

Final Project Report

for

Baldwin Hills to Ballona Creek Project



Prepared by:
**City of Los Angeles, Department of Public Works,
Bureau of Sanitation, Watershed Protection Division**

February 28, 2011

Funding and Cost
City of Los Angeles
Proposition O Program: \$4,927,000
State of California: \$2,000,000
Total Project Cost: \$6,927,000

This report is prepared in accordance with agreement 04-415-554-3 between the State of California and the City of Los Angeles. Funding of this project has been provided in part through an agreement with the State Water Resources Control Board under the Coastal Proposition 50 Santa Monica Bay Restoration Grant Program. The contents of this document do not necessarily reflect the views and policies of the SWRCB

GRANT SUMMARY

Completed Grant Summaries are made available to the public on the State Water Resources Control Board's (SWRCB) website at <http://www.waterboards.ca.gov/funding/grantinfo.html>

Use the tab and arrow keys to move through the form. If field is not applicable, please put N/A in field.

Date filled out: February 1, 2011

Grant Information: Please use complete phrases/sentences. Fields will expand as you type.	
1. Grant Agreement Number: 04-416-554-3	
2. Project Title: Baldwin Hills to Ballona Creek	
3. Project Purpose - Problem Being Addressed: To beneficially reuse dry weather flow and first flush stormwater from the Baldwin Hills area to Ballona Creek	
4. Project Goals	
a. Short-term Goals: Construction of a system to divert and treat dry weather flow and first flush stormwater	
b. Long-term Goals: Reduction of pollutant loadings introduced to Ballona Creek. Comply with NPDES Permit	
5. Project Location: (lat/longs, watershed, etc.) Lat/Longs: 34.02944000/-118.37055000; Watershed: Ballona Creek	
a. Physical Size of Project: (miles, acres, sq. ft., etc.) Project Site: 2 Acres of Park	
b. Counties Included in the Project: Los Angeles	
c. Legislative Districts: (Assembly and Senate) Assembly District 47, Senate District 26	
6. Which SWRCB program is funding this grant? Please "X" box that applies.	
<input type="checkbox"/> Prop 13 <input type="checkbox"/> Prop 40 <input checked="" type="checkbox"/> Prop 50 <input type="checkbox"/> EPA 319(h) <input type="checkbox"/> Other	
Grant Contact: Refers to Grant Project Director.	
Name: Wing Tam	Job Title: Project Director
Organization: Bureau of Sanitation City of Los Angeles	Webpage Address: www.lacity.org
Address: 1149 S Broadway 10 th Floor, Los Angeles CA90015	
Phone: (213)-485-0586	Fax: (213)-485-3939
E-mail: Wing.Tam@lacity.org	
Grant Time Frame: Refers to the implementation period of the grant.	
From: April 14, 2005	To: March 31, 2011
Project Partner Information: Name all agencies/groups involved with project. City of Los Angeles	
Nutrient and Sediment Load Reduction Projection: (If applicable)	

Please provide a hard copy to your Grant Manager and an electronic copy to your Program Analyst for SWRCB website posting. All applicable fields are mandatory. Incomplete forms will be returned.

SIGNATURE PAGE

**PROPOSITION 50
SANTA MONICA BAY RESTORATION PROGRAM
Baldwin Hills to Baldwin Hills
AGREEMENT NO 04-416-554-3**

PREPARED BY

The City of Los Angeles, Department of Public Works

Daniel Loo, Project Manager

Date

GRANTEE

The City of Los Angeles, Department of Public Works

Wing Tam, Project Director

Date

GRANTOR

California State Water Resources Control Board
Santa Monica Bay Restoration Commission

Jack Topel, Grant Manager

Date

**Section III
Table of Contents**

Section IV: Executive Summary..... 5
Section V: Problem Statement and Relevant Issues **Error! Bookmark not defined.**
Section VI: Project Goals..... 9
Section VII: Project Description..... 11
Section VIII: Results..... 15
Section IX: Public Outreach 17
Section X: Conclusions..... 18
Section XI: Appendices 22

List of Figures

Appendices

Appendix A – List of References..... 22
Appendix B – List of Deliverables 24
Appendix C – Tables of Lab Results 30
Appendix D – Photos 39
Appendix E – Stakeholder Attendance List..... 42

Section IV: Executive Summary

Routine shoreline monitoring conducted by the City of Los Angeles along Santa Monica Bay indicates regular exceedences of bacteriological standards. In fact, many of the local beaches throughout the Bay are posted with signs warning beach goers of the presence of bacterial pollution. Henceforth, the California Regional Water Quality Control Board (RWQCB) listed the Santa Monica Bay Beaches as impaired for Bacteria (i.e., total coliform, fecal coliform, and enterococcus) under Section 303(d) of the Clean Water Act.

A Total Maximum Daily Load (TMDL) standard was developed that required drastic reduction in bacterial discharges into Santa Monica Bay. In response to that, an Implementation Plan was developed with various stakeholders such as the City of Los Angeles, City of Santa Monica, City of El Segundo, Los Angeles County, California Department of Transportation, various environmental groups, and the LARWQCB. Stakeholders have agreed that by implementing sub-regional projects targeting “hot spots”, the watershed can meet its bacteria TMDL requirements.

The Baldwin Hills to Ballona Creek Project was one of these projects. Its goal was to minimize to the maximum extent practicable the introduction of bacteria discharges. The project is located at 2800 S Fairfax Avenue which has predominantly high density single family land use area. The project targets a drainage area of approximately 3700 acres. This project will be capable of capturing up to 45,000 gallons of surface runoff per day.

This project diverts dry weather runoff from an existing storm drain for treatment through a floatable screening well and lift station. The runoff will be distributed to turf area via a subsurface irrigation system. Excess subsurface irrigation water will flow into a dry creek with a perforated pipe and back to the storm drain. The total cost of the project was \$6,927,000. Of this amount, \$2,000,000 was funded by the State of California, Proposition 50 and the remaining amount was funded by the City of Los Angeles, Proposition O program. The project construction started in July 2009 and it was completed in December 2009. Water quality monitoring was conducted between December 2009 and February 2011.

This report concludes that this project was successfully designed and implemented. The report also demonstrated the complexities in attempting to reduce stormwater pollution. While a significant reduction in metal and total suspended solids discharges were not observed, it is noticed that a significant reduction in bacterial discharges was achieved. The outcomes of this project are: (1) 47% removal of total copper, (2) 48% removal of total zinc, (3) -8.6 % removal of total suspended solids, (4) 42% removal of total lead, (5) 5% removal of total nickel, (6) 98 removal of enterococci bacteria, (7) 96 % removal of total coliform and (8) 97% decrease in fecal coliform. Furthermore, because the dry creek will treat 1.25 acres of park surface water, a measurable improvement in the water quality for the targeted subwatershed is not expected.

Section V: Problem Statement and Relevant Issues

The project was part of Santa Monica Bay Beaches Bacteria (SMBBB) TMDL Implementation Plan for Jurisdictional Groups 2 and 3 (City of Los Angeles, City of Santa Monica, County of Los Angeles, Caltrans, City of El Segundo). The SMBBB TMDL Implementation Plan was developed over a 2-year period with stakeholders input from the local communities, RWQCB, and environmental groups.

The project assisted the City of Los Angeles in continuing to meet the Santa Monica Bay Beaches Bacteria TMDL. The project is located at 2800 S Fairfax Avenue which is a highly urbanized area and is prioritized as a hotspot. The project location was selected based on a potential project sites from Santa Monica Bay Beaches Bacteria TMDL Implementation Plan.

The project targets a drainage area of approximately 3700 acres. The project area is a targeted priority site location that generates stormwater runoff that has the potential to contribute trash, oil and grease, suspended solids, metals, and bacteria through the stormwater system into Santa Monica Bay. Santa Monica Bay Beaches are listed on the 2002 and 2006 California 303(d) List because of elevated bacteria levels and beach closures.

The Santa Monica Bay Beaches (SMBB) Bacteria Total Maximum Daily Loads (TMDL) was developed and approved by the USEPA on July 15, 2003. The beneficial uses of the local beaches are impaired due to excessive amounts of trash and pathogenic pollutants. The presence of these pollutants along the bay also inhibits growth of aquatic organisms, causing further degradation of the water quality. Pollutants that are found in the sediment of receiving waters can potentially bioaccumulate in organisms. By maximizing the reduction of pollutant loadings in the runoff, this project will result in an increased beneficial and recreation use of receiving water bodies. The Baldwin Hills to Ballona Creek project will reduce the potential for human health and safety risk thus reducing beach closures associated with high pathogen levels.

Section VI: Project Goals

This project utilized subsurface irrigation capable of treating 45,000 gallons by installing stormwater lift station, an underground irrigation system, dry creek with perforated pipe for collecting and returning excess irrigation to the existing storm drain box. Off-site surface runoff will be diverted from the existing 9'-6" x 10'-6" storm drain to a lift station and through a screen for removal of floatable wastes and heavy sediments. The water is then pumped to subsurface irrigation system for water reuse and filtration.

One of the goals of the Baldwin Hills to Ballona Creek Project was to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. Pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics:

- Current loadings or historic deposits of the pollutant are impacting the beneficial uses of receiving water bodies.
- Elevated levels of the pollutant are found in sediments of receiving water and/or have the potential to bioaccumulate in organisms therein.
- The detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and habitats.

The goals of this project are:

1. Contribute to compliance target of 10% reduction of SMBB wet weather bacteria exceedance days by first interim compliance milestone, July 2009.
2. Preserve the aquatic marine habitat by reducing the amount of pollutants found in sediment.
3. Enhance the beneficial and recreational uses of receiving water bodies by reducing beach closures.
4. Reduce the potential for human health risk and safety.
5. Reduce the need for potable water for irrigation

The desired outcomes of this project are:

1. 75% decrease in Copper and Zinc Pollutant loads
2. 50% removal of total phosphorus
3. 45% removal of total nitrogen
4. 75% removal of total suspended solids

The project performance measures are summarized in the table below.

Table 1 Project Performance Measures Table

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Reduce overall stormwater pollution from the targeted area consistently with the anticipated removal of the units	Reduce stormwater pollution (about 1-2%) discharged to the Santa Monica Bay.	Reduction of runoff concentrations between influent and effluent	Quantification of the reduced loads both in terms of percent reduction and mass loading	Water quality analysis (Standard Operating Procedures or EPA Methods) results for influent and effluent concentrations for TSS, Pb, Zn, and Cu, and Ni.	Reduction in concentrations from influent to effluent is as follows: Indicator Bacteria-75%, TSS-75%, Pb-75%, Zn-75%, Cu-75%, and Ni-45%
Compliance with Wet Weather TMDL	Reduction in Wet Weather Exceedances	Reduction in MPN of indicator bacteria between influent and effluent	Less occurrence of pathogen related health problems among beach goers.	Water quality analysis (Standard Operating Procedures or EPA Methods) results for influent and effluent concentrations for indicator bacteria.	Achieving the compliance target of a 10% reduction of SMBB wet weather bacteria exceedance days

Section VII: Project Description

Grant Award and Agreement

An application for Baldwin Hills to Ballona Creek Project funding was submitted by the City of Los Angeles under the Proposition 50-Santa Monica Bay Restoration Program to the State Water Resources Control Board (SWRCB). The original grant application envisioned the installation of stormwater lift station, flow diversion facility, hydrodynamic separator, underground detention tank, bioretention area, effluent detention tank, final effluent pump station, recirculation pump and overflow pipes. An agreement for the grant was signed in April 14, 2005.

Subsequent to the grant agreement, it became apparent that the hydrodynamic separator and underground detention tank would not be economical and a more effective approach as a 2 acre subsurface irrigation system with no reduction in open space for improved park aesthetics and on-site runoff treatment. The City filed a deviation form to amend the grant agreement around January 20, 2009. The revised contract was signed in December 2010.

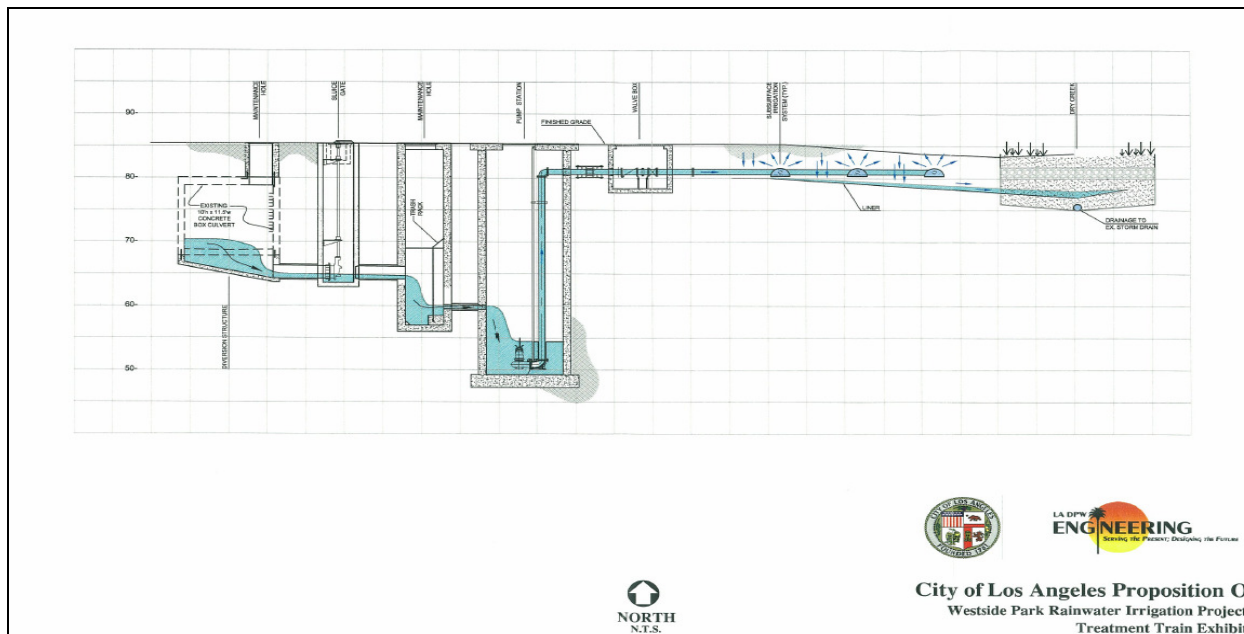
Project Type

This is a stormwater pollution abatement project. This project includes the installation of a stormwater lift station (approximately 1 cfs to 1.6 cfs peak flow rate), an underground irrigation system (for 2 acres area of the park), dry creek with a perforated pipe for collecting and returning excess irrigation to the existing storm drain box.

Offsite surface runoff will be diverted from the existing 9'-6" x 10'-6" storm drain RCB to a lift station and through a screen for the removal of floatable wastes and heavy sediments. Flow meter data indicates that the average dry weather flow rate is 0.06 cfs. With this flow rate the lift station will consist of two pump backup system (designed for 1 cfs to 1.6 cfs peak flow rate). This water is then pumped to the subsurface irrigation system for water reuse and filtration.

Filtered stormwater will be introduced to a series of subsurface irrigation systems called Epic chambers. These Epic chambers will store approximately 180,000 gallons of stormwater in the underground storage chambers and soil profile. The system will irrigate the grass and natural vegetation through root uptake of water in the soil. Once the system reaches its capacity and the soil is saturated, the excess water will be discharged toward the dry creek and back into the storm drain. The dry creek will also be designed to collect the park surface runoff in the event of a storm.

The following figures depict the plan view of the proposed improvements plan and BMP typical profile.



Project Costs

The total cost of the project was \$6,927,000. Of this amount, \$2,000,000 was funded by the State of California, Proposition 50 and the remaining amount was funded by the City of Los Angeles, Proposition O program.

A total amount of \$2,000,000 was awarded to the City of Los Angeles by the SWRCB from Proposition 50 funds with a required match of \$600,000. The minimum match of \$600,000 was committed by the City’s Proposition O program. SWRCB awarded the grant for this project in November 2006. The grant agreement was established in April 14, 2005. The first quarterly report was submitted in April 2007.

Project Implementation

This project was exempt from the requirements of CEQA per Exemption Class 1(4) of the City’s CEQA Guidelines, which provides that “installation of new equipment and /or industrial facilities involving negligible or no expansion of use is exempt from the requirements of CEQA if required for safety, health, the public convenience, or environmental control. The preparation of the Notice of Exemption document was completed and filed with the County of Los Angeles County Clerk.

Pollutant Load Reduction

Since pollutant concentrations tends to be much higher at the beginning of a storm compared to the middle or end of the event, a significant pollutant load reduction can occur as a result of capturing the storm runoff:

Table 2 also includes the estimated pollutants load reductions.

Table 2- Estimated Annual Pollutant Load Reduction

Pollutant	Removal Rate (%)	Estimated Annual¹ Pollutant Loads	Estimated Annual Pollutant Load Reduction
T Coliform	75	5,297,282 billion colonies/year	3,972,962 billion colonies/year
Cu	75	10.9 kg/yr	8.2 kg/yr
Zn	75	118.8 kg/yr	89 kg/yr
Pb	75	5.1 kg/yr	3.9 kg/yr
TSS	75	60,638 kg/yr	45,479 kg/yr
TP	50	183 kg/yr	91.4 kg/yr
TN	45	1339 kg/yr	603 kg/yr

¹ Los Angeles County Department of Public Works, Watershed Management Division – Stormwater Quality Data, Table 4-9 Cumulative Event Mean Concentrations 1994 – 2000 Storm Season (http://www.ladpw.org/WMD/npdes/wq_data.cfm)

Section VIII: Results

The amount of trash and sediments in the sluice gate chamber was 4 cubic feet and the maintenance hole chamber was 13 cubic feet. The total amount of trash and debris removed is 17 cubic feet.

Sampling for four separate storm events met the following criteria: 1) forecasted rainfall is greater than or equal to 0.1 inch and 2) the onset of rainfall is preceded by at-least 72 hours of dry-weather. The sampling for four storm events was collected on December 6, 2010, December 18, 2010, December 22, 2010 and December 29, 2011. The dry wet weather samples were collected on December 13, 2010, December 16, 2010, December 28, 2010 and January 6, 2011. Table 3 includes the summary of estimated pollutants removal rates for the four storm events. Table 4 is the summary of the lab results for wet weather and dry weather events. The table also shows the pollution expected to be removed on an annual basis. Appendix C shows tables of lab results for four storm events.

Table 3- Summary: Average Percent Removal among all 4 Storm Events

Pollutant	MDL	ML	Unit	Average Removal Percentage for Wet Weather	Average Removal Percentage for Dry Weather
E. Coli			MPN/100mL	97.5	97.3
Enterococcus			MPN/100mL	98.2	98.6
Total Coliform			MPN/100mL	96.1	95.2
Copper (Dissolved)			ug/l	46.9	53.0
Copper (Total)			ug/l	22.1	35.7
Lead (Dissolved)			ug/l	41.7	71.5
Lead (Total)			ug/l	-50.0	46.5
Nickel (Dissolved)			ug/l	5.4	24.7
Nickel (Total)			ug/l	-8.4	14.9
Zinc (Dissolved)			ug/l	47.7	80.3
Zinc (Total)			ug/l	37.4	82.5
Total Suspended Solids			mg/l	-8.6	71.3

Table 4 Summary of Lab Results for Storm Events

WET WEATHER EVENT ONE (12/06/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	13000	< 1000	92%
Enterococcus			MPN/100mL	26000	1000	96.2%
Total Coliforms			MPN/100mL	250000	2600	99%
Copper (Total)	0.080	0.50	ug/l	24.7	11.1	55.1%
Copper (Dissolved)	0.080	0.50	ug/l	13	13.1	-0.8%
Lead (Total)	0.20	1.0	ug/l	4.48	0.84	81.3%
Lead (Dissolved)	0.20	1.0	ug/l	1.37	0.94	31.4%
Nickel (Total)	0.11	0.50	ug/l	3.46	3.87	-11.8%
Nickel (Dissolved)	0.11	0.50	ug/l	3.13	3.90	-24.6%
Zinc (Total)	0.40	1.0	ug/l	114	79.1	30.6%
Zinc (Dissolved)	0.40	1.0	ug/l	80	67.9	15.0%
Total Suspended Solids		1.0	mg/l	5.2	1.6	69.2%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
18	BC Metals TMDL
11	BC Metals TMDL
59	BC Metals TMDL
49	BC Metals TMDL
470	CTR
469	CTR
119	BC Metals TMDL
94	BC Metals TMDL

WET WEATHER EVENT TWO (12/18/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100MI	21000	100	99.5%
Enterococcus			MPN/100MI	> 24000	< 10	100.0%
Total Coliforms			MPN/100MI	> 240000	11000	95.4%
Copper (Total)	0.080	0.50	ug/l	42.8	5.3	87.6%
Copper (Dissolved)	0.080	0.50	ug/l	17.1	5.4	68.3%
Lead (Total)	0.20	1.0	ug/l	22.00	0.33	98.5%
Lead (Dissolved)	0.20	1.0	ug/l	1.70	0.35	79.4%
Nickel (Total)	0.11	0.50	ug/l	5.48	3.20	41.6%
Nickel (Dissolved)	0.11	0.50	ug/l	2.83	4.01	-41.7%
Zinc (Total)	0.40	1.0	ug/l	217	64.3	70.4%
Zinc (Dissolved)	0.40	1.0	ug/l	68	67.2	1.6%
Total Suspended Solids		1.0	mg/l	48.0	< 1.0	97.9%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
18	BC Metals TMDL
11	BC Metals TMDL
59	BC Metals TMDL
49	BC Metals TMDL
470	CTR (Acute)
469	CTR (Acute)
119	BC Metals TMDL
94	BC Metals TMDL

Table 4 Summary of Lab Results for Storm Events

WET WEATHER EVENT THREE (12/22/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100MI	21000	100	99.5%
Enterococcus			MPN/100MI	> 24000	120	99.5%
Total Coliforms			MPN/100MI	> 240000	4800	98.0%
Copper (Total)	0.080	0.50	ug/l	22.2	10.3	53.6%
Copper (Dissolved)	0.080	0.50	ug/l	6.4	6.4	0.0%
Lead (Total)	0.20	1.0	ug/l	18.30	7.27	60.3%
Lead (Dissolved)	0.20	1.0	ug/l	0.57	0.17	70.2%
Nickel (Total)	0.11	0.50	ug/l	3.31	3.58	-8.2%
Nickel (Dissolved)	0.11	0.50	ug/l	0.8	0.84	-3.7%
Zinc (Total)	0.40	1.0	ug/l	137	32.4	76.4%
Zinc (Dissolved)	0.40	1.0	ug/l	35	6.3	81.9%
Total Suspended Solids		1.0	mg/l	52.0	58.0	-11.5%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
18	BC Metals TMDL
11	BC Metals TMDL
59	BC Metals TMDL
49	BC Metals TMDL
470	CTR (Acute)
469	CTR (Acute)
119	BC Metals TMDL
94	BC Metals TMDL

WET WEATHER EVENT FOUR (12/29/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	11000	100	99.1%
Enterococcus			MPN/100mL	17000	520	96.9%
Total Coliforms			MPN/100mL	160000	13000	91.9%
Copper (Total)	0.080	0.50	ug/l	17.3	18.8	-8.7%
Copper (Dissolved)	0.080	0.50	ug/l	5.2	4.1	20.7%
Lead (Total)	0.20	1.0	ug/l	15.70	27.20	-73.2%
Lead (Dissolved)	0.20	1.0	ug/l	0.63	3.03	-381.0%
Nickel (Total)	0.11	0.50	ug/l	AE* (0.70)	7.30	--
Nickel (Dissolved)	0.11	0.50	ug/l	2.30	1.46	36.5%
Zinc (Total)	0.40	1.0	ug/l	107	92.9	13.2%
Zinc (Dissolved)	0.40	1.0	ug/l	23	11.2	51.1%
Total Suspended Solids		1.0	mg/l	27.6	80.0	-189.9%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
18	BC Metals TMDL
11	BC Metals TMDL
59	BC Metals TMDL
49	BC Metals TMDL
470	CTR (Acute)
469	CTR (Acute)
119	BC Metals TMDL
94	BC Metals TMDL

Table 4 Summary of Lab Results for Storm Events

DRY WEATHER EVENT ONE (12/13/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	1300	< 100	92%
Enterococcus			MPN/100mL	860	20	97.7%
Total Coliforms			MPN/100mL	16000	960	94%
Copper (Total)	0.080	0.50	ug/l	22.8	9.6	57.9%
Copper (Dissolved)	0.080	0.50	ug/l	19.0	9.6	49.6%
Lead (Total)	0.20	1.0	ug/l	3.34	0.66	80.2%
Lead (Dissolved)	0.20	1.0	ug/l	2.48	0.71	71.4%
Nickel (Total)	0.11	0.50	ug/l	6.52	4.25	34.8%
Nickel (Dissolved)	0.11	0.50	ug/l	6.56	4.54	30.8%
Zinc (Total)	0.40	1.0	ug/l	380	58.8	84.5%
Zinc (Dissolved)	0.40	1.0	ug/l	381	58.5	84.6%
Total Suspended Solids		1.0	mg/l	5.6	< 1.0	82.1%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
24	BC Metals TMDL
23	BC Metals TMDL
13	BC Metals TMDL
8.1	BC Metals TMDL
52	CTR (Chronic)
52	CTR (Chronic)
304	BC Metals TMDL
300	BC Metals TMDL

DRY WEATHER EVENT TWO (12/16/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	82000	< 100	99.9%
Enterococcus			MPN/100mL	> 24000	10	100.0%
Total Coliforms			MPN/100mL	> 240000	4800	98.0%
Copper (Total)	0.080	0.50	ug/l	69.7	10.5	84.9%
Copper (Dissolved)	0.080	0.50	ug/l	24.9	15.6	37.3%
Lead (Total)	0.20	1.0	ug/l	7.31	1.08	85.2%
Lead (Dissolved)	0.20	1.0	ug/l	1.98	1.55	21.7%
Nickel (Total)	0.11	0.50	ug/l	15.80	4.48	71.6%
Nickel (Dissolved)	0.11	0.50	ug/l	12.30	4.87	60.4%
Zinc (Total)	0.40	1.0	ug/l	234	44.4	81.0%
Zinc (Dissolved)	0.40	1.0	ug/l	148	49.2	66.8%
Total Suspended Solids		1.0	mg/l	40.0	< 1.0	97.5%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
24	BC Metals TMDL
23	BC Metals TMDL
13	BC Metals TMDL
8.1	BC Metals TMDL
52	CTR (Chronic)
52	CTR (Chronic)
304	BC Metals TMDL
300	BC Metals TMDL

Table 4 Summary of Lab Results for Storm Events

DRY WEATHER EVENT THREE (12/28/10)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	15000	< 100	99.3%
Enterococcus			MPN/100mL	5700	< 100	98.2%
Total Coliforms			MPN/100mL	240000	200	99.9%
Copper (Total)	0.080	0.50	ug/l	16.7	4.7	72.0%
Copper (Dissolved)	0.080	0.50	ug/l	12.6	2.1	83.2%
Lead (Total)	0.20	1.0	ug/l	2.89	1.57	45.7%
Lead (Dissolved)	0.20	1.0	ug/l	1.53	0.45	70.6%
Nickel (Total)	0.11	0.50	ug/l	5.07	1.55	69.4%
Nickel (Dissolved)	0.11	0.50	ug/l	4.90	1.3	73.1%
Zinc (Total)	0.40	1.0	ug/l	113.0	32	71.5%
Zinc (Dissolved)	0.40	1.0	ug/l	97.8	7	92.9%
Total Suspended Solids		1.0	mg/l	4.5	2.0	55.6%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
24	BC Metals TMDL
23	BC Metals TMDL
13	BC Metals TMDL
8.1	BC Metals TMDL
52	CTR (Chronic)
52	CTR (Chronic)
304	BC Metals TMDL
300	BC Metals TMDL

DRY WEATHER EVENT FOUR (01/06/11)

Pollutant	MDL	ML	Unit	Baldwin Hills to Ballona Creek		
				Inlet	Outlet	% Removal
E. Coli			MPN/100mL	4800	< 100	97.9%
Enterococcus			MPN/100mL	590	< 10	98.3%
Total Coliforms			MPN/100mL	2800	310	88.9%
Copper (Total)	0.080	0.50	ug/l	6.4	6.6	-3.0%
Copper (Dissolved)	0.080	0.50	ug/l	5.1	6.5	-27.3%
Lead (Total)	0.20	1.0	ug/l	0.79	0.20	74.7%
Lead (Dissolved)	0.20	1.0	ug/l	0.27	0.21	22.2%
Nickel (Total)	0.11	0.50	ug/l	1.91	3.38	-77.0%
Nickel (Dissolved)	0.11	0.50	ug/l	1.75	3.58	-104.6%
Zinc (Total)	0.40	1.0	ug/l	59	9.4	84.1%
Zinc (Dissolved)	0.40	1.0	ug/l	52	7.3	85.8%
Total Suspended Solids		1.0	mg/l	2.0	< 1.0	50.0%

Water Quality Limit	Standard
235	Rec-1 Marine
104	Rec-1 Marine
10000	Rec-1 Marine
24	BC Metals TMDL
23	BC Metals TMDL
13	BC Metals TMDL
8.1	BC Metals TMDL
52	CTR (Chronic)
52	CTR (Chronic)
304	BC Metals TMDL
300	BC Metals TMDL

Section VIII: Public Outreach

Interested persons and the public have had the opportunity to participate in the development and review of the Implementation Plan for Jurisdictional 2 and 3. The responsible jurisdictions and agencies in Jurisdictional 2 and 3 held four half-day stakeholder workshops during the development of the Implementation Plan. These were held on May 29, 2003; August 12, 2004; and November 9, 2004. Appendix F includes a stakeholder attendance list for the workshop held on May 29, 2003.

Section IX: Conclusions

Overall Conclusions

As part of this project, stormwater runoff is diverted from an existing storm drain for treatment through a floatable screening well and lift station at the project site. The runoff will be distributed to turf area via subsurface irrigation system. Excess subsurface irrigation water will flow into a dry creek with a perforated pipe and back into the storm drain. Appendix E – Shows Pre and Post Installation photos - shows the location of the project site before and after. The total cost of the project was \$6,927,000. The Baldwin Hills to Ballona Creek project is not expected to result in any measurable improvement in Santa Monica Bay water quality.

The Baldwin Hills to Ballona Creek Project met its goals in addressing multiple pollutants with which the SMBB is impaired, enhancing receiving water body's beneficial and recreational uses, preserving the aquatic marine habitat and reducing the potential for human health risk and safety. However, the project did not meet its goal in achieving the compliance target of a 10% reduction of SMBB wet weather bacteria exceedance days by first interim compliance milestone.

The outcomes of this project are: (1) 42.8 % removal of total copper, (2) 77.6 % removal of total zinc, (3) 43.5% removal of total suspended solids, (4) 57.2% removal of total lead, (5) 54.4% removal of total nickel, (6) 27.9 % removal of enterococcus, (7) 37.9% removal of total coliform and (8) 3.09% increase in e coli.

Typical technical and design issues encountered as part of this project included:

- Potential for groundwater and storage water contamination
- Site Constraints and Reduction of Open Space.
- The site should avoid utility conflicts and not require significant utility relocation.
- Clogging

Therefore the hydrodynamic separator and storage tank were eliminated from this project because the sites did not meet one or more of the necessary site characteristics as state above.

With respect to invoice processing we encountered the following problems:

- Contract –Administration (Con-Ad) inspectors need time to conduct inspections; it usually falls behind schedule for two weeks and hence delays the schedule to sign off invoices. Con-Ad has high turnover rates among their inspectors and needs time to train the new inspectors who take over the inspection assignment.
- Need to understand the system of GSD regarding invoice processing to prevent delays in sign-off invoices from vendor.

Next Steps

The project is consistent with the Low Impact Development (LID) concept by incorporating distributed small-scale green BMP as opposed to a large conventional structural BMP, the Mayor's million tree initiatives by incorporating trees/plants into the stormwater quality treatment system and the "Green Street" initiative by providing landscape along street corridors and increasing the aesthetics values for the area.

MAINTENANCE

Maintenance for each device will be done twice a year; once at the beginning of the wet season to prepare the device for rain events and ensure it will work properly, and once at the end of the wet season to rid any trash and debris that may have been captured during rain events and ensure the device will work properly during the dry season. The accumulation of debris and sediment can be removed with simple annual maintenance practices.

Maintenance is usually conducted by periodically pumping out sediments and debris. In areas of high sediment flows, pretreatment is required to minimize the inflow of particulates so that the need to clean the system is reduced. Frequent maintenance is required to re-suspend and remove sediment and debris and to ensure that the outlet structure is functioning properly. Large scale removal of accumulated sediment in the system may be difficult due to limited access. In addition, underground systems will be considered confined spaces that require additional safety requirements for inspection and maintenance.

The City of Los Angeles Bureau of Sanitation and Department of Recreation and Parks will jointly coordinate and develop responsibility for water quality monitoring, operation and maintenance of the installed BMPs.

Section X: Appendices

Appendix A

Appendix A – List of References

1- Minnesota Urban Small Size BMP Manual -

http://www.metrocouncil.org/Environment/Watershed/BMP/CH3_STFiltBioretention.pdf

2- FILTERRA® Stormwater Bioretention Filtration System - <http://www.americastusa.com/filterra.html>

3- Watershed Protection Division. (2009). Water Quality Compliance Master Plan for Urban Runoff. City of Los Angeles, California (<http://www.lastormwater.org/Siteorg/program/masterplan.htm>).

4- Green Infrastructure for Los Angeles (2009). Addressing Urban Runoff and Water Supply Through Low Impact Development/Green Streets & Green Alleys Design Guidelines Standards. City of Los Angeles, California (<http://www.lastormwater.org/Siteorg/program/green.htm>).

Appendix B

Appendix B – List of Deliverables

<u>Task</u>	<u>Deliverable by Subtask #</u>	<u>Due Date</u>	<u>% of Work Complete</u>	<u>Date Submitted</u>
Exhibit A –Scope of Work			100%Total	
Task A1. Project Assessment and Evaluation Plan, Monitoring Plan, Quality Assurance Project Plan				
Subtask A1.1	GPS Coordinates	1/31/08	Completed	4/30/08
Subtask A1.2	PAEP	1/31/08	Completed	4/30/08
Subtask A1.3	Monitoring Plan (MP)	1/31/08	Completed	4/30/08
Subtask A1.4	Quality Assurance Project Plan (QAPP)	1/31/08	Completed	4/30/08
Task A2. Work to be Performed by Grantee				
Subtask A2.1.1	50% Design Plans and Engineer's Preliminary Construction Cost Estimate	7/30/08	Completed	7/30/08
Subtask A2.1.2	As-Advertised Design Plans and Specifications	10/30/08	Completed	4/30/10
Subtask A2.1.3	Copy of Construction Notice to Proceed	7/30/10	Completed	7/30/10
Subtask A2.2.1	Pre- and During Photo Documentation	10/29/10	Completed	7/30/10
Subtask A2.2.3	Post-construction Photo Documentation	1/30/11	Completed	1/31/11
Subtask A2.3.2	Trash and Debris Monitoring Data	1/30/11	Completed	3/1/11
Subtask A2.4.3	Water Quality Monitoring Data	1/30/11	Completed	2/17/11
Subtask A2.5.1	Photo Documentation of Installed Sign	1/30/11	Completed	1/31/11
Subtask A2.6.1	Draft Project Report	2/1/11	Completed	3/1/11
Subtask A2.6.2	Final Project Report	3/1/11	Completed	3/31/11
Exhibit B – Invoicing, Budget Detail and Reporting Provisions			100% Total	
Subtask B1.1	Invoice	Quarterly	Completed	3/1/11
Subtask B7.0 Reports				
Subtask B7.1	Quarterly Progress Reports	Quarterly	Completed	10/29/10
Subtask B7.3	Grant Summary Form	6/30/07	Completed	4/30/07
Subtask B7.4	Natural Resource Projects Inventory Project Survey Form	Before Final Invoice	Completed	1/31/11
Exhibit C – SWRCB General Conditions			100% Total	
Subtask C7	Copy of final CEQA/NEPA Documentation	4/30/07	Completed	01/13/06
Subtask C30	Signed Cover Sheets for all Permits	As needed		Not applicable

Appendix C

Table 5: Lab Results Wet Weather Bacteria

ENVIRONMENTAL MONITORING DIVISION

BIOLOGY SECTION - MICROBIOLOGY UNIT

Watershed Protection Division

Baldwin Hills to Ballona Creek

Sample #	Collected On	WPD ID#	Station	E COLI CS	ENTEROCOCCUS CS	TOTAL COLIFORMS CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT150398-1	12/6/2010	WPD-10930	WP-In	13000	26000	250000
HT150398-2	12/6/2010	WPD-10931	WP-Ef	<1000	1000	26000
HT150398-3	12/6/2010	WPD-10932	WP-Dup	13000	20000	300000
HT150398-4	12/6/2010	WPD-10933	WP-Blk	<1	<1	<1

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS CS	E COLI CS	ENTEROCOCCUS CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT151034-1	12/18/2010	WPD-10977	WP-In	>240000	21000	>24000
HT151034-2	12/18/2010	WPD-10978	WP-Ef	11000	100	10
HT151034-3	12/18/2010	WPD-10979	WP-Dup	16000	100	10
HT151034-4	12/18/2010	WPD-10980	WP-Blk	<1	<1	<1

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Table 5: Lab Results Wet Weather Bacteria

ENVIRONMENTAL MONITORING DIVISION

BIOLOGY SECTION - MICROBIOLOGY UNIT

Watershed Protection Division

Baldwin Hills to Ballona Creek

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS CS	E COLI CS	ENTEROCOCCUS CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT151118-1	12/22/2010	WPD-10998	WP-In	>240000	21000	>24000
HT151118-2	12/22/2010	WPD-10999	WP-Ef	4800	100	120
HT151118-3	12/22/2010	WPD-11000	WP-Dup	>240000	22000	>24000
HT151118-4	12/22/2010	WPD-11001	WP-Blk	<1	<1	<1

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS CS	E COLI CS	ENTEROCOCCUS CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT151330-1	12/29/2010	WPD-11008	WP-In	160000	11000	17000
HT151330-2	12/29/2010	WPD-11009	WP-Ef	13000	100	520
HT151330-3	12/29/2010	WPD-11010	WP-Dup	7700	300	410
HT151330-4	12/29/2010	WPD-11011	WP-Blk	<1	<1	<1

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Table 6: Lab Results Dry Weather Bacteria

ENVIRONMENTAL MONITORING DIVISION

BIOLOGY SECTION - MICROBIOLOGY UNIT

Watershed Protection Division

Baldwin Hills to Ballona Creek

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS	E COLI CS	ENTEROCOCCUS	
				CS	MPN/100ml	MPN/100ml	
HT150725-1	12/13/2010	WPD-10956	WP-In	MPN/100ml	16000	1300	860
HT150725-2	12/13/2010	WPD-10957	WP-Ef	960	<100	20	
HT150725-3	12/13/2010	WPD-10958	WP-Dup	980	<100	52	
HT150725-4	12/13/2010	WPD-10959	WP-Blk	<1	<1	<1	

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS	E COLI CS	ENTEROCOCCUS	
				CS	MPN/100ml	MPN/100ml	
HT150925-1	12/16/2010	WPD-10971	WP-In	MPN/100ml	>240000	82000	>24000
HT150925-2	12/16/2010	WPD-10972	WP-Ef	740	<100	<10	
HT150925-3	12/16/2010	WPD-10973	WP-Dup	>240000	82000	>24000	
HT150925-4	12/16/2010	WPD-10974	WP-Blk	<1	<1	<1	

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Table 6: Lab Results Dry Weather Bacteria

BIOLOGY SECTION - MICROBIOLOGY UNIT
 Watershed Protection Division
Baldwin Hills to Ballona Creek

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS	E COLI CS	ENTEROCOCCUS
				CS	CS	CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT151294-1	12/28/2010	WPD-11004	WP-IN *WP-EF	200	<100	<100
HT151294-2	12/28/2010	WPD-11005	WP-EF *WP-IN	240000	15000	5700
HT151294-3	12/28/2010	WPD-11006	WP-DUP	73000	13000	5900
HT151294-4	12/28/2010	WPD-11007	WP-BLK	<1	<1	<1

Note: It is our opinion that influent and effluent sample labels were accidentally switched in the field. Total Suspended Solids (TSS) results also suggest this; TSS IN = 2 mg/l, TSS EF = 4.5 mg/l

*Corrected Report (01/03/11): Per Jon Ball, influent and effluent samples were mislabeled. The effluent sample is HT151294-1 and the influent sample is HT151294-2.

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Sample #	Collected On	WPD ID#	Station	TOTAL COLIFORMS	E COLI CS	ENTEROCOCCUS
				CS	CS	CS
				MPN/100ml	MPN/100ml	MPN/100ml
HT151556-1	1/6/2011	WPD-11037	WP-In	28000	4800	590
HT151556-2	1/6/2011	WPD-11038	WP-Ef	310	<100	<10
HT151556-3	1/6/2011	WPD-11039	WP-Dup	26000	7300	660
HT151556-4	1/6/2011	WPD-11040	WP-Blk	<1	<1	<1

Status: **Approved**

Samples analyzed by Standards Methods SM9223B (APHA 1998) and Enterolert™ (IDEXX Labs, Inc.)

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT150398-1 WPD-10930 12/6/2010	HT150398-2 WPD-10931 12/6/2010	HT150398-3 WPD-10932 12/6/2010	HT150398-4 WPD-10933 12/6/2010
Total Hardness	mg/l			52.4	173	53.4	0.017
Copper	ug/l	0.09	0.50	24.7	11.1	27.4	0.14
Copper (Dissolved)	ug/l	0.09	0.50	13	13.1	12.9	0.45
Lead	ug/l	0.06	0.50	4.48	0.84	4.44	ND
Lead (Dissolved)	ug/l	0.06	0.50	1.37	0.94	1.36	ND
Nickel	ug/l	0.07	1.00	3.46	3.87	3.69	0.11
Nickel (Dissolved)	ug/l	0.07	1.00	3.13	3.9	3.36	ND
Zinc	ug/l	0.2	1.00	114	79.1	112	ND
Zinc (Dissolved)	ug/l	0.2	1.00	79.9	67.9	83.5	ND
Total Suspended Solids	mg/l		1.0	5.2	1.6	5.6	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT151034-1 WPD-10977 12/18/2010	HT151034-2 WPD-10978 12/18/2010	HT151034-3 WPD-10979 12/18/2010	HT151034-4 WPD-10980 12/18/2010
Total Hardness	mg/l			35.3	301	291	0.102
Copper	ug/l	0.09	0.50	42.8	5.31	5.36	0.32
Copper (Dissolved)	ug/l	0.09	0.50	17.1	5.42	4.84	0.46
Lead	ug/l	0.06	0.50	22	0.33	0.31	0.06
Lead (Dissolved)	ug/l	0.06	0.50	1.7	0.35	0.3	ND
Nickel	ug/l	0.07	1.00	5.48	3.2	3.29	0.13
Nickel (Dissolved)	ug/l	0.07	1.00	2.83	4.01	3.23	0.12
Zinc	ug/l	0.2	1.00	217	64.3	65.7	0.58
Zinc (Dissolved)	ug/l	0.2	1.00	68.3	67.2	65.1	0.83
Total Suspended Solids	mg/l		1.0	48	ND	ND	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT151118-1 WPD-10998 12/22/2010	HT151118-2 WPD-10999 12/22/2010	HT151118-3 WPD-11000 12/22/2010	HT151118-4 WPD-11001 12/22/2010
Total Hardness	mg/l			13.4	38.5	13.5	0.008
Copper	ug/l	0.09	0.50	22.2	10.3	23.8	0.1
Copper (Dissolved)	ug/l	0.09	0.50	6.44	6.44	6.05	0.1
Lead	ug/l	0.06	0.50	18.3	7.27	20.6	ND
Lead (Dissolved)	ug/l	0.06	0.50	0.57	0.17	1.15	ND
Nickel	ug/l	0.07	1.00	3.31	3.58	2.85	0.08
Nickel (Dissolved)	ug/l	0.07	1.00	0.81	0.84	0.84	0.08
Zinc	ug/l	0.2	1.00	137	32.4	144	ND
Zinc (Dissolved)	ug/l	0.2	1.00	34.7	6.29	37.2	ND
Total Suspended Solids	mg/l		1.0	52	58	47	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division
Westside Park Report

Parameter	Unit	MDL	ML	HT151330-1 WPD-11008 12/29/2010	HT151330-2 WPD-11009 12/29/2010	HT151330-3 WPD-11010 12/29/2010	HT151330-4 WPD-11011 12/29/2010
Total Hardness	mg/l			10.3	55.9	59.2	0.039
Copper	ug/l	0.09	0.50	17.3	18.8	15.6	ND
Copper (Dissolved)	ug/l	0.09	0.50	5.21	4.13	3.03	0.3
Lead	ug/l	0.06	0.50	15.7	27.2	23.4	ND
Lead (Dissolved)	ug/l	0.06	0.50	0.63	3.03	1.57	0.1
Nickel	ug/l	0.07	1.00	0.7	7.3	6.1	ND
Nickel (Dissolved)	ug/l	0.07	1.00	2.3	1.46	0.94	0.15
Zinc	ug/l	0.2	1.00	107	92.9	64.9	ND
Zinc (Dissolved)	ug/l	0.2	1.00	22.9	11.2	5.6	ND
Total Suspended Solids	mg/l		1.0	27.6	80	84.5	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results S2 Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT150725-1 WPD-10956 12/13/2010	HT150725-2 WPD-10957 12/13/2010	HT150725-3 WPD-10958 12/13/2010	HT150725-4 WPD-10959 12/13/2010
Total Hardness	mg/l			276	265	265	0.109
Copper	ug/l	0.09	0.50	22.8	9.59	9.46	0.31
Copper (Dissolved)	ug/l	0.09	0.50	19	9.58	8.98	0.29
Lead	ug/l	0.06	0.50	3.34	0.66	0.66	ND
Lead (Dissolved)	ug/l	0.06	0.50	2.48	0.71	0.63	0.06
Nickel	ug/l	0.07	1.00	6.52	4.25	4.52	ND
Nickel (Dissolved)	ug/l	0.07	1.00	6.56	4.54	4.24	0.08
Zinc	ug/l	0.2	1.00	380	58.8	59.1	ND
Zinc (Dissolved)	ug/l	0.2	1.00	381	58.5	57.9	ND
Total Suspended Solids	mg/l		1.0	5.6	ND	ND	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT150925-1 WPD-10971 12/16/2010	HT150925-2 WPD-10972 12/16/2010	HT150925-3 WPD-10973 12/16/2010	HT150925-4 WPD-10974 12/16/2010
Total Hardness	mg/l			159	265	157	0.139
Copper	ug/l	0.09	0.50	69.7	10.5	64	0.35
Copper (Dissolved)	ug/l	0.09	0.50	24.9	15.6	24.9	1.91
Lead	ug/l	0.06	0.50	7.31	1.08	6.63	0.1
Lead (Dissolved)	ug/l	0.06	0.50	1.98	1.55	2.07	0.11
Nickel	ug/l	0.07	1.00	15.8	4.48	13.6	ND
Nickel (Dissolved)	ug/l	0.07	1.00	12.3	4.87	11.6	0.4
Zinc	ug/l	0.2	1.00	234	44.4	210	ND
Zinc (Dissolved)	ug/l	0.2	1.00	148	49.2	147	2.04
Total Suspended Solids	mg/l		1.0	40	ND	41.6	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML	HT151294-1 WPD-11004 12/28/2010	HT151294-2 WPD-11005 12/28/2010	HT151294-3 WPD-11006 12/28/2010	HT151294-4 WPD-11007 12/28/2010
Total Hardness	mg/l			41	188	194	0.022
Copper	ug/l	0.09	0.50	4.67	16.7	16.3	0.17
Copper (Dissolved)	ug/l	0.09	0.50	2.12	12.6	12.8	0.17
Lead	ug/l	0.06	0.50	1.57	2.89	2.72	ND
Lead (Dissolved)	ug/l	0.06	0.50	0.45	1.53	1.01	ND
Nickel	ug/l	0.07	1.00	1.55	5.07	6.22	ND
Nickel (Dissolved)	ug/l	0.07	1.00	1.32	4.9	4.77	ND
Zinc	ug/l	0.2	1.00	32.2	113	111	ND
Zinc (Dissolved)	ug/l	0.2	1.00	6.9	97.8	100	ND
Total Suspended Solids	mg/l		1.0	2	4.5	4.4	ND

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Table 7: Lab Results Metals and TSS

Environmental Monitoring Division

Baldwin Hills to Ballona Creek

Parameter	Unit	MDL	ML
Total Hardness	mg/l		
Copper	ug/l	0.09	0.50
Copper (Dissolved)	ug/l	0.09	0.50
Lead	ug/l	0.06	0.50
Lead (Dissolved)	ug/l	0.06	0.50
Nickel	ug/l	0.07	1.00
Nickel (Dissolved)	ug/l	0.07	1.00
Zinc	ug/l	0.2	1.00
Zinc (Dissolved)	ug/l	0.2	1.00
Total Suspended Solids	mg/l		1.0

Note:

ND = Not detected; values below MDL

MDL = Method Detection Limit is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B.

ML = Minimum Level is the concentration of a substance equivalent to the lowest calibration standard.

* = Results that fall between MDL and ML are estimated values.

Appendix D

Pictures of Westside Park

BEFORE (Pre-Construction Photos)



Photo taken of Project site area.

DURING CONSTRUCTION

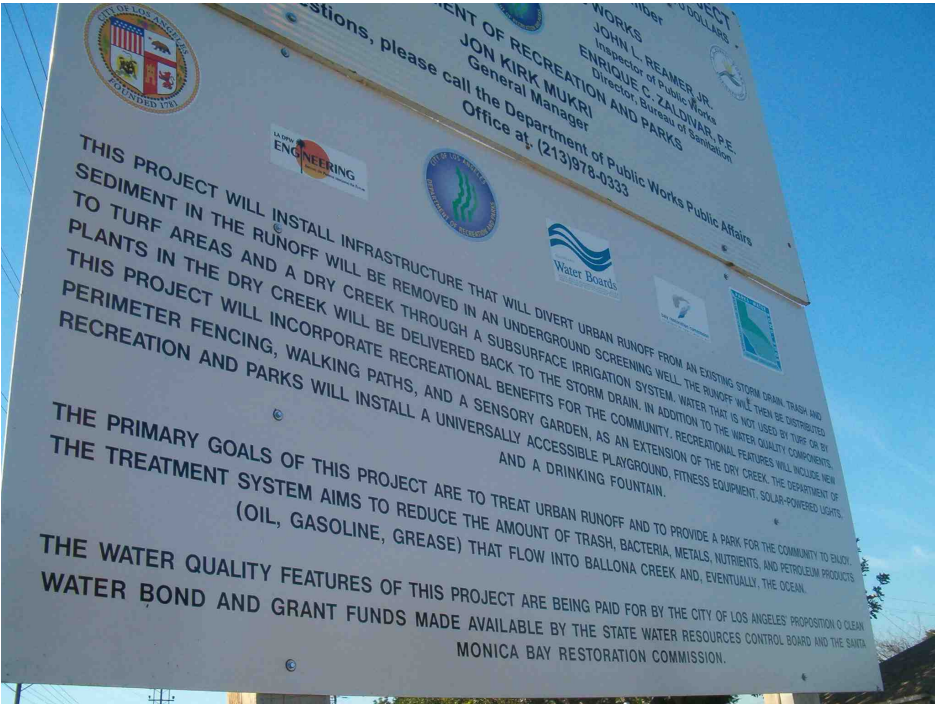


Photo Documentation of Installed Sign.



Photo was taken on August 2010. Picture of the site looking east.



Photo was taken on September 2010. Picture of the site looking east.



Photo was taken on October 2010. Picture of the treatment train installation.



Photo was taken on October 2010. Picture of the pumping station and treatment train installation.



Photo was taken on October 2010. Picture of the installation of the infiltration system.

AFTER (Post Construction)



Photo was taken on February 2011. The lift station control panels at the site.



Photo was taken on February 2011. The play grounds at the site.



Photo was taken on February 2011. The treatment train location at the site.



Photo was taken on February 2011. Planting the vegetation at the site.