September 18, 2013

Maria de la Paz Carpio-Obeso
Ocean Unit Chief
State Water Resources Control Board
1001 I Street, 16th Floor
Sacramento, CA 95814

Dear Ms. de la Paz Carpio-Obeso,

Please find enclosed the Draft Compliance Plan for the Heisler Park Area of Special Biological Significance as required per the March 20, 2012 General Exception.

If you have any questions, please contact Tracy Ingebrigtsen at (949) 497-0781.

Sincerely,

David Shissler, P.E.
Director of Water Quality

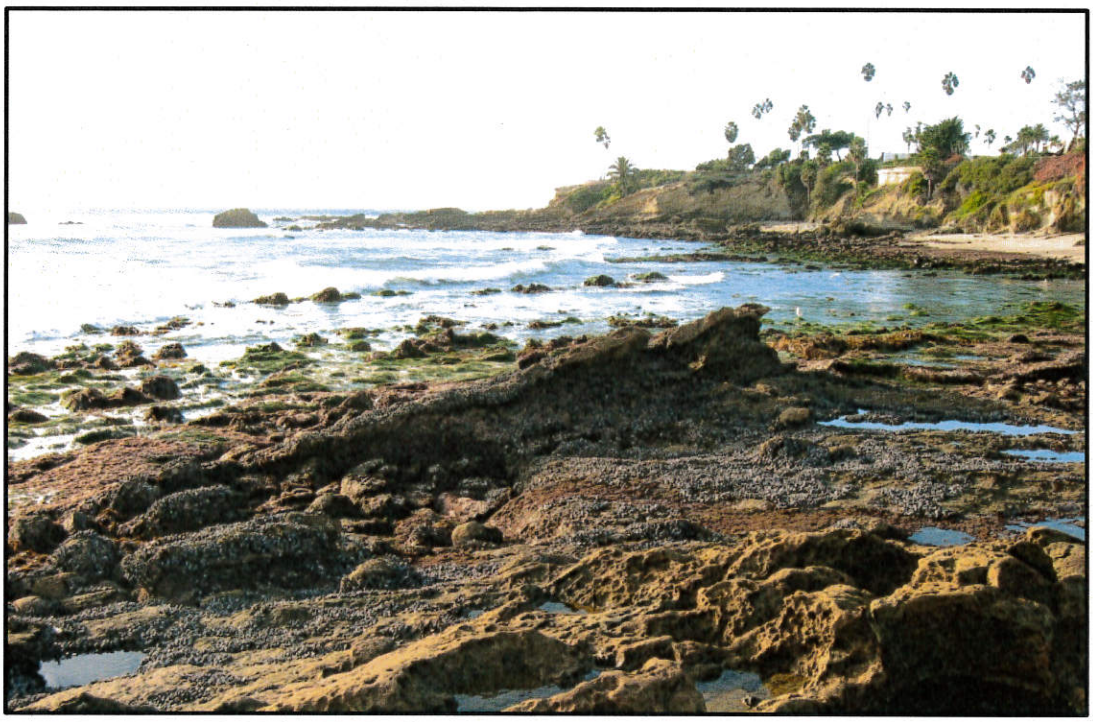
cc: David Gibson, San Diego Regional Water Quality Control Board

Enclosed

505 FOREST AVE. • LAGUNA BEACH, CA 92651 • TEL (949) 497-0378 • FAX (949) 494-1864

Section A.13

City of Laguna Beach
Heisler Park Area of Special Biological Significance Compliance Plan



A.13.1 Introduction

The State Water Resources Control Board designated the ocean adjacent to Heisler Park (Laguna Beach, CA) as an Area of Special Biological Significance (ASBS) in 1974 due to the abundance of life in the tidepools and nearshore environment. In total, there are 34 designated ASBS along the California coast. ASBS require the highest level of protection from pollutants discharged from inland sources and as such, the State's Ocean Plan prohibits the discharge of waste into designated ASBS. Storm drain discharges are considered to be a waste discharge and thus are prohibited.

The City of Laguna Beach was notified by the State Water Board in October of 2004 to either cease the discharge of storm water and nonpoint source waste into Heisler Park ASBS or request an exception to the Ocean Plan. The City formally requested an exception in December of 2004 to allow the continued discharge of storm water into the ASBS. The General Exception was approved on March 20, 2012 and the City was notified on March 20, 2012 of inclusion in the General Exception.

The General Exception requires the City of Laguna Beach to conduct ocean water monitoring and create an ASBS Compliance Plan that describes the strategy to comply with the special conditions listed in the General Exception.

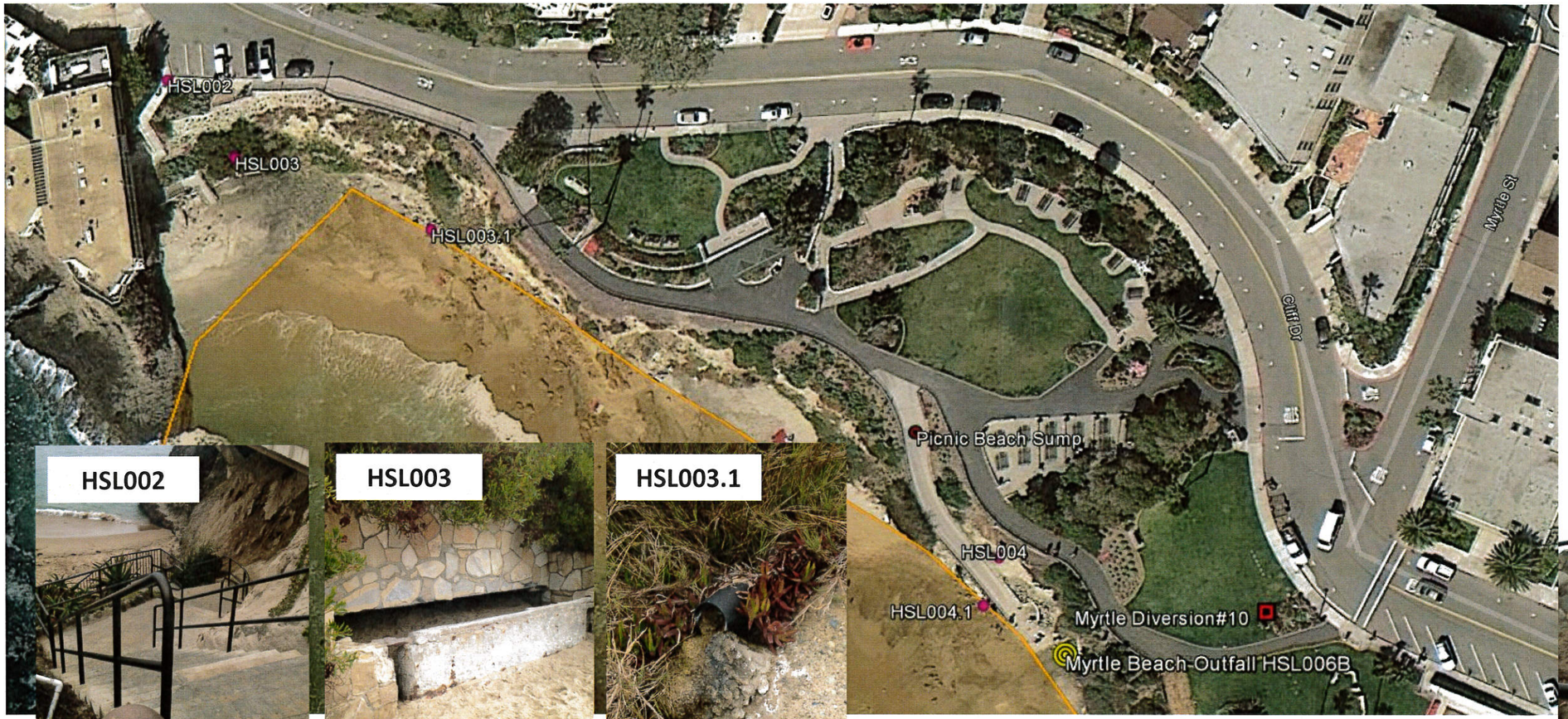
The City of Laguna Beach has spent approximately $9 million dollars to renovate Heisler Park. Many of the Park improvements were designed and incorporated to improve water quality in adjacent Heisler Park ASBS. Currently, all dry weather nuisance flows from the Park and the surrounding watershed are diverted to the sanitary sewer system through a series of sump pumps and diversion units. During the wet season storm water flows through diversion units to remove trash and large debris. The following compliance plan outlines details of the program, activities and best management practices that have been put into place to improve water quality in the Heisler Park ASBS.

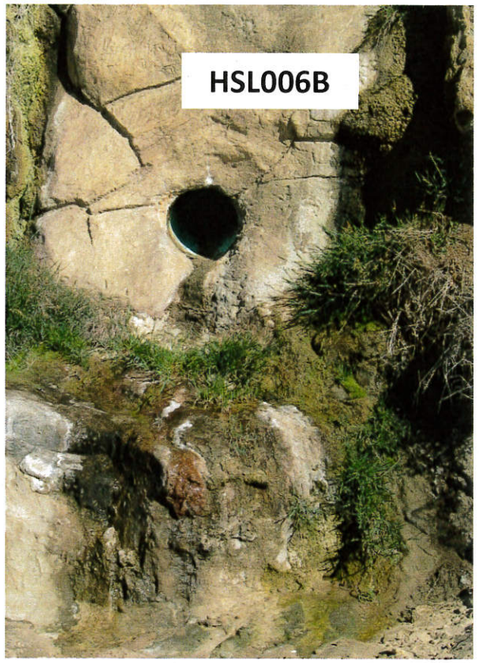
A.13.2 Heisler Park Area of Special Biological Significance Drainage Area

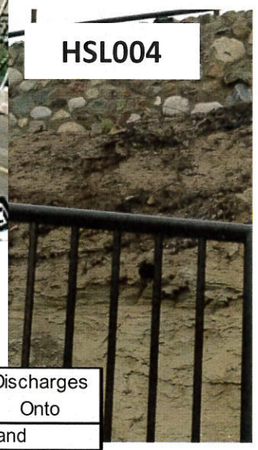
Map 1 - Heisler Park Area of Special Biological Significance and Associated Watershed

- Shaded green area indicates area that drains into nuisance water diversion unit.
- Red squares indicate nuisance water diversion units.
- Orange highlight area is the full extent of the Heisler Park ASBS.
- Heisler Park ASBS drainage area is mainly residential with several restaurants, hotels and light commercial business.

Map 2 – North Heisler Park ASBS Drainage/Diversion Summary

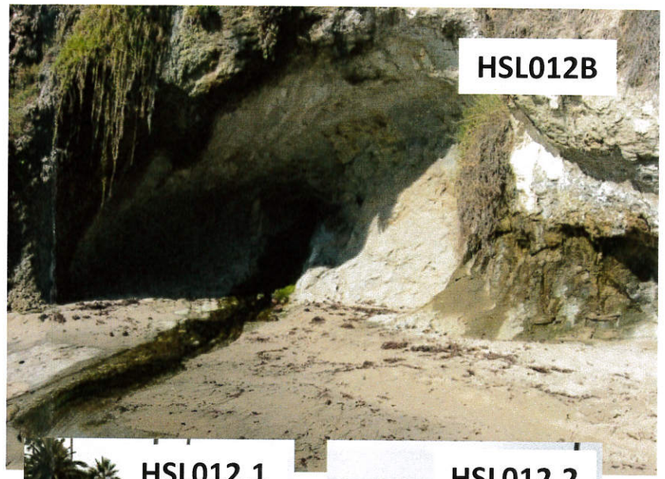


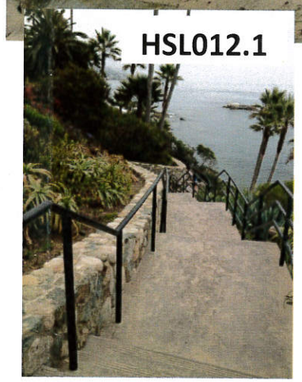


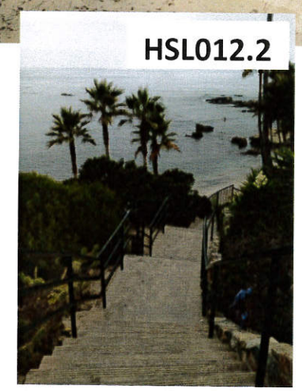


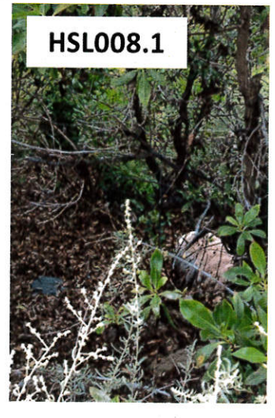
SampleID	SourceCode	SourceType	Longitude	Latitude	Beach Name	Type	Material	Flow	Location	Upstream Source	Shape	Width	Discharges Onto
HSL002	non-point	discharge	-117.79477	33.545152	Divers cove	Non-porous	concrete	When raining	On beach	urban w atershed	Rectangular	-99.00	sand
HSL003	municipal/industrial storm drain	discharge	-117.79465	33.545033	Divers cove	non-porous	concrete	When raining	On beach	urban w atershed	Rectangular	72-inch	sand
HSL003.1	small storm drains	discharge	-117.79428	33.544915	Divers cove	non-porous	pvc	When raining	On beach	urban w atershed	round	4-inch	sand
HSL004	small storm drains	discharge	-117.79327	33.544418	Picnic Beach	non-porous	pvc	When raining	In bluff	urban w atershed	round	4-inch	sand
HSL004.1	small storm drains	discharge	-117.79329	33.544348	Picnic Beach	non-porous	pvc	When raining	In bluff	urban w atershed	round	12-inch	sand
HSL006B	Heisler ASBS, 18 inch	Storm Drain	-117.79315	33.544274	Picnic Beach	non-porous	pvc	intermittent	In bluff	urban w atershed	round	18-inch	sand
Picnic Beach Sump Pump	In park drainage, pumped to CDS	sump pump	-117.79341	33.544604									

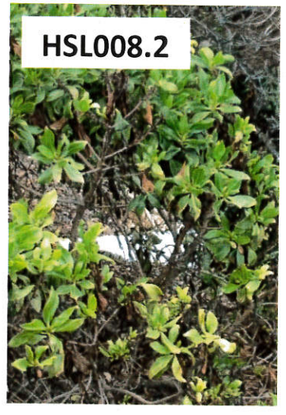
Map 3 – Central Heisler Park ASBS Drainage/Diversion Summary









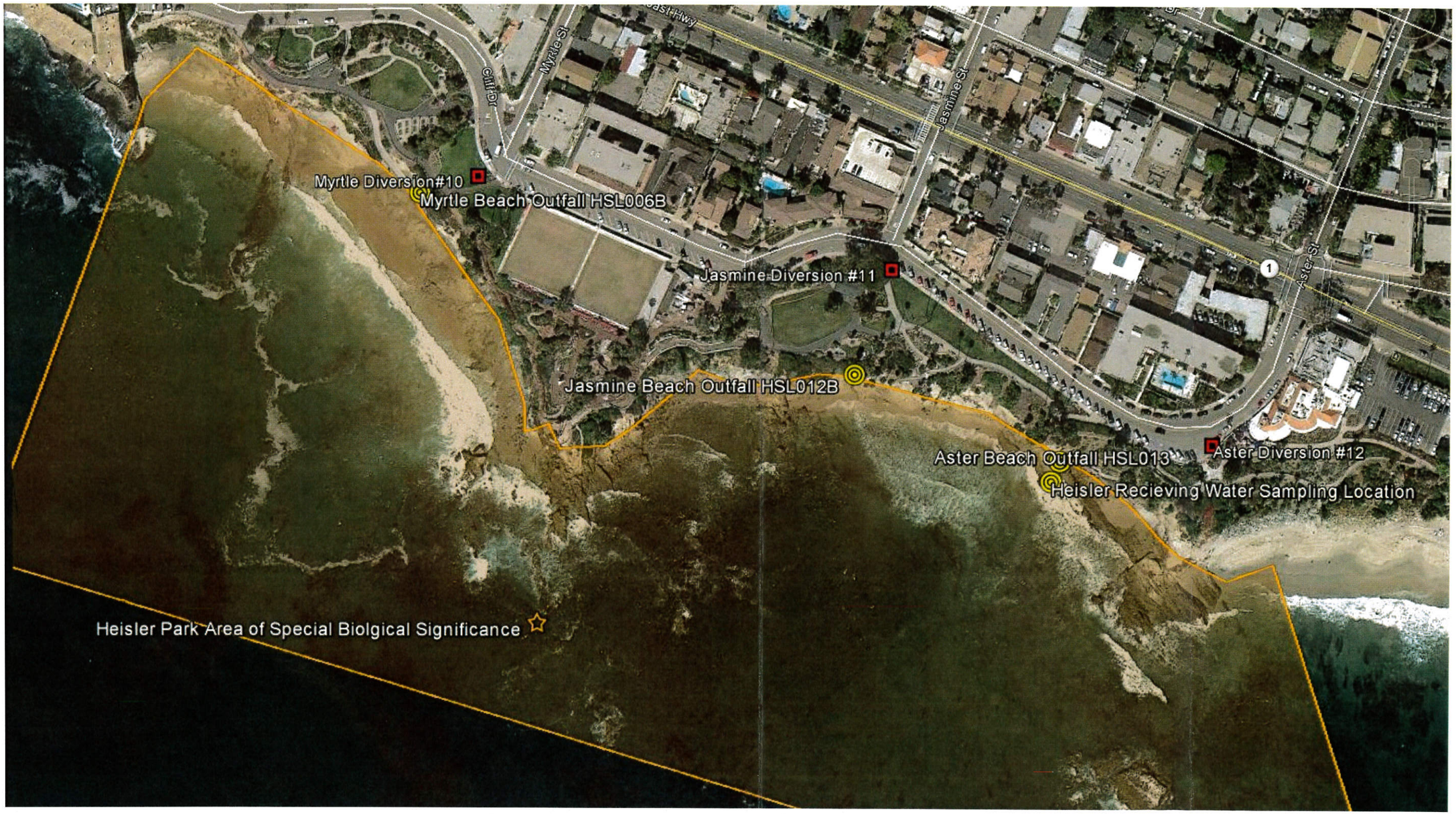


SampleID	Source Code	Source Type	Longitude	Latitude	Beach Name	Type	Material	Flow	Location	Upstream Source	Shape	Width	Discharges Onto
HSL008.1	Small storm drain	discharge	-117.792288	33.543256	Rock Pile Beach	non-porous	PVC	When raining	In bluff	urban w atershed	round	6-inch	bluff
HSL008.2	Small storm drain	discharge	-117.79222	33.543195	Rock Pile Beach	non-porous	PVC	When raining	In bluff	urban w atershed	round	6-inch	bluff
HSL012B	Jasmine Heisler ASBS 18-inch	storm drain	-117.790762	33.543436	Rock Pile Beach	non-porous	PVC	Intermittent	In bluff	urban w atershed	round	18-inch	sand
HSL012.1	Non-point	discharge	-117.790556	33.543611	Rock Pile Beach	non-porous	Concrete	When raining	Sidew alk/Ramp	urban w atershed	rectangular	-99.00	sand
HSL012.2	Non-point	discharge	-117.790191	33.543505	Rock Pile Beach	non-porous	Concrete	When raining	Sidew alk/Ramp	urban w atershed	rectangular	-99.00	sand
HSL012.3	Small storm drain	discharge	-117.790506	33.543409	Rock Pile Beach	non-porous	PVC	Intermittent	Bottom of ramp	groundw ater	round	4-inch	sand
HSL019	Municipal/industrial storm drain	discharge	-117.79245	33.5435	Divers cove	non-porous	Metal	When raining	In bluff	unknow n	round	4-inch	bluff
Jasmine Restroom Sump	In park drainage, pumped to CDS	sump pump	-117.790782	33.543528									
South Monument Point Sump	In park drainage, pumped to CDS	sump pump	-117.792272	33.543224									
Myrtle Sump Pump	In park drainage, pumped to CDS	sump pump	-117.7925	33.543611									

Map 4 – South Heisler Park ASBS Drainage/Diversion Summary

SampleID	Source Code	Source Type	Longitude	Latitude	Beach Name	Type	Material	Flow	Location	Upstream Source	Shape	Width	Discharges Onto
HSL013	municipal/industrial storm	discharge	-117.78965	33.54305	Bird Rock	non-porous	concrete	When raining	base of bluff	urban w atershed	round	24-inch	mixed
South Bird Rock Sump Pump	In park drainage, pumped	sump pump	-117.78829	33.542946									

Map 5 –Heisler Park ASBS Sampling Locations and Receiving Water Sampling Location



A.13.2. Non Structural Best Management Practices

The Heisler Park ASBS watershed area is located within the City of Laguna Beach which is covered under the Orange County Municipal Storm Water Permit, R9-2009-0002, (MS4 Permit). To maintain compliance with the MS4 Permit the City prepared a Local Implementation Plan (LIP). The LIP describes the programs and activities that the City implements to eliminate all non-authorized non-stormwater runoff and meet additional MS4 Permit requirements with the goal of improving water quality. As these are similar goals for protection of the Heisler Park ASBS most of the City's programs and activities remain the same across the entire City of Laguna Beach. Additional program components and activities can be reviewed in prior sections of the City's LIP. (http://lagunabeachcity.net/cityhall/wq/clean_water_compliance_programs) The majority of the non-authorized non-storm water runoff in the Heisler Park ASBS watershed has been eliminated through the use of three urban water diversion units as described in Section A.13.3. Additional measures are documented below and within Section A.13.3.

A.13.2.1 Inspection Frequencies for the Heisler Park ASBS watershed.

- Construction Sites –Construction program compliance details are located in Section A.8 of the LIP. Construction sites that are located within the Heisler Park watershed and meet high priority definitions will be inspected weekly during the rainy season.
- Commercial/Industrial Facilities - The Commercial and Industrial Facility program compliance details are located in section A.9 of the LIP. There are no industrial businesses located within Heisler Park watershed. Commercial Facilities located adjacent to Heisler Park will be inspected twice during the rainy season, all other facilities located within the surrounding watershed shall be inspected at the current MS4 Permit required frequency (20 percent per year)
- Stormwater Outfalls 18 inches or larger – Stormwater outfalls 18 inches or larger will be inspected once prior to the beginning of the rainy season and once during the rainy season. The urban water diversion units that are located upstream of the stormwater outfalls are maintained in accordance with Section A.5 of the LIP.
- Management of pesticides and other chemicals is outlined in section A.5.6 of this LIP.

A.13.2.2 Management of Pesticides, Herbicides, and Fertilizers

- Within Heisler Park and all City of Laguna Beach Parks, the City implements BMPs to reduce the contribution of pollutants to stormwater. More information regarding BMP implementation is listed in Section A.5.6. Heisler Park has several structural BMPs, explained in detail in Section A.13.3, that reduce the potential of pollutants leaving the Park.

A.13.2.3 New Development/Redevelopment

- The City of Laguna Beach has updated the current LIP to comply with the Regional Board's fourth term MS4 Permit. As such, the City has incorporated new compliance criteria for new and redevelopment projects within the City of Laguna Beach. The new criteria require incorporation of source control BMPs, LID BMPS and in some cases treatment control BMPs. Section A.7 of the LIP gives an extensive overview of the New Development/Redevelopment compliance criteria.

A.13.2.4 Public Education/Outreach

- The City follows a robust public outreach program as outlined in Section A.6.3 of the LIP. In addition, within Heisler Park special signage has been incorporated into the park landscape regarding storm water pollution, the sensitive ASBS and best management practices for protecting the ocean. Laguna Beach also has a Marine Protection Officer and volunteer docents that provide education and outreach to the many visitors to Heisler Park beaches.

Photos – Examples of signage located within Heisler Park.

A.13.3 Structural Best Management Practices

The following structural best management practices have been installed within the City of Laguna Beach's Heisler Park. The structural BMPs not only control storm water runoff from Heisler Park but also from the surrounding watershed which drains into the Heisler Park ASBS. Priority pollutants of concern are bacteria, trash and nutrients. These priority pollutants are controlled or eliminated using the following structural BMPs and the aforementioned non-structural BMPs. The structural BMPs described and pictured below address not only dry weather flows but also wet weather flows. At

this time it is not anticipated that any additional structural BMPs will need to be implemented. If monitoring shows ocean water degradation additional structural controls will be considered.

A.13.3.1 Heisler Park Nuisance Water Diversion Units

- As shown on the map in section A.13.2, there are four nuisance water diversion units that divert all non-authorized, non-storm water runoff away from the Heisler Park ASBS and into the sanitary sewer system. The three main diversion units located at Aster, Jasmine and Myrtle streets are continuous deflection separators (CDS Units) which remove trash, sediment and other small debris year round. The units will be fully automated by January 2013 allowing for year round operation of the units and the diversion of small storm events to the sanitary sewer. The 4th diversion simply diverts non-storm water. Within Heisler Park there are four small sump pumps that collect water from the Park's storm drain system. This water is pumped up to the CDS units for removal of trash and diversion to the sanitary sewer. Storm drain diversions are likely the single most effective method of keeping polluted water from entering the ocean.

Photo – Jasmine Street Diversion Unit/Lid to sump pump.

A.13.3.2 Restrooms/Lift Station Rebuild Inside and Adjacent to the Heisler Park ASBS.

- Two public restrooms inside Heisler Park were rebuilt to replace aging existing facilities which posed a significant threat of failure and subsequent sewer spillage. The Main Beach lift station (located adjacent to Heisler Park) was completely rebuilt and the adjacent restroom facility was removed. A sewer spill in this heavily used beach area could have major impacts on human health due

to elevated bacteria levels in the ocean. The marine habitat could also be negatively affected by the influx of organics and nutrients found in sewage. Clean and sanitary public restrooms may prevent individuals from using the ocean or surrounding park areas as toilets. Rebuilding the lift stations to provide more reliable service and adding fail-safe's to prevent backflow from the main further mitigates the risk of spills.

Photo – Rebuilt restroom facility.

A.13.3.3 Low Impact Design (LID) Site Design BMPs

- Heisler Park completed a major renovation in 2012 which incorporated a number of LID site design BMPs including bioswales, disconnection of storm drains, tilted pathways and infiltration zones to give both nuisance water flows and storm water flows a chance to infiltrate on site prior to entering the storm drain system. The benefits of this approach to drainage include elimination of trickling dry weather flows into the storm drains, maximizing onsite capture of storm water flows prior to discharge, biofiltration of all flows, and utilization of flows to optimize irrigation efficiency.

Photo – Bioswale terraces capture flow for biofiltration and infiltration.

Photos – Pathways and surrounding terrain are tilted toward a depressed bioswale for infiltration.

Photo– All Storm Drain inlets are disconnected from other hardscape to promote infiltration.

A.13.3.4 Smarttimer, Irrigation and Landscaping

- During the Park renovation several landscaping structural BMPS were incorporated including; replacing all irrigation lines and heads within the project area with new equipment, converting the existing timer clocks to satellite controlled Smarttimer irrigation clocks and replanting graded areas with water-wise and native plants where appropriate. The improvements to the irrigation and landscaping help prevent excess runoff by reducing water waste through leaks and over irrigation.

Photos – SmartTimer irrigation controller with antennae on top, water-wise plants in landscaped area.


A.13.3.5 Bluff Erosion Control and Drainage Improvements

- The bluffs along the coast of Heisler Park were eroding rapidly due to increased sheet flows and point source discharges from both paved and landscaped areas. Wet weather events caused rapid erosion but nuisance dry-weather flows also

contributed to the problem. Besides acute dangers from collapsing hillsides and rockfalls, the long term effects of sedimentation in the ASBS could be profound. The Park renovation addressed excess erosion of the bluffs by controlling access and redirecting surface flows into bioswales for infiltration using a curb and walkway along the bluff top for conveyance.

Photos – Curbs, railings and improved stairs to beach ensure visitors are not destroying the bluff tops. Tilted pathway push sheet flows to the grassy area for infiltration.

A.13.3.5 Trash Management

- Trash is managed within the Heisler Park Watershed in several ways. First, and most effectively, all nuisance and storm water flows from the entire watershed drain through CDS units which collect and settle out all trash and large debris prior to discharge. City street sweeping takes place once per week. Heisler Park has dedicated maintenance staff that are assigned to maintain Heisler Park. Staff empty trash cans and pick up loose litter on a daily basis as well as keep all facilities and equipment in good repair.

A.13.4 Monitoring

The City of Laguna Beach opted to participate in a regional monitoring program to comply with the General Exception requirements. The City partnered with the Southern California Coastal Water Research Project (SCCWRP) for Bight. The SCCWRP coordinated and collected regional sampling for benthic marine aquatic life, bioaccumulation and reference stream studies. The City collected samples for core discharge monitoring and chronic toxicity. A summary of the samples collected by the City of Laguna Beach is outlined in Table A.12.4.1 below. Core discharge monitoring and receiving water locations are shown on Map 5 in Section 13.2 above.

Table A.13.4.1 Laguna Beach Heisler Park ASBS Monitoring Program for 2013 Bight

Laguna Beach ASBS Monitoring

Cost Per Sample per Laboratory	# of Locations	# of Samples per Year	Flow	Oil and Grease	TSS	Indicator Bacteria (Fecal Coliform, Total Coliform, Enterococcus)	Chronic Toxicity - 1 species (sea urchin fertilization)	Chronic Toxicity -3 species (sea urchin fertilization, sea urchin embryo development, giant kelp germination)	Table B- Total Metals by EPA Method 1640 (seawater)	Total Metals by EPA Method 200.8 (Freshwater only)	PAHs (ocean plan PAHS)	Pyrethroid Pesticides	Organophosphate Pesticides	Ammonia	Nitrate as N	Total OrthoPhosphates (as P)	Location Subtotal	Annual sampling cost per location
Physis				$ 40	$ 30				$ 275	$ 115	$ 245	$ 225	$ 195	$ 30	$ 30	$ 30		
ABC Laboratory							$ 430	$ 1,355										
Orange County Public Works						$ 81.9												
Locations	Parameter costs include frequency and number of outfalls. Check formula for number of samples.																	
Core Discharge Monitoring (Stormwater)																		
Outfalls > 18 inches (Myrtle/Jasmine)	2	3	X	$240	$ 180	$491.40	$3,870										$ 4,781	$ 4,781.40
Outfalls > 36 inches or worst 18 inch (Aster)	1	3	X	$120	$ 90	$245.70	$1,290			$ 345	$ 735	$ 675	$ 585	$ 90	$ 90	$ 90	$ 4,356	$ 4,355.70
Receiving Water Monitoring																		
Ocean and Aster @ largest drain 18 inches or greater/worst case location																		
Pre storm event	1	3		$120	$ 90	$245.70			$ 825		$ 735	$ 675	$ 585	$ 90	$ 90	$ 90	$ 3,546	$ 3,545.70
Post storm event	1	3		$120	$ 90	$245.70		$ 4,065	$ 825		$ 735	$ 675	$ 585	$ 90	$ 90	$ 90	$ 7,611	$ 7,610.70
Physis Field QA Fresh Water																	$ 1,880	
Physis Field QA Seawater Water																	$ 2,040	
Reference Area (Paid by SWRCB Grant)																	**Laguna Beach Total Cost**	**$24,213.50**
Pre storm sampling	1	3		$120	$ 90	$245.70		$ 4,065	$ 825		$ 735	$ 675	$ 585	$ 90	$ 90	$ 90	$ 7,611	
Post/During storm sampling	1	3		$120	$ 90	$245.70		$ 4,065	$ 825		$ 735	$ 675	$ 585	$ 90	$ 90	$ 90	$ 7,611	
																	Approximate Total Shared Cost	**$ -**
																	Approximate Laguna Share	**$ -**
Totals per analyte (not including Reference Area)				$600	$ 450	$ 1,229	$5,160	$ 4,065	$ 1,650	$ 345	$ 2,205	$ 2,025	$ 1,755	$270	$270	$ 270		
Total Toxicity																	$ 9,225	
Total Chemistry																	$ 13,760	
Total Bacti																	$ 1,228.50	
																	Approximate Total ASBS Chem/Tox Sampling	**$24,213.50**

SCCWRP Costs (Laguna Beach Share)	$	38,024.00
Reference Site, El Morro Canyon - SWRCB Grant	$	-
Physis Laboratory	$	13,760.00
ABC Laboratory	$	9,225.00
Orange County Sampling Costs	$	7,254.90
Contingency (Additional Compliance Sampling, Misc.)	$	7,000.00
ASBS Approximate Total	**$**	**75,263.90**

Not all locations require all the parameters each sampling event. Example - Toxicity testing is only required 1 time per location for core monitoring.
New Total is $11,330.70 less than old total
Removed pre storm chronic tox and Reference Site costs

A.13.4 Monitoring Data

All required samples were collected during the 2012/2013 rainy season and are presented in the following tables. Two of the three required reference stream sample collection events were completed by SCCWRP during the 2012/13 rainy season and the remaining event is expected to be collected in the 2013/2014 rainy season. At this time we cannot compare outfall data to reference stream studies. In addition, benthic marine aquatic life, and bioaccumulation data are not yet available from the SCCWRP for the Heisler Park ASBS study area. Once this data is available further analysis will be included in this compliance plan. The following is an analysis of the data that was collected during the 2012/13 storm season.

- Bacteria – From the sampling data summarized below, bacteria in the stormwater outfalls after rain events are quite high. The draining watershed is mainly residential with some input from the undeveloped open space. There are currently no identifiable sources for the fecal and enterococci bacteria. Reducing bacteria inputs is a priority throughout the watershed. The three urban water diversion units located in the Heisler Park ASBS have been automated to allow for the diversion of first flush storm events and small storms. It is believed operating the units to divert low flow storm events will decrease the amount of bacteria entering the Heisler Park ASBS.

- PAHs – Several PAHs were detected during the Bight 13 sampling. Likely sources of the PAHs are road runoff from the highly traveled Coast Highway and nearby parking lots. As indicated above, the automation of the diversion units located within the Heisler Park ASBS is expected to reduce the amount of PAHs entering the ASBS. Dry season nuisance flows and small storm events will be directed to the sanitary sewer. The automation of these units was completed in September 2013.

- Pesticides - During the Bight 13 sampling three pesticides were detected and only during one rain event. It is likely that a resident or business had recently applied pesticides prior to the rain event. Because pesticides are approved for use by the State of California, local jurisdictions do not have control on how or where pesticides are purchased and applied. We will continue to provide outreach and education to businesses and residents with the City of Laguna Beach regarding safe pesticide application and Integrated Pest Management.

A.13.4.1 Monitoring Data – Toxicity, Bacteria, General Chemistry, Metals

			Aster									Jasmine Stormwater Outfall			Myrtle Stormwater Outfall		
		Ocean Plan Water Quality Criteria	Aster Core (Stormwater Outfall) HSL013			Aster Seawater Pre Storm HSL013 Ocean			Aster Seawater Post Storm HSL013 Ocean			Jasmine Core (Stormwater Outfall) HSL012B			Myrtle Core (Stormwater Outfall) HSL006B		
	Date:		2/9/2013	2/20/2013	3/8/2013	2/7/2013	2/18/2013	3/5/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013
Constituent	Units																
Flow	cfs		0.06	0.021	0.564	NR	NR	NR	NR	NR	NR	0.017	0.003	0.545	DRY	0.004	0.011
	L/s		1.699	0.595	15.97	NR	NR	NR	NR	NR	NR	0.481	0.085	15.4	DRY	0.113	0.311
Chronic Toxicity																	
Chronic Urchin Fertilization	NOEC %		50%	NR	NR	NR	NR	NR	100%	100%	100%	50%	NR	NR	NR	NR	100%
	Tuc	1	**2**	NR	NR	NR	NR	NR	1	1	1	**2**	NR	NR	NR	NR	1
Chronic Urchin	NOEC %		NR	NR	NR	NR	NR	NR	100%	88.41	83.40%	NR	NR	NR	NR	NR	NR
Development/Mytilus Water	Tuc	1	NR	NR	NR	NR	NR	NR	1			NR	NR	NR	NR	NR	NR
Chronic Kelp Germination	NOEC %		NR	NR	NR	NR	NR	NR	100%	100%	100%	NR	NR	NR	NR	NR	NR
	Tuc	1	NR	NR	NR	NR	NR	NR	1	1	1	NR	NR	NR	NR	NR	NR
Bacteria																	
Enterococcus	CFU/100ml	104	60	**20000**	**10000**	9	50	9	**31000**	250	**9900**	**22000**	**1000**	**22000**	NS	**85000**	**5800**
Fecal Coliforms	CFU/100ml	400	9	**5200**	**2600**	9	9	9	**13500**	40	**1240**	360	90	**30000**	NS	**710**	**1000**
Total Coliforms	CFU/100ml	10000	9	4600	7000	20	20	9	2500	20	7700	2700	99	**32000**	NS	2000	**14000**
General																	
Total Suspended Solids	mg/L		0.7	1.1	74.3	3.1	11.4	2.3	36.4	6	7.9	9.5	1	42	NS	5	17.4
Oil and Grease	mg/L		ND	ND	3.7	1.1	ND	1	ND	ND	ND	ND	ND	3.6	NS	ND	4.3
Ammonia-N	mg/L	6	0.4	0.57	1.01	ND	ND	0.1	ND	0.03	ND	NR	NR	NR	NS	NR	NR
Nitrate-N	mg/L		1.04	1.94	1.27	0.04	0.22	0.37	0.24	0.23	0.21	NR	NR	NR	NS	NR	NR
Total Orthophosphate as P	mg/L		0.12	0.15	0.31	ND	0.02	0.03	ND	0.02	0.03	NR	NR	NR	NS	NR	NR
Metals																	
Arsenic (As)	ug/L	80	0.46	0.73	1.40	1.42	1.33	1.86	1.44	1.54	1.41	NR	NR	NR	NS	NR	NR
Cadmium (Cd)	ug/L	10	0.11	0.09	0.17	0.03	0.03	0.04	0.03	0.03	0.00	NR	NR	NR	NS	NR	NR
Chromium (Cr)	ug/L	20	1.50	1.35	3.20	0.24	0.21	0.15	0.38	0.52	0.53	NR	NR	NR	NS	NR	NR
Copper (Cu)	ug/L	30	4.51	6.28	44.18	1.50	1.67	1.75	0.68	1.90	3.23	NR	NR	NR	NS	NR	NR
Lead (Pb)	ug/L	20	0.20	0.32	8.88	0.04	0.05	0.03	0.07	0.13	0.28	NR	NR	NR	NS	NR	NR
Mercury (Hg)	ug/L	0.4	0.00	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Nickel (Ni)	ug/L	50	1.91	1.89	3.47	0.26	0.27	0.63	0.29	0.39	0.47	NR	NR	NR	NS	NR	NR
Selenium (Se)	ug/L	150	0.16	0.14	0.13	0.01	0.02	0.02	0.02	0.02	0.02	NR	NR	NR	NS	NR	NR
Silver (Ag)	ug/L	7	ND	ND	0.01	ND	ND	ND	ND	ND	0.02	NR	NR	NR	NS	NR	NR
Zinc (Zn)	ug/L	200	10.65	17.18	111.81	1.55	2.25	3.02	2.64	2.52	45.45	NR	NR	NR	NS	NR	NR

ND = Non Detect

NS = Not Sampled, Sample could not be collected (no flow)

NR = Not Required (constituent not required per sampling plan or ASBS monitoring plan)

A.13.4.2 Monitoring Data – PAH

			Aster									Jasmine Stormwater Outfall			Myrtle Stormwater Outfall		
		Ocean Plan Water Quality Criteria	Aster Core (Stormwater Outfall) HSL013			Aster Seawater Pre Storm HSL013 Ocean			Aster Seawater Post Storm HSL013 Ocean			Jasmine Core (Stormwater Outfall) HSL012B			Myrtle Core (Stormwater Outfall) HSL006B		
	Date:		2/9/2013	2/20/2013	3/8/2013	2/7/2013	2/18/2013	3/5/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013
Constituent	Units																
PAHs	30 day ave. 8.8 ng/L																
1-Methylnaphthalene	ng/L		ND	ND	3.7	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
1-Methylphenanthrene	ng/L		ND	ND	19.8	2.1	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
2,3,5-Trimethylnaphthalene	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
2,6-Dimethylnaphthalene	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
2-Methylnaphthalene	ng/L		ND	ND	8.3	ND	ND	ND	ND	ND	1.1	NR	NR	NR	NS	NR	NR
Acenaphthene	ng/L		ND	ND	2	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Acenaphthylene	ng/L		6.2	ND	7.8	1.3	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Anthracene	ng/L		35.2	ND	23.5	10.5	11.2	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benz[a]anthracene	ng/L		ND	ND	73	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benzo[a]pyrene	ng/L		ND	ND	47.8	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benzo[b]fluoranthene	ng/L		ND	ND	73.4	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benzo[e]pyrene	ng/L		ND	ND	55.8	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benzo[g,h,i]perylene	ng/L		ND	ND	33.7	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Benzo[k]fluoranthene	ng/L		ND	ND	25.3	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Biphenyl	ng/L		ND	ND	6.1	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Chrysene	ng/L		ND	ND	182.2	ND	ND	ND	ND	ND	3.4	NR	NR	NR	NS	NR	NR
Dibenz[a,h]anthracene	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Dibenzothiophene	ng/L		ND	ND	32.2	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fluoranthene	ug/L	15	**142.1**	ND	**356.6**	**48.9**	**29.6**	9.6	ND	ND	5.9	NR	NR	NR	NS	NR	NR
Fluorene	ng/L		ND	ND	6	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Indeno[1,2,3-c,d]pyrene	ng/L		ND	ND	29.9	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Naphthalene	ng/L		3.6	ND	13.2	1.5	2.1	ND	2.8	1.1	1.2	NR	NR	NR	NS	NR	NR
Perylene	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Phenanthrene	ng/L		85.6	5.7	150.8	31.8	32.6	10.5	ND	3.2	3.4	NR	NR	NR	NS	NR	NR
Pyrene	ng/L		328.6	ND	341.7	135	51.9	15.2	ND	ND	6.4	NR	NR	NR	NS	NR	NR

ND = Non Detect

NS = Not Sampled, Sample could not be collected (no flow)

NR = Not Required (constituent not required per sampling plan or ASBS monitoring plan)

A.13.4.3 Monitoring Data – Organophosphorus Pesticides

			Aster									Jasmine Stormwater Outfall			Myrtle Stormwater Outfall		
		Ocean Plan Water Quality Criteria	Aster Core (Stormwater Outfall) HSL013			Aster Seawater Pre Storm HSL013 Ocean			Aster Seawater Post Storm HSL013 Ocean			Jasmine Core (Stormwater Outfall) HSL012B			Myrtle Core (Stormwater Outfall) HSL006B		
	Date:		2/9/2013	2/20/2013	3/8/2013	2/7/2013	2/18/2013	3/5/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013
Constituent	Units																
Organophosphorus Pesticides																	
Bolstar (Sulprofos)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Chlorpyrifos	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Demeton	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Diazinon	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Dichlorvos	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Dimethoate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Disulfoton	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Ethoprop (Ethoprofos)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fenchlorphos (Ronnel)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fensulfothion	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fenthion	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Malathion	ng/L		ND	ND	**274.5**	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Methamidophos (Monitor)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Methidathion	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Methyl Parathion	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Mevinphos (Phosdrin)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Phorate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Phosmet (Imidan)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Tetrachlorvinphos (Stirofos)	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Tokuthion	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Trichloronate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR

ND = Non Detect

NS = Not Sampled, Sample could not be collected (no flow)

NR = Not Required (constituent not required per sampling plan or ASBS monitoring plan)

A.13.4.4 Monitoring Data – Pyrethroid Pesticides

			Aster									Jasmine Stormwater Outfall			Myrtle Stormwater Outfall		
		Ocean Plan Water Quality Criteria	Aster Core (Stormwater Outfall) HSL013			Aster Seawater Pre Storm HSL013 Ocean			Aster Seawater Post Storm HSL013 Ocean			Jasmine Core (Stormwater Outfall) HSL012B			Myrtle Core (Stormwater Outfall) HSL006B		
	Date:		2/9/2013	2/20/2013	3/8/2013	2/7/2013	2/18/2013	3/5/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013	2/9/2013	2/20/2013	3/8/2013
Constituent	Units																
Pyrethroid Pesticides																	
Allethrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Bifenthrin	ng/L		ND	ND	**125.7**	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Cyfluthrin	ng/L		ND	ND	**99.1**	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Cypermethrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Danitol	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Deltamethrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Esfenvalerate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fenvalerate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Fluvalinate	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
L-Cyhalothrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Permethrin, cis-	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Permethrin, trans-	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Prallethrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR
Resmethrin	ng/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NS	NR	NR

ND = Non Detect
NS = Not Sampled, Sample could not be collected (no flow)
NR = Not Required (constituent not required per sampling plan or ASBS monitoring plan)

A.13.6 Implementation Schedule

All of the Non-Structural and Structural Best Management Practices for the Heisler Park ASBS have been incorporated or constructed. During the 2013/14 storm season the three urban water diversion units will be operated automatically, allowing for the diversion of small storm events. It is believed this more nuanced operation of the diversion units will reduce the amount of bacteria, PAHs and pesticides entering the Heisler Park ASBS.

At this time there are no remaining best management practices to construct or initiate. Additional best management practices will be investigated and implemented if future monitoring indicates a problem in the Heisler Park ASBS.