7,8-TCDD**	10	9	<2.40e-06	2.2E-05	0	10	9	<1.00e-12	3.7E-04	1	2.0E-05	no
EVBMP0002	1	**TCDD TEQ**	6	--	4.40e-07	1.16e-06	6	6	--	4.2E-05	5.8E-04	3	0.93	yes
	2	**Cadmium**	6	1	0.155	0.280	0	6	1	3.07	37.7	5	0.39	no
	3	**Lead**	6	--	3.35	26.0	1	5	--	284	1,090	3	0.27	yes
	4	**Total Suspended Solids**	6	--	12.0	120	1	0	--	--	--	0	0.11	no
	5	**Copper**	6	--	4.60	13.0	0	5	--	121	600	1	0.01	no
	6	**2,3,7,8-TCDD**	6	6	<2.40e-06	<4.00e-06	0	6	6	<1.00e-12	<1.00e-12	0	0	no
EVBMP0002-A	1	**TCDD TEQ**	5	--	3.75e-08	6.95e-08	3	5	--	6.15e-07	6.95e-06	0	0.17	no
	2.5	**Cadmium**	5	4	<0.100	0.130	0	5	4	<1.00e-12	>2.51	1	0.01	no
	2.5	**Lead**	5	--	3.80	4.80	0	5	--	194	344	1	0.01	no
	5	**2,3,7,8-TCDD**	5	5	<1.10e-06	<5.30e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	5	--	3.60	7.70	0	3	--	44.3	150	0	0	no
	5	**Total Suspended Solids**	5	--	12.0	61.0	0	0	--	--	--	0	0	no
EVBMP0002-B	1	**TCDD TEQ**	5	--	9.21e-08	2.84e-06	3	5	--	>9.21e-06	>0.000284	1	0.38	yes
	2	**Lead**	5	--	2.60	3.40	0	5	--	>180	>292	1	0.01	no
	4.5	**2,3,7,8-TCDD**	5	5	<4.50e-07	<3.33e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	5	5	<0.100	<0.250	0	5	5	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	5	--	4.10	5.50	0	3	--	>110	>150	0	0	no
	4.5	**Total Suspended Solids**	5	3	<10.0	14.0	0	0	--	--	--	0	0	no
EVBMP0003	1	**TCDD TEQ**	18	--	2.26e-06	1.7E-05	17	18	--	3.2E-05	5.2E-04	9	1.00	yes
	2	**Lead**	18	--	9.15	55.0	13	18	--	238	664	9	0.93	yes
	3.5	**Cadmium**	9	2	0.180	0.730	0	9	2	>1.97	>4.44	7	0.24	no
	3.5	**Total Suspended Solids**	18	--	36.0	890	7	0	--	--	--	0	0.24	no
	5	**Copper**	9	--	7.00	24.0	1	9	--	80.0	167	0	7.2E-05	no
	6	**2,3,7,8-TCDD**	18	15	<3.20e-06	<7.40e-06	0	18	15	<1.00e-12	2.2E-05	3	1.1E-07	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
EVBMP0003-A	1	**TCDD TEQ**	3	--	2.70e-06	9.93e-06	3	3	--	5.7E-05	5.2E-04	2	0.89	yes
	2	**Lead**	3	--	1.97	9.00	1	3	--	>109	>160	0	0.11	no
	4.5	**2,3,7,8-TCDD**	3	3	<2.74e-06	<3.67e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	3	3	<0.250	<0.250	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	3	--	5.37	9.00	0	3	--	119	154	0	0	no
	4.5	**Total Suspended Solids**	3	--	19.0	47.0	0	0	--	--	--	0	0	no
EVBMP0004	1	**Lead**	3	--	6.80	7.30	3	3	--	328	419	2	0.89	yes
	2	**TCDD TEQ**	3	--	1.52e-08	2.07e-06	1	3	--	7.59e-07	5.1E-05	1	0.34	yes
	4.5	**2,3,7,8-TCDD**	3	3	<4.30e-07	<5.70e-07	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	3	3	<0.100	<0.100	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Copper**	3	--	3.00	5.40	0	3	--	127	150	0	0	no
	4.5	**Total Suspended Solids**	3	--	20.0	41.0	0	0	--	--	--	0	0	no
EVBMP0005	1	**TCDD TEQ**	2	--	8.61e-07	1.25e-06	2	2	--	3.9E-05	>4.76e-5	2	0.94	yes
	2.5	**Cadmium**	2	1	<0.180	0.180	0	2	1	<1.95	1.95	1	0.31	no
	2.5	**Lead**	2	--	3.05	3.10	0	2	--	148	>250	1	0.31	no
	5	**2,3,7,8-TCDD**	2	2	<6.00e-07	<6.00e-07	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	5	**Copper**	2	--	6.60	9.00	0	2	--	72.1	>110	0	0	no
	5	**Total Suspended Solids**	2	1	<41.0	41.0	0	0	--	--	--	0	0	no
EVBMP0006	3	**Cadmium**	1	--	0.470	0.470	0	1	--	1.80	1.80	1	0.50	no
	3	**Copper**	1	--	15.0	15.0	1	1	--	33.5	33.5	0	0.50	no
	3	**Lead**	1	--	12.0	12.0	1	1	--	54.0	54.0	0	0.50	no
	3	**TCDD TEQ**	1	--	4.83e-06	4.83e-06	1	1	--	2.4E-05	2.4E-05	0	0.50	no
	3	**Total Suspended Solids**	1	--	200	200	1	0	--	--	--	0	0.50	no
	6	**2,3,7,8-TCDD**	1	1	<7.90e-07	<7.90e-07	0	1	1	<1.00e-12	<1.00e-12	0	0	no
EVBMP0007	1	**TCDD TEQ**	3	--	3.44e-08	3.92e-06	2	3	--	1.61e-06	1.8E-04	1	0.50	yes
	2	**Copper**	3	--	6.34	17.2	1	2	--	113	122	0	0.19	no
	3.5	**Cadmium**	3	2	<0.250	0.251	0	3	2	<1.00e-12	1.92	1	0.11	no
	3.5	**Lead**	3	--	4.10	11.4	1	3	--	179	211	0	0.11	no
	5.5	**2,3,7,8-TCDD**	3	3	<2.84e-06	<3.69e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Total Suspended Solids**	3	--	22.0	58.0	0	0	--	--	--	0	0	no
EVBMP0008	1	**TCDD TEQ**	3	--	1.39e-08	1.01e-07	1	3	--	1.39e-06	2.66e-06	0	0.11	no
	4	**2,3,7,8-TCDD**	3	3	<2.15e-06	<4.20e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	3	3	<0.128	<0.250	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	3	--	3.30	5.33	0	3	--	10.5	48.8	0	0	no
	4	**Lead**	3	--	1.90	1.94	0	3	--	>41.7	133	0	0	no
	4	**Total Suspended Solids**	3	--	34.0	38.0	0	0	--	--	--	0	0	no
EVBMP0009	1.5	**Copper**	2	--	6.69	9.95	0	2	--	226	395	1	0.31	no
	1.5	**TCDD TEQ**	2	--	2.81e-08	4.74e-08	1	2	--	3.24e-06	6.00e-06	0	0.31	no
	4.5	**2,3,7,8-TCDD**	2	2	<2.08e-06	<2.08e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	2	2	<0.128	<0.128	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Lead**	2	--	2.38	2.74	0	2	--	158	211	0	0	no
	4.5	**Total Suspended Solids**	2	--	12.9	18.0	0	0	--	--	--	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
HZBMP0001	1	**Total Suspended Solids**	13	--	140	600	7	0	--	--	--	0	0.50	no
	2	**Cadmium**	6	4	<0.200	0.600	0	6	4	<1.00e-12	>3.65	2	0.02	no
	3	**TCDD TEQ**	12	4	3.35e-09	1.2E-05	3	12	4	5.11e-08	2.0E-05	0	1.4E-04	no
	4.5	**Copper**	13	--	5.70	15.0	1	13	--	33.3	1,160	1	5.2E-06	yes
	4.5	**Lead**	13	1	2.10	19.0	2	13	1	24.9	114	0	5.2E-06	no
	6	**2,3,7,8-TCDD**	12	11	<2.10e-06	<3.10e-06	0	12	11	<1.00e-12	1.83e-06	1	1.5E-06	no
HZBMP0002	1	**Copper**	4	--	1.80	2.30	0	2	--	317	>600	1	0.11	no
	2	**Lead**	4	2	<0.650	0.900	0	4	2	<57.5	>380	1	0.04	no
	4.5	**2,3,7,8-TCDD**	4	4	<2.40e-06	<5.60e-06	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	4	4	<0.100	<0.100	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	4.5	**TCDD TEQ**	4	3	<1.00e-10	<1.00e-10	0	4	3	<1.00e-12	6.50e-09	0	0	no
	4.5	**Total Suspended Solids**	4	2	<1.00	12.0	0	0	--	--	--	0	0	no
HZBMP0003	1	**Total Suspended Solids**	15	4	9.00	840	3	0	--	--	--	0	0.02	no
	2	**TCDD TEQ**	15	4	2.90e-11	4.00e-06	4	15	4	>4.50e-09	>4.00e-4	1	1.6E-04	yes
	3	**Copper**	15	--	2.00	19.0	1	12	--	54.8	3,450	3	1.6E-04	yes
	4	**Lead**	15	7	0.400	19.0	2	15	7	13.4	>310	1	4.2E-06	yes
	5.5	**2,3,7,8-TCDD**	15	15	<1.00e-06	<6.07e-06	0	15	15	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	7	6	<0.100	<0.250	0	7	6	<1.00e-12	>72.0	1	0	no
HZSW0005	3.5	**2,3,7,8-TCDD**	1	1	<4.00e-07	<4.00e-07	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Lead**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**TCDD TEQ**	1	--	5.58e-09	5.58e-09	0	1	--	1.12e-06	1.12e-06	0	0	no
	3.5	**Total Suspended Solids**	1	--	5.00	5.00	0	0	--	--	--	0	0	no
HZSW0008	3.5	**2,3,7,8-TCDD**	1	1	<6.20e-07	<6.20e-07	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Lead**	1	--	0.400	0.400	0	1	--	11.5	11.5	0	0	no
	3.5	**TCDD TEQ**	1	--	2.13e-09	2.13e-09	0	1	--	7.59e-08	7.59e-08	0	0	no
	3.5	**Total Suspended Solids**	1	--	28.0	28.0	0	0	--	--	--	0	0	no
HZSW0011	1	**Copper**	2	--	2.70	3.00	0	2	--	425	670	1	0.31	no
	4	**2,3,7,8-TCDD**	2	2	<5.20e-06	<5.20e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Lead**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**TCDD TEQ**	2	--	3.52e-09	7.02e-09	0	2	--	1.76e-06	3.51e-06	0	0	no
	4	**Total Suspended Solids**	2	--	4.00	6.00	0	0	--	--	--	0	0	no
HZSW0012	3.5	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Lead**	1	1	<0.200	<0.200	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	3.5	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Total Suspended Solids**	1	--	7.00	7.00	0	0	--	--	--	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
HZSW0014	3.5	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Copper**	3	--	6.40	7.90	0	3	--	40.9	136	0	0	no
	3.5	**Lead**	3	--	3.10	3.70	0	3	--	35.7	115	0	0	no
	3.5	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Total Suspended Solids**	3	--	61.0	70.0	0	0	--	--	--	0	0	no
HZSW0020	1.5	**Lead**	2	--	9.65	14.0	2	2	--	105	149	0	0.50	no
	1.5	**Total Suspended Solids**	2	--	72.5	76.0	1	0	--	--	--	0	0.50	no
	4.5	**2,3,7,8-TCDD**	2	2	<2.60e-06	<2.60e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	4.5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4.5	**TCDD TEQ**	2	--	4.53e-09	5.04e-09	0	2	--	6.23e-08	6.63e-08	0	0	no
ILBMP0001	1	**TCDD TEQ**	23	--	1.74e-07	3.4E-05	19	23	--	9.38e-06	6.8E-04	8	0.91	yes
	2	**Cadmium**	23	4	0.420	1.30	0	23	4	5.32	52.1	19	0.15	no
	3	**Lead**	23	--	5.40	19.0	12	23	--	111	710	4	0.03	yes
	4	**Total Suspended Solids**	23	--	37.0	330	6	0	--	--	--	0	0.02	no
	5	**Copper**	23	--	12.0	35.0	9	20	--	130	725	3	2.7E-03	yes
	6	**2,3,7,8-TCDD**	23	23	<1.40e-06	<1.20e-5	0	23	23	<1.00e-12	<1.00e-12	0	0	no
ILBMP0002	1	**Lead**	13	--	14.0	82.0	10	12	--	349	1,020	7	0.98	yes
	2	**TCDD TEQ**	13	--	1.77e-06	2.4E-05	10	13	--	4.0E-05	7.2E-04	7	0.96	yes
	3	**Total Suspended Solids**	13	--	36.0	1,800	4	0	--	--	--	0	0.13	no
	4	**Cadmium**	13	7	<0.250	1.10	0	13	7	<1.00e-12	9.45	6	4.7E-03	no
	5	**Copper**	13	--	10.0	59.0	4	12	--	67.4	266	0	4.6E-04	no
	6	**2,3,7,8-TCDD**	13	12	<2.20e-06	<6.99e-06	0	13	12	<1.00e-12	8.9E-05	1	4.0E-07	no
ILBMP0003	3.5	**2,3,7,8-TCDD**	4	4	<1.70e-06	<6.70e-06	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	4	4	<0.100	<0.100	0	4	4	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Copper**	4	--	3.90	4.80	0	3	--	100.0	267	0	0	no
	3.5	**Lead**	3	--	0.860	0.920	0	1	--	132	132	0	0	no
	3.5	**TCDD TEQ**	4	--	2.50e-09	2.69e-08	0	4	--	6.25e-07	8.95e-06	0	0	no
	3.5	**Total Suspended Solids**	4	--	4.00	10.0	0	0	--	--	--	0	0	no
ILBMP0007	1	**TCDD TEQ**	1	--	9.40e-08	9.40e-08	1	1	--	1.7E-05	1.7E-05	0	0.50	no
	4	**2,3,7,8-TCDD**	1	1	<4.70e-07	<4.70e-07	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4	**Cadmium**	1	1	<0.250	<0.250	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4	**Copper**	1	--	6.50	6.50	0	0	--	--	--	0	0	no
	4	**Lead**	1	1	<0.500	<0.500	0	1	1	<1.00e-12	<1.00e-12	0	0	no
	4	**Total Suspended Solids**	1	--	5.70	5.70	0	0	--	--	--	0	0	no
ILSW0003	1	**Total Suspended Solids**	2	--	52.5	83.0	1	0	--	--	--	0	0.50	no
	4	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Cadmium**	2	--	0.455	0.540	0	0	--	--	--	0	0	no
	4	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Lead**	2	--	2.80	3.50	0	2	--	76.8	133	0	0	no
	4	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
ILSW0004-A	1	**Total Suspended Solids**	1	--	110	110	1	0	--	--	--	0	0.50	no
	4	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Cadmium**	1	--	0.350	0.350	0	0	--	--	--	0	0	no
	4	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	4	**Lead**	1	--	2.60	2.60	0	1	--	19.7	19.7	0	0	no
	4	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
ILSW0007	3.5	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Cadmium**	1	--	0.290	0.290	0	0	--	--	--	0	0	no
	3.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Lead**	1	--	2.10	2.10	0	1	--	37.2	37.2	0	0	no
	3.5	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Total Suspended Solids**	1	--	47.0	47.0	0	0	--	--	--	0	0	no
ILSW0008	3.5	**2,3,7,8-TCDD**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Cadmium**	1	--	0.340	0.340	0	0	--	--	--	0	0	no
	3.5	**Copper**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Lead**	1	--	2.60	2.60	0	1	--	31.4	31.4	0	0	no
	3.5	**TCDD TEQ**	0	--	--	--	0	0	--	--	--	0	0	no
	3.5	**Total Suspended Solids**	1	--	69.0	69.0	0	0	--	--	--	0	0	no
LFSW0002-A	1.5	**TCDD TEQ**	3	--	8.38e-08	9.38e-06	2	3	--	1.27e-06	2.0E-04	1	0.50	yes
	1.5	**Total Suspended Solids**	3	--	66.0	87.0	1	0	--	--	--	0	0.50	no
	3	**Lead**	3	--	3.70	6.70	1	3	--	64.2	67.0	0	0.11	no
	5	**2,3,7,8-TCDD**	3	3	<2.40e-06	<8.80e-06	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	5	**Cadmium**	0	--	--	--	0	0	--	--	--	0	0	no
	5	**Copper**	3	--	4.30	7.30	0	3	--	33.9	37.8	0	0	no
LPBMP0001	2	**Cadmium**	2	--	0.315	0.480	0	2	--	2.08	>2.92	2	0.50	no
	2	**TCDD TEQ**	2	--	2.17e-07	2.38e-07	2	2	--	2.96e-06	4.42e-06	0	0.50	no
	2	**Total Suspended Solids**	2	--	92.0	130	1	0	--	--	--	0	0.50	no
	4.5	**Copper**	2	--	9.25	14.0	1	2	--	76.3	91.5	0	0.31	no
	4.5	**Lead**	2	--	9.75	15.0	1	2	--	93.8	112	0	0.31	no
	6	**2,3,7,8-TCDD**	2	2	<5.20e-07	<5.20e-07	0	2	2	<1.00e-12	<1.00e-12	0	0	no
LPBMP0001-A	1	**TCDD TEQ**	6	--	4.88e-06	5.0E-05	6	6	--	1.8E-04	1.2E-03	4	0.98	yes
	2	**Total Suspended Solids**	6	--	37.5	180	2	0	--	--	--	0	0.34	no
	3	**Copper**	6	--	11.1	21.0	3	4	--	62.9	242	0	0.17	no
	4.5	**Cadmium**	6	4	<0.100	0.350	0	6	4	<1.00e-12	>1.39	2	0.02	no
	4.5	**Lead**	6	--	2.55	32.0	2	6	--	114	172	0	0.02	no
	6	**2,3,7,8-TCDD**	6	6	<1.80e-06	<4.40e-06	0	6	6	<1.00e-12	<1.00e-12	0	0	no
LPBMP0002	1	**TCDD TEQ**	7	--	2.88e-07	1.3E-05	7	7	--	4.23e-06	2.5E-04	1	0.61	yes
	2	**Total Suspended Solids**	7	--	53.0	280	2	0	--	--	--	0	0.23	no
	3	**Copper**	7	--	14.0	32.0	4	7	--	81.1	221	0	0.09	no
	4	**Cadmium**	7	4	<0.500	0.750	0	7	4	<1.00e-12	4.44	3	0.03	no
	5	**Lead**	7	--	4.20	20.0	2	7	--	>66.0	>130	0	0.01	no
	6	**2,3,7,8-TCDD**	7	7	<1.92e-06	<7.47e-06	0	7	7	<1.00e-12	<1.00e-12	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
LPBMP0003	1.5	**TCDD TEQ**	7	--	1.88e-07	7.94e-06	6	7	--	7.84e-06	7.2E-05	1	0.50	yes
	1.5	**Total Suspended Solids**	7	--	69.0	240	3	0	--	--	--	0	0.50	no
	3.5	**Cadmium**	7	4	<0.500	<0.500	0	7	4	<1.00e-12	2.19	3	0.03	no
	3.5	**Lead**	7	--	3.00	8.50	3	7	--	>50.0	79.6	0	0.03	no
	5.5	**2,3,7,8-TCDD**	7	7	<7.50e-07	<9.64e-06	0	7	7	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Copper**	7	--	12.0	14.0	1	7	--	79.0	174	0	0	no
LPBMP0004	1	**Total Suspended Solids**	8	--	31.0	110	1	0	--	--	--	0	0.04	no
	2	**TCDD TEQ**	8	1	1.81e-08	1.49e-07	3	8	1	7.32e-07	4.37e-06	0	0.01	no
	3.5	**Copper**	8	--	7.00	14.0	1	8	--	116	385	1	2.1E-03	yes
	3.5	**Lead**	8	--	3.50	5.60	1	8	--	106	277	1	2.1E-03	yes
	5.5	**2,3,7,8-TCDD**	8	8	<2.40e-06	<5.84e-06	0	8	8	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	8	8	<0.250	<0.500	0	8	8	<1.00e-12	<1.00e-12	0	0	no
LXBMP0002	1.5	**TCDD TEQ**	2	--	7.63e-08	1.07e-07	2	2	--	2.24e-06	4.12e-06	0	0.50	no
	1.5	**Total Suspended Solids**	2	--	156	300	1	0	--	--	--	0	0.50	no
	4	**Cadmium**	2	1	<0.120	0.120	0	2	1	<0.177	>0.177	1	0.31	no
	4	**Copper**	2	--	9.65	14.0	1	2	--	45.8	63.6	0	0.31	no
	4	**Lead**	2	--	3.82	6.90	1	2	--	30.0	40.9	0	0.31	no
	6	**2,3,7,8-TCDD**	2	2	<5.10e-06	<5.10e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
LXBMP0003	1	**Total Suspended Solids**	6	--	78.5	1,000	3	0	--	--	--	0	0.50	no
	2	**TCDD TEQ**	6	3	<4.35e-08	1.23e-07	3	6	3	<1.23e-07	1.5E-05	0	0.07	no
	3	**Copper**	6	--	3.85	20.0	1	5	--	17.9	2,970	1	0.03	yes
	4	**Cadmium**	6	4	<0.100	0.440	0	6	4	<1.00e-12	>17.7	2	0.02	no
	5.5	**2,3,7,8-TCDD**	6	6	<8.80e-07	<8.30e-06	0	6	6	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Lead**	6	1	0.810	18.0	1	6	1	12.4	>44.1	0	0	no
LXBMP0004	1	**Total Suspended Solids**	5	--	260	520	5	0	--	--	--	0	0.97	no
	2	**Lead**	5	--	8.80	14.0	5	5	--	44.3	102	0	0.50	no
	3	**Cadmium**	5	1	0.120	0.190	0	5	1	>0.272	>0.634	4	0.38	no
	4.5	**Copper**	5	--	11.0	15.0	1	5	--	40.6	86.9	0	0.01	no
	4.5	**TCDD TEQ**	5	--	4.50e-10	1.72e-07	1	5	--	3.81e-09	5.54e-07	0	0.01	no
	6	**2,3,7,8-TCDD**	5	5	<2.30e-06	<6.00e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
LXBMP0005	1	**Total Suspended Solids**	5	--	54.0	180	2	0	--	--	--	0	0.50	no
	2	**TCDD TEQ**	5	--	2.50e-10	4.59e-06	2	5	--	4.05e-09	2.3E-04	1	0.17	yes
	3	**Cadmium**	5	3	<0.100	0.130	0	5	3	<1.00e-12	>2.88	2	0.05	no
	4.5	**Copper**	5	--	8.40	12.0	0	5	--	59.3	435	1	0.01	no
	4.5	**Lead**	5	--	4.40	5.50	1	5	--	>29.3	>229	0	0.01	no
	6	**2,3,7,8-TCDD**	5	5	<1.50e-06	<7.30e-06	0	5	5	<1.00e-12	<1.00e-12	0	0	no
LXBMP0006	1	**Total Suspended Solids**	3	--	40.0	1,300	1	0	--	--	--	0	0.50	no
	3.5	**Cadmium**	3	2	<0.128	0.400	0	3	2	<1.00e-12	>0.231	1	0.11	no
	3.5	**Copper**	3	--	3.10	26.0	1	3	--	17.5	207	0	0.11	no
	3.5	**Lead**	3	--	0.584	24.0	1	3	--	>17.3	18.3	0	0.11	no
	3.5	**TCDD TEQ**	3	2	<1.00e-10	5.63e-08	1	3	2	<1.00e-12	4.33e-08	0	0.11	no
	6	**2,3,7,8-TCDD**	2	2	<1.06e-06	<1.06e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no

Location	Rank	COC	Concentration					Particulate Strength					Weight	Both Criteria Exceeded?
			Number of Samples	Number of NDs	Median	Maximum	N > PL	Number of PS	Number of NDs	Median PS	Maximum	N > 95th		
LXBMP0009	3.5	**2,3,7,8-TCDD**	2	2	<4.17e-06	<4.17e-06	0	2	2	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Cadmium**	3	3	<0.128	<0.250	0	3	3	<1.00e-12	<1.00e-12	0	0	no
	3.5	**Copper**	3	--	4.10	7.04	0	2	--	58.6	104	0	0	no
	3.5	**Lead**	3	--	1.20	2.69	0	2	--	36.7	44.2	0	0	no
	3.5	**TCDD TEQ**	2	--	2.70e-09	3.22e-09	0	2	--	1.22e-07	1.34e-07	0	0	no
	3.5	**Total Suspended Solids**	2	--	22.0	24.0	0	0	--	--	--	0	0	no
LXSW0002	1	**Total Suspended Solids**	9	2	4.00	190	1	0	--	--	--	0	0.02	no
	2.5	**Copper**	9	--	1.80	13.0	0	9	--	243	1,750	3	3.8E-03	no
	2.5	**TCDD TEQ**	9	3	1.21e-09	1.9E-05	2	9	3	3.02e-07	9.8E-05	1	3.8E-03	yes
	4	**Lead**	9	--	0.340	27.0	1	9	--	104	>233	0	7.2E-05	no
	5.5	**2,3,7,8-TCDD**	8	8	<1.20e-06	<8.80e-06	0	8	8	<1.00e-12	<1.00e-12	0	0	no
	5.5	**Cadmium**	8	8	<0.100	<0.100	0	8	8	<1.00e-12	<1.00e-12	0	0	no
Outfall 008	1	**Total Suspended Solids**	23	1	68.0	1,300	11	0	--	--	--	0	0.50	no
	2	**Lead**	33	--	3.70	120	13	22	--	46.5	112	0	5.7E-05	no
	3	**TCDD TEQ**	33	5	1.33e-09	2.20e-06	6	23	5	9.04e-09	2.34e-07	0	5.1E-10	no
	4	**Cadmium**	32	14	0.0280	1.50	0	18	14	<1.00e-12	>5.29	4	2.2E-10	no
	5	**Copper**	33	1	5.20	18.0	2	23	1	41.6	183	0	2.2E-14	no
	6	**2,3,7,8-TCDD**	33	33	<9.52e-07	<9.49e-06	0	33	33	<1.00e-12	<1.00e-12	0	0	no
Outfall 009	1	**Total Suspended Solids**	53	18	6.00	4,000	8	0	--	--	--	0	1.2E-07	no
	2	**TCDD TEQ**	74	7	9.23e-09	3.7E-04	29	55	7	8.07e-07	2.1E-04	6	1.0E-07	yes
	3	**Lead**	74	6	1.70	260	18	55	6	96.8	>1,000	7	6.0E-13	yes
	4	**Cadmium**	74	41	<0.120	9.20	1	52	41	<1.00e-12	>33.0	11	2.6E-22	yes
	5	**Copper**	74	--	4.00	39.0	3	48	--	78.8	950	3	8.0E-28	yes
	6	**2,3,7,8-TCDD**	74	71	<1.00e-06	3.4E-05	0	73	71	<1.00e-12	4.0E-05	2	6.1E-41	no