

SSFL NPDES Outfalls 008 & 009 ISRA & BMP Work Plan Update

SSFL Surface Water Expert Panel
with support from Geosyntec Consultants
August 25, 2011 Public Meeting

Presentation Outline

1. Expert Panel Introduction
2. Monitoring Data Summary
3. BMP Construction Update
4. Northern Drainage RMMP Summary
5. Phytoremediation
6. Q&A



45 min



45 min

Expert Panel Overview

Member introductions

- Dr. Bob Gearheart, PE, Humboldt State University
- Jon Jones, PE, Wright Water Engineers
- Dr. Michael Josselyn, WRA Consultants
- Dr. Robert Pitt, PE, University of Alabama
- Dr. Michael Stenstrom, PE, Univ. California, Los Angeles



Expert Panel Scope of Work

Improve stormwater quality at NPDES Outfalls 008 and 009

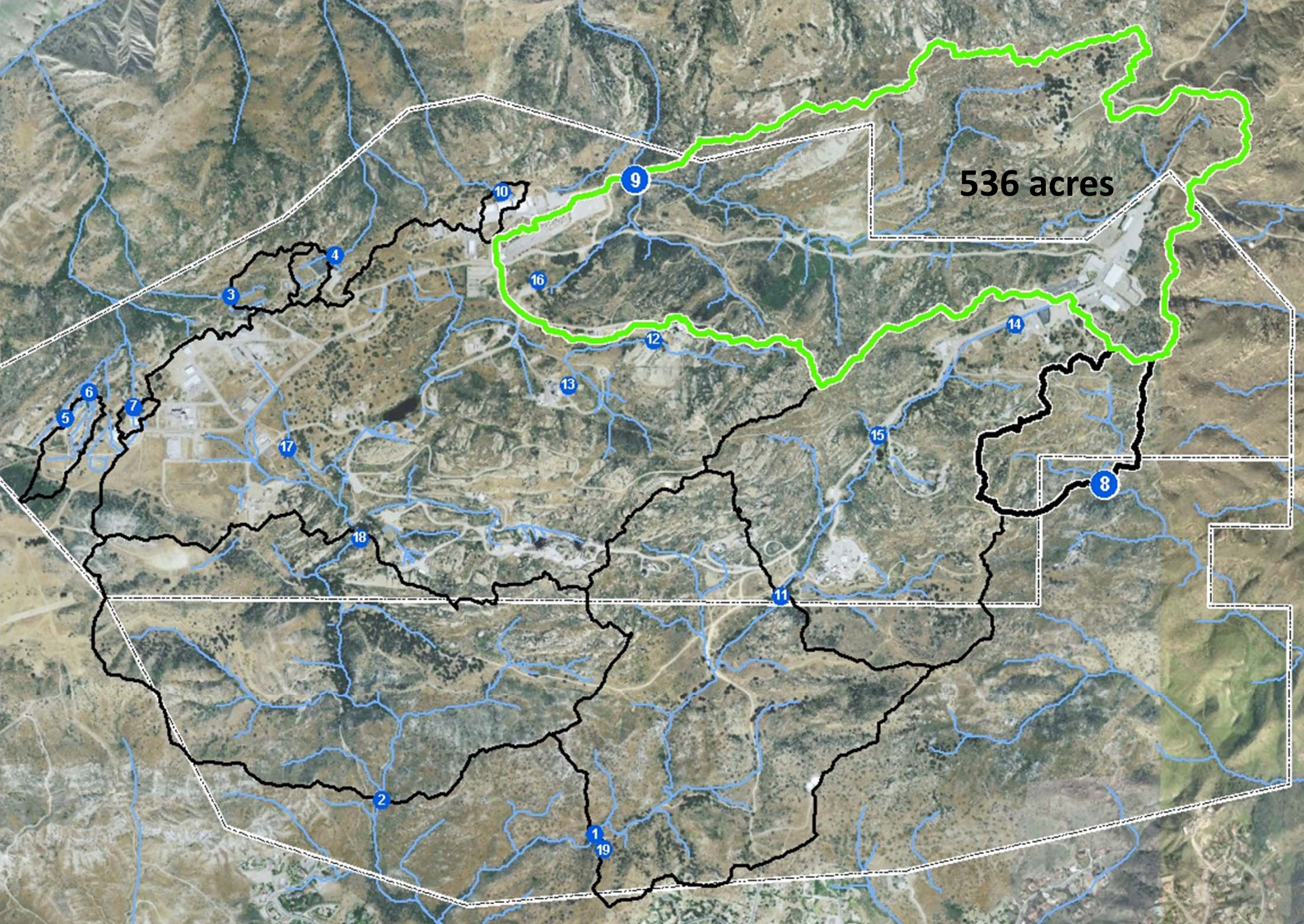


Outfall 008



Outfall 009

Outfall 008 and 009 Watersheds



Regulation of SSFL Stormwater

- SSFL surface water discharges (mostly stormwater runoff) are regulated by the LARWQCB through an NPDES permit, which requires:
 - Discharge sampling during storm events, and
 - Compliance with very protective numeric effluent limits for a wide list of pollutants.
- Panel has recommended source removal (e.g., ISRA & site demo) and BMPs to meet the Permit requirements
- BMPs are applied during the remediation and demolition period; ultimately sitewide restoration will occur and stormwater treatment should no longer be necessary

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 578-6600 • Fax (213) 578-1640
<http://www.waterboards.ca.gov>

ORDER NO. R4-2010-0090
NPDES NO. CA0001309

WASTE DISCHARGE REQUIREMENTS FOR THE BOEING COMPANY,
SANTA SUSANA FIELD LABORATORY

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 1. Discharger Information

Discharger	The Boeing Company
Name of Facility	Santa Susana Field Laboratory
	5800 Woolsey Canyon Road
Facility Address	Canoga Park, CA 91304-1148
	Ventura County

The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a minor discharge.

The discharge by the Owner from the discharge points identified below is subject to waste discharge requirements as set forth in this Order.

April 6, 2010
Revised: May 20, 2010
Revised: June 3, 2010 6

What are Stormwater BMPs?

Erosion and sediment controls



Active treatment systems



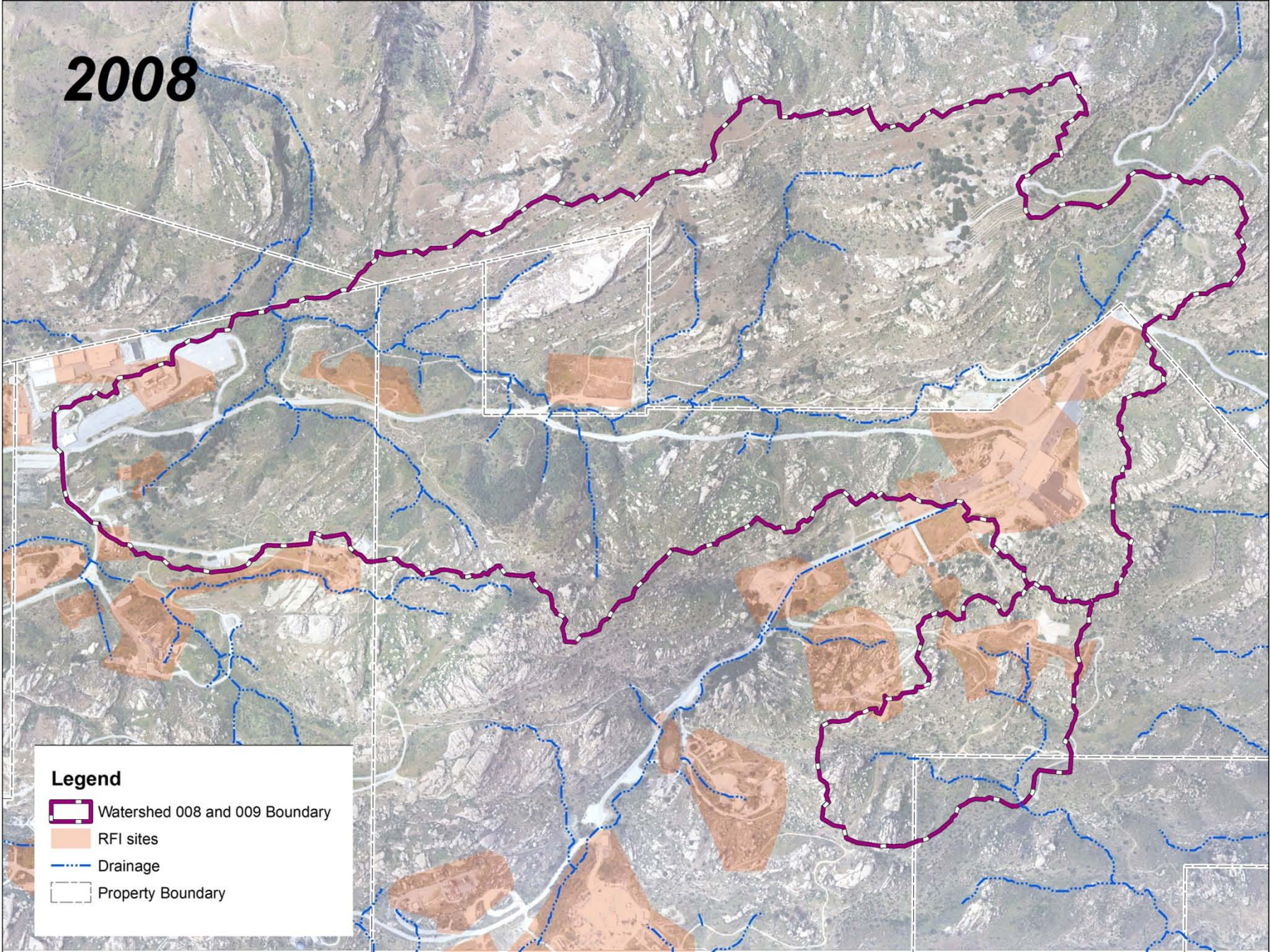
Natural treatment BMPs







Outfall 008/009 BMP Chronology

Year by year visual overview of most significant stormwater quality management activities in these watersheds

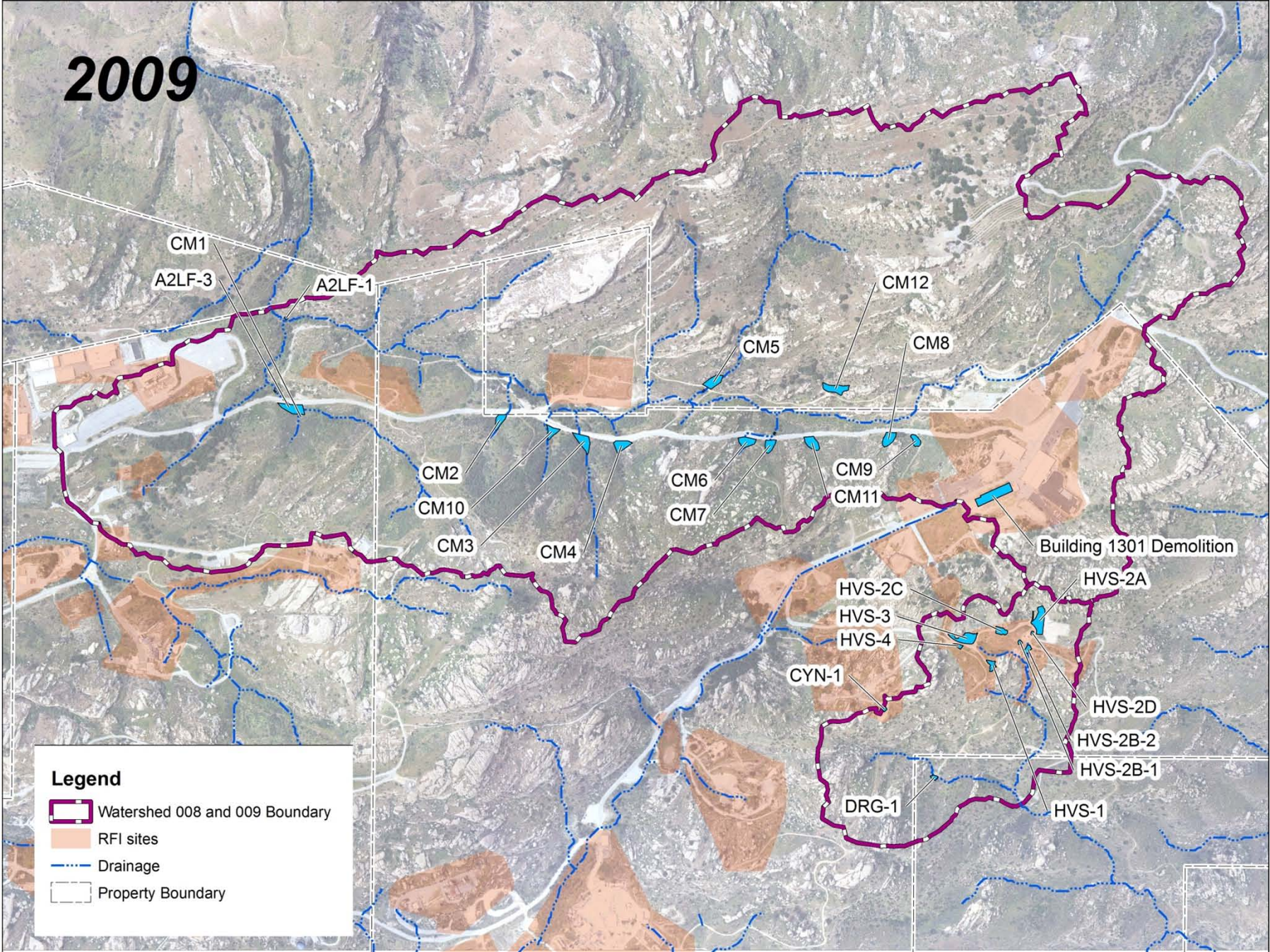
2008







Legend

-  Watershed 008 and 009 Boundary
-  RFI sites
-  Drainage
-  Property Boundary

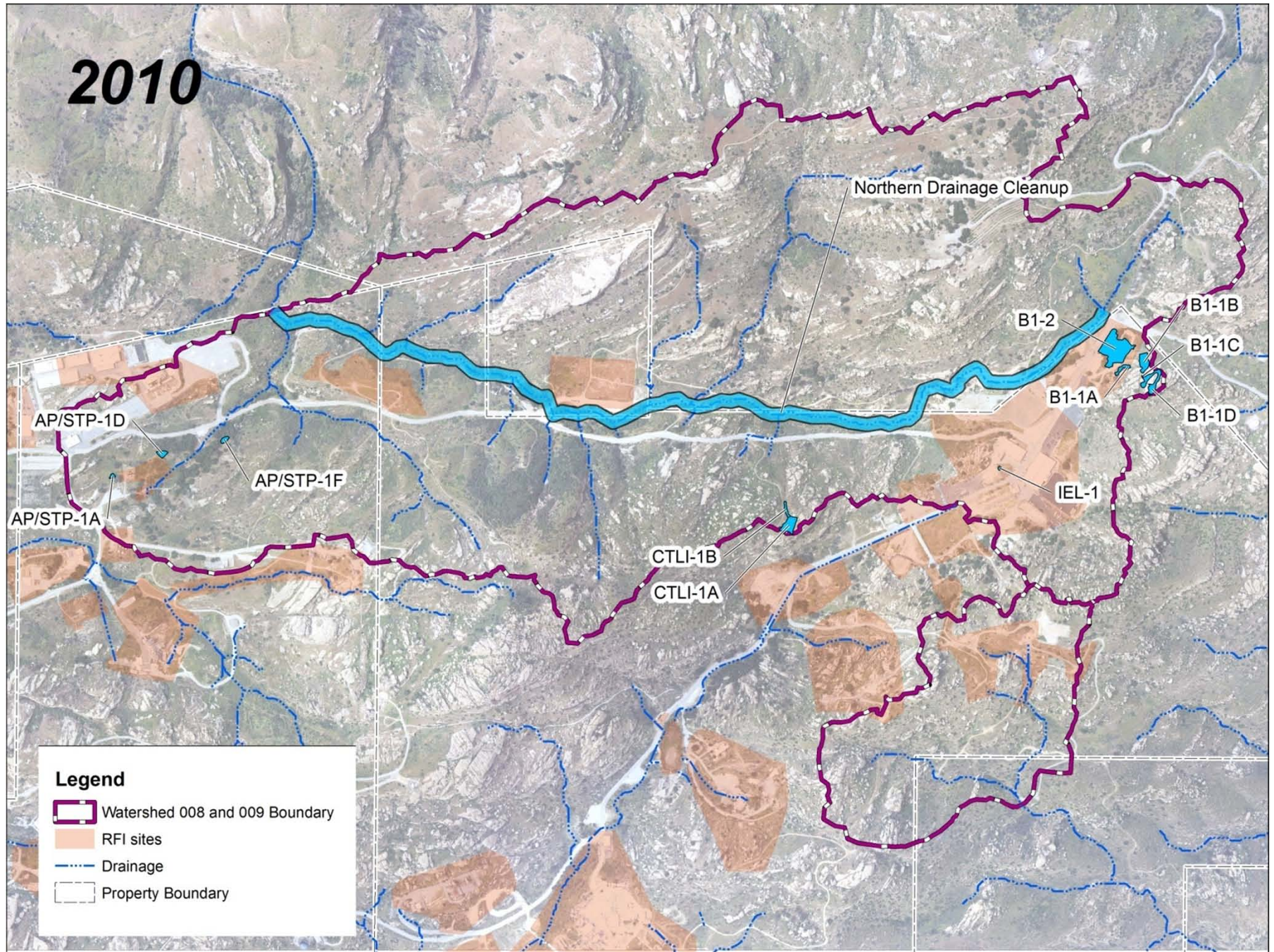
2009



Legend

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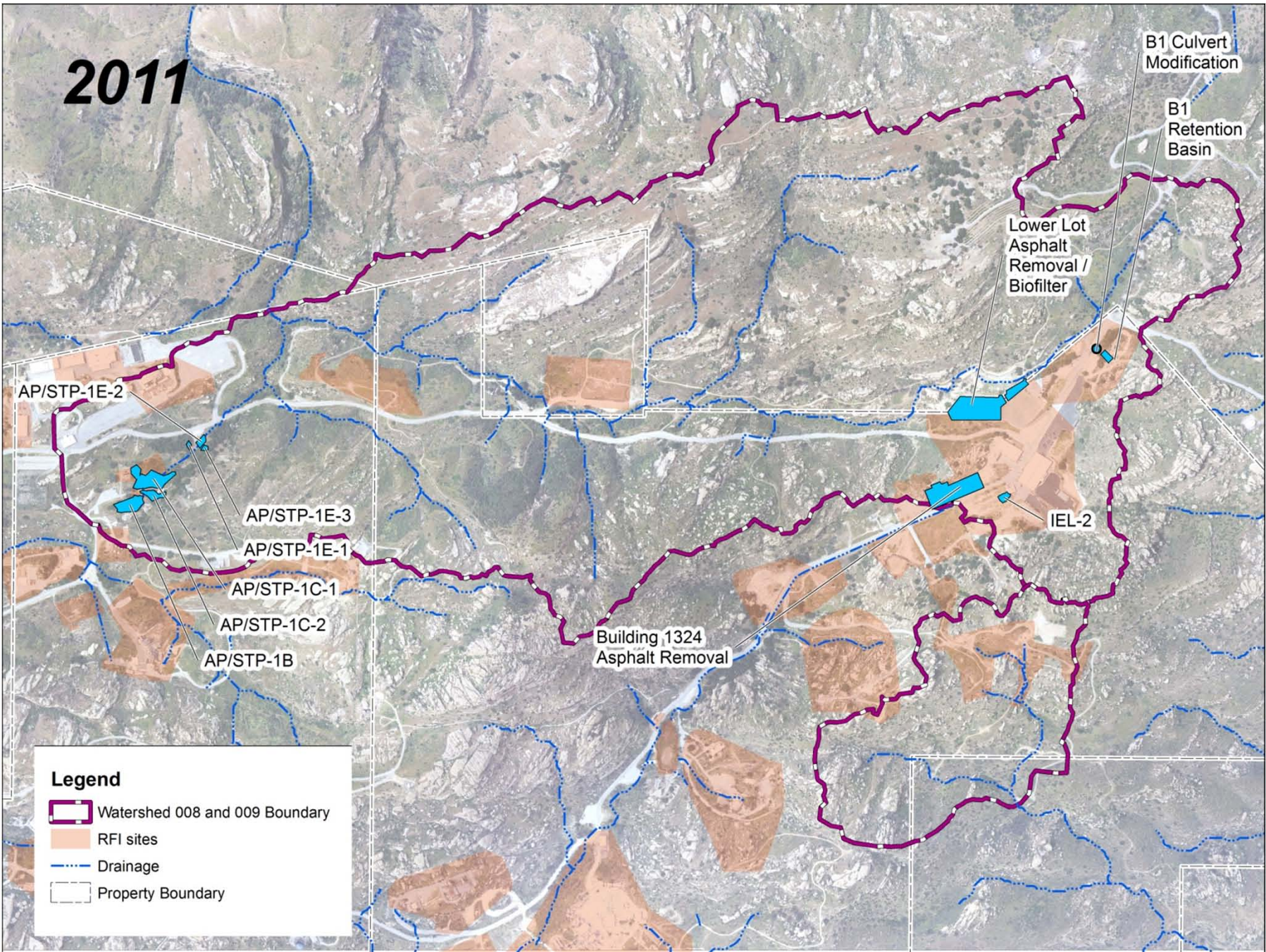
2010



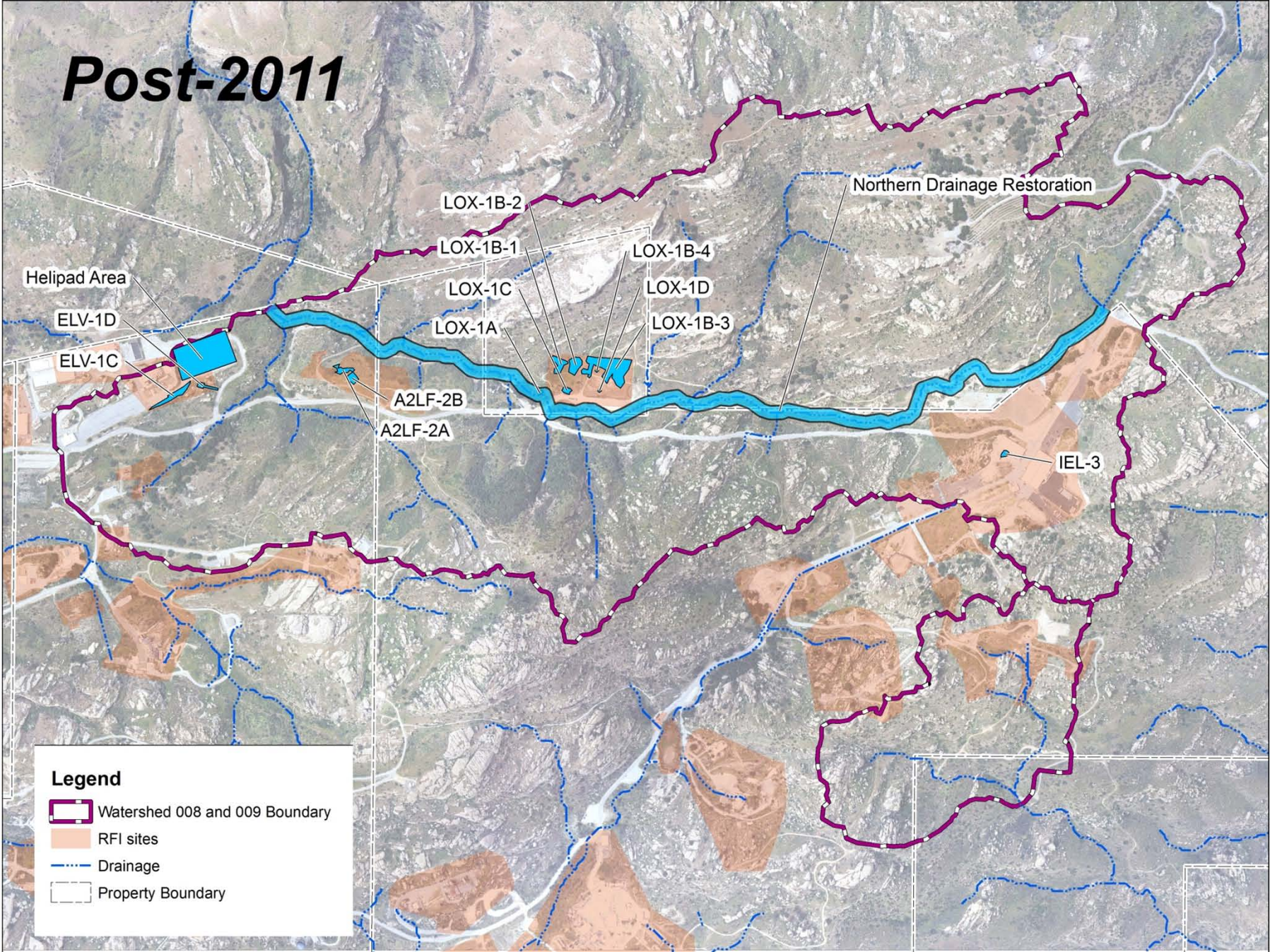
Legend

- Watershed 008 and 009 Boundary
- RFI sites
- Drainage
- Property Boundary

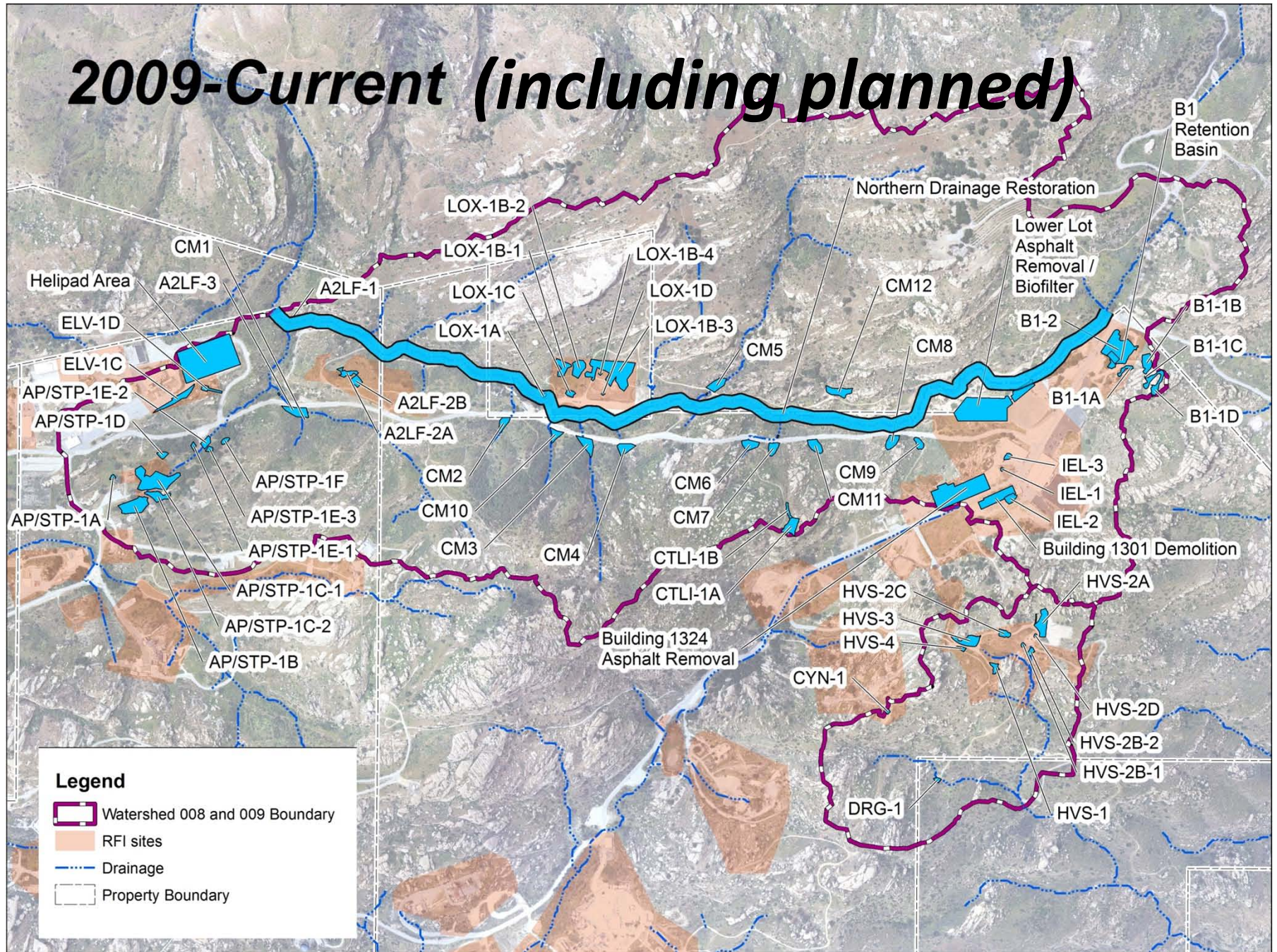
2011



Post-2011



2009-Current (including planned)



2. Monitoring Data Summary

Four Stormwater Monitoring Programs

Program	Sampling Locations	Purpose
NPDES	Outfalls (e.g., 008 & 009)	Evaluating permit compliance
ISRA	Up- and downstream of ISRA soil areas	Evaluating performance of ISRA soil removal & restoration
Culvert Modifications (CMs)	Influent and effluent at five CMs	Evaluating performance of CMs
BMP	Downslope of developed areas and/or areas of historic industrial activity (e.g., Area 1 & 2 Landfills)	Planning new BMPs

Reports to LARWQCB

- 2010 NPDES Annual Monitoring Report
 - Summarized NPDES monitoring data
 - Submitted in March 2011
 - Quarterly reports also submitted periodically
- 2010/11 Rainy Season Annual Report
 - Summarized ISRA, CM, and BMP monitoring data and new BMP recommendations
 - Submitted in late July 2011
- 2011 BMP Work Plan Addendum
 - Describes new BMP design concepts
 - To be submitted in Sept. 2011
- Reports posted on Boeing SSFL website

NPDES (008 & 009)

- 2010/2011 Rainy Season
 - 008: 6 samples collected
 - 009: 13 samples collected
- 2010/11 results for outfalls 008 and 009 show relatively low number of exceedances, particularly given the relatively large number of storms this year
 - 23.5 inches rain this year, ~30% above average
 - 008: 1 lead exceedance
 - 009: 1 lead, 2 dioxin exceedances



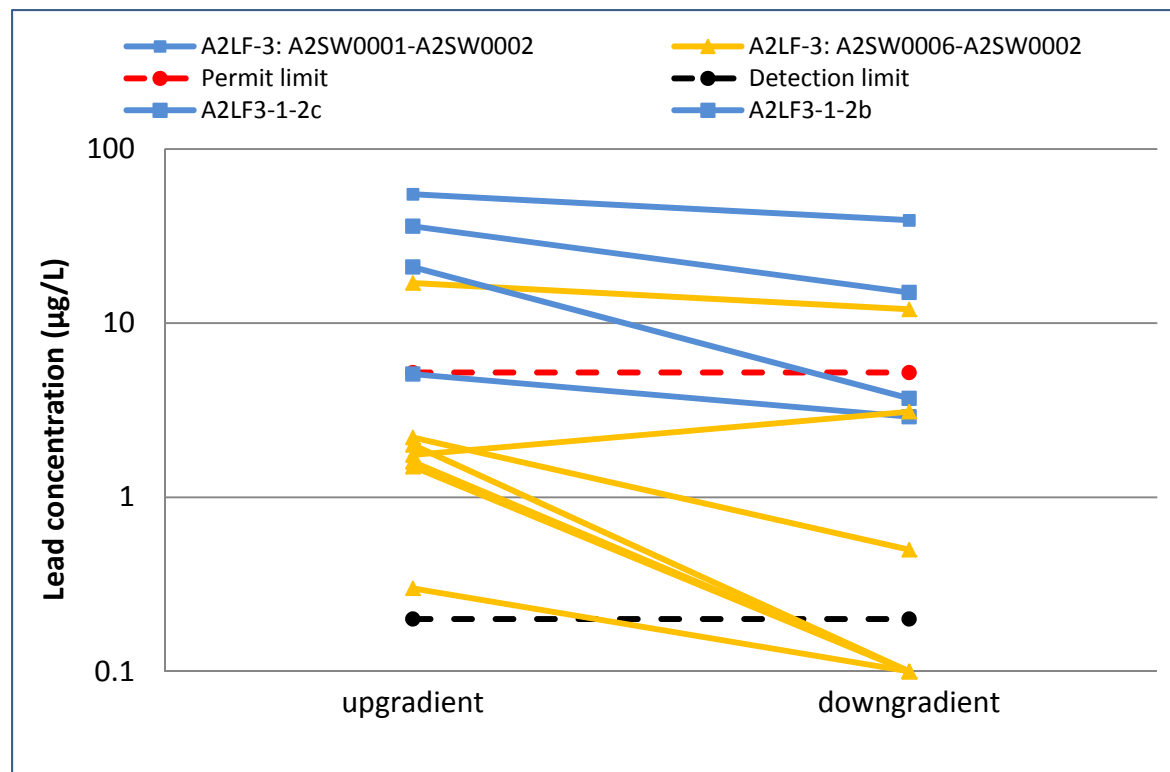
Outfall 008

ISRA & Culvert Modifications (CMs)

- 2009/2010 Rainy Season – 19.0” rainfall
 - Monitoring conducted at 12 Phase I ISRA areas and 5 CM areas
 - 62 total samples collected from 18 locations
- 2010/2011 Rainy Season – 23.5” rainfall
 - Monitoring conducted at 12 Phase I ISRA areas, 11 Phase II ISRA areas, and 5 CM areas
 - 91 total samples collected from 25 locations

ISRA Performance

- Paired upstream/downstream stormwater sample results now available for 2 rainy seasons (Dec '09 – Mar '11)
- Panel continuously evaluated these monitoring results
- Line chart (below) is one tool used to compare results



ISRA Performance

Findings

- Downgradient concentrations tend to be lower than upgradient samples
- With time, vegetation expected to improve runoff quality
- Results generally below NPDES permit limits
- Fulfilled 2 year data collection commitment in 008

Recommendation

- Continue sampling during 3 storms per year in 008 watershed, and continue sampling all storms in 009



CM Performance

Findings

- Water quality improvement observed, although more data needed to continue to assess performance
- Post-storm observations also demonstrate successful sediment capture
- Boeing and NASA are continuing CM monitoring per Panel's recommendations

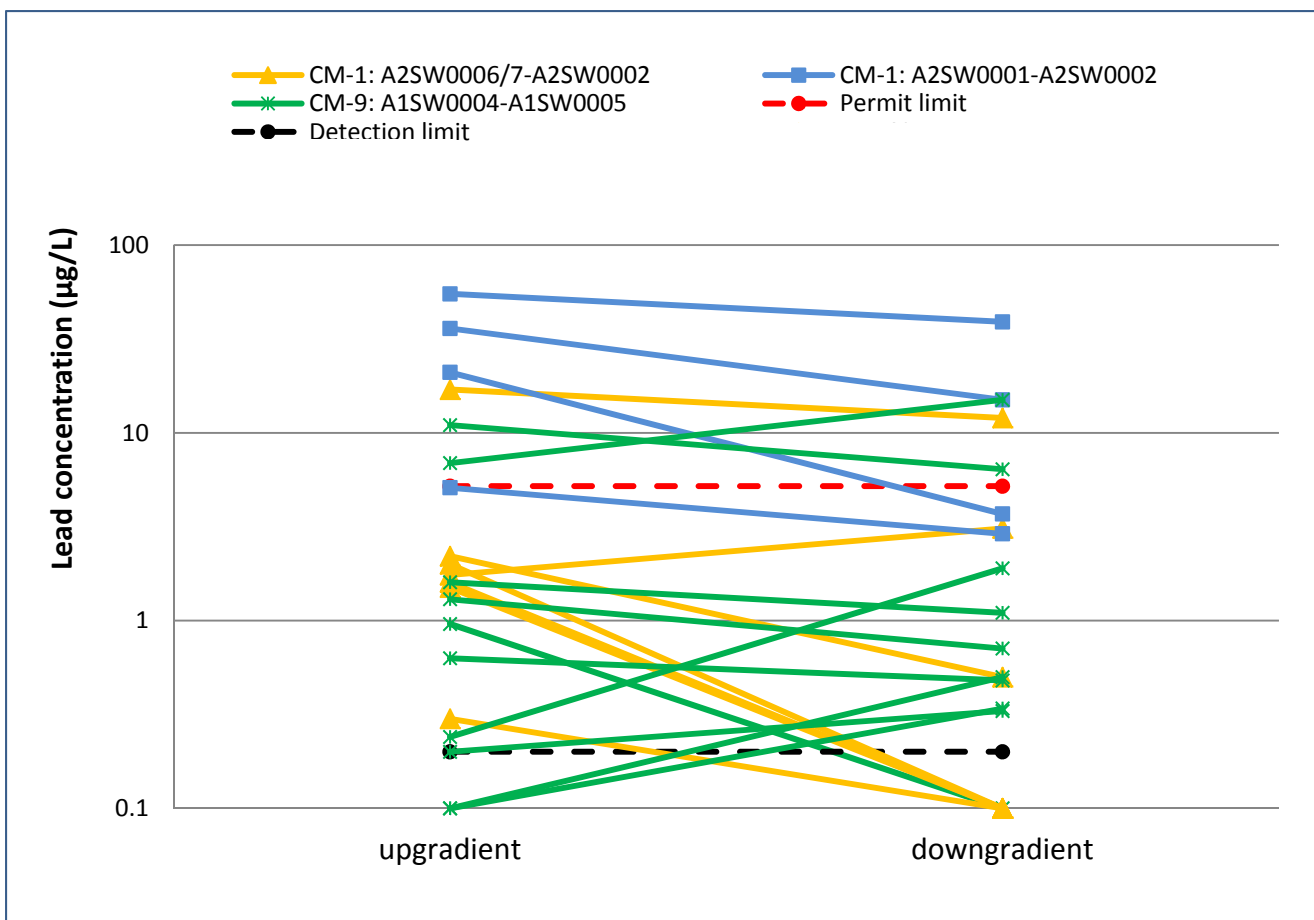
CM3, captured sediment reached top of weir boards, March, 2011:



50 cubic yards of sediment removed from CMs in 2010/11 season!

CM Performance

Statistically significant reduction found for TSS, copper, and lead



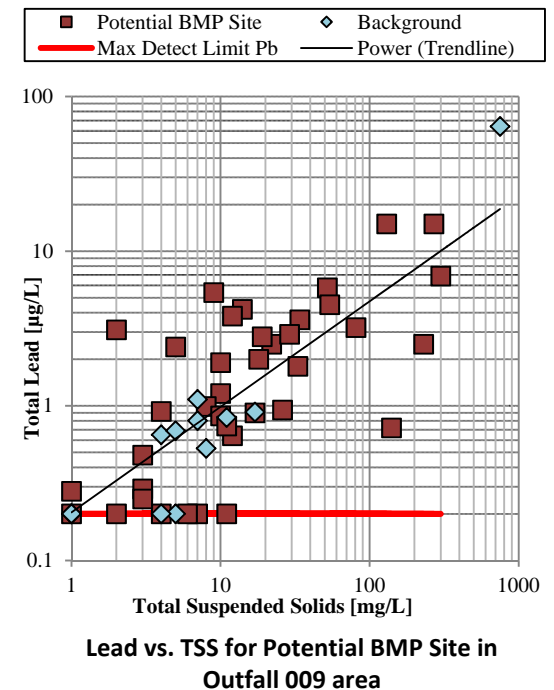
BMP Subareas

2010/2011 Rainy Season

- 13 samples collected from 3 locations in 008 watershed
- 54 samples collected from 19 locations in 009 watershed (includes 6 “stormwater background locations”)

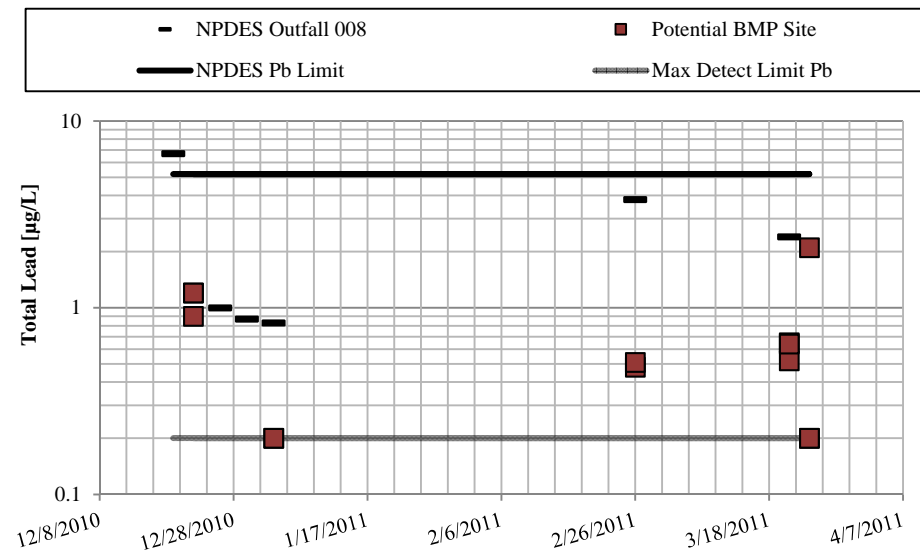
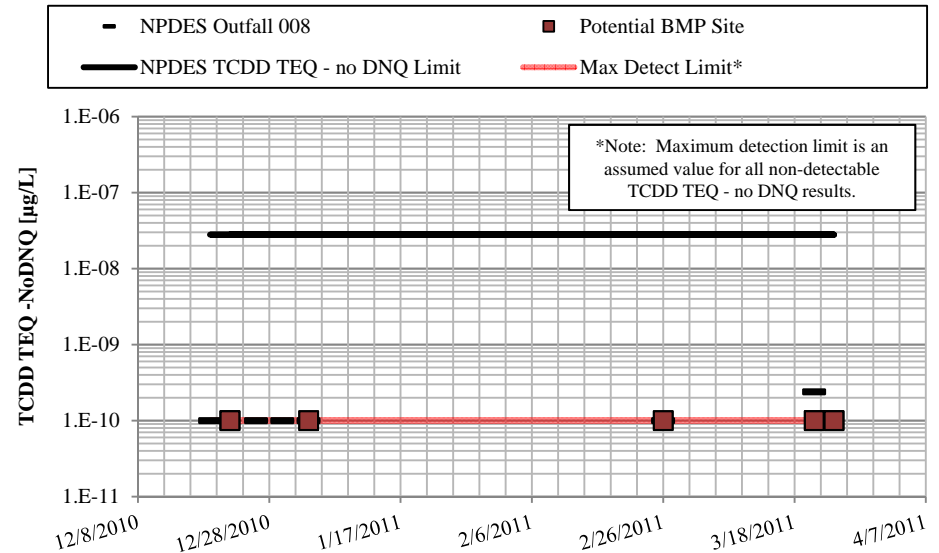
Initial Findings:

- Positive correlations seen between contaminants and suspended sediment, confirming strategy to control erosion
- BMP subarea results generally higher than background sites, supporting the selection of both types of sites



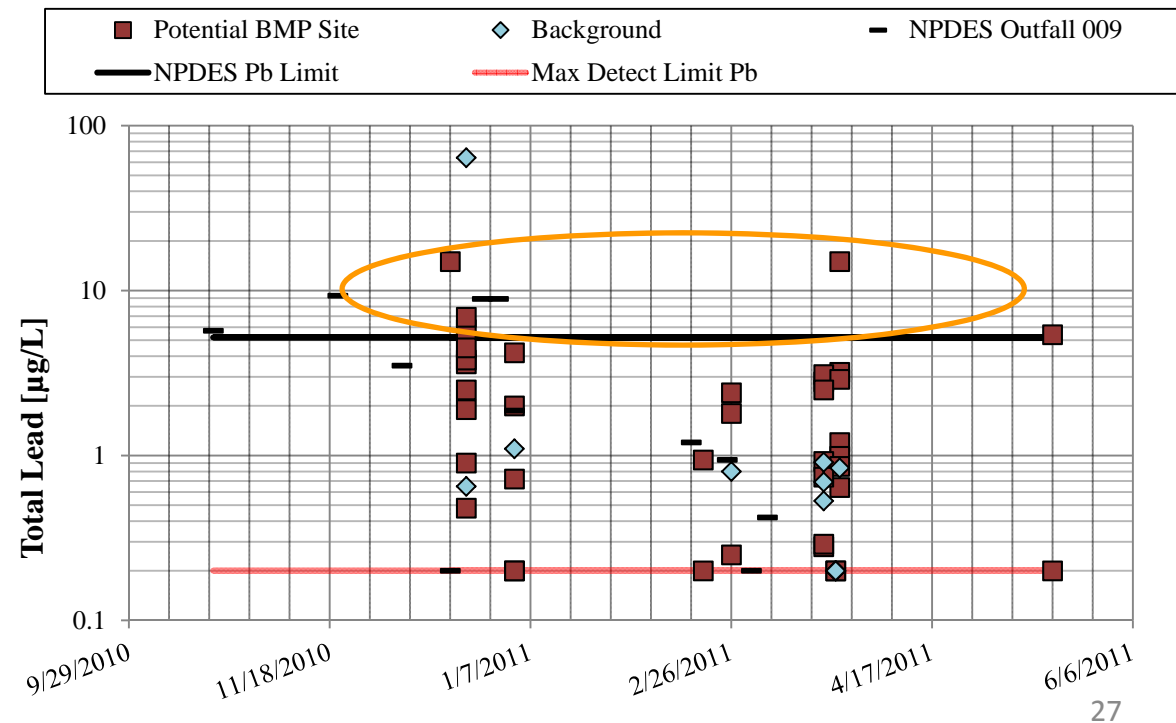
BMP Data Summary – 008 Watershed

- Similar to NPDES & ISRA results, stormwater quality good
- Panel recommends continued erosion control & restoration
- Additional treatment not necessary, but continue to monitor



BMP Data Summary – 009 Watershed

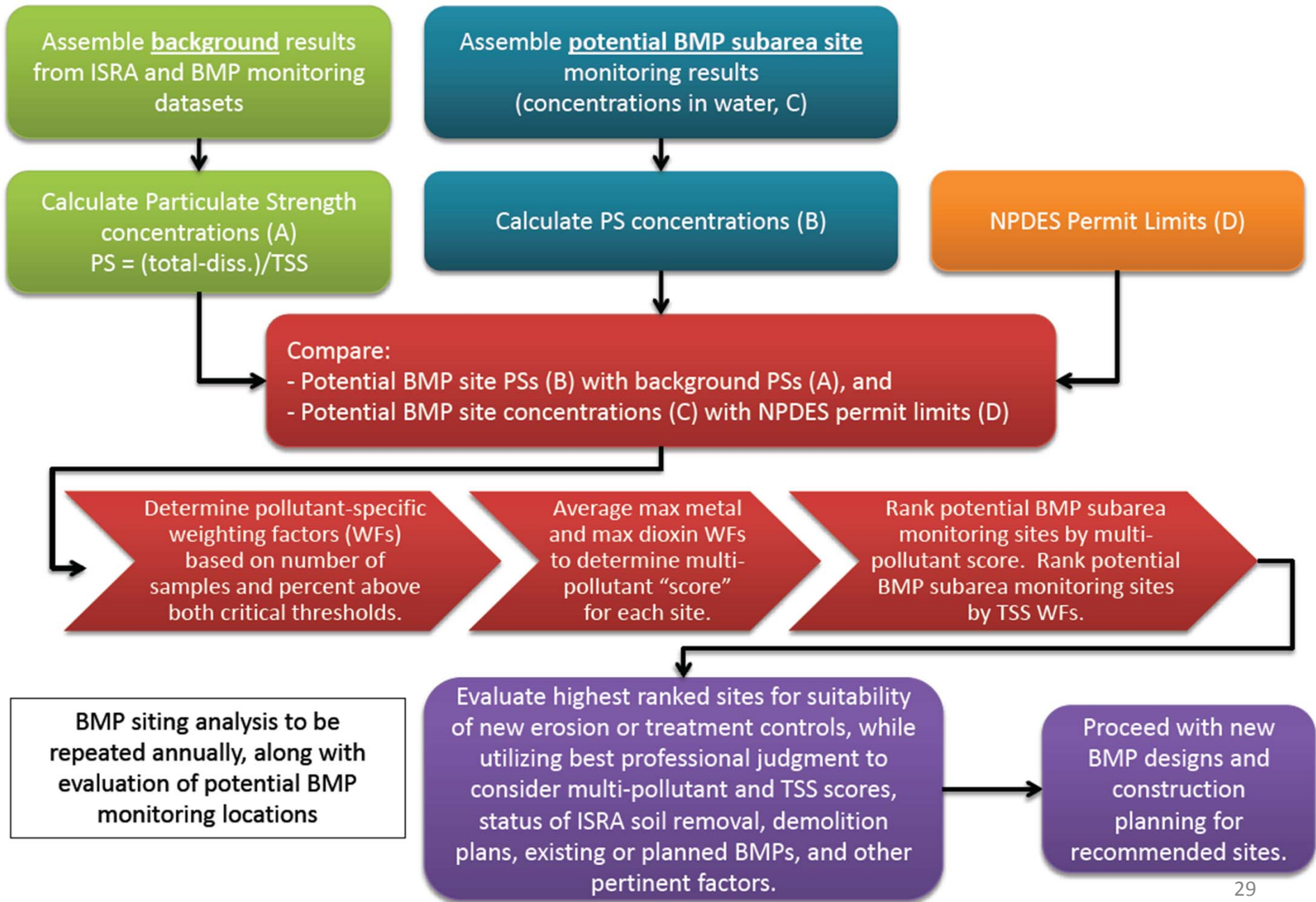
- Most top-ranked BMP locations have significant paved areas – therefore demolition activities are anticipated to have long-term water quality benefits
- New recommended BMPs will address most subareas where monitoring results have been observed above Permit limits
- Key constituents:
 - Dioxin
 - Lead
 - Copper
 - Sediments



BMP Subarea Ranking Analysis Approach

- Key constituents used to prioritize areas for BMP placement
- Innovative, rigorous approach
- Monitoring locations were scored based on number and percent of samples above permit limits and/or background concentrations
- Locations then ranked based on scores, and top locations identified
- This process is repeated annually through 2014

Attachment 1. Summary Flowchart for BMP Site Ranking Analysis Approach



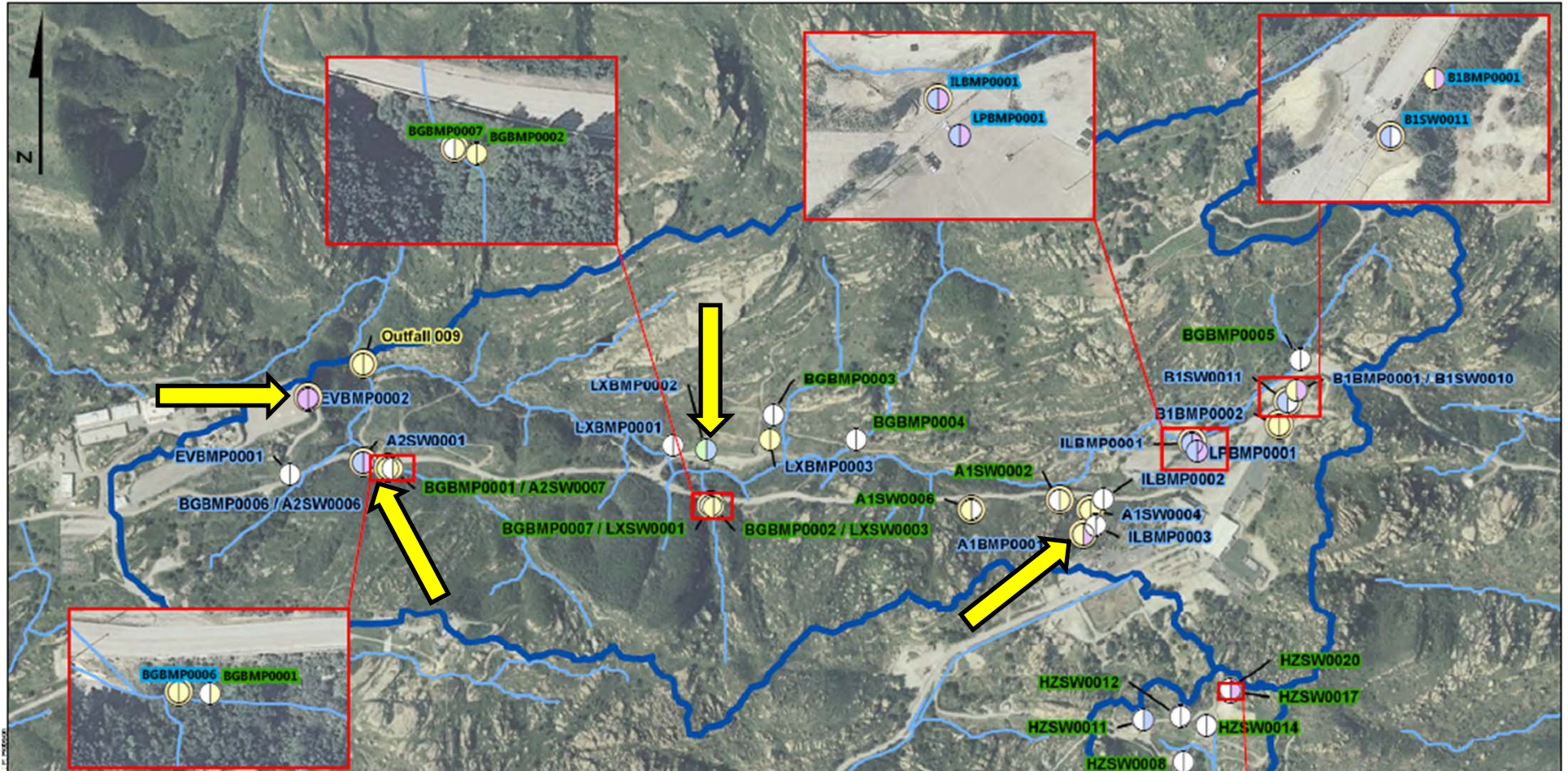
BMP Subarea Ranking Results

- Top locations initially identified as highest ranked subareas based on multi-contaminant scores. These include:
 - Locations ranked 1st and 2nd highest for each category (metals, dioxins, TSS)
 - Locations that detected the 2,3,7,8-TCDD dioxin congener
 - Locations where new stormwater controls are being constructed
 - 3 subareas that have ISRA activities still planned

New BMP Recommendations for 2012

1. **Helipad (NASA):** Create sheetflow runoff storage and treatment, and/or asphalt removal combined with erosion control, creation of depression areas, and removal of contaminated surface soils
2. **ELV/CM1 (NASA):** ISRA removal with erosion controls, reconstruction of existing drainage ditch below ELV, and installation of new culvert inlet media filter near Helipad Road, also possibly asphalt removal
3. **LOX (NASA):** Sandbag berm and slope drains along northern bank of Northern Drainage, and implement ISRA removal without backfill to encourage infiltration if appropriate
4. **A1LF (Boeing):** Continued maintenance at CM9, asphalt removal, channel armoring erosion control in drainage at base of hillside, and rerouting/treatment of sheet flow from top of landfill

→ = Locations of new recommended BMPs



Implementation Process (Stockpile biofilter example)

1. Panel recommendation
2. Conceptual illustration
3. Landowner review/discussion
4. Feasibility assessment
5. Design
6. Permitting – CDFG, ACOE, RWQCB, County...
7. Bid preparation
8. Contractor selection
9. Construction

