

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

SSFL Stormwater Expert Panel  
January 22, 2011 Public Meeting & Tour

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**Presentation Outline**

1. Expert Panel introduction and SSFL stormwater overview
2. Interim Source Removal Action (ISRA) update
3. 008/009 BMP Work Plan update



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**1. Expert Panel Introduction & SSFL  
Stormwater Overview**

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## Expert Panel Overview

### Member introductions

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



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## Expert Panel Scope of Work

Improve stormwater quality at NPDES outfalls 008 and 009



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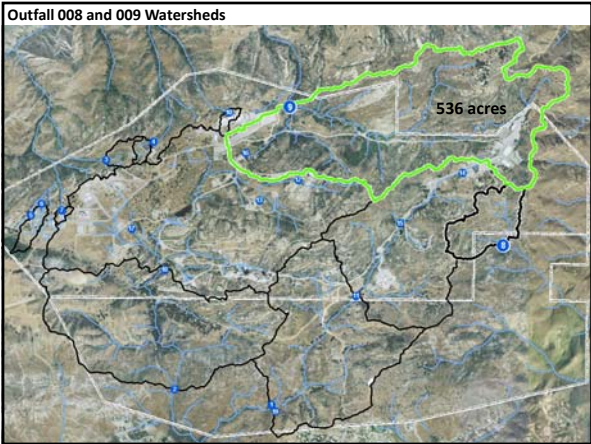
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### Regulation of SSFL Stormwater

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 recommends source removal and BMPs to meet the Permit requirements

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### What are Stormwater BMPs?




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### Panel Case Study Example: Closure of the Former Rocky Flats Nuclear Weapons Site

Denver Metropolitan Area



Pre-closure



Post-closure

- Contaminated site with stormwater discharges regulated under a NPDES permit with numeric effluent limits
- Natural stormwater treatment BMPs (detention basins) implemented to achieve compliance

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## 2. ISRA update

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### What is ISRA?

**Interim Source Removal Action**, intended to remove sources of NPDES pollutants of concern (down to background or near background) in surface soils in 008 & 009 watersheds, not intended to constitute final cleanup

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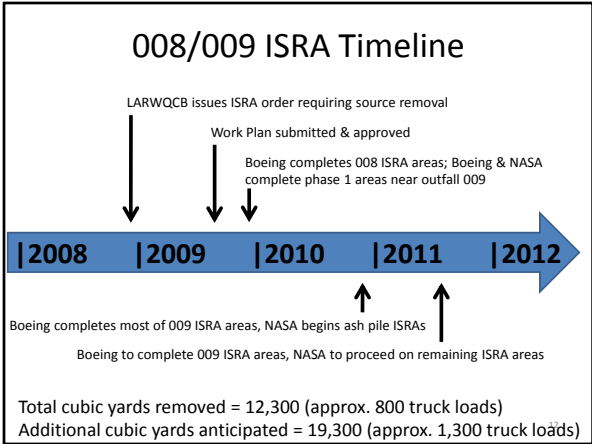
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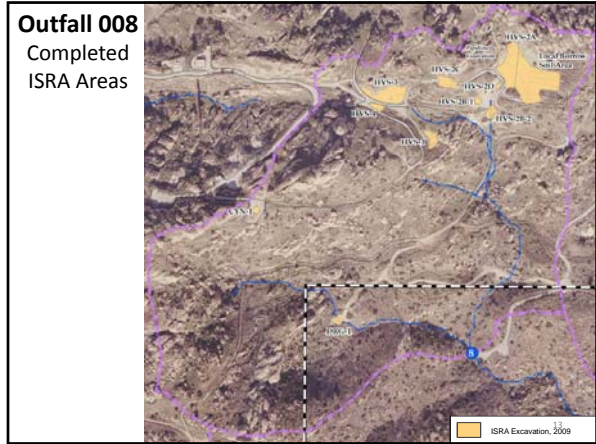
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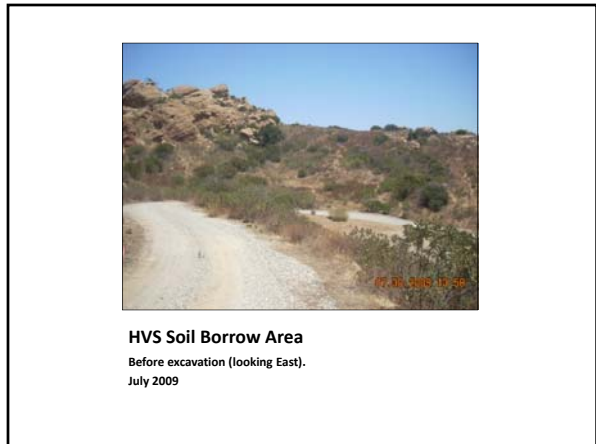
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**HVS-2A and Soil Borrow Area**  
After vegetation clearance; before excavation (looking Northeast). Orange fence in place to protect *Quercus agrifolia* (coast live oak).  
August 2009

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**HVS-2A**  
Excavation, and conditioning soils using water spray for dust control (looking South).

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**HVS-2A**  
During excavation, vacuuming around oak tree to protect roots (looking Southwest).

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**HVS-2A**  
Completed excavation (looking North).  
October 2009

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**HVS-2A**  
Completed excavation (looking South).  
November 2009

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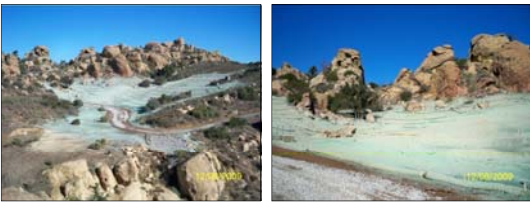
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**HVS-2A and Soil Borrow Area**  
After excavation; re-contoured and restored with hydroseed mulch (looking Northeast).  
December 2009

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**HVS-2A**  
Native plants and additional BMPs installed (looking South).  
Orange and green pin flags show plant locations.  
April 2010

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**HVS Soil Borrow Area**  
Vegetation growth 1 year after restoration (looking Northeast).  
October 2010

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**HVS-2A and Soil Borrow Area**  
Vegetation growth 1 year after restoration.  
November 2010  
Left: HVS-2A (looking South). Right: HVS-2A (foreground) and Soil Borrow Area (background) (looking East).

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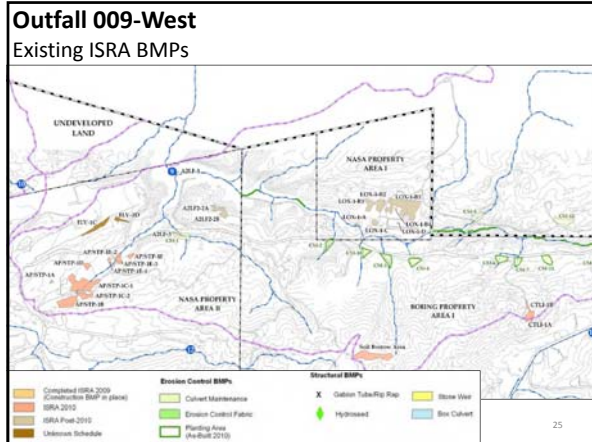
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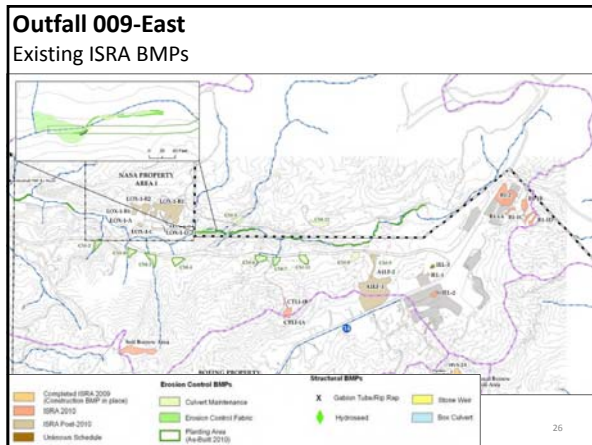
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**How has the Panel been involved?**

- Involvement in every step of ISRA
- Input on ISRA performance monitoring plan
- Development of split sampling protocol
- Analysis of ISRA performance monitoring results
- Optimizing 008/009 BMP plans based on ISRA
- Recommendations for ISRA BMPs
  - Erosion controls, revegetation
  - B1 sediment basin, culvert inlet filter
  - Ash pile channel
  - A1LF, including phytoremediation study
  - Dirt roads




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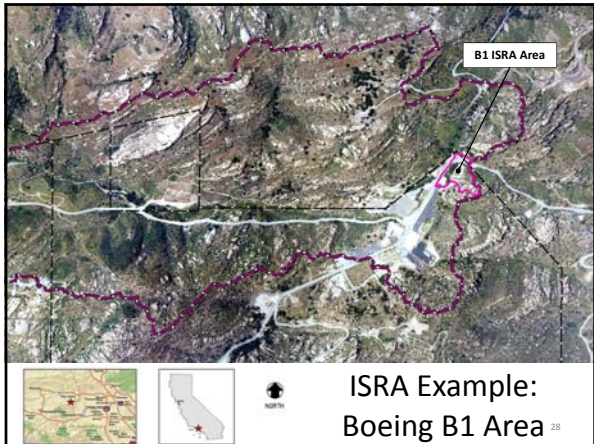
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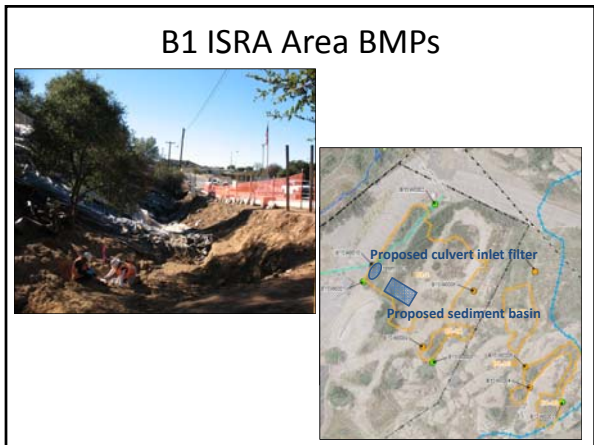
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### ISRA Performance Monitoring

- Paired upgradient & downgradient stormwater samples have been collected for two rain seasons
- Initial findings:
  - More data are needed to conclusively assess performance
  - Observations during recent severe storms indicate that ISRA sites are stable, with little loss of sediment
  - With time, vegetation expected to improve runoff quality

Location	Pb (ug/L)
Upgradient	14
Downgradient	4

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### 3. 008 & 009 BMP Work Plan Update

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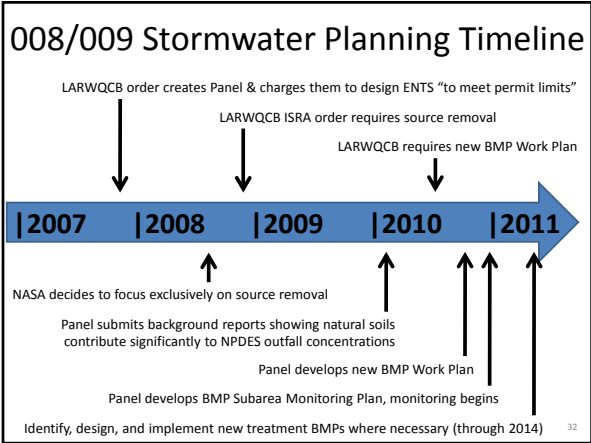
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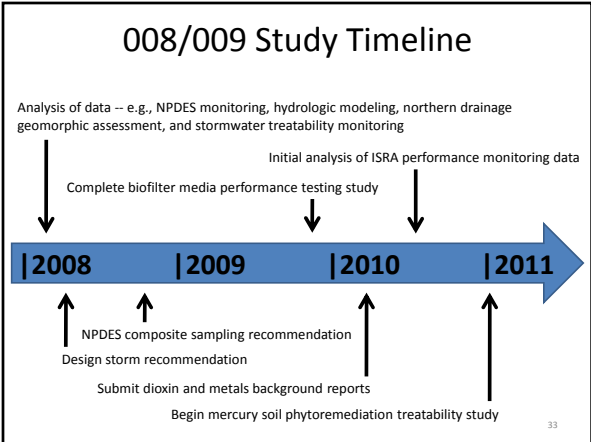
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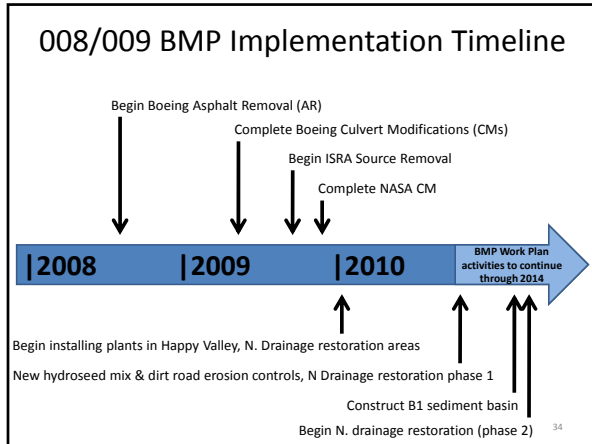
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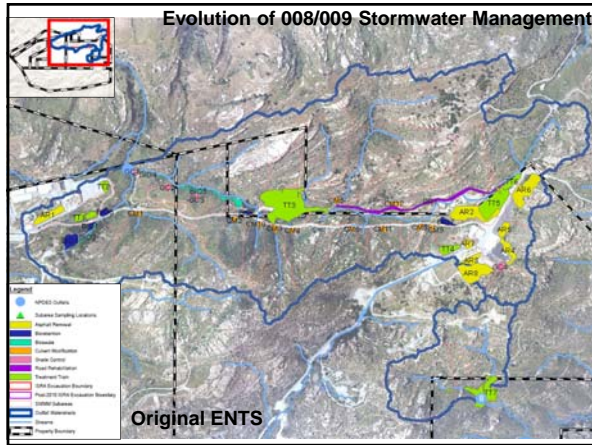
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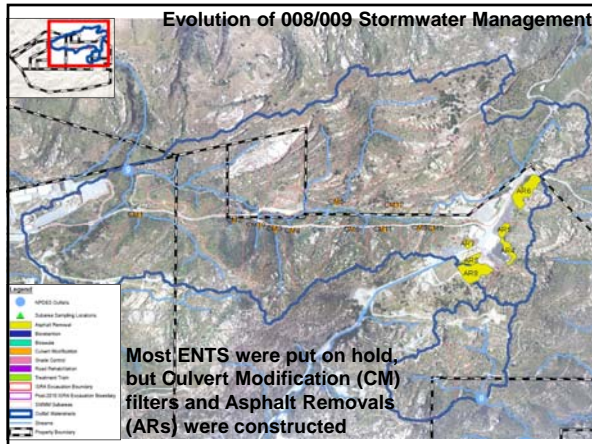
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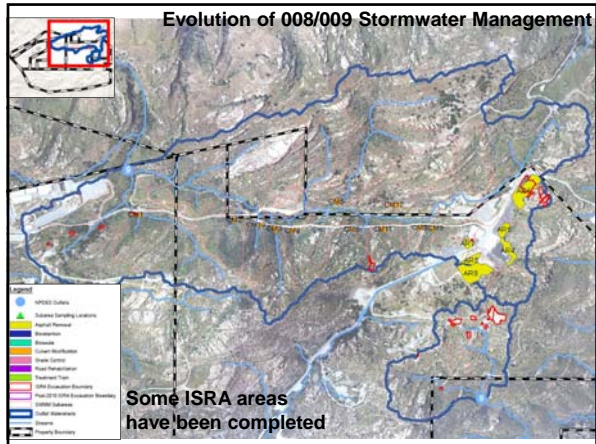
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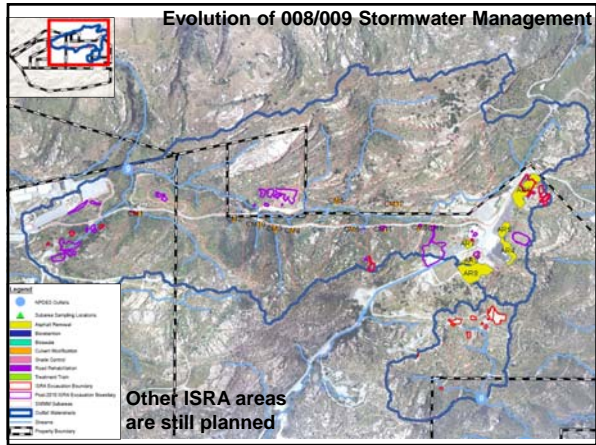
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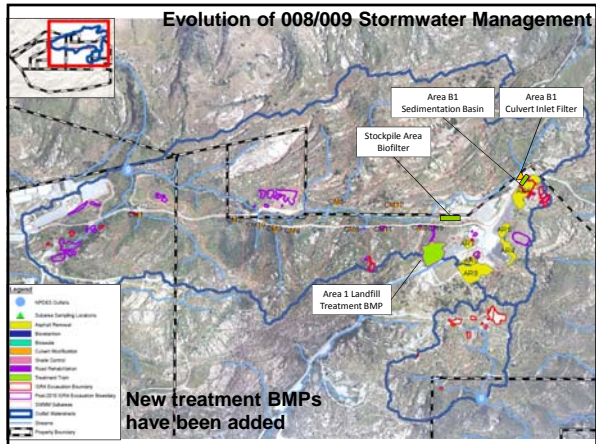
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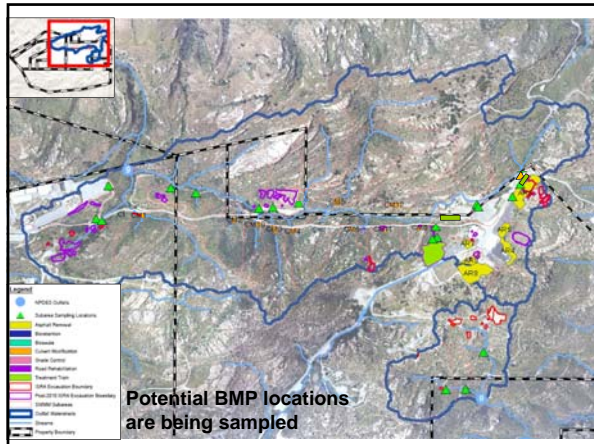
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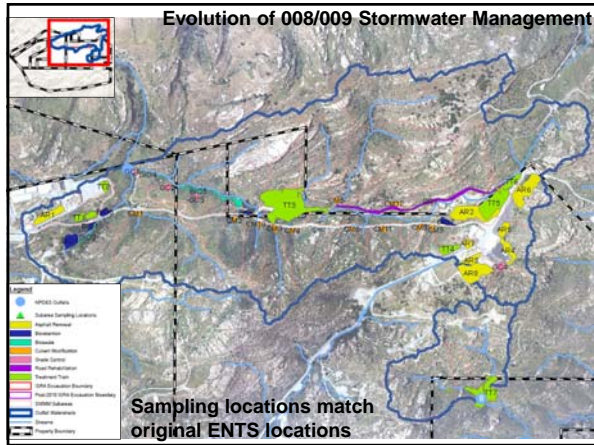
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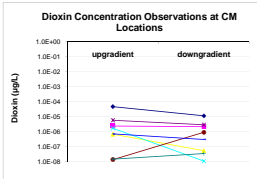
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### CM Performance

- Influent/effluent samples collected for two seasons
- Conclusions:
  - Initial result indicate water quality improvement, although more data needed to conclusively assess performance
  - Post-storm observations also demonstrate successful sediment capture



CM9, water ponded to top of weir boards, Dec 22, 2010:



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### Dirt Road BMP Recommendations

- Panel identified dirt roads as significant source of sediment in watersheds
- Recommended erosion controls:
  - Retire unused roads
  - Gravel
  - Straw wattle
  - Water bars, rolling dips
  - Native hydroseed mix



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## Revegetation

Native seedlings planted at following areas for long-term erosion control:

- ISRA construction areas (008 photos below)
- Exposed banks of northern drainage




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## Northern Drainage Restoration

- Northern drainage sediment & debris removal occurred as a result of DTSC and LARWQCB orders
  - 10,500 CY debris removed (approx. 700 truck loads)
- Panel recommendations for channel restoration include:
  - Control sources of in-channel sediments
  - Stabilize eroding banks
  - Grade controls
- Phase 1 complete:
  - Hydroseed
  - Rip rap bank protection
  - Native plantings along banks




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## Northern Drainage Current Status

Phase 1 focused on Boeing reaches  
Phase 2 plan now being developed




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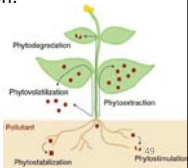
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### Panel-Directed Stormwater Studies & Innovative Activities

- Stormwater biofiltration media performance testing
  - To compare performance of various media and support BMP design
- Phytoremediation testing study with Edenspace lab
  - To evaluate native grasses for ability to accumulate mercury and other metals
- SWMM hydrologic modeling – calibrated for both watersheds, reviewed by Dr Huber (one of SWMM’s developers)
- Nonprofit resources for BMP plant selection:
  - Pollinators Partnership
  - Wildlife Habitat Council

Biofilter media:




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### What’s Next – 2011 BMP Plan Activities

- Planned treatment BMP designs ongoing, then construction
  - B1 sediment basin and culvert inlet filter
  - Soil stockpile biofilter
  - Area 1 Landfill ISRA treatment BMP
- Submit BMP triggers memo to LARWQCB
  - Values to be based on stormwater background concentrations
- Submit 2010/11 subarea sampling results and new treatment BMP recommendations to LARWQCB

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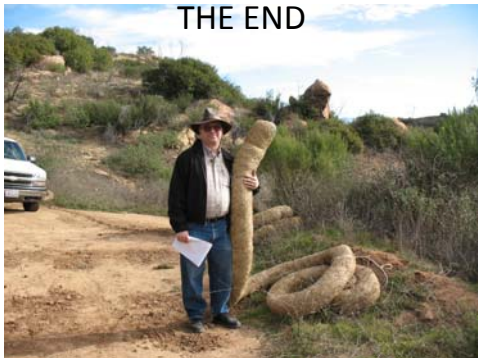
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For more information on Outfall 008 & 009 ISRA and BMP planning, please visit:  
[http://www.boeing.com/aboutus/environment/santa\\_susana/isra.html](http://www.boeing.com/aboutus/environment/santa_susana/isra.html)

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