

The Boeing Company  
Santa Susana Field Laboratory  
5800 Woolsey Canyon Road  
Canoga Park, CA 91304-1148

Certified Mail

January 7, 2010  
In reply refer to SHEA-109489



Regional Water Quality Control Board  
Los Angeles Region  
320 West 4<sup>th</sup> Street, Suite 200  
Los Angeles, CA 90013

Attention: Mr. Peter Raftery

Subject: Performance Monitoring Sampling and Analysis Plan  
Final Interim Source Removal Action (ISRA) Work Plan submitted  
in Response to California Water Code Section 13304 Order (NPDES  
No. CA0001309, CI No. 6027, SCP No. 1111, Site ID No. 2040109)

Dear Mr. Raftery:

The Boeing Company (Boeing), on behalf of Boeing and the National Aeronautics and Space Administration (NASA), hereby submits the attached ISRA Performance Monitoring Sampling and Analysis Plan, as referenced in the May 1, 2009 Final ISRA Work Plan, for your review.

If you have any questions or require anything further, please contact Lori Blair at 818-466-8741.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Gallacher".

Tom Gallacher  
Director, Santa Susana Field Laboratory  
Environment, Health, and Safety

LNB:bjc

Attachment: ISRA Performance Monitoring Sampling and Analysis Plan

cc: Ms. Cassandra Owens, RWQCB  
Mr. Buck King, DTSC  
Mr. Paul Carpenter, DTSC  
Mr. Rick Lainhart, U.S. ACOE  
Mr. Allen Elliott, NASA  
Mr. Steve Slaten, NASA



BUILDING A BETTER WORLD

## TECHNICAL MEMORANDUM

TO: Lori Blair, Boeing  
Steve Slaten, NASA

DATE: January 7, 2010

FROM: Alex Fischl, MWH

CC: Dixie Hambrick, MWH  
Bill McElroy, CH2M HILL  
Surface Water Expert Panel

SUBJECT: ISRA Performance Monitoring Sampling and Analysis Plan

---

### Introduction

This memorandum outlines the sampling and analysis plan (SAP) for the performance monitoring program at the Interim Source Removal Action (ISRA) areas of the Santa Susana Field Laboratory (SSFL). As stated in the approved *Final ISRA Work Plan* (MWH, 2009a), performance monitoring will be implemented at each ISRA area following the completion of remedial actions and will involve the collection of surface water runoff samples both up- and down-gradient of ISRA areas. This performance monitoring program is designed to collect engineering performance data to assess the contribution of ISRA constituents of concern (COCs) to surface water runoff following completion of remedial activities at ISRA areas, and is not meant to be a comprehensive study of stormwater discharge of ISRA COCs within the Outfall 008 and 009 watersheds. In addition, this study is not an extension of the National Pollutant Discharge Elimination System (NPDES) program, and therefore, data collected as part of this study are not a measurement of NPDES compliance within the watersheds. . The purpose of this SAP is to provide procedures for the sampling and analysis that will be conducted as part of the performance monitoring program.

### Project Background

Monitoring of surface water discharges at SSFL is currently conducted under Waste Discharge Requirements, which serve as NPDES Permit No CA0001309, and Monitoring and Reporting Program (MRP) No 6027. On December 3, 2008, the RWQCB issued a California Water Code Section 13304 Cleanup and Abatement Order (CAO) requiring an ISRA for Outfalls 008 and 009

portion of the 2009/2010 rainy season (anticipated early January 2010), including A2LF-1 and A2LF-3 (Figure 2). Performance monitoring will be implemented for these ISRA areas once the remedial action and site restoration at each area are complete. As required in the *Final ISRA Work Plan* (MWH, 2009a), performance monitoring will include collection of surface water runoff samples up- and down-gradient of completed ISRA areas during rain events. Up-gradient samples are included to provide surface water runoff quality information from background soil conditions and will be compared to down-gradient samples to assess the contribution of ISRA COCs from completed remedial areas.

During the 2009/2010 rainy season, performance monitoring will also be implemented at four culvert maintenance (CM) systems within the Outfall 009 watershed, including CM-3, CM-8, CM-9, and CM-11 (Figures 3 and 4). Surface water runoff samples will be collected up- and down-gradient of each of these CMs. The general purpose of monitoring at these CMs is to assess the performance of culvert maintenance activities that have been implemented to help promote sediment settling and the potential removal of pollutants. Performance monitoring is planned to be implemented at CM-8, CM-9, and CM-11 during the 2009/2010 rainy season to assess the effectiveness of the CM activities, which included soil removal, as historical sample results at these locations indicate the culvert and/or associated drainage contain soil with ISRA COCs at concentrations greater than soil remediation goals (SRGs). Performance monitoring is planned to be implemented at CM-3 during the 2009/2010 rainy season to provide reference monitoring data for the other CM systems. CM activities were performed at CM-3, but the subcatchment basin has been minimally impacted by historical site activities and historical sample results indicate the culvert and associated drainage do not contain soil with ISRA COCs at concentrations greater than SRGs. CM-3 was selected over the other CMs systems that meet the characteristics suitable for providing reference monitoring data because it receives runoff from a larger area, and is therefore the most likely to flow.

### **Performance Monitoring Sampling Locations**

Proposed performance monitoring sampling locations for ISRA areas planned to be completed during the 2009/2010 rainy season, and the CM-3, CM-8, CM-9, and CM-11 areas are shown on Figures 1 through 4. Proposed down-gradient sample locations are shown in blue and up-gradient sample locations are shown in green. For Outfall 008, primary down-gradient performance sample locations were identified to assess overall ISRA effectiveness of multiple ISRA areas and planting areas, and are placed in areas where runoff has historically been commonly observed during rain events. Secondary performance sample locations for the Outfall 008 are located down-gradient of the individual remedial areas;

# ISRA Performance Monitoring Plan

January 7, 2010

Page 3

samples collected from these locations will be placed on hold at the laboratory and analyzed if primary sample results indicate the need to further assess down-gradient effects.

The sample locations shown on Figures 1 through 4 are proposed and may be revised based on field observations during rain events to locations where runoff is more common or sampling is safer.

## **Performance Monitoring Inspection and Sampling Frequency**

Performance monitoring inspections will be performed in conjunction with rain event SWPPP inspections, which are performed immediately prior to and at 24 hour intervals during rain events as outlined in the ISRA SWPPP (MWH, 2009b). During performance monitoring inspections, the presence and characteristics of storm water runoff both up- and down-gradient of the ISRA areas will be noted on the performance monitoring inspection and sample collection form included as Appendix A. Since many of the ISRA areas are not within drainages (or even if located in a drainage, the drainage may not typically convey runoff), performance monitoring inspections will be conducted approximately 50 to 100 feet up- and down-gradient of each ISRA area, and continue into down-gradient drainage channels until runoff is observed, but not past the Outfall 008 or 009 NPDES sampling station. If runoff is observed, a performance monitoring sample will be collected of the flowing surface water following the methods described below. Performance monitoring inspections will continue throughout the rain event on a 24-hour basis to document runoff conditions.

Performance monitoring sampling will be conducted as soon as conditions allow during rain events. Every attempt will be made to collect samples during the first two hours of discharge, during daylight hours (sunrise to sunset). The SSFL NPDES Permit definition of a discharge (rain) event is one that produces more than 0.1 inch of rainfall in a 24-hour period and must be preceded by at least 72 hours of dry weather. During extended rain events, additional performance samples will be collected on a weekly basis and placed on hold at the laboratory for pending analysis contingent upon previous performance sample or NPDES outfall sample results. For rain events lasting over one month, performance samples will be analyzed by the laboratory on at least a monthly basis to monitor changes in runoff conditions.

## **Performance Monitoring Sampling Methods and Analysis**

Performance monitoring samples will be collected and analyzed consistent with the methods set forth in NPDES Permit No. CA0001309 and MRP No 6027. Details of sample collection methodology and sample analysis are provided below.

### ***Sample Collection Methods***

Grab samples will be collected from flowing surface water, not from puddles, by placing a pre-cleaned disposable sample container directly into a stream of flowing water at the sampling location. Each sample location will be documented with GPS and photographs. For laboratory analysis, the sample will be poured directly from the disposable container to preserved or non-preserved sample bottles, taking care to minimize bubbles and headspace. Extended grab sampling methods can be considered if warranted based on performance monitoring or NPDES Outfall sampling results. If possible, the up-gradient samples will be collected prior to the down-gradient samples to minimize the potential for cross-contamination. Turbidity, conductivity, temperature, and pH will be measured using a calibrated water quality meter in the field immediately after the sample is collected. Field parameters will be documented on the performance monitoring inspection and sample collection form provided in Attachment 1. Qualitative flow observations, sample color, and any other notable information will also be documented on the sample form.

Each sample will be assigned a unique sample identification (ID) following RCRA Facility Investigation (RFI) protocols (e.g., HZSW0001S001). Each sample ID will include:

# ISRA Performance Monitoring Plan

January 7, 2010

Page 4

The two-letter RFI site ID code (i.e., "HZ" for Happy Valley: "HZSW0001S001");

The sample type ("SW" for surface water) with a four-digit sample location number ("HZSW0001S001"); and,

A sample designator "S" and a three digit sample number ("HZSW0001S001"). Note that a sample location (i.e., HZSW0001) may have more than one sample collected at it (i.e., one sample collected during each rain event represented by the following sample IDs: HZSW0001S001, HZSW0001S002, HZSW0001S003, etc.).

Immediately after sample collection, sample bottles will be capped, labeled, documented on a Chain of Custody form and prepared for pick up by a California state-certified laboratory.

Field duplicates, equipment blanks, and other quality control (QC) samples and split quality assurance (QA) samples will not be collected since these are engineering performance sampling data. If field duplicate or split samples are requested by the RWQCB, then these will be collected and their respective field sample ID will be indicated on the Chain of Custody form. Data will undergo review of the Level 2 QC parameters reported by the laboratory to evaluate impacts and potential bias in the usability of the data. Selected data may be validated for quality assurance purposes or to resolve data anomalies.

## ***Sample Laboratory Analysis***

Laboratory analysis of performance monitoring samples will include ISRA COCs associated with the ISRA or CM areas the performance sample is monitoring. Samples will also be analyzed by the laboratory for total suspended solids (TSS) to assess sediment transport of ISRA COCs. Based on the surface water expert panel's review of the performance monitoring results, samples may also be analyzed for particle size distribution (PSD). The COCs associated with each ISRA and CM area are identified on Table 1. Laboratory analytical methods and reporting limits, which are consistent with those specified in the NPDES permit, are presented on Table 2.

## **Study Duration and Reporting**

Performance monitoring sampling will commence following the completion of ISRA remedial activities and is currently proposed to continue through two rainy seasons (i.e., performance monitoring for ISRA areas completed in 2009 will occur during the 2009/2010 and 2010/2011 rainy season). However, an evaluation of the monitoring plan and results from the initial rainy season for each ISRA area will be performed, and, as necessary, this plan will be revised prior to the subsequent rainy season. Performance monitoring sampling results will be published in quarterly ISRA Monitoring Reports submitted to the RWQCB. Sampling results may appear in sequential quarterly reports if validated data is not available prior to the end of the quarter, and non-validated data is included in the quarterly report.

## **References**

MWH, 2009a. *Final ISRA Work Plan*, Santa Susana Field Laboratory, Ventura County. May.

MWH, 2009b. *Storm Water Pollution Prevention Plan (SWPPP), Interim Source Removal Action*, Santa Susana Field Laboratory, Ventura County, California, August 14.

RWQCB, 2007. Letter from T. Egoscue, DTSC, to T. Gallacher, Boeing, Cleanup and Abatement Order No. R4-2007-0054 Requiring the Boeing Company, SSFL to Cleanup and Abate the Effects of Contaminants Discharged to Surface Waters, the Northern, Drainage, An Ephemeral Stream that Discharges to the Arroyo Simi, A Tributary to Calleguas Creek. November 6.

## **Figures**

- Figure 1      Outfall 008 ISRA, Proposed Performance Monitoring Sampling Locations
- Figure 2      Outfall 009 ISRA (Western Portion), Proposed Performance Monitoring Sampling Locations
- Figure 3      Outfall 009 ISRA (Western Central), Proposed Performance Monitoring Sampling Locations
- Figure 4      Outfall 009 ISRA (Eastern Portion) Proposed Performance Monitoring Sampling Locations

## **Tables**

- Table 1      Performance Monitoring Sampling Laboratory Analyses
- Table 2      Performance Sample Analytical Reporting Limits

## **Attachments**

- Attachment 1    Performance Monitoring Inspection and Sample Collection Form

**Table 1**  
**Performance Monitoring Sampling Laboratory Analyses**  
**Page 1 of 1**

<b>ISRA Location</b>	<b>Analytical Suite</b>	<b>EPA Method</b>
<b>Outfall 008</b>		
CYN-1	Copper, Lead	EPA 200.8
DRG-1	Dioxins / TCDD TEQ	EPA 1613
HVS-1	Lead Dioxins / TCDD TEQ	EPA 200.8 EPA 1613
HVS-2A	Lead	EPA 200.8
HVS-2B-1	Copper, Lead	EPA 200.8
HVS-2B-2	Copper	EPA 200.8
HVS-2C	Lead	EPA 200.8
HVS-2D	Lead Dioxins / TCDD TEQ	EPA 200.8 EPA 1613
HVS-3, HVS-4	Copper Dioxins / TCDD TEQ	EPA 200.8 EPA 1613
<b>Outfall 009</b>		
A2LF-1	Dioxins / TCDD TEQ	EPA 1613
A2LF-3	Lead Dioxins / TCDD TEQ	EPA 200.8 EPA 1613
CM-3	Cadmium, Copper, Lead, Mercury Dioxins / TCDD TEQ	EPA 200.8/245.1 EPA 1613
CM-8	Lead	EPA 200.8
CM-9	Cadmium, Copper, Lead, Mercury	EPA 200.8/245.1
CM-11	Dioxins / TCDD TEQ	EPA 1613

**Notes:**

Dioxins / TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective World Health Organization's (WHO's) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

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

EPA - Environmental Protection Agency

**Table 2**  
**Performance Sample Analytical Reporting Limits**  
 (Page 1 of 1)

<b>Parameter</b>	<b>Laboratory Method</b>	<b>Reporting Limit</b>	<b>Units</b>
<b>Metals</b>			
Total Cadmium	EPA 200.8	1.0	µg/L
Total Copper	EPA 200.8	2.0	µg/L
Total Lead	EPA 200.8	1.0	µg/L
Total Mercury	EPA 245.1	0.2	µg/L
<b>Dioxins</b>			
2,3,7,8-TCDD	EPA 1613	5.0	pg/L
1,2,3,7,8-PeCDD	EPA 1613	25	pg/L
1,2,3,4,7,8-HxCDD	EPA 1613	25	pg/L
1,2,3,6,7,8-HxCDD	EPA 1613	25	pg/L
1,2,3,7,8,9-HxCDD	EPA 1613	25	pg/L
1,2,3,4,6,7,8-HpCDD	EPA 1613	25	pg/L
OCDD	EPA 1613	50	pg/L
2,3,7,8-TCDF	EPA 1613	5.0	pg/L
1,2,3,7,8-PeCDF	EPA 1613	25	pg/L
2,3,4,7,8-PeCDF	EPA 1613	25	pg/L
1,2,3,4,7,8-HxCDF	EPA 1613	1.2	pg/L
1,2,3,6,7,8-HxCDF	EPA 1613	0.92	pg/L
2,3,4,6,7,8-HxCDF	EPA 1613	25	pg/L
1,2,3,7,8,9-HxCDF	EPA 1613	25	pg/L
1,2,3,4,6,7,8-HpCDF	EPA 1613	1.2	pg/L
1,2,3,4,7,8,9-HpCDF	EPA 1613	8.9	pg/L
OCDF	EPA 1613	50	pg/L
Total TCDD	EPA 1613	5.0	pg/L
Total PeCDD	EPA 1613	9.2	pg/L
Total HxCDD	EPA 1613	9.4	pg/L
Total HpCDD	EPA 1613	6.6	pg/L
Total HpCDF	EPA 1613	1.2	pg/L
Total HxCDF	EPA 1613	25	pg/L
Total PeCDF	EPA 1613	1.4	pg/L
Total TCDF	EPA 1613	5.0	pg/L
<b>General Chemistry</b>			
Total Suspended Solids (TSS)	SM2540D	10	mg/L
Partical Size Distribution (PSD)	ASTM D6913-04 (2009)	--	--

**Notes:**

Parameters listed include the ISRA Area COCs for Outfall 008 and Outfall 009 presented in this sampling plan.

"--" - not applicable

ASTM - American Society for Testing and Materials

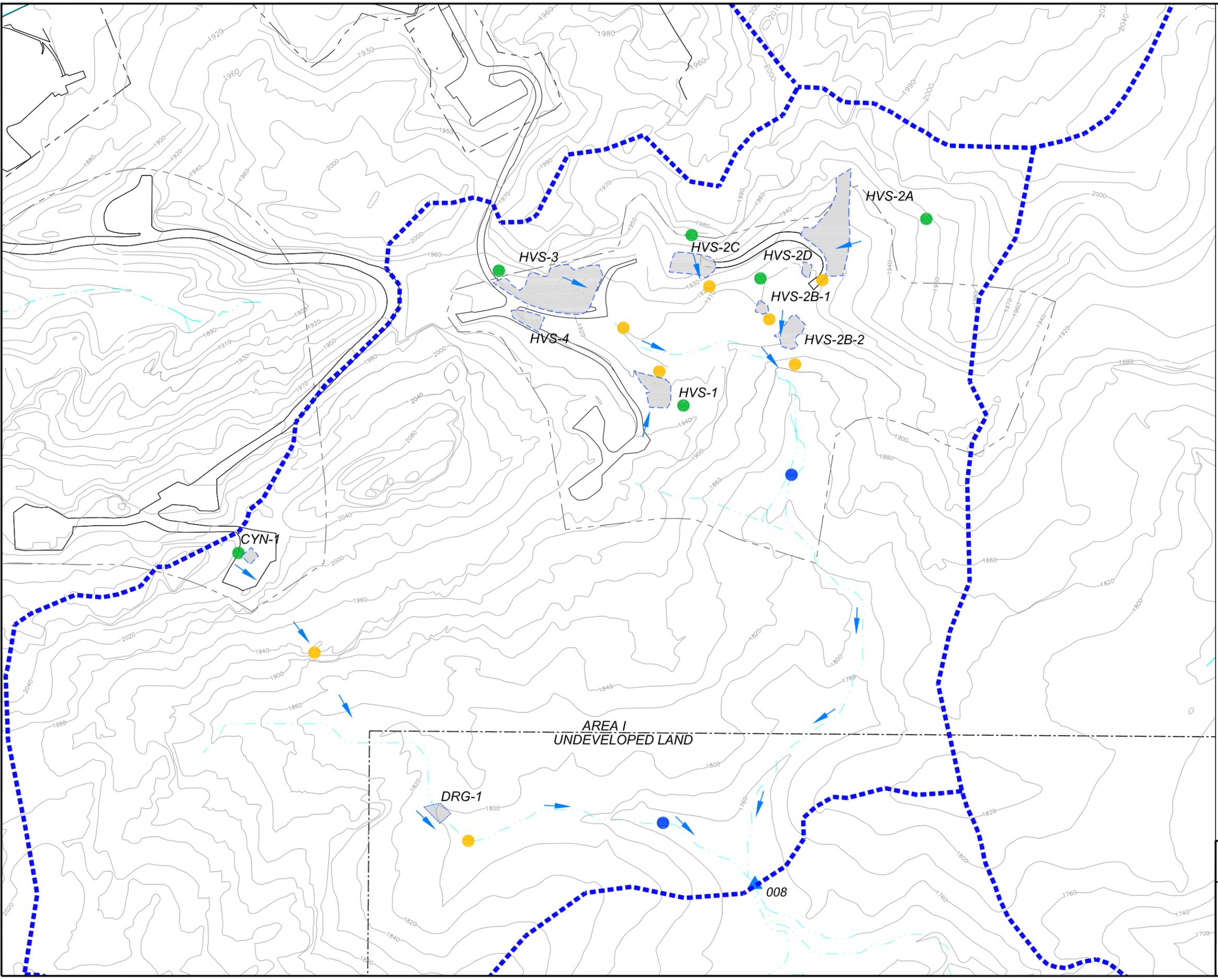
EPA - Environmental Protection Agency

mg/L - milligrams per liter

µg/L - micrograms per liter

pg/L - picograms per liter

FILE: CAD\MUEBKE\BOEING\SANTA\_SUSANA\ISRA\_EXCAVATIONS\HAPPY\_VALLEY\_AREA\_EXCAVATIONS\_8\_10\_09



- Legend**
- Administrative Area Boundary
  - RFI Site Boundary
  - Approximate Excavation Area
  - Surface Water Divide
  - Surface Water Drainage
  - Topographic Contour
  - Surface Water Flow Direction
  - NPDES Outfall
  - Proposed Upgradient Performance Monitoring Sampling Location
  - Proposed Downgradient Performance Monitoring Sampling Location
  - Proposed Downgradient Secondary Performance Monitoring Sampling Location

**MWH**  
 SANTA SUSANA FIELD LABORATORY  
 VENTURA COUNTY, CALIFORNIA

**OUTFALL 008 ISRA  
 PROPOSED PERFORMANCE MONITORING  
 SAMPLING LOCATIONS**

FIGURE 1

Legend



Building



NPDES Outfall



Surface Water Divide



Surface Water Drainage



Topographic Contour



Surface Water Flow Direction

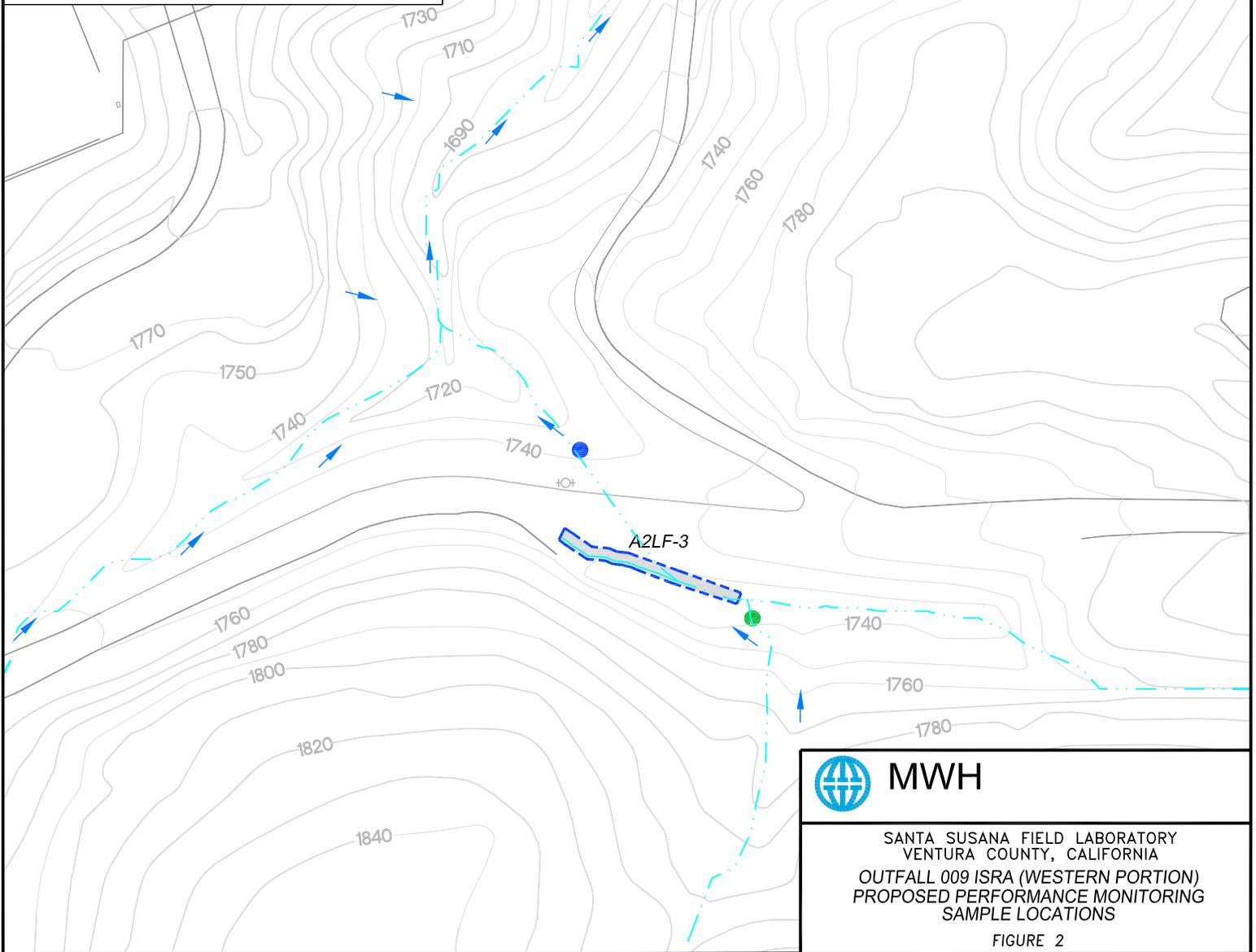
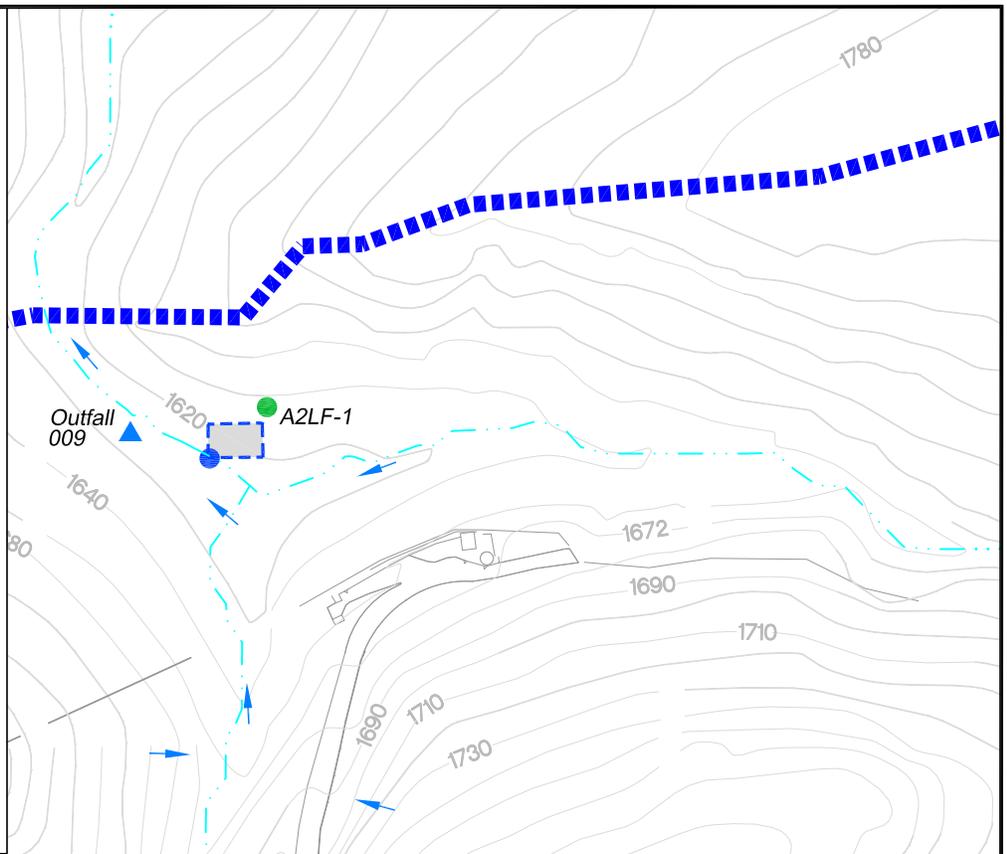


Proposed Upgradient Performance Monitoring Sample Location



Proposed Down Gradient Performance Monitoring Sample Location

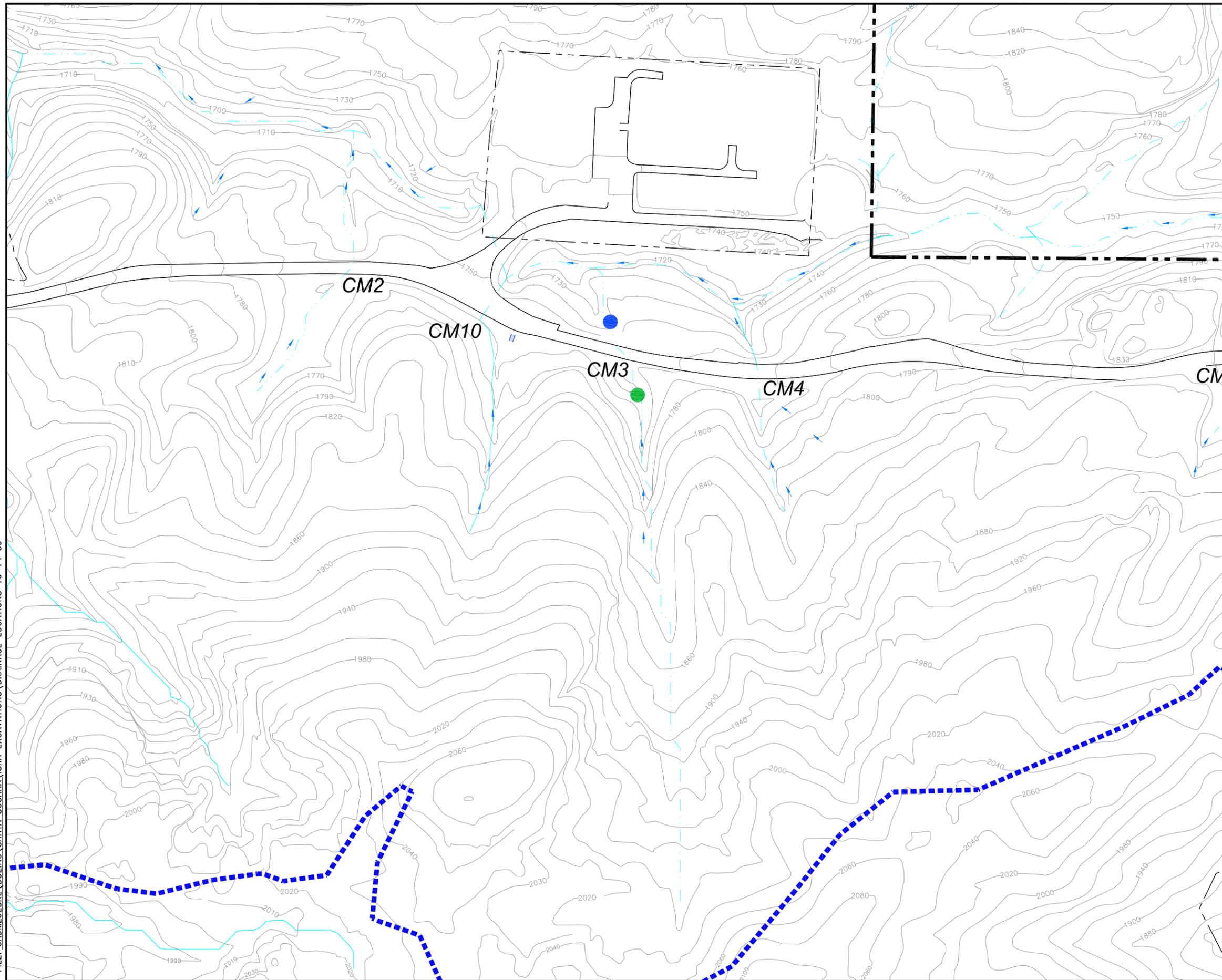
Note: Surface water flows through underground culverts when crossing roadways.



MWH

SANTA SUSANA FIELD LABORATORY  
VENTURA COUNTY, CALIFORNIA  
OUTFALL 009 ISRA (WESTERN PORTION)  
PROPOSED PERFORMANCE MONITORING  
SAMPLE LOCATIONS

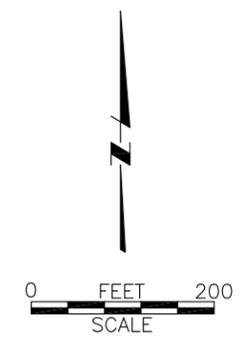
FIGURE 2



### Legend

-  SSFL Property Boundary
-  RFI Site Boundary
-  Surface Water Drainage
-  Topographic Contour
-  Surface Water Flow Direction
-  Excavation
-  Proposed Downgradient Performance Monitoring Sample Location
-  Proposed Upgradient Performance Monitoring Sample Location

Note: Surface water flows through underground culverts when crossing roadways.

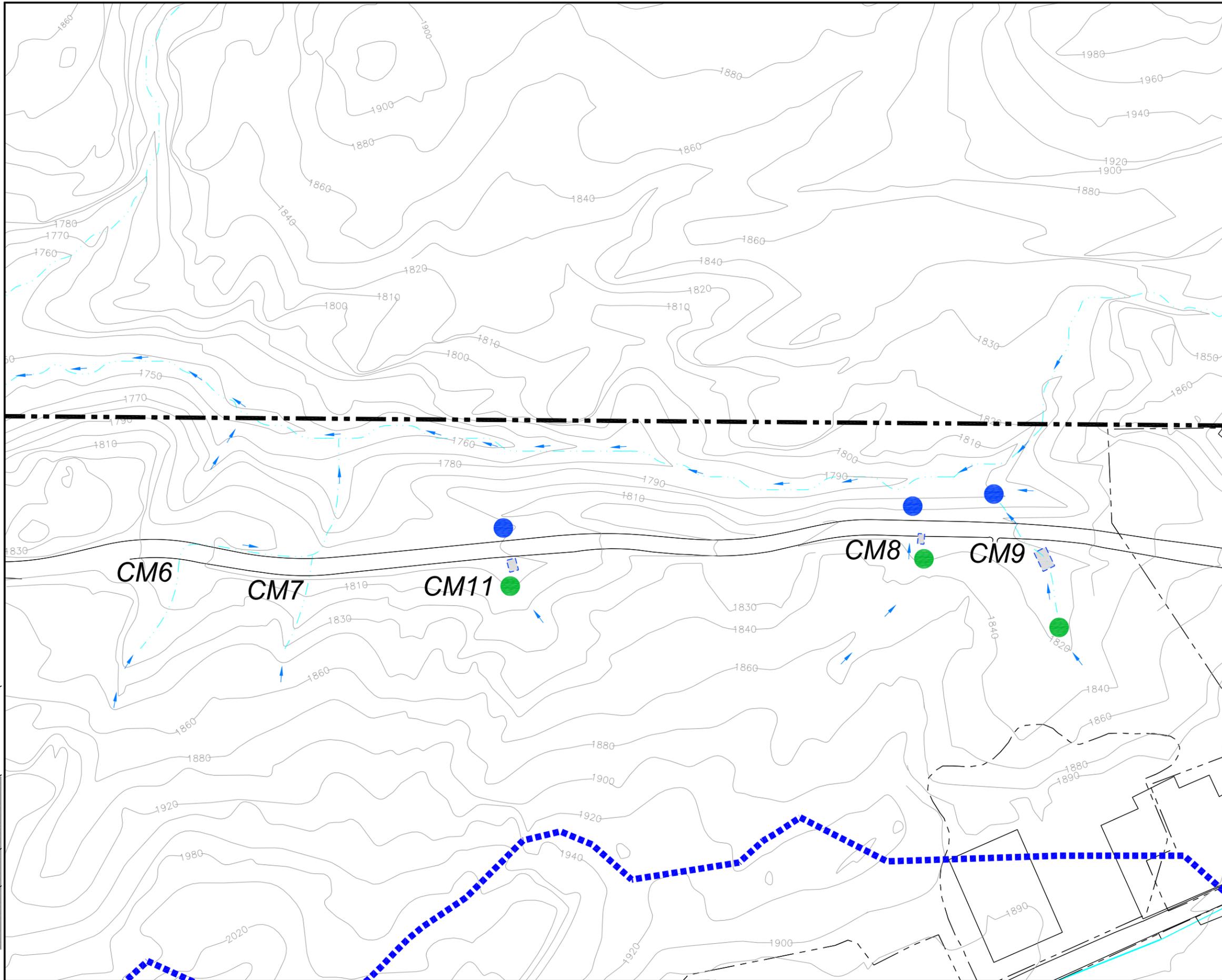


SANTA SUSANA FIELD LABORATORY  
VENTURA COUNTY, CALIFORNIA

OUTFALL 009 ISRA (WESTERN CENTRAL)  
PROPOSED PERFORMANCE MONITORING  
SAMPLE LOCATIONS

FIGURE 3

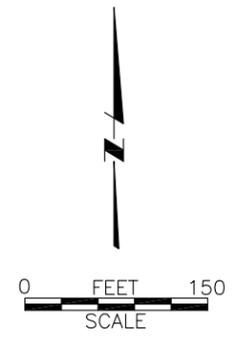
FILE: CAD\MUEBKE\BOEING\SANTA\_SUSANA\ISRA\_EXCAVATIONS\DRAINAGE LOCATIONS 10 14 09



### Legend

- SSFL Property Boundary
- Surface Water Divide
- RFI Site Boundary
- Surface Water Drainage
- Topographic Contour
- Surface Water Flow Direction
- Excavation
- Proposed Downgradient Performance Monitoring Sample Location
- Proposed Upgradient Performance Monitoring Sample Location

Note: Surface water flows through underground culverts when crossing roadways.



 **MWH**  
 SANTA SUSANA FIELD LABORATORY  
 VENTURA COUNTY, CALIFORNIA

**OUTFALL 009 ISRA (EASTERN CENTRAL)  
 PROPOSED PERFORMANCE MONITORING  
 SAMPLE LOCATIONS**

FIGURE 4

**Performance Monitoring Inspection and Sample Collection Form**



Inspector/Sampler: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Weather: \_\_\_\_\_  
 Outfall (008 or 009) \_\_\_\_\_

Rain Event Start Date/Time: \_\_\_\_\_  
 Rain Event Inspection #: \_\_\_\_\_  
 Prior Rain Event Inseption Date: \_\_\_\_\_

	Sample Location*	ISRA Area(s)	Qualitative Flow Observations**	Photo Number(s)	Sample Tracking Information					Sample Field Measurements				Sample Observations			
					Object ID	Sample ID	Sample Type***	Sample Time	Analyses	Conductivity (mS or uS)	pH	Temperature (C)	Turbidity (NTU)	Color	Odors Present	Foam Present	Sheen Present
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

\*Sample Location: Primary Upgradient; Primary Downgradient; Secondary Downgradient

\*\*Qualitative Flow Measurement: **No Flow**; **Low Flow**: trickle or minor amount of flow; **Moderate Flow**: Water is flowing normally, no significant erosion or turbid water; **High Flow**: Significant water flow/velocity, slope erosion.

\*\*\*Sample Type: Primary, Duplicate, Internal Split, RWQCB Split, DTSC Split