INDIVIDUAL WATER QUALITY ASSESSMENT REPORT

Site Name/Facility: Soledad Canyon/Sorrento Creek & Flintkote Channel

Master Program Map No.: 9, 11 & 12

Date: October 15, 2013

Civil Engineer: (name, company, phone number): Derek Reed
Dudek
760-479-4131

Registered Civil Engineer Number & Expiration Date
RCE No. 56042, Exp. 12/31/2014

***Instructions:** This form must be completed for each target facility following the completion of the Individual Maintenance Plan (IMP) report form and prior to any work being conducted at the facility. Attach additional sheets if needed.

EXISTING CONDITIONS

The City of San Diego (City) has developed the Master Storm Water System Maintenance Program (MMP; Master Maintenance Program) to optimize its business processes and environmental protection practices related to channel operation and maintenance activities. The Master Maintenance Program is intended to integrate operation and maintenance planning, implementation and assessment activities with its water quality protection programs. This document provides a summary of the Individual Water Quality Assessment (IWQA) activities conducted within the Soledad Canyon/Sorrento Creek & Flintkote Channel in order to comply with the MMP's Programmatic Environmental Impact Report (PEIR).

IWQA procedures under the MMP provide a methodology for a water quality management model to evaluate potential water quality benefits and impacts associated with channel maintenance activities. The site-specific field measurements and conditions provide the analytical data to both determine the pollutant load removed, and therefore water quality benefits, resulting from sediment excavation during maintenance and estimate the loss of temporary pollutant sorption/retention capacity as a result of sediment and vegetation removal during channel maintenance. The sediment pollutant load removal, combined with an estimate of pollutant removal during vegetation regrowth between maintenance events, is compared to the estimated loss of pollutant removal capacity due to vegetation removal as a means of assessing potential water quality benefits and impacts of channel maintenance. Additional factors are also presented, including a suite of water quality improvement activities the City will

EXISTING CONDITIONS
implement within the Los Peñasquitos Watershed. The IWQA procedures are documented in the Standard Operating Procedure (SOP) To Conduct Water Quality Assessment and Quantification Model for Flood Channel Maintenance found in Appendix A of the Water Quality Assessment – White Paper ("White Paper", Appendix F of the PEIR). The SOP identifies two criteria that must be met for IWQA component implementation: 1) The storm water facility must have fairly consistent dry weather (low) flows, and 2) it must have vegetation capable of assimilation of pollutants. Both of these criteria are met by the sections of Soledad Canyon/Sorrento Creek and Flintkote Channel designated for maintenance at this time. The results of the IWQA procedures established in the White Paper are considered below as one of several lines of evidence in assessing the overall water quality benefits and impacts associated with channel maintenance.
Project Description:
The channels associated with this assessment report, collectively referred to hereafter as the Sorrento Valley Channels, are located in the Sorrento Valley area, within the jurisdiction of the City. See Figure 1 in Attachment 1 for the general project location. The major drainage facilities that serve the region consist of the Soledad Canyon Channel (commonly known as the Sorrento Creek Channel), the Los Peñasquitos Creek, the 11000 Roselle Street/11100 Flintkote Avenue Channel (commonly known as the Flintkote Channel), and the Dunhill Street at Roselle Street Channel (commonly known as the Dunhill Street Channel). The Sorrento Creek Channel is included in Maps 7, 11, and 12 of the MMP, the Los Peñasquitos Creek is included in MMP map 7 and 8, the Flintkote Channel is included in MMP map 9, and the Dunhill Street Channel is included in MMP map 10. For purposes of this assessment, every drainage facility has been assigned a Reach number. The general location of every drainage facility and their assigned reach numbers are included in Figure 2 in Attachment 1 Although brief descriptions for Reaches 1 through 7 have been included below, based on the results of the Individual Hydrologic and Hydraulic Assessment (IHHA), Reach 3 and Reach 7 are the drainage facilities proposed for maintaince. The remaining reaches associated with the overall hydraulic analysis included herein are only incidental to the analyses and recommendations per this assessment. The project is located in Sorrento Valley at the Interstate 5/Interstate 805 interchange within the City's Coastal Overlay Zone and Torrey Pines Community Plan and Local Coastal Program (LCP). The project area is zoned IL-3-1 (Industrial-Light) and designated for Industrial and Open Space land uses in the Torrey Pines Community Plan

EXISTING CONDITIONS

LCP. Reaches 3 and 7 are adjacent to the City's Multiple Species Conservation Program's Multi-Habitat Planning Area. The project area is also located within the Federal Emergency Management Agency's (FEMA) Special Flood Hazard Areas subject to inundation by the 1-percent Annual Chance Flood and 100-year floodway.

A more detailed discussion of Reaches 1 through 7 is provided below in channel geometry.

Description of creek/channel geometry:

Sorrento Creek – Reach 1:

Sorrento Creek (MMP map 7-Los Peñasquitos Creek): Reach 1 is an earthen-bottom channel that extends from the southerly boundary of the Torrey Pines Preserve, which is located opposite to Estuary Way, to a point approximately 740 feet to the southeast where the Los Peñasquitos Creek's Reach 4, confluences with Sorrento Creek's Reach 2. The Reach 1 main channel top width is approximately 100 feet, and the channel bottom width varies from approximately 60 to 90 feet. The west bank of the channel is protected with rock riprap. The original channel configuration identified in the 1997 Sorrento Creek Emergency Project and the redesigned 2006 Sorrento Creek Maintenance Project included an additional 980 linear feet north into the Torrey Pines State Reserve.

Soledad Creek – Reaches 2 through 3:

Soledad Creek (MMP maps 11 & 12 – Soledad Creek): The proposed maintenance in the Soledad Creek can be segmented into two distinct channel types: a) Earthen, Reach 2, and b) Concrete-lined, Reach 3.

Reach 2

Earthen-portion of Soledad Creek (MMP map 11): Reach 2 is also an earthen-bottom channel that extends to the southeast for approximately 1,590 feet from the upstream end of Reach 1 to the downstream end of Sorrento Creek's Reach 3. The Reach 2 main channel top width varies in width from approximately 10 feet at its narrowest to 20 feet for most of its length and transitions to approximately 45 feet at its upstream end. The channel bottom width varies from approximately 8 to 15 feet. The west bank of the channel is protected with rock riprap.

Reach 3

Concrete-lined portion of Soledad Creek (MMP maps 11 &12-Soledad Creek): Reach 3 is a trapezoidal concrete-lined channel that extends from the southerly end of Reach 2 to the southeast for approximately 2,280 feet to a point located approximately 1,550 feet to the southeast of Sorrento Valley Boulevard, where the trapezoidal concrete-lined channel ends and transitions to an earthen-bottom channel. The trapezoidal channel geometry consists of a 63-foot wide bottom, 1.5 (H)-to-1 (V) side slope section and a minimum

depth of 5 feet.

Los Peñasquitos Creek – Reaches 4 through 6:

Los Peñasquitos Creek (MMP map 8-Los Peñasquitos Creek): Similar to the Sorrento Creek Channel, the Los Peñasquitos Creek was also divided into three reaches, Reach 4, 5, and 6. Reach 4 is bound by commercial complexes to the north, and by Sorrento Valley Boulevard to the south. Reach 5 is within Caltrans Right-of-Way, and it is completely below the Interstate 5/Interstate 805 interchange bridges. Reach 6 is bound by undeveloped open space to the north, and by commercial/light industrial complexes to the south. Reaches 4, 5, and 6 roughly flow in an east to west direction and confluence with Reach 2. Reach 4 extends for approximately 1,350 feet from the confluence with Reach 2, to the west side of the Interstate 5 southbound bridge. Reach 5 extends for approximately 635 feet from Reach 4 to the east side of Caltrans northbound on-ramp bridge. Reach 6 extends to the east for approximately 1,170 feet from the east end of Reach 5. Reaches 4 and 6 consist of an earthen-bottom channel, while Reach 5 is a concrete-lined channel. Reach 4 through 6 vary in bottom width from 75 to 100 feet, with 1.5-to-1 side slopes that are protected with riprap.

Flintkote Channel – Reach 7:

Flintkote channel (MMP Map 9-11000 Roselle St/11100 Flintkote Ave): Reach 7 is a trapezoidal concrete-lined channel that extends for approximately 1,000 feet, from the easterly side of Flintkote Avenue to Sorrento Creek (Reach 2) near the stream confluence. Reach 7 flows roughly in a southwest to northeast direction, bisecting a light industrial park along its entire length, and crossing Roselle Street. A 2-foot high, 12-foot wide culvert conveys the storm flows under Roselle Street and a dual 36-inch Reinforced Concrete Pipe (RCP) culvert discharges the storm flows into Sorrento Creek's Reach 2. The trapezoidal geometry is described as an 8-foot wide bottom, 1-to-1 side slopes and a depth of approximately 4 feet.

The proposed maintenance areas (i.e., Reaches 3 and 7) are consistent with the project impact footprints prescribed in the MMP. Reaches 1, 2 and 4 through 6 are potential maintenance areas that are not currently proposed for maintenance, and are not discussed further in this IWQA.

The maintenance activities proposed for the designated extents of Reaches 3 and 7 of the Sorrento Valley channels include vegetation trimming, and the removal of approximately 2,000 to 4,000 cubic yards in Reach 3, and approximately 125-175 cubic yards in Reach 7, of material (i.e., sediment and vegetation debris). The impact acreage includes the maintenance, access/loading, and staging/stockpiling areas which accumulate to approximately 3.29 acres for Reach 3 and 0.18 acres for Reach 7.

Existing Conditions:

Reaches 3 and 7 of the Sorrento Valley channels are located in the Los Peñasquitos Watershed Management Area (WMA) which comprises two Hydrological Areas (HA) 906.1 (Miramar Reservoir) and 906.2 (Poway) (City of San Diego, 2008). Surface waters in the Los Peñasquitos WMA are subject to comply with the Water Quality Control Plan for the San Diego Basin (Basin Plan, San Diego RWQCB 1994), which designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters. The Los Peñasquitos Watershed Urban Runoff Management Program (PEN-WURMP, City of San Diego, 2012) identifies the following priority pollutants as being recommended for pollutant loading reductions:

- Bacteria in both HAs
- Sedimentation in the Miramar HA

The PEN-WURMP identifies eating and drinking establishments and animal facilities as suspected contributors to the discharges of bacteria within both HAs (City of San Diego, 2012).

In accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (SWRCB, 2004), Soledad Canyon, Los Peñasquitos Creek, and Los Peñasquitos Lagoon are 303(d) listed as impaired water bodies, in which standards are not met. Total Maximum Daily Loads (TMDL) are required, but not yet completed, for at least one of the pollutants listed for the segments (SWRCB, 2010). Flintkote is tributary to the Los Peñasquitos Creek at its convergence with the Los Peñasquitos Lagoon. The pollutants listed for the three water bodies on the 303(d) list are presented in Table 1.

Table 1. 303(d) Listed Pollutants

Water Body	Pollutant	Current TMDL (Yes or No)	Current or Anticipated TMDL Date
Soledad Canyon	Sediment Toxicity	No	2019
	Selenium	No	2021
Los Peñasquitos Creek	Enterococcus	No	2019
	Fecal Coliform	No	2019
	Selenium	No	2019
	Total Nitrogen as N	No	2019
	Total Dissolved Solids (TDS)	No	2019
	Toxicity	No	2021
Los Peñasquitos Lagoon	Sedimentation/Siltation	No	2012

Unknown point and nonpoint sources, urban runoff/storm sewers, wastewater, natural sources, and flow regulation/modification are listed among the potential sources for these pollutants.

Dry weather historical monitoring data for Los Peñasquitos Creek, Los Peñasquitos Lagoon, and Soledad Canyon have been required under the regional municipal separate storm sewer system (MS4) National Pollutant Discharge Elimination System (NPDES) permit R9-2007-0001 (San Diego RWQCB, 2007) issued to the 21 Municipal Copermitties in San Diego County, including the City of San Diego. The data compiled under this permit was also reviewed during the background investigation for the IWQA. There are several monitoring stations within the three interconnected water bodies associated with this maintenance area. Data from LPC-TWAS-1was most closely evaluated due to its location in the upstream earthen portion of Soledad Canyon Creek. Under this historical monitoring, dry weather flow concentrations of Enterococcus, TDS, and Toxicity for *Ceriodaphnia* and *Selenastrum* exceeded water quality benchmarks established in the Basin Plan at least once between September 2007 and May 2011 (Project Clean Water, 2012).

On May 8, 2013, the Regional Water Quality Control Board San Diego Region (RWQCB) approved a new MS4 permit for San Diego, southern Orange, and southwestern Riverside counties (San Diego RWQCB, 2013). The region-wide NPDES Permit (commonly referred to as the Regional MS4 Permit) is intended to set the framework for municipalities, such as the City, to implement a collaborative watershed-based approach to restore and maintain the health of surface waters. The Regional MS4 Permit requires development of Water Quality Improvement Plans (WQIPs) that will allow the City (and other watershed stakeholders) to prioritize and address pollutants through an appropriate suite of best management practices (BMPs) for each watershed. Water quality BMPs related to channel maintenance activities are outlined later in this report and provide a framework that may be used by the City to address priority pollutants. It is recommended that the relative effectiveness of any implemented water quality and conservation strategies be evaluated and the programs adaptively managed to maximize pollutant and/or storm water flow reduction benefits over the course of the program lifecycle. This adoptive management approach, coupled with other storm water management techniques implemented by the City as part of the Regional MS4 Permit, may lead to long term reductions in the need for channel maintenance activities.

During the preliminary site visit, conducted on April 16, 2013, and sampling activities carried out on April 23, 2013, it was observed that Reach 7 is heavily vegetated and Reach 3 contains thick vegetation near the downstream extent. Discernible flow was observed at the downstream and upstream portions of Reach 3, however flow was not observed at Reach 7. Water was observed along the full length of Reach 3 and some areas exhibited ponded water. As described in the Individual Biological Assessment

(IBA), freshwater marsh (FWM), disturbed/ruderal, and non-native vegetation/ornamental habitat was observed in Reach 3 and FWM and non-native vegetation habitat was observed in Reach 7.

Description of Sediment Sampling Activities:

In accordance with the SOP, a single sample location was selected for every 1,000 cubic yards (yd^3) of estimated accumulated sediment to be removed within the proposed maintenance area in Reaches 3 and 7 of the Sorrento Valley channels. Using upper limit estimates of maintenance sediment removal volume, one sediment sample location was selected for Reach 7 and three sediment sample locations were selected for Reach 3. Specific sample locations were selected based on field conditions and to be representative of channel characteristics, such as vegetation and water depth. The sample locations were distributed so as to best represent the full extent of sediment within Reaches 3 and 7. The sample locations (R-3-1 through R-3-3 and R-7-1) are indicated on Figure 3 in Attachment 1.

Sediment sampling activities were conducted by personnel on April 23, 2013 in accordance with EPA SOP #2016 (USEPA 1994). Sediment depths in Reaches 3 and 7 were shallow enough that samples were collected via shoveling until refusal in accordance with standard EPA methodologies. Locations were chosen based on where sediment deposition was prevalent, and in some cases the deposition rose above the water level. Sediment depths ranged from one to six inches. The location of each sediment sample was marked with a hand-held GPS device. A photo log is included in Attachment 2.

The sediment from each sample location was placed in a clean, dedicated five gallon bucket and homogenized using a clean stainless steel spoon. Homogenized sediment was then split into two, laboratory-supplied, clean 8-ounce glass jars that were labeled with the sample ID, date, time, analytes, company, project, and initials of sampling personnel. Samples were placed on ice in an insulated cooler and transported to the laboratory by courier under chain-of-custody (COC) procedures. COC documentation can be found in Attachment 3. All non-dedicated sampling equipment was decontaminated prior to sampling and between each sample collection by washing in non-phosphate detergent (Alconox®) and deionized water followed by two separate rinses in deionized water. Rinse water was collected and will be disposed of in accordance with applicable local, state and federal guidelines.

A bulk sediment sample was collected near the location of R-3-1 for grain-size analysis in accordance with the SOP and ASTM-D6913-04. This sample was collected using a clean shovel from ground surface to approximately 1.5 feet below ground surface and placing the sediment into clean, dedicated 5-gallon buckets. Lids were placed on the buckets and each was labeled with a sample ID. Grain-size gradation curves are provided

in Attachment 4.

All sediment laboratory analyses with the exception of toxicity were conducted by Pat-Chem Laboratories, Inc. of Moorpark, California, a state-accredited laboratory. Sediment toxicity tests were performed by Nautilus Environmental in San Diego, California. The samples were analyzed for the constituents listed in table A-3 of the SOP with the exception of TDS, which is not applicable to a sediment matrix. The laboratory analytical results can be found in Attachment 4 and tabulated results of constituents in Attachment 5. A list of sediment constituents for which laboratory analysis were performed is presented in Attachment 6.

Description of Flow Measurement Activities:

On April 23, 2013, field personnel measured instantaneous flow (flow) during low flow conditions at two sections in the Sorrento Valley Channels. Following SOP guidelines, locations upstream of the proposed maintenance area and downstream of the proposed maintenance area were selected for flow measurements. Upon arrival at Reach 7, it was determined that there was no discernible flow and therefore no flow measurements were taken. Henceforth flow measurements will refer to those taken in Reach 3. The convergence of the earthen bottomed Reach 4 and concrete lined Reach 3 was selected as the upstream measurement point. The downstream flow measurement location was at the convergence of the earthen bottomed Reach 2 and concrete lined Reach 3. Locations of each flow measurement site were marked with a hand-held GPS device. These locations are indicated on Figure 3 in Attachment 1.

Upon entering the channel, field personnel extended a tape measure across the full width of the wetted channel and measured total width in feet. Flow velocity was measured using a Valeport Model 801 Electromagnetic Flow Meter at regular horizontal intervals. In addition, flow measurement locations were chosen to capture significant changes in channel geometry (e.g. obstructions in channel, pools, or thalweg). The flow meter was set at 60% depth for water depth less than 1.5 feet, or 20% and 80% depth for stages greater than 1.5 feet (USGS, 1976). Personnel stood downstream and slightly off to the side of the flow meter while facing upstream to minimize interference with flow measurements. The 10 second average flow rate (velocity) was recorded at each interval. Water depth and distance from the left wetted bank (LWB) were also recorded along with each velocity reading. Field forms used to record flow measurements can be found in Attachment 7.

The total wetted channel was 26.2 feet wide at the upstream measurement location. Eleven flow measurements were recorded along the channel at approximately two and half foot horizontal spacing. At the downstream location the total wetted channel width was 12 feet, where thirteen measurements were recorded at approximately one foot spacing. To conduct representative flow measurements, a certain percent of the flow

must be captured. Sample interval distances are based off of this percentage and are directly related to wetted channel width. In some cases, a closer sample interval width may be chosen to account for drastic changes in channel geometry of natural channels, as done at the downstream location.

Total flow (discharge) across the channel was calculated by integrating velocity measurements over the cross-sectional area of the channel at each location using an excel model. A discharge of 3.28 cubic feet per second (cfs) was determined for the upstream location and a discharge of 1.07 cfs was determined for the downstream location. The discrepancy between upstream and downstream discharge may be attributed to incomplete capture of discharge at the downstream measurement location, potentially due to the presence of a thick cattail grove. An example of the excel model used to calculate discharge is presented in Attachment 8. It should be noted that these discharges were derived from one-time instantaneous measurements, and may not characterize overall ambient discharge within Reach 3.

In the absence of dry weather flow monitoring data, the number of dry weather days per year was estimated using the following methodology: Daily precipitation data was obtained from the San Diego Lindbergh Field Weather Station (Station ID: GHCND: USW00023188) accessed from the National Climatic Data Center (NCDC, 2013). The SOP defines a wet day as a storm event where ≥ 0.2 inches of rain fell within a 24-hour period and the following three calendar days. Following this definition, the number of wet days in each year since 1950 was determined using the San Diego Lindbergh Field Weather Station daily precipitation record. These numbers were subtracted from the total number of days in the year to determine the number of dry days in a given year since 1950. The number of wet days was subtracted from the total number of days in the year, as opposed to days in the wet season, because Reach 3 is likely perennial in nature, and therefore experiences significant amounts of dry weather flow through the dry summer season. An estimated 322 dry days per year in Reach 3 was derived by averaging the annual number of dry days since 1950.

The annual treatment volume, i.e. the volume of water that discharges through Reach 3 during low flow conditions in one year, was estimated following the SOP by multiplying the upstream discharge determined from instantaneous flow measurements by the number of dry days per year. Using this method, the annual treatment volume in Reach 3 is estimated to be approximately 680 million gallons.

There are limitations to this SOP driven approach, especially due to the fact that the SOP does not provide explicit direction for determining annual treatment volume other than relying on historical information. Additionally, a rain event considers a 24 hour period that may cross over two calendar days. Historical precipitation data is presented as sums for calendar days, not hourly readings. With these uncertainties, compounded with one

instantaneous flow measurement, the resulting annual treatment volume calculation is not necessarily adequate to characterize Reach 3 or the Sorrento Valley Channel system as a whole.

Description of Volume Measurement Activities:

Site visits were conducted by personnel in March 2013 and April 2013 to evaluate the current channel conditions from a hydrologic and hydraulic perspective. Dimensions used to estimate the water volume were derived from field observations and as-built drawings and are listed in Table 2.

Table 2. Parameters used in approximating Sorrento Channel volume, Reaches 3 and 7.

Reach	Type	Length (ft)[1]	Avg. Bottom Width (ft)[1]	Avg. Top Width (ft)[1]	Approximate Sediment Depth (ft)[2]	Approximate Water Depth (ft)[3]
3	Concrete	2,280	63	78	0.5	0.25 – deeper downstream.
7	Concrete	1,000	8	16	0.25	<0.1

Notes:

1) See IHHA for further information on channel dimensions.
2) Based on field observations, consistent with estimated sediment depth ranges outlined in IHHA.
3) Average of water depth estimated at each sediment sampling location using best professional judgment.

Cross sectional area was estimated using the parameters in Table 2. Water volume was estimated by determining a cross sectional area of water within only Reach 3, and multiplying this area by length. The resulting approximate water volume is 154, 575 cubic feet (ft^3). It should be noted that there is some uncertainty associated with this estimate due to approximated channel dimensions.

Hydraulic residence time (HRT) was determined by dividing the length of Reach 3 by the average measured upstream velocity of 0.0825 feet per second (ft/s). This method is employed by Caltrans when determining the HRT of a water quality or biofiltration swale following the Caltrans Storm Water Quality Handbook (Caltrans, 2011). Using the average upstream velocity, a HRT of 7.71 hours was determined. It should be noted that these velocities represent one-time instantaneous measurements, and may not characterize overall ambient flow velocities within Reach 3.

Description of Water Quality Sampling Activities:

On April 23, 2013, personnel collected surface water grab samples during low-flow conditions following SOP guidelines and Surface Water Collection SOP #EH-01 (Syracuse Research Corporation, 2003). Samples were collected at a location upstream of the maintenance area (R-3-U) and downstream of the maintenance area (R-3-D) in Reach 3. These locations are indicated on Figure 3 in Attachment 1.

The downstream sample was collected first. The sampler stood in the center of the channel, downstream of the sampling location facing upstream. Any sediment suspended when the sampler entered the channel was allowed to settle out prior to sample

collection. Clean, laboratory supplied bottles labeled with the sample ID, date, time, analytes, company, project, and initials of sampling personnel, were filled, capped and placed on ice in an insulated cooler, and transported to the laboratory via courier following COC procedures.

The samples were analyzed for the constituents listed in Attachment 8. This suite of constituents was determined based on the SOP and a through a review of the 303(d) pollutants listed in Table 1 and TMDLs in the local surface waters. Water sample chemical analyses, with the exception of the bacterial indicators (total coliform, fecal coliform and enterococcus) and toxicity were conducted by Pat-Chem Laboratories, Inc. of Moorpark, California, a state-accredited laboratory. The toxicity tests were performed by Nautilus Environmental in San Diego, California and the bacterial indicators were analyzed by the City of San Diego Environmental Monitoring & Technical Services (EMTS) Division Marine Microbiology Laboratory also in San Diego, California. Bacterial indicators were selected due to their being listed as pollutants in the Los Peñsaquitos Creek on the 303(d) list (SWRCB, 2010). The laboratory analytical results can be found in Attachment 4 and tabulated analysis results in Attachment 9.

The concentrations of all constituents analyzed were below their respective water quality benchmarks with the exception of TDS, total nitrogen and total selenium. The upstream and downstream concentrations of TDS, 2,620 mg/L and 2,472 mg/L respectively, exceed the water quality benchmark of 1,500 mg/L established by the Basin Plan. The downstream concentration of total nitrogen, 1.52 mg/L exceed the water quality benchmark of 1.0 mg/L extrapolated from the water quality benchmark of 0.1 mg/L for total phosphorous established in the Basin Plan. Both the upstream (0.0099 mg/L) and downstream (0.0092 mg/L) concentrations of selenium exceed the water quality benchmark of 0.005 mg/L (40 CFR 131.38).

Description of Wetland Assessment (Existing) Activities:

Assessment of existing wetland conditions was performed following the SOP. Field observations made during water quality and sediment sampling activities on April 23, 2013 as well as information obtained from the IBA site survey was considered in carrying out the Existing Wetland Assessment. Three macrofeatures of wetland treatment systems were assessed: existing vegetation, hydrosoil and hydroperiod. Scores for these features are presented in Table 3. Scoring criteria can be found in Attachment 10.

Table 3. Existing Wetland Macrofeature Assessment Scoring

Wetland Macrofeature	Score	
	Reach 3	Reach 7
Vegetation	0.6	1.4
Hydrosoil	1	1
Hydroperiod	2	0
Overall Existing Score	**3.6**	**2.4**

Because Reach 3 and Reach 7 are separated geographically, their wetland macrofeatures were considered separately. Because Reach 7 did not exhibit discernible flow, wetland pollutant removal load capacity cannot be estimated following the SOP. Therefore, although wetland macrofeatures for Reach 7 were assessed, this assessment does not factor into Benefit/Impact calculations discussed below. Following the SOP, the Overall Score of the reaches is used to evaluate potential water quality impacts as described in the Evaluation of Benefits/Impacts Section. The scores presented in Table 3 were determined using the procedure described below.

Vegetation

The Sorrento Valley IBA presents the acreage of each vegetation community or land cover type surveyed that will be impacted by maintenance activities in Reaches 3 and 7. Three vegetation communities, undisturbed and disturbed freshwater marsh (FWM), Disturbed/Ruderal, Non-native/Ornamental Vegetation, and one land cover type, Developed/Concrete Channel, are identified in Table 2 of the IBA. A score of 0 – 3 was assigned to each of these surveyed vegetation communities and land cover types based on the SOP scoring criteria (Attachment 10) and personal communication with the qualified IBA biologists. These scores are listed in Table 4 below.

Table 4. Vegetation Community/Land Use Type Scoring

Vegetation Community or Land Cover Type (Holland Code)	Vegetation Score	Reach 3 Coverage (acre)	Reach 7 Coverage (acre)	Scoring Rationale
Freshwater Marsh*	3	0.63	0.19	>75% coverage of wet areas, both submerged and emergent wetland species, abundant cattail (*Typha* sp.)
Disturbed/Ruderal	1	0.05	0	Primarily bare ground or invasive, broad-leaved, non-native species
Non-native/Ornamental Vegetation	1	0.02	0.01	Primarily cultivated plants with low surface area coverage
Developed/Concrete Channel	0	2.77	0.19	No visible vegetation in wet areas
Total Acreage		3.47	0.38	-
Overall Existing Vegetation Score		0.6	1.4	-

* Includes disturbed form

Using the acreage identified in Table 2 of the IBA, an area-weighted average vegetation score was determined for each reach. The overall vegetation score for Reach 3 and Reach 7 in Table 3 above represents the area-weighted average of these individual vegetation scores for Reaches 3 and 7.

Hydrosoil

Following the SOP criteria in Attachment 10, an existing hydrosoil score of 0 – 3 was assigned to each sediment sampling location based upon field observations recorded during sediment sampling activities. These scores were then weighted by the sediment removal volume represented by each sediment sample. Determination of these sediment removal volumes is discussed in the Sediment Pollutant Loading Estimates section below. The location-specific and overall hydrosoil scores are identified in Table 5.

Table 5. Hydrosoil Scoring

Sediment Sampling Location	Reach	Associated Sediment Removal Volume (yd^3)	Hydrosoil Score	Scoring Rationale
R-3-1	3	833	1	Primarily fine sand, concrete lined.
R-3-2	3	833	1	Primarily fine sand, slight organic odor, concrete lined.
R-3-3	3	833	1	Primarily fine sand, concrete lined.
R-7-1	7	150	1	Primarily fine sand, concrete lined.
Overall Existing Hydrosoil Score			1	-

An existing hydrosoil score of 1 was assigned to all sediment sample locations based primarily on the fact that Reaches 3 and 7 are concrete lined but still exhibit significant sediment deposition of fine sand.

Hydroperiod

Following the SOP criteria in Attachment 10, an existing hydroperiod score of 0 – 3 was assigned to each sediment sampling location based upon observations of water depth and movement recorded during sediment sampling activities and consideration of overall HRT in Reaches 3 and 7. The overall hydroperiod score was determined by taking the average of the score from the individual sediment sampling locations, as indicated in Table 6.

Table 6. Hydroperiod Scoring

Sediment Sampling Location	Reach	Approximate Water Depth (ft.)	Hydroperiod Score	Scoring Rationale
R-3-1	3	0.25	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-3-2	3	0*	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-3-3	3	0*	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-7-1	7	0.08	0	No visible surface water within the storm water facility reach other than ponded areas.
Overall Existing Hydroperiod Score			2	

* Sediment accumulation above water level.

Under the SOP scoring system, the overall wetland assessment score of 3.6 for Reach 3 is comparable to fair conditions for wetland quality and health and a score of 2.4 for Reach 7 is considered poor conditions. It should be noted, however, that this scoring system is not designed to assess the range of wetland characteristics within flood conveyance channels. The primary function of these channels is to provide flood control for human health and safety. Unlike natural or engineered wetlands, flood conveyance channels can be fully developed and devoid of vegetation, or, as in the case of Sorrento Valley, exhibit aspects of hydrosoil, hydroperiod and vegetation that resemble wetland conditions. However, the Sorrento Valley Channels were not designed as a wetland or natural treatment system (NTS). For example, of the species discussed in the White Paper as commonly used in natural treatment systems, *Typha sp.* (cattail) is the one that predominates within Reaches 3 and 7, despite its providing the lowest nitrogen, biological oxygen demand (BOD) and total suspended solid (TSS) treatment efficiency (Gersberb *et al*., 1986). While the proposed maintenance is projected to return the flood conveyance capacity of Reaches 3 and 7 to previous design levels, the likely sediment redeposition and recovery of FWM (wetland) species, including *Typha,* within one to five years may facilitate pollutant removal.

Description of Wetland Assessment (Recovery) Activities:

Following the SOP, vegetation, hydrosoil and hydroperiod in Reaches 3 and 7 were scored on the basis of their ability to recover to their current state following maintenance. Scores for these features macrofeatures are presented in Table 7 and scoring criteria can be found in Attachment 10.

Table 7. Recovery Wetland Macrofeature Assessment Scoring

Wetland Macrofeature	Score	
	Reach 3	Reach 7
Vegetation	2.9	2.8
Hydrosoil	2	2
Hydroperiod	2	2
Overall Recovery Score	**6.9**	**7.3**

The scores presented in Table 7 were determined in the following manner:

Vegetation

In a similar manner to the existing vegetation score, a recovery vegetation score of 0 – 3 was assigned to each vegetation community identified Table 2 of the IBA. Assignments were made based on the criteria established in the SOP (Attachment 10) and personal communication with IBA biologists. These scores are listed in Table 8 below.

Table 8. Vegetation Community/Land Use Type Scoring

Vegetation Community or Land Cover Type (Holland Code)	Vegetation Score	Reach 3 Coverage (acre)	Reach 7 Coverage (acre)	Scoring Rationale
Freshwater Marsh*	3	0.63	0.18	Emergent wetland species will exhibit re-growth within 1 year
Disturbed/Ruderal	2	0.05	0	Recovery of mixed population of woody and leafy vegetation will take 1 – 5 years
Non-native/Ornamental Vegetation	2	0.02	0.01	Recovery of mixed population of woody and leafy vegetation will take 1 – 5 years
Total Acreage		0.7	0.19	-
Overall Recovery Vegetation Score		2.9	2.8	-

* Includes disturbed form

Hydrosoil

A single recovery hydrosoil score of 2 was assigned to Reaches 3 and 7 following the SOP criteria in Attachment 10 and best professional judgment. This assignment was based on the fact that the sediment currently deposited in Reaches 3 and 7 primarily consists of a heterogeneous mix of sand, organics and fines that will likely re-accumulate within one to five years of maintenance activities.

Hydroperiod

A single recovery hydroperiod score of 2 was assigned to Reaches 3 and 7 following the SOP criteria in Attachment 10 and best professional judgment. This assignment is based primarily on the fact that the overlying water depth in Reaches 3 and 7 was generally observed to be less than 0.5 – 1 ft. and the regrowth of the FWM will facilitate the

deposition of fines and organics.

Sediment Pollutant Loading Estimates:

Pollutant loading estimates were performed following the guidelines outlined in the SOP and using best professional judgment. Total sediment volumes of approximately 2,500 yd^3 and 150 yd^3 are scheduled to be removed from Reaches 3 and 7 respectively. These removal volumes were distributed among the 4 sediment samples in the following manner: The 150 yd^3 for Reach 7 was allocated to the only sediment sample collected in Reach 7 (R-7-1) and the 2,500 yd^3 for Reach 3 was divided evenly among the remaining 3 sediment samples collected in Reach 3 (R-3-1 through R-3-3). Total load removal estimates for each pollutant were determined by taking the sum of the estimates for each sediment sampling location. The resultant pollutant loading estimates can be found in Attachment 11 and an example of the Excel model used to determine the pollutant loads in Attachment 12. Manganese exhibited the greatest overall estimated load removal with 743 lbs from Reach 3 56 lbs from Reach 7 for a total load removal of 799 lbs. Nitrate, nitrite, antimony, selenium, Malathion and Chlorpyrifos, were not detected above laboratory reporting limits (RLs) in any of the sediment samples.

MAINTENANCE IMPACTS

Evaluation of Benefits / Impacts:

Are there constituents that have potential impacts greater than benefits?	**Yes**	
	No	**X**

An evaluation of the water quality benefits versus impacts of the proposed channel maintenance in Reach 3 was carried out in accordance with the SOP. The estimated annual existing pollutant removal load capacity for each constituent measured in the upstream water quality sample (R-3-U) was determined. The resulting estimates were multiplied over the three year duration of the proposed maintenance period to derive the theoretical existing pollutant load removal capacity for the given maintenance period, i.e. existing pollutant removal. A theoretical maintained pollutant load removal capacity, i.e. maintained pollutant removal was also calculated for the three year maintenance period following the SOP. This calculation takes into account the pollutant removal resulting from sediment excavation as well as that facilitated by regrowth of wetland vegetation between maintenance events. Although biomass plays a key role in the pollution uptake capacity of most wetland species, studies have also shown that the growth phase provides increased levels of pollutant removal, as well as harvesting the biomass after the growth cycle to prevent the release of absorbed pollutants during decomposition (Kouki et al., 2012). These additional benefits to the removal of vegetation as a result of the proposed maintenance activities are not captured in the calculations presented, but are relevant in assessing the overall benefit of removing and trimming the existing vegetation. The maintained pollutant removal estimates were compared to the corresponding existing

pollutant removal estimates for each constituent. The results of this comparison are presented in Attachment 13. An example of the Excel model used to calculate the NTS removal estimates is provided as Attachment 14.

Cadmium, phosphorus, and Diazinon were only detected in the Reach 7 sediment sample. Lead was not detected above laboratory RLs in the water samples and antimony, nitrate, nitrite and the rest of the organophosphorous pesticides (Malathion and Chlorpyrifos) were not detected above laboratory RLs in either the sediment or water samples. For the remaining constituents analyzed in both matrices, the estimated maintained NTS pollutant removal exceeds the estimated existing NTS pollutant removal.

These results of the water quality impact analysis outlined by the SOP suggest that proposed sediment removal during maintenance of Reach 3 will remove a larger pollutant load than that which is theoretically removed during ambient flow by NTS processes over the three year maintenance period, and therefore provide an overall water quality benefit. Due to lack of discernible flow, the corresponding evaluation for Reach 7 could not be conducted. However, the sediment pollutant loading estimates for Reach 7 (Attachment 11) indicate that the proposed maintenance activities will generate a pollutant reduction benefit through the removal of pollutant-laden sediment. Sediment excavation in Reaches 3 and 7 will prevent the re-suspension and downstream transport of sediment-bound pollutants during wet weather, and regrowth of fresh water marsh species in Reach 3 within one year will further enhance dry-season pollutant removal from the channel. However, The City, in accordance with the California Coastal Commission Development Permit No. A-6-NOC-11-086 (CDP) and Site Development Permit No. 1134892 (SDP) will implement the suite of water quality improvement activities described in the following section.

Water Quality Improvement Activities:

The results of this IWQA process suggest that there is a pollutant reduction benefit due to sediment removal as a result of the proposed maintenance activities, and therefore no additional mitigation is necessary. Nevertheless, the City will implement water quality improvement activities, as required by the governing CDP which satisfy the SDP requirements. The City will utilize a suite of pollution prevention, source control and treatment BMPs to address sediment and other pollutant inputs to the Sorrento Valley channels within the coastal zone (Table 9).

Table 9. Water Quality Improvement Activities

Number	Water Quality Activity Type	Description	Implementation Frequency	Duration
1	Pollution Prevention	Commercial and residential property sediment reduction outreach distribution.	250 parcels	Approximately one month prior to maintenance initiation.
2	Source Control	Street sweeping improvements-targeted vacuum-assisted/regenerative air machine usage.	19.4 curb miles	One year subsequent to sediment removal maintenance events.
3	Source Control	Street sweeping improvements-targeted median sweeping route addition.	10.8 curb miles	
4	Treatment	Enhanced catch basin inspection and as-needed cleaning implementation.	25 inlet locations	
5	Special Study	Evaluate the need and potential effectiveness of implementing slope stabilization measures and small scale water quality basin BMPs on City-owned parcels within the Los Penasquitos drainage area.	N/A	One year subsequent to sediment removal maintenance event.
6	Special Study	Degraded canyon area municipal separate storm sewer (MS4) outfall evaluation and improvement process.	N/A	One year subsequent to sediment removal maintenance event for one priority channel segment.
7	Pilot Implementation Study	Conduct repairs on a prioritized representative degraded outfall to determine the relative level of planning, engineering and implementation effort needed to address identified canyon-area outfall problems.	1 outfall location (La Jolla Farms location)	Five years

Applicable PEIR mitigation measures can be found in their entirety in Attachment 15. Since the findings of this IWQA result in a water quality benefit by reducing pollutant loads downstream; potential water quality impacts are not identified, and therefore no additional mitigation is required.

Attachment 2 of the IMP includes all additional permits and their conditions which must be incorporated.

Additional Comments or Recommendations

The SOP acknowledges that site conditions may require modifications to the procedures. Some procedures described in this document were modified from the original SOP based on existing site-specific conditions.

References

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ATTACHMENT 1

Figure 1 – Vicinity Map
Figure 2 – Project Area
Figure 3 – Sample Locations

P:\400_Hydrogeology\7165 Murphy Canyon IWQA\GIS\MXD\Fig1 Sorrento Vicinity Map IWQA.mxd

DUDEK

AUGUST 2013

FIGURE 1

Regional Map

SORRENTO INITIAL WATER QUALITY ASSESSMENT (IWQA)

VISTA SORRENTO PARKWAY
I-5
SORRENTO VALLEY ROAD
REACH 6
REACH 5
REACH 4
REACH 2
REACH 1
REACH 3
REACH 7
REACH 8
Los Penasquitos Creek
Sorrento Creek
Soledad Creek
Flintkote Channel
SORRENTO VALLEY BLVD
LUSK BLVD
I-805N
I-805S
I-5N
I-5S
ROSELLE STREET
FLINTKOTE AVENUE

0 200 400 Feet

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

DUDEK

SOURCES
Reaches provided by URS
Figure modified after 2013 H&H Reaches - Sorrento Valley Channel Reach Number Map, URS 2013

FIGURE 2
Project Area

AUGUST 2013

SORRENTO INITIAL WATER QUALITY ASSESSMENT (IWQA)

DRAFT

P:\400_Hydrology\07365 Murphy Canyon IWQA\GIS\MXD\Figure 2_Sorrento_ProjectArea Map_IWQA.mxd

P:\400 Hydrology\7165 Murphy Canyon NPDES\GIS\MXD\Figure 3 Sorrento Sample Locations.mxd

DUDEK

AUGUST 2013

FIGURE 3

Sample Locations

SORRENTO INITIAL WATER QUALITY ASSESSMENT (IWQA)

DRAFT

ATTACHMENT 2

Photographic Log

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
City of San Diego, O&M	Sorrento Channel	

Photo No.	Date:
1	4/23/13

Direction Photo Taken:

Southeast

Description:

Concrete lined channel of Reach 3 looking upstream, showing sparse vegetation and sheet flow with exposed concrete

Photo No.	Date:
2	4/23/13

Direction Photo Taken:

Northwest

Description:

Downstream water quality sampling location R-3-D looking downstream

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
City of San Diego, O&M	Sorrento Channel	

Photo No.	Date:
3	4/23/13

Direction Photo Taken:

Southeast

Description:

Upstream water quality sampling location R-3-D-U

Photo No.	Date:
4	4/23/13

Direction Photo Taken:

South southeast

Description:

R-3-1 sediment sampling location, showing vegetation mat

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
City of San Diego, O&M		

Photo No.	Date:
5	4/23/13

Direction Photo Taken:

Southeast

Description:

R-3-2 sediment sampling location with vegetation and exposed sediment

Photo No.	Date:
6	4/23/13

Direction Photo Taken:

Southeast

Description:

R-3-3 sediment sampling location, showing vegetation

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
City of San Diego, O&M	Sorrento Channel	

Photo No.	Date:
7	4/23/13

Direction Photo Taken:

Northeast

Description:

Concrete lined channel of Reach 7 showing vegetation and accumulated sediment, absence of flowing water

Photo No.	Date:
8	4/23/13

Direction Photo Taken:

Northwest

Description:

R-7-1 sediment sampling location showing vegetation and exposed sediment

ATTACHMENT 3

Chain-of-Custody Forms

DUDEK
605 Third Street
Encinitas, CA 92024
Tel: 760-942-5147
Fax: 760-942-5206

Chain - of - Custody Form

#1304275

Page 1 of 1

Laboratory: Pat Chem	Lab Job #:
Lab Contact: Theresa Trevizo	Shipping Method: Courier
Project Manager: Bryn Evans	PM Email: elizabeth.chilman@uvs.com (cc: echilman@dudek.com)

Project Name: City of San Diego DPM IWQA Sorrento

Job Number: 7165

Sampled by: Lydia Roach, Laura Roll, Elizabeth Chilman

Sampler Signature:

Sample ID	Sample Collection Date	Time	Matrix: Water	Vapor	Soil	Method Preserved: HCl	HNO_3	NONE	Filtered (Y/N)	Number of Sample Containers: 40 mL glass VOA	8 oz. Glass Jar	1L Amber	½ gal Poly	5 gal bucket
R-3-D	4/23/13	0800	X					X	N			1	2	
R-3-U	4/23/13	0900	X						N			1	2	
R-3-1	4/23/13	1000			X						2			
R-3-2	4/23/13	1020			X						2			
R-3-3	4/23/13	1040			X						2			
R-7-1	4/23/13	1140			X						2			
R-3 Grainsize	4/23/13				X									1
R-7 Grainsize	4/23/13				X									1
Total # of containers per type											8	2	4	2

Type of Analysis to be Performed

Sample ID	~~EPA 8260B~~ LDR VOCs Grainsize	~~LDR~~ SVOCs EPA 8270	OCPs / Pesticides EPA 8081	TPH (GRO, DRO, Motor Oil) EPA m8015	TDS + Hardness (total)	Metals (total)	Percent Solids	Tot-P, NO_3, NO_2, TKN	Metals (Dissolved)	Dissolved P	TSS
R-3-D			X		X	X		X	X	X	X
R-3-U			X		X	X		X	X	X	X
R-3-1			X			X	X	X			
R-3-2			↓			↓	↓	↓			
R-3-3											
R-7-1			↓			↓	↓	↓			
R-3 Grainsize	X										
R-7 Grainsize	X										

TAT: Standard Turn-Around Time: 24 hr, 48 hr, 72 hr; Other:

Special Instructions: Please see LDR constituent lists (emailed)

Total # of containers: 16

Please return original COC to Dudek

Relinquished by:	Company	Date	Time	Received by:	Company	Date	Time
Lydia Roach	DUDEK	4/23/13	1436	Paula Coll	PCL	4/23/13	1436
Paula Coll	PCL	4/23/13	1640		PCL	4/23/13	1436

Sample Receipt
- ☐ Samples Intact
- ☐ Cooler Temp: ____ °C
- ☐ Conforms to COC

Rev 01/13

City of San Diego Metropolitan Wastewater Department

Environmental Monitoring & Technical Services Division

Marine Microbiology Laboratory

2392 Kincaid Rd
San Diego, CA 92101-0811
(619)758-2361

DATE: 4/23/13

CHAIN OF CUSTODY RECORD

Project/Client: City of MWWA	Sampler(s): Laura Rull Lydia Rueth Elizabeth Chilman	Type of sampling equipment / How sample obtained / Other sampling notes:
Contact Name:	Contact Name: Elizabeth Chilman	
Phone:	Phone: 353-812-5271	

SAMPLE				ANALYSES						COMMENTS
Time	Initials	Source / I.D.	Matrix (water, bio-solid, etc.)	Total Coliform	Fecal Coliform	*E. coli*	Enterococcus	Coliphage	Other	(grab, comp , etc)
0930	LR	B-3-U	Water	X	X		X			
0800	LR	B-3-D	Water	X	X		X			

CHAIN-OF-CUSTODY

Relinquished by(print): Elizabeth Chilman	Relinquished by(print): Elizabeth Chilman	COMMENTS:
Sign:	Sign:	
Received by(print):	Received by(print):	
Sign:	Sign:	
Date/Time:	Date/Time: 4/23/13 1425	
Location:	Location:	

DUDEK
605 Third Street
Encinitas, CA 92024
Tel: 760-942-5147
Fax: 760-942-5206

Chain - of - Custody Form

Page 1 of 1

Laboratory: Pace Analytical	Lab Job #:
Lab Contact: Rebecca Tracy	Shipping Method: FedEx
Project Manager: Kim Evans	PM Email: kevans@dudek.com

Project Name: City of San Diego DPM IWQA Surveys 7 & 8

Job Number:

Sampled by: Lydia Rood, Laura Poll, Elizabeth Chilson

Sampler Signature:

Sample ID	Sample Collection Date	Sample Collection Time	Matrix: Water	Matrix: Vapor	Matrix: Soil	Method Preserved: HCl	Method Preserved: HNO_3	Method Preserved: NONE	Method Preserved: Filtered (Y/N)	Number of Sample Containers: 40 mL glass VOA	Number of Sample Containers: 8 oz. Glass Jar	Number of Sample Containers: 1 L Amber	Number of Sample Containers: 1 Liter Poly	Number of Sample Containers: Sediment Sample Jar	Type of Analysis to be Performed: VOCs (EPA 8260B)	SVOCs (EPA 8270)	OCPs / Pesticides (EPA 8081)	TPH (GRO, DRO, Motor Oil) (EPA m8015)	TDS	Metals (Cu, Pb, Zn)	Bacteria (Enterococcus, Fecal Coliform)	Bacteria (Total Coliform, E. coli)	Grain Size (PSDS)	TAT: Standard Turn-Around Time	TAT: 24 hr / 48 hr / 72 hr Other:	Special Instructions
R-3-D	11/13/13	0800	X					X	N			1	2				X		X	X		X	X	X	X	X
R-3-U	11/13/13	0900	X						N			1	2				X		X	X		X	X	X	X	
R-3-1	11/13/13	1000			X						2						X		X	X	X					
R-3-2	11/13/13	1020			X						2															
R-3-3	11/13/13	1040			X						2															
R-7-1	11/14/13	1100			X						2															
R-3 Grainsize	11/13/13				X									1	X										X	
R-7 Grainsize	11/13/13				X									1	X										X	

Total # of containers per type: 6 | 2 | 4 | 2

Total # of containers: 16

Please return original COC to Dudek

Relinquished by:	Company	Date	Time	Received by:	Company	Date	Time
Lydia Rood	DUDEK	11/14/13	1100				

Sample Receipt

- ☐ Samples Intact
- ☐ Cooler Temp: ____ °C
- ☐ Conforms to COC

Rev 01/13

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120
Phone 858.587.7333
Fax 858.587.3961

Chain of Custody

Date 4/23/13 Page 1 of 1

Sample Collection By: Lydia Pooch, Callie Rolli, Elizabeth Chilman

Report to:		**Invoice To:**	
Company	URS Corp	Company	URS Corp
Address		Address	4225 Executive Sq. Suite 1600
City/State/Zip		City/State/Zip	La Jolla, CA 92037
Contact		Contact	Elizabeth Chilman
Phone		Phone	858-812-8271
Email		Email	elizabeth.chilman@urs.com

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	ANALYSES REQUIRED										Receipt Temperature (°C)
1	R-3-D-TOX-S	4/23/13	0800	sediment	plastic bag	1												
2	R-3-U-TOX-S	↓	0900	↓	↓	1												
3	R-3-U-TOX	4/23/13	0900	water	cubitainer	2												
4	R-3-D-TOX	↓	0800	↓	↓	2												
5																		
6																		
7																		
8																		
9																		
10																		

PROJECT INFORMATION		SAMPLE RECEIPT	
Client:		Total No. of Containers	
PO No.:		Received Good Condition?	
Shipped Via:		Matches Test Schedule?	

1) RELINQUISHED BY (CLIENT)
(Signature) [signature] (Time) 1510
(Printed Name) Elizabeth C Chilman (Date) 4/23/13
(Company) URS Corporation

2) RECEIVED BY (COURIER)
(Signature) (Time)
(Printed Name) (Date)
(Company)

SPECIAL INSTRUCTIONS/COMMENTS:

3) RELINQUISHED BY (COURIER)
(Signature) (Time)
(Printed Name) (Date)
(Company)

4) RECEIVED BY (LABORATORY)
(Signature) [signature] (Time) 1510
(Printed Name) Ming Lai (Date) 4/23/13
(Company) Nautilus

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

ATTACHMENT 4

Laboratory Analytical Reports

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-3-D (Sample I.D.# : 1304275-01) Collected: 23-Apr-13 By Dudek							
Arsenic	EPA 200.8	AD32406	0.5	24-Apr-13 (AF)		2.8 ug/l	
Cadmium	EPA 200.8	AD32406	0.2	24-Apr-13 (AF)	<	0.2 ug/l	
Chromium	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		5.8 ug/l	
Copper	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		3.8 ug/l	
Manganese	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		26 ug/l	
Nickel	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		9.9 ug/l	
Lead	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Antimony	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Selenium	EPA 200.8	AD32406	2.0	24-Apr-13 (AF)		9.2 ug/l	
Zinc	EPA 200.8	AD32406	5.0	24-Apr-13 (AF)		8.2 ug/l	
Arsenic - Dissolved	EPA 200.8	AD32406	0.5	24-Apr-13 (AF)		2.2 ug/l	
Cadmium - Dissolved	EPA 200.8	AD32406	0.2	24-Apr-13 (AF)	<	0.2 ug/l	
Chromium - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		3.5 ug/l	
Copper - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		3.2 ug/l	
Manganese - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		18 ug/l	
Nickel - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		7.5 ug/l	
Lead - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Antimony - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Selenium - Dissolved	EPA 200.8	AD32406	2.0	24-Apr-13 (AF)		7.0 ug/l	
Zinc - Dissolved	EPA 200.8	AD32406	5.0	24-Apr-13 (AF)		8.0 ug/l	
Chlorpyrifos	EPA 8141	AD32401	1.0	25-Apr-13 (SJ)	<	1.0 ug/l	
Diazinon	EPA 8141	AD32401	0.2	25-Apr-13 (SJ)	<	0.2 ug/l	
Malathion	EPA 8141	AD32401	1.0	25-Apr-13 (SJ)	<	1.0 ug/l	
Total Hardness	SM 2340	AD32422	2	24-Apr-13 (CS)		1290 mg/l	
Phosphorus, Dissolved as P	EPA 365.3	AD32413	0.03	24-Apr-13 (LL)	<	0.03 mg/l	
Total Kjeldahl Nitrogen	EPA 351.3	AD32421	0.10	24-Apr-13 (JA)		0.20 mg/l	
Phosphorus, Total as P	EPA 365.3	AD32413	0.03	24-Apr-13 (LL)	<	0.03 mg/l	
Total Nitrogen	varies	[CALC]	0.30	24-Apr-13 (JA)		1.52 mg/l	

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-3-D (Sample I.D.# : 1304275-01) Collected: 23-Apr-13 By Dudek							
Total Suspended Solids	EPA 160.2	AD32412	1	24-Apr-13 (LL)		8 mg/l	
Total Dissolved Solids	EPA 160.1	AD32411	1	24-Apr-13 (LL)		2472 mg/l	
Nitrite as N	EPA 353.2	AD32416	0.10	24-Apr-13 (JA)		0.22 mg/l	
Nitrate as N	EPA 353.3	AD32416	0.10	24-Apr-13 (JA)		1.10 mg/l	
R-3-U (Sample I.D.# : 1304275-02) Collected: 23-Apr-13 By Dudek							
Arsenic	EPA 200.8	AD32406	0.5	24-Apr-13 (AF)		3.4 ug/l	
Cadmium	EPA 200.8	AD32406	0.2	24-Apr-13 (AF)	<	0.2 ug/l	
Chromium	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		6.9 ug/l	
Copper	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		4.2 ug/l	
Manganese	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		47 ug/l	
Nickel	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		13 ug/l	
Lead	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Antimony	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Selenium	EPA 200.8	AD32406	2.0	24-Apr-13 (AF)		9.9 ug/l	
Zinc	EPA 200.8	AD32406	5.0	24-Apr-13 (AF)		22 ug/l	
Arsenic - Dissolved	EPA 200.8	AD32406	0.5	24-Apr-13 (AF)		2.6 ug/l	
Cadmium - Dissolved	EPA 200.8	AD32406	0.2	24-Apr-13 (AF)	<	0.2 ug/l	
Chromium - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		6.1 ug/l	
Copper - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		3.3 ug/l	
Manganese - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		32 ug/l	
Nickel - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)		8.8 ug/l	
Lead - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Antimony - Dissolved	EPA 200.8	AD32406	1.0	24-Apr-13 (AF)	<	1.0 ug/l	
Selenium - Dissolved	EPA 200.8	AD32406	2.0	24-Apr-13 (AF)		7.8 ug/l	
Zinc - Dissolved	EPA 200.8	AD32406	5.0	24-Apr-13 (AF)		19 ug/l	
Chlorpyrifos	EPA 8141	AD32401	1.0	25-Apr-13 (SJ)	<	1.0 ug/l	
Diazinon	EPA 8141	AD32401	0.2	25-Apr-13 (SJ)	<	0.2 ug/l	
Malathion	EPA 8141	AD32401	1.0	25-Apr-13 (SJ)	<	1.0 ug/l	

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-3-U (Sample I.D.# : 1304275-02) Collected: 23-Apr-13 By Dudek							
Total Hardness	SM 2340	AD32422	2	24-Apr-13 (CS)		1150 mg/l	
Phosphorus, Dissolved as P	EPA 365.3	AD32413	0.03	24-Apr-13 (LL)	<	0.03 mg/l	
Total Kjeldahl Nitrogen	EPA 351.3	AD32421	0.10	24-Apr-13 (JA)		0.20 mg/l	
Phosphorus, Total as P	EPA 365.3	AD32413	0.03	24-Apr-13 (LL)	<	0.03 mg/l	
Total Nitrogen	varies	[CALC]	0.30	24-Apr-13 (JA)	<	0.30 mg/l	
Total Suspended Solids	EPA 160.2	AD32412	1	24-Apr-13 (LL)		7 mg/l	
Total Dissolved Solids	EPA 160.1	AD32411	1	24-Apr-13 (LL)		2620 mg/l	
Nitrite as N	EPA 353.2	AD32416	0.10	24-Apr-13 (JA)	<	0.10 mg/l	
Nitrate as N	EPA 353.3	AD32416	0.10	24-Apr-13 (JA)	<	0.10 mg/l	
R-3-1 (Sample I.D.# : 1304275-03) Collected: 23-Apr-13 By Dudek							
Copper	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		9.3 mg/kg	
Manganese	EPA 200.8	AD32405	10	24-Apr-13 (AF)		230 mg/kg	
Lead	EPA 6020	AD32405	0.02	24-Apr-13 (AF)		6.8 mg/kg	
Zinc	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		58 mg/kg	
Arsenic	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		5.2 mg/kg	
Cadmium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)	<	0.2 mg/kg	
Chromium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		5.7 mg/kg	
Nickel	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		3.9 mg/kg	
Antimony	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Selenium	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Diazinon	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Malathion	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Surrogate: 1,3-Dimethyl-2-nitrobenzei	*EPA 8141*	*AD32402*		*25-Apr-13 (SJ)*		*36.8 % (30-120)*	
Total Kjeldahl Nitrogen	EPA 351.3	AD32403	0.5	24-Apr-13 (JA)		100 mg/kg	
Phosphorus, Total as P	EPA 365.3	AD32414	0.5	24-Apr-13 (LL)		171 mg/kg	
% Solids	% calculation	AD32410		24-Apr-13 (CS)		70.9 %	

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Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
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Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-3-1 (Sample I.D.# : 1304275-03) Collected: 23-Apr-13 By Dudek							
Nitrite as N	EPA 354.1	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
Nitrate as N	EPA 353.3	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
R-3-2 (Sample I.D.# : 1304275-04) Collected: 23-Apr-13 By Dudek							
Copper	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		2.5 mg/kg	
Manganese	EPA 200.8	AD32405	10	24-Apr-13 (AF)		60 mg/kg	
Lead	EPA 6020	AD32405	0.02	24-Apr-13 (AF)		2.5 mg/kg	
Zinc	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		21 mg/kg	
Arsenic	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		2.8 mg/kg	
Cadmium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)	<	0.2 mg/kg	
Chromium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		1.7 mg/kg	
Nickel	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		1.3 mg/kg	
Antimony	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Selenium	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Diazinon	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Malathion	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Surrogate: 1,3-Dimethyl-2-nitrobenzei	*EPA 8141*	*AD32402*		*25-Apr-13 (SJ)*		*40.3 % (30-120)*	
Total Kjeldahl Nitrogen	EPA 351.3	AD32403	0.5	24-Apr-13 (JA)		19 mg/kg	
Phosphorus, Total as P	EPA 365.3	AD32414	0.5	24-Apr-13 (LL)		42.3 mg/kg	
% Solids	% calculation	AD32410		24-Apr-13 (CS)		74.3 %	
Nitrite as N	EPA 354.1	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
Nitrate as N	EPA 353.3	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
R-3-3 (Sample I.D.# : 1304275-05) Collected: 23-Apr-13 By Dudek							
Copper	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		8.4 mg/kg	
Manganese	EPA 200.8	AD32405	10	24-Apr-13 (AF)		140 mg/kg	
Lead	EPA 6020	AD32405	0.02	24-Apr-13 (AF)		5.1 mg/kg	
Zinc	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		51 mg/kg	

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La Jolla CA, 92037

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PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-3-3 (Sample I.D.# : 1304275-05) Collected: 23-Apr-13 By Dudek							
Arsenic	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		3.4 mg/kg	
Cadmium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)	<	0.2 mg/kg	
Chromium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		3.6 mg/kg	
Nickel	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		3.1 mg/kg	
Antimony	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Selenium	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Diazinon	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Malathion	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Surrogate: 1,3-Dimethyl-2-nitrobenzei	*EPA 8141*	*AD32402*		*25-Apr-13 (SJ)*		*40.5 % (30-120)*	
Total Kjeldahl Nitrogen	EPA 351.3	AD32403	0.5	24-Apr-13 (JA)		83 mg/kg	
Phosphorus, Total as P	EPA 365.3	AD32414	0.5	24-Apr-13 (LL)		109 mg/kg	
% Solids	% calculation	AD32410		24-Apr-13 (CS)		65.4 %	
Nitrite as N	EPA 354.1	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
Nitrate as N	EPA 353.3	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
R-7-1 (Sample I.D.# : 1304275-06) Collected: 23-Apr-13 By Dudek							
Copper	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		21 mg/kg	
Manganese	EPA 200.8	AD32405	10	24-Apr-13 (AF)		230 mg/kg	
Lead	EPA 6020	AD32405	0.02	24-Apr-13 (AF)		14 mg/kg	
Zinc	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		110 mg/kg	
Arsenic	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		6.7 mg/kg	
Cadmium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		0.3 mg/kg	
Chromium	EPA 6020	AD32405	0.2	24-Apr-13 (AF)		14 mg/kg	
Nickel	EPA 6020	AD32405	0.5	24-Apr-13 (AF)		9.9 mg/kg	
Antimony	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	
Selenium	EPA 6020	AD32405	1.0	24-Apr-13 (AF)	<	1.0 mg/kg	

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Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)		RESULT	NOTE
R-7-1 (Sample I.D.# : 1304275-06) Collected: 23-Apr-13 By Dudek							
Chlorpyrifos	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Diazinon	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Malathion	EPA 8141	AD32402	50.0	25-Apr-13 (SJ)	<	50.0 ug/kg	
Surrogate: 1,3-Dimethyl-2-nitrobenzei	*EPA 8141*	*AD32402*		*25-Apr-13 (SJ)*		*40.2 % (30-120)*	
Total Kjeldahl Nitrogen	EPA 351.3	AD32403	0.5	24-Apr-13 (JA)		270 mg/kg	
Phosphorus, Total as P	EPA 365.3	AD32414	0.5	24-Apr-13 (LL)		241 mg/kg	
% Solids	% calculation	AD32410		24-Apr-13 (CS)		60.0 %	
Nitrite as N	EPA 354.1	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	
Nitrate as N	EPA 353.3	AD32415	0.5	24-Apr-13 (JA)	<	0.5 mg/kg	

Respectfully Submitted,

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Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32405 - EPA 3050B										
Blank (AD32405-BLK1)				Prepared & Analyzed: 24-Apr-13						
Copper	ND	0.2	mg/kg							
Zinc	ND	0.5	"							
Manganese	ND	1.0	"							
Lead	ND	0.02	"							
LCS (AD32405-BS1)				Prepared & Analyzed: 24-Apr-13						
Zinc	2.70	0.5	mg/kg	2.50		108	85-115			
Manganese	2.48	1.0	"	2.50		99.3	85-115			
Lead	2.42	0.02	"	2.50		96.7	85-115			
Copper	2.52	0.2	"	2.50		101	85-115			
LCS Dup (AD32405-BSD1)				Prepared & Analyzed: 24-Apr-13						
Manganese	2.46	1.0	mg/kg	2.50		98.3	85-115	0.992	20	
Copper	2.48	0.2	"	2.50		99.0	85-115	1.58	20	
Lead	2.44	0.02	"	2.50		97.8	85-115	1.11	20	
Zinc	2.64	0.5	"	2.50		106	85-115	2.47	20	
Duplicate (AD32405-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Manganese	228	10	mg/kg		226			1.04	20	
Lead	6.73	0.02	"		6.76			0.445	20	
Zinc	58.4	0.5	"		58.0			0.602	20	
Copper	9.42	0.2	"		9.30			1.28	20	
Matrix Spike (AD32405-MS1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Lead	30.5	0.02	mg/kg	25.0	6.76	95.1	80-120			
Manganese	237	10	"	25.0	226	43.8	80-120			QM-05
Copper	32.8	0.2	"	25.0	9.30	94.2	80-120			
Zinc	78.2	0.5	"	25.0	58.0	80.6	80-120			

Respectfully Submitted,

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Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32405 - EPA 3050B										
Matrix Spike Dup (AD32405-MSD1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Manganese	235	10	mg/kg	25.0	226	37.4	80-120	0.678	20	QM-05
Lead	29.8	0.02	"	25.0	6.76	92.2	80-120	2.42	20	
Zinc	78.6	0.5	"	25.0	58.0	82.6	80-120	0.638	20	
Copper	32.4	0.2	"	25.0	9.30	92.4	80-120	1.39	20	
Batch AD32406 - EPA 200 Series										
Blank (AD32406-BLK1)				Prepared & Analyzed: 24-Apr-13						
Cadmium	ND	0.2	ug/l							
Arsenic	ND	0.5	"							
Chromium	ND	1.0	"							
Copper	ND	1.0	"							
Manganese	ND	1.0	"							
Selenium	ND	2.0	"							
Nickel	ND	1.0	"							
Zinc	ND	5.0	"							
Antimony	ND	1.0	"							
Lead	ND	1.0	"							
LCS (AD32406-BS1)				Prepared & Analyzed: 24-Apr-13						
Nickel	51.1	1.0	ug/l	50.0		102	85-115			
Lead	47.2	1.0	"	50.0		94.3	85-115			
Selenium	49.4	2.0	"	50.0		98.7	85-115			
Zinc	50.6	5.0	"	50.0		101	80-120			
Chromium	51.6	1.0	"	50.0		103	85-115			
Antimony	48.2	1.0	"	50.0		96.3	85-115			
Copper	51.5	1.0	"	50.0		103	85-115			
Arsenic	48.6	0.5	"	50.0		97.3	80-120			

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Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32406 - EPA 200 Series										
LCS (AD32406-BS1)				Prepared & Analyzed: 24-Apr-13						
Manganese	53.4	1.0	"	50.0		107	85-115			
Cadmium	49.7	0.2	"	50.0		99.4	85-115			
LCS Dup (AD32406-BSD1)				Prepared & Analyzed: 24-Apr-13						
Lead	47.8	1.0	ug/l	50.0		95.6	85-115	1.35	20	
Arsenic	48.7	0.5	"	50.0		97.5	80-120	0.205	20	
Chromium	50.7	1.0	"	50.0		101	85-115	1.72	20	
Antimony	48.2	1.0	"	50.0		96.4	85-115	0.104	20	
Nickel	50.7	1.0	"	50.0		101	85-115	0.884	20	
Cadmium	49.5	0.2	"	50.0		99.0	85-115	0.383	20	
Selenium	49.8	2.0	"	50.0		99.7	85-115	0.948	20	
Manganese	53.1	1.0	"	50.0		106	85-115	0.488	20	
Zinc	50.4	5.0	"	50.0		101	80-120	0.555	20	
Copper	51.5	1.0	"	50.0		103	85-115	0.0389	20	
Duplicate (AD32406-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Zinc	8.15	5.0	ug/l		8.23			0.977	20	
Antimony	0.580	1.0	"		0.650			11.4	20	
Lead	ND	1.0	"		ND				20	
Manganese	26.2	1.0	"		26.4			0.723	20	
Cadmium	ND	0.2	"		ND				20	
Arsenic	2.85	0.5	"		2.83			0.704	20	
Selenium	9.29	2.0	"		9.16			1.41	20	
Nickel	10.1	1.0	"		9.93			1.99	20	
Copper	3.90	1.0	"		3.76			3.66	20	
Chromium	5.97	1.0	"		5.81			2.72	20	
Matrix Spike (AD32406-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						

Respectfully Submitted,

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Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32406 - EPA 200 Series										
Matrix Spike (AD32406-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Zinc	51.0	5.0	ug/l	50.0	8.23	85.5	80-120			
Copper	49.1	1.0	"	50.0	3.76	90.7	80-120			
Manganese	73.8	1.0	"	50.0	26.4	94.7	80-120			
Nickel	55.4	1.0	"	50.0	9.93	91.0	80-120			
Antimony	50.5	1.0	"	50.0	0.650	99.7	80-120			
Chromium	53.3	1.0	"	50.0	5.81	95.1	80-120			
Lead	49.6	1.0	"	50.0	ND	99.2	80-120			
Cadmium	45.7	0.2	"	50.0	ND	91.4	80-120			
Selenium	59.1	2.0	"	50.0	9.16	99.9	80-120			
Arsenic	52.7	0.5	"	50.0	2.83	99.7	80-120			
Matrix Spike Dup (AD32406-MSD1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Zinc	50.9	5.0	ug/l	50.0	8.23	85.3	80-120	0.196	20	
Lead	49.6	1.0	"	50.0	ND	99.3	80-120	0.121	20	
Selenium	58.4	2.0	"	50.0	9.16	98.4	80-120	1.24	20	
Nickel	55.1	1.0	"	50.0	9.93	90.4	80-120	0.579	20	
Chromium	52.4	1.0	"	50.0	5.81	93.3	80-120	1.70	20	
Arsenic	52.1	0.5	"	50.0	2.83	98.6	80-120	1.01	20	
Copper	49.1	1.0	"	50.0	3.76	90.7	80-120	0.0611	20	
Cadmium	45.6	0.2	"	50.0	ND	91.2	80-120	0.219	20	
Manganese	73.2	1.0	"	50.0	26.4	93.5	80-120	0.830	20	
Antimony	51.0	1.0	"	50.0	0.650	101	80-120	1.02	20	

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32406 - EPA 200 Series										
Blank (AD32406-BLK1)				Prepared & Analyzed: 24-Apr-13						
Nickel - Dissolved	ND	1.0	ug/l							
Zinc - Dissolved	ND	5.0	"							
Antimony - Dissolved	ND	1.0	"							
Chromium - Dissolved	ND	1.0	"							
Copper - Dissolved	ND	1.0	"							
Selenium - Dissolved	ND	2.0	"							
Cadmium - Dissolved	ND	0.2	"							
Arsenic - Dissolved	ND	0.5	"							
Manganese - Dissolved	ND	1.0	"							
Lead - Dissolved	ND	1.0	"							
LCS (AD32406-BS1)				Prepared & Analyzed: 24-Apr-13						
Manganese - Dissolved	53.4	1.0	ug/l	50.0		107	85-115			
Arsenic - Dissolved	48.6	0.5	"	50.0		97.3	85-115			
Lead - Dissolved	47.2	1.0	"	50.0		94.3	85-115			
Antimony - Dissolved	48.2	1.0	"	50.0		96.3	85-115			
Nickel - Dissolved	51.1	1.0	"	50.0		102	85-115			
Copper - Dissolved	51.5	1.0	"	50.0		103	85-115			
Zinc - Dissolved	50.6	5.0	"	50.0		101	80-120			
Chromium - Dissolved	51.6	1.0	"	50.0		103	85-115			
Cadmium - Dissolved	49.7	0.2	"	50.0		99.4	85-115			
Selenium - Dissolved	49.4	2.0	"	50.0		98.7	85-115			
LCS Dup (AD32406-BSD1)				Prepared & Analyzed: 24-Apr-13						
Arsenic - Dissolved	48.7	0.5	ug/l	50.0		97.5	85-115	0.205	20	
Copper - Dissolved	51.5	1.0	"	50.0		103	85-115	0.0389	20	
Cadmium - Dissolved	49.5	0.2	"	50.0		99.0	85-115	0.383	20	

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Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32406 - EPA 200 Series										
LCS Dup (AD32406-BSD1)				Prepared & Analyzed: 24-Apr-13						
Chromium - Dissolved	50.7	1.0	"	50.0		101	85-115	1.72	20	
Selenium - Dissolved	49.8	2.0	"	50.0		99.7	85-115	0.948	20	
Antimony - Dissolved	48.2	1.0	"	50.0		96.4	85-115	0.104	20	
Lead - Dissolved	47.8	1.0	"	50.0		95.6	85-115	1.35	20	
Zinc - Dissolved	50.4	5.0	"	50.0		101	80-120	0.555	20	
Manganese - Dissolved	53.1	1.0	"	50.0		106	85-115	0.488	20	
Nickel - Dissolved	50.7	1.0	"	50.0		101	85-115	0.884	20	
Duplicate (AD32406-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Lead - Dissolved	ND	1.0	ug/l		ND				20	
Arsenic - Dissolved	2.21	0.5	"		2.22			0.451	20	
Cadmium - Dissolved	ND	0.2	"		ND				20	
Selenium - Dissolved	6.89	2.0	"		6.99			1.44	20	
Chromium - Dissolved	3.93	1.0	"		3.47			12.4	20	
Antimony - Dissolved	0.650	1.0	"		0.690			5.97	20	
Copper - Dissolved	3.15	1.0	"		3.22			2.20	20	
Manganese - Dissolved	18.1	1.0	"		18.4			1.48	20	
Zinc - Dissolved	7.83	5.0	"		8.00			2.15	20	
Nickel - Dissolved	7.57	1.0	"		7.51			0.796	20	
Matrix Spike (AD32406-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Cadmium - Dissolved	46.0	0.2	ug/l	50.0	ND	92.0	80-120			
Chromium - Dissolved	50.5	1.0	"	50.0	3.47	94.0	80-120			
Manganese - Dissolved	66.6	1.0	"	50.0	18.4	96.4	80-120			
Arsenic - Dissolved	51.5	0.5	"	50.0	2.22	98.6	75-125			
Lead - Dissolved	49.3	1.0	"	50.0	ND	98.7	80-120			
Antimony - Dissolved	50.5	1.0	"	50.0	0.690	99.7	80-120			

Respectfully Submitted,

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Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32406 - EPA 200 Series										
Matrix Spike (AD32406-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Nickel - Dissolved	53.7	1.0	"	50.0	7.51	92.3	80-120			
Copper - Dissolved	48.7	1.0	"	50.0	3.22	91.0	80-120			
Selenium - Dissolved	56.3	2.0	"	50.0	6.99	98.6	80-120			
Zinc - Dissolved	51.6	5.0	"	50.0	8.00	87.3	80-120			
Matrix Spike Dup (AD32406-MSD1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Manganese - Dissolved	66.8	1.0	ug/l	50.0	18.4	96.8	80-120	0.330	20	
Chromium - Dissolved	50.7	1.0	"	50.0	3.47	94.5	80-120	0.455	20	
Lead - Dissolved	49.1	1.0	"	50.0	ND	98.2	80-120	0.427	20	
Selenium - Dissolved	55.2	2.0	"	50.0	6.99	96.3	80-120	1.99	20	
Zinc - Dissolved	51.3	5.0	"	50.0	8.00	86.6	80-120	0.661	20	
Cadmium - Dissolved	45.5	0.2	"	50.0	ND	91.0	80-120	1.09	20	
Antimony - Dissolved	50.4	1.0	"	50.0	0.690	99.4	80-120	0.258	20	
Copper - Dissolved	48.5	1.0	"	50.0	3.22	90.6	80-120	0.432	20	
Nickel - Dissolved	53.7	1.0	"	50.0	7.51	92.4	80-120	0.0931	20	
Arsenic - Dissolved	51.1	0.5	"	50.0	2.22	97.8	75-125	0.741	20	

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Metals by SM 3500 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32405 - EPA 3050B										
Blank (AD32405-BLK1)				Prepared & Analyzed: 24-Apr-13						
Selenium	ND	1.0	mg/kg							
Antimony	ND	1.0	"							
Chromium	ND	0.2	"							
Arsenic	ND	0.2	"							
Nickel	ND	0.5	"							
Cadmium	ND	0.2	"							
LCS (AD32405-BS1)				Prepared & Analyzed: 24-Apr-13						
Antimony	2.44	1.0	mg/kg	2.50		97.7	85-115			
Selenium	2.63	1.0	"	2.50		105	85-115			
Nickel	2.44	0.5	"	2.50		97.7	85-115			
Cadmium	2.48	0.2	"	2.50		99.1	85-115			
Chromium	2.34	0.2	"	2.50		93.6	85-115			
Arsenic	2.49	0.2	"	2.50		99.7	85-115			
LCS Dup (AD32405-BSD1)				Prepared & Analyzed: 24-Apr-13						
Selenium	2.62	1.0	mg/kg	2.50		105	85-115	0.190	20	
Arsenic	2.48	0.2	"	2.50		99.1	85-115	0.624	20	
Cadmium	2.46	0.2	"	2.50		98.5	85-115	0.628	20	
Nickel	2.40	0.5	"	2.50		96.0	85-115	1.78	20	
Antimony	2.43	1.0	"	2.50		97.1	85-115	0.637	20	
Chromium	2.33	0.2	"	2.50		93.1	85-115	0.536	20	
Duplicate (AD32405-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Antimony	ND	1.0	mg/kg		0.135				20	
Cadmium	0.115	0.2	"		0.115			0.00	20	
Chromium	5.64	0.2	"		5.66			0.354	20	
Nickel	4.04	0.5	"		3.93			2.64	20	

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Metals by SM 3500 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32405 - EPA 3050B										
Duplicate (AD32405-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Arsenic	5.20	0.2	"		5.20			0.0961	20	
Selenium	ND	1.0	"		ND				20	
Matrix Spike (AD32405-MS1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Nickel	27.0	0.5	mg/kg	25.0	3.93	92.3	80-120			
Antimony	24.1	1.0	"	25.0	0.135	96.0	80-120			
Cadmium	24.8	0.2	"	25.0	0.115	98.6	80-120			
Selenium	25.0	1.0	"	25.0	ND	100	80-120			
Arsenic	28.8	0.2	"	25.0	5.20	94.2	80-120			
Chromium	28.4	0.2	"	25.0	5.66	91.1	80-120			
Matrix Spike Dup (AD32405-MSD1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Chromium	28.3	0.2	mg/kg	25.0	5.66	90.6	80-120	0.405	20	
Selenium	25.2	1.0	"	25.0	ND	101	80-120	0.836	20	
Cadmium	24.6	0.2	"	25.0	0.115	97.9	80-120	0.709	20	
Antimony	24.2	1.0	"	25.0	0.135	96.3	80-120	0.352	20	
Arsenic	28.6	0.2	"	25.0	5.20	93.8	80-120	0.418	20	
Nickel	26.8	0.5	"	25.0	3.93	91.4	80-120	0.818	20	

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

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4225 Executive Square, Suite 1600
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Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32401 - Solvent Extraction										
Blank (AD32401-BLK1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Chlorpyrifos	ND	1.0	ug/l							
Diazinon	ND	0.2	"							
Malathion	ND	1.0	"							
LCS (AD32401-BS1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*4.68*		*ug/l*	*10.0*		*46.8*	*30-120*			
Malathion	4.10	1.0	"	5.00		81.9	50-130			
LCS Dup (AD32401-BSD1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*5.50*		*ug/l*	*10.0*		*55.0*	*30-120*			
Malathion	4.46	1.0	"	5.00		89.1	50-130	8.42	30	
Matrix Spike (AD32401-MS1)		**Source: 1304001-17**		Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*4.71*		*ug/l*	*10.0*		*47.1*	*30-120*			
Malathion	4.11	1.0	"	5.00	ND	82.2	50-130			
Matrix Spike Dup (AD32401-MSD1)		**Source: 1304001-17**		Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*4.96*		*ug/l*	*10.0*		*49.6*	*30-120*			
Malathion	4.21	1.0	"	5.00	ND	84.2	50-130	2.40	40	
Batch AD32402 - Solvent Extraction										
Blank (AD32402-BLK1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*1090*		*ug/kg*	*2000*		*54.4*	*30-120*			
Chlorpyrifos	ND	50.0	"							
Diazinon	ND	50.0	"							
Malathion	ND	50.0	"							

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

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Report Date: 25-Apr-13 19:13
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Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32402 - Solvent Extraction										
LCS (AD32402-BS1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*918*		*ug/kg*	*2000*		*45.9*	*30-120*			
Malathion	836	50.0	"	1000		83.6	60-130			
LCS Dup (AD32402-BSD1)				Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*1060*		*ug/kg*	*2000*		*53.0*	*30-120*			
Malathion	877	50.0	"	1000		87.7	60-130	4.79	30	
Matrix Spike (AD32402-MS1)		**Source: 1304001-18**		Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*866*		*ug/kg*	*2000*		*43.3*	*30-120*			
Malathion	766	50.0	"	1000	ND	76.6	40-130			
Matrix Spike Dup (AD32402-MSD1)		**Source: 1304001-18**		Prepared: 24-Apr-13 Analyzed: 25-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	*821*		*ug/kg*	*2000*		*41.0*	*30-120*			
Malathion	716	50.0	"	1000	ND	71.6	40-130	6.75	40	

Respectfully Submitted,

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Project/P.O.#: City of San Diego O&M IWQA

General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32403 - General Preparation										
Blank (AD32403-BLK1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	ND	0.5	mg/kg							
LCS (AD32403-BS1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	38	0.5	mg/kg	33.3		114	80-120			
LCS Dup (AD32403-BSD1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	35	0.5	mg/kg	33.3		105	80-120	8.22	20	
Duplicate (AD32403-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	100	0.5	mg/kg		100			0.643	20	
Matrix Spike (AD32403-MS1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	130	0.5	mg/kg	33.3	100	86.0	75-125			
Matrix Spike Dup (AD32403-MSD1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	130	0.5	mg/kg	33.3	100	93.0	75-125	1.75	35	
Batch AD32410 - General Preparation										
Blank (AD32410-BLK1)				Prepared & Analyzed: 24-Apr-13						
% Solids	0.00		%							
Duplicate (AD32410-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
% Solids	70.3		%		70.9			0.850	15	
Batch AD32413 - General Preparation										
Blank (AD32413-BLK1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Dissolved as P	ND	0.03	mg/l							
Phosphorus, Total as P	ND	0.03	"							

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General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32413 - General Preparation										
LCS (AD32413-BS1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	0.5000	0.03	mg/l	0.500		100	80-120			
Phosphorus, Dissolved as P	0.5000	0.03	"	0.500		100	80-120			
LCS Dup (AD32413-BSD1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Dissolved as P	0.4970	0.03	mg/l	0.500		99.4	80-120	0.602	20	
Phosphorus, Total as P	0.4970	0.03	"	0.500		99.4	80-120	0.602	20	
Duplicate (AD32413-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	ND	0.03	mg/l		ND				20	
Phosphorus, Dissolved as P	ND	0.03	"		ND				20	
Matrix Spike (AD32413-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	0.4010	0.03	mg/l	0.500	ND	80.2	80-120			
Phosphorus, Dissolved as P	0.5570	0.03	"	0.500	ND	111	80-120			
Matrix Spike Dup (AD32413-MSD1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	0.4050	0.03	mg/l	0.500	ND	81.0	80-120	0.993	20	
Phosphorus, Dissolved as P	0.4960	0.03	"	0.500	ND	99.2	80-120	11.6	20	
Batch AD32414 - General Preparation										
Blank (AD32414-BLK1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	ND	0.5	mg/kg							
LCS (AD32414-BS1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	16.8	0.5	mg/kg	16.7		101	75-125			

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32414 - General Preparation										
LCS Dup (AD32414-BSD1)				Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	16.3	0.5	mg/kg	16.7		98.0	75-125	2.82	20	
Duplicate (AD32414-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	177	0.5	mg/kg		171			3.45	20	
Matrix Spike (AD32414-MS1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Phosphorus, Total as P	330	0.5	mg/kg	167	171	95.6	75-125			
Batch AD32421 - General Preparation										
Blank (AD32421-BLK1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	ND	0.10	mg/l							
LCS (AD32421-BS1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	1.15	0.10	mg/l	1.00		115	80-120			
LCS Dup (AD32421-BSD1)				Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	1.15	0.10	mg/l	1.00		115	80-120	0.00	20	
Duplicate (AD32421-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	0.21	0.10	mg/l		0.20			3.39	20	
Matrix Spike (AD32421-MS1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	1.40	0.10	mg/l	1.00	0.20	120	80-120			
Matrix Spike Dup (AD32421-MSD1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Total Kjeldahl Nitrogen	1.36	0.10	mg/l	1.00	0.20	116	80-120	2.90	20	

Respectfully Submitted,

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Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32422 - General Preparation										
Blank (AD32422-BLK1)				Prepared & Analyzed: 24-Apr-13						
Total Hardness	ND	2	mg/l							
LCS (AD32422-BS1)				Prepared & Analyzed: 24-Apr-13						
Total Hardness	260	2	mg/l	250		104	80-120			
Duplicate (AD32422-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Total Hardness	1280	2	mg/l		1290			0.311	20	

Respectfully Submitted,

Pat Brueckner 4/25/2013
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Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

General Physical Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32411 - General Preparation										
Blank (AD32411-BLK1)				Prepared & Analyzed: 24-Apr-13						
Total Dissolved Solids	ND	1	mg/l							
LCS (AD32411-BS1)				Prepared & Analyzed: 24-Apr-13						
Total Dissolved Solids	932	1	mg/l	989		94.2	85-115			
Duplicate (AD32411-DUP1)		**Source: 1304271-01**		Prepared & Analyzed: 24-Apr-13						
Total Dissolved Solids	532	1	mg/l		512			3.83	15	
Batch AD32412 - General Preparation										
Blank (AD32412-BLK1)				Prepared & Analyzed: 24-Apr-13						
Total Suspended Solids	ND	1	mg/l							
LCS (AD32412-BS1)				Prepared & Analyzed: 24-Apr-13						
Total Suspended Solids	862	1	mg/l	803		107	85-115			
Duplicate (AD32412-DUP1)		**Source: 1304275-01**		Prepared & Analyzed: 24-Apr-13						
Total Suspended Solids	7.60	1	mg/l		7.60			0.00	15	

Respectfully Submitted,

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La Jolla CA, 92037

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Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Anions by EPA Method 300.0 - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32415 - General Preparation										
Blank (AD32415-BLK1)				Prepared & Analyzed: 24-Apr-13						
Nitrate as N	ND	0.5	mg/kg							
Nitrite as N	ND	0.5	"							
LCS (AD32415-BS1)				Prepared & Analyzed: 24-Apr-13						
Nitrate as N	17.7	0.5	mg/kg	16.7		106	80-120			
Nitrite as N	16.6	0.5	"	16.7		99.8	85-115			
LCS Dup (AD32415-BSD1)				Prepared & Analyzed: 24-Apr-13						
Nitrite as N	16.7	0.5	mg/kg	16.7		100	85-115	0.200	20	
Nitrate as N	18.0	0.5	"	16.7		108	80-120	1.68	20	
Duplicate (AD32415-DUP1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Nitrite as N	ND	0.5	mg/kg		ND				20	
Nitrate as N	0.690	0.5	"		ND				20	
Matrix Spike (AD32415-MS1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Nitrate as N	18.5	0.5	mg/kg	16.7	ND	111	75-125			
Nitrite as N	16.5	0.5	"	16.7	ND	98.8	85-115			
Matrix Spike Dup (AD32415-MSD1)		**Source: 1304275-03**		Prepared & Analyzed: 24-Apr-13						
Nitrite as N	16.7	0.5	mg/kg	16.7	ND	100	85-115	1.21	20	
Nitrate as N	18.7	0.5	"	16.7	ND	112	75-125	0.717	20	
Batch AD32416 - General Preparation										
Blank (AD32416-BLK1)				Prepared & Analyzed: 24-Apr-13						
Nitrite as N	ND	0.10	mg/l							
Nitrate as N	ND	0.10	"							

Respectfully Submitted,

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4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Anions by EPA Method 300.0 - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32416 - General Preparation										
LCS (AD32416-BS1)				Prepared & Analyzed: 24-Apr-13						
Nitrate as N	0.525	0.10	mg/l	0.500		105	80-120			
Nitrite as N	0.495	0.10	"	0.500		99.0	80-120			
LCS Dup (AD32416-BSD1)				Prepared & Analyzed: 24-Apr-13						
Nitrite as N	0.472	0.10	mg/l	0.500		94.4	80-120	4.76	20	
Nitrate as N	0.507	0.10	"	0.500		101	80-120	3.49	20	
Duplicate (AD32416-DUP1)		**Source: 1304271-01**		Prepared & Analyzed: 24-Apr-13						
Nitrate as N	ND	0.10	mg/l		ND				20	
Nitrite as N	ND	0.10	"		ND				20	
Matrix Spike (AD32416-MS1)		**Source: 1304271-01**		Prepared & Analyzed: 24-Apr-13						
Nitrite as N	0.498	0.10	mg/l	0.500	ND	99.6	80-120			
Nitrate as N	0.542	0.10	"	0.500	ND	108	80-120			
Matrix Spike Dup (AD32416-MSD1)		**Source: 1304271-01**		Prepared & Analyzed: 24-Apr-13						
Nitrate as N	0.532	0.10	mg/l	0.500	ND	106	80-120	1.86	20	
Nitrite as N	0.488	0.10	"	0.500	ND	97.6	80-120	2.03	20	

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

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Customer: **URS Corporation (San Diego) - Vendor # 112052**
4225 Executive Square, Suite 1600
La Jolla CA, 92037

Attention: Bryn Evans
Report Date: 25-Apr-13 19:13
Subject: Murphy Canyon 7165

Project/P.O.#: City of San Diego O&M IWQA

Notes and Definitions

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis

Respectfully Submitted,

Pat Brueckner 4/25/2013
Laboratory Director

GEOCON WEST, INC.

Project Name:	Pat-Chem Labs	**Sampled By:**	Client	**Date:**	4/24/13
Project No.:	A8798-06-01	**Set Up By:**	CC	**Date:**	4/27/13
Location:	-	**Tested By:**	CC	**Date:**	4/29/13
Sample #	2	**Depth:**	-	**Engineer/ Geologist:**	NDB
Soil Description:	R-3				

Total Wet Weight in Use with Tare	522.30
Total Dry Weight in Use with Tare	374.67
Moisture Content	39.40%
Container Number	Pan 14
Container Weight	0
Dry Weight After 200 Washed with Tare	374.67
Total Dry Weight of Sample	374.67

U.S. SIEVE SIZE	**CUMULATIVE WEIGHT RETAINED**			
	Accumulative	**Wegiht**	**% Retained**	**% Passing**
2"			0.00%	100.00%
1½"			0.00%	100.00%
1"			0.00%	100.00%
¾"			0.00%	100.00%
½"	2.9		0.77%	99.23%
⅜"	2.9		0.77%	99.23%
No. 4	2.9		0.77%	99.23%
No. 10	3.2		0.85%	99.15%
No. 20	3.6		0.96%	99.04%
No. 40	6.7		1.79%	98.21%
No. 100	262.3		70.01%	29.99%
No. 200	346.1		92.39%	7.61%
Pan	374.7		100.00%	0.00%

Percent Loss: 0.00%

GEOCON WEST, INC.

Project Name:	Pat-Chem Labs	**Sampled By:**	Client	**Date:**	4/24/13
Project No.:	A8798-06-01	**Set Up By:**	CC	**Date:**	4/27/13
Location:	-	**Tested By:**	CC	**Date:**	4/29/13
Sample #	3	**Depth:**	-	**Engineer/ Geologist:**	NDB
Soil Description:	R-7				

Total Wet Weight in Use with Tare	155.60
Total Dry Weight in Use with Tare	109.64
Moisture Content	41.92%
Container Number	Pan 15
Container Weight	0
Dry Weight After 200 Washed with Tare	109.64
Total Dry Weight of Sample	109.64

U.S. SIEVE SIZE	**CUMULATIVE WEIGHT RETAINED**			
	Accumulative	**Wegiht**	**% Retained**	**% Passing**
2"			0.00%	100.00%
1½"			0.00%	100.00%
1"			0.00%	100.00%
¾"			0.00%	100.00%
½"			0.00%	100.00%
⅜"			0.00%	100.00%
No. 4	0.2		0.16%	99.84%
No. 10	1.1		1.02%	98.98%
No. 20	4.9		4.51%	95.49%
No. 40	11.9		10.81%	89.19%
No. 100	53.1		48.40%	51.60%
No. 200	100.3		91.44%	8.56%
Pan	109.6		100.00%	0.00%

Percent Loss: 0.00%

Nautilus Environmental

Toxicity Test Results
Sorrento Water Quality Project

April 23, 2013 Sampling Event

Prepared for: **URS Corporation**
4225 Executive Square, Suite 1600
La Jolla, CA 92037

Prepared by: **Nautilus Environmental**

Submitted: **May 15, 2013**

Data Quality Assurance:

- Nautilus Environmental is a certified laboratory under the State of California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP), Certificate No. 1802.
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All test results have met internal Quality Assurance Program requirements.

Results verified by: _____

California
4340 Vandever Ave
San Diego, California 92120
858.587.7333
fax: 858.587.3961

British Columbia
8664 Commerce Court
Burnaby, British Columbia
V5A 4N7
604.420.8773
fax: 604.603.9381

Introduction

Water and sediment samples were collected from the Sorrento Water Quality project site on April 23, 2013. Samples were collected from locations both upstream and downstream of the project site. After the samples were collected, it was determined that the upstream site would be the focus of this study. The upstream water sample was tested, and the downstream water sample was not included in the analysis. The upstream sediment sample, however, was not testable (see Quality Assurance section for additional information). The downstream sediment sample was therefore tested as a substitute. Sample information is summarized in Table 1.

Chronic toxicity tests with the water sample were conducted using the green algae *Selenastrum capricornutum* (*Selenastrum*) and water flea *Ceriodaphnia dubia* (*Ceriodaphnia*). Solid-phase testing with the sediment sample was conducted using the freshwater amphipod *Hyalella azteca* (*Hyalella*). Testing was performed at Nautilus Environmental (Nautilus), located in San Diego, California from April 24 to May 6, 2013.

Materials and Methods

The water samples were collected into low-density polyethylene (LDPE) cubitainers, and the sediment samples were collected into plastic bags. Collection was performed by URS Corporation (URS) personnel and the samples were delivered to Nautilus on the same day as collection. Appropriate chain-of-custody (COC) procedures were employed during collection and transport. Upon arrival at Nautilus, coolers were opened, samples inspected, and the contents verified against information provided on the COC forms. Receipt temperatures were measured and recorded on the COC form for each sample. The samples were stored at 4°C in the dark until used for testing. Sample receipt information is provided in Table 1.

Testing was conducted in accordance with methods published in USEPA (2000a and 2002). Test specifications are summarized in Tables 2 through 4.

Table 1. Sample Information

Client:	URS Corporation
Project:	Sorrento Water Quality
Sample IDs:	1) R-3-U-TOX (upstream water sample) 2) R-3-D-TOX (downstream water sample)[a] 3) R-3-U-TOX-S (upstream sediment sample)[b] 4) R-3-D-TOX-S (downstream sediment sample)
Sample Collection Date, Time:	1) R-3-U-TOX: 4/23/13, 09:00 2) R-3-D-TOX: 4/23/13, 08:00 3) R-3-U-TOX-S: 4/23/13, 09:00 4) R-3-D-TOX-S : 4/23/13, 08:00
Sample Receipt Date, Time:	4/23/13, 15:10 (all samples)
Sample Material:	Ambient stream water and streambed sediment.

[a] Sample not included in study and therefore not tested.
[b] Not tested due to sample characteristics. See Quality Assurance section.

Table 2. ***Selenastrum*** **Chronic Toxicity Test Specifications**

Test Period:	4/24/13 - 4/28/13
Test Organism:	*Selenastrum capricornutum* (green algae)
Test Organism Source/ Age:	In-house culture/ 6 days
Dilution/ Control Water:	Nutrient-enriched EPA diluted mineral water, 8:2 (8 parts Nanopure, 2 parts Perrier®)
Test Concentrations:	100[a], 50, 25, 12.5, and 6.25 percent sample, plus lab control[b]
Protocol Used:	EPA/821/R-02-013 (US EPA 2002b)
Acceptability Criteria:	Mean control density of ≥ 1 x 10^6 cells/ml ≤ 20% variability among control replicates (CV) MSD for density ≤ 29%
Statistical Analysis Software:	CETIS™, version 1.8.4.23

[a] Sample was 0.45-µm filtered prior to preparation of the dilution series to ensure that any native algae present in the sample could not compete with the *Selenastrum* for nutrients; an unfiltered and undiluted sample was tested concurrently for comparison purposes.
[b] Macro- and micronutrient solutions were added to sample and dilution waters to ensure any observed decreases in algal growth were due to toxic constituents present in the sample rather than nutrient deficiency.
Note: Filtered and unfiltered 100 percent sample blanks (not inoculated with *Selenastrum*) were also tested to determine if native algae or particulate material present in the samples might be competing for nutrients, light, and/or space.

Table 3. ***Ceriodaphnia*** **Chronic Toxicity Test Specifications**

Test Period:	4/24/13 - 5/1/13
Test Organism:	*Ceriodaphnia dubia* (water flea)
Test Organism Source/ Age:	In-house culture/ < 8 hours
Dilution/ Control Water:	8:2 diluted mineral water
Additional Control:	Conductivity Control (8:2 with seawater added to match conductivity of sample).
Test Concentrations:	100, 50, 25, 12.5, and 6.25 percent sample, plus lab and conductivity controls
Protocol Used:	EPA/821/R-02-013 (US EPA 2002b)
Acceptability Criteria:	Mean control survival ≥ 80% ≥ 60% of surviving females produce 3 or more broods Mean number of offspring ≥ 15 per surviving female MSD for reproduction ≤ 47%
Statistical Analysis Software:	CETIS™, version 1.8.4.23

Table 4. Solid Phase Amphipod Toxicity Test Specifications

Test Period:	4/26/13 - 5/6/13
Test Organism:	*Hyalella azteca* (amphipod)
Test Organism Source/ Age:	Aquatic Indicators; St. Augustine, FL/ 14 days
Overlying Water:	Activated carbon filtered water
Overlying Water Renewal:	50 percent of volume twice daily
Control Sediment:	Beach sand collected from San Diego, CA, and cleaned with deionized water
Test Concentrations:	Undiluted sediment; 2cm in 500mL overlying water
Aeration:	Continuous (2-3 bubbles per second)
Sample Manipulation:	Samples were sieved through a 1mm Nitex® mesh screen to remove native organisms and large debris that may interfere with the survival and recovery of test organisms
Protocol Used:	EPA 600/R-99/064 (USEPA 2000a)
Test Acceptability Criteria:	≥ 80 percent mean survival in controls and measureable growth in control replicates.
Statistical Analysis Software:	GraphPad Prism, v. 4.02

Results

Raw data and statistical analyses for each test species are presented in full in Appendix A. Sample information and water quality measurements upon receipt are in Appendix B, and a copy of the chain-of-custody form can be found in Appendix C.

Water Sample

Results for the chronic bioassays are presented in Tables 5 and 6. The R-3-U-TOX sample had an effect on Selenastrum growth, with a statistically significant reduction observed in the 100 percent concentration. Effects were also observed in the 100 percent unfiltered concentration.

The R-3-U-TOX sample also had an effect on Ceriodaphnia reproduction, with a statistically significant reduction observed in the 100 percent concentration. The conductivity control also resulted in a statistically significant reduction in reproduction, indicating that the effects observed in the sample may be due to high conductivity. No effects were observed to Ceriodaphnia survival.

Table 5. Summary of Statistical Results for Chronic Testing – R-3-U-TOX

Test Species & Endpoint	NOEC (% sample)	EC_{50} (% sample)	TU_c value (chronic toxic units)
Selenastrum Growth	50	> 100	2.0
Ceriodaphnia Survival	100	> 100	1.0
Reproduction	50	91.1	2.0

NOEC = the highest concentration tested that results in No Observed Effect.
EC_{50} = Concentration expected to cause a 50% adverse effect to the test organisms.
TU_c value (Chronic toxic unit) = 100 ÷ NOEC. Note: a TU of 1.0 means no toxicity was observed.

Table 6. Summary of Chronic Toxicity Test Data – R-3-U-TOX

Test Concentration (% sample)	***Selenastrum*** Mean Cell Density (10^6 cells/ml)	***Ceriodaphnia***	
		Mean Survival (%)	Mean Reproduction (neonates/org.)
Lab Control	3.14	100	30.3
Conductivity Control	-	80	**12.6***
6.25	3.25	100	30.8
12.5	3.15	90	28.0
25	3.21	100	34.0
50	3.15	100	25.9
100	**2.56***	100	**13.1***
100 unfiltered	**1.60***	-	-

***bold asterisk** indicates a statistically significant reduction from the lab control.

Sediment Sample

Results of solid-phase testing with Hyalella are provided in Table 7 and Figures 1 and 2. The R-3-D-TOX-S sample did not have any effects on Hyalella survival or growth.

Table 7. Summary of 10-Day Hyalella Survival and Growth Results – R-3-D-TOX-S

Site	Mean Survival (%)	p value	Survival Statistically Reduced from Control[a]	Mean Growth (mg/org)	p value	Growth Statistically Reduced from Control[a]
Lab Control	100	-	-	0.288		-
R-3-D-TOX-S	100	N/A	No	0.290	N/A	No

[a] Student's one-tailed t-test, $p \leq 0.05$. Statistics for survival endpoint performed on arcsin-square root transformed data.
NA - Not applicable, mean survival equals or exceeds that in the lab control.

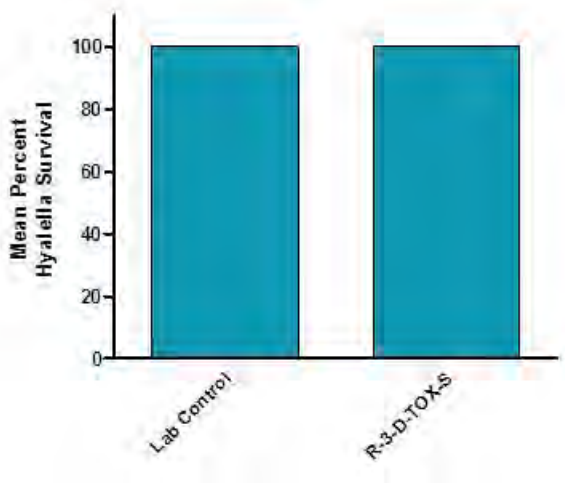


Figure 1. Summary of 10-Day *Hyalella* Survival (± 95% Confidence Interval; n=5).

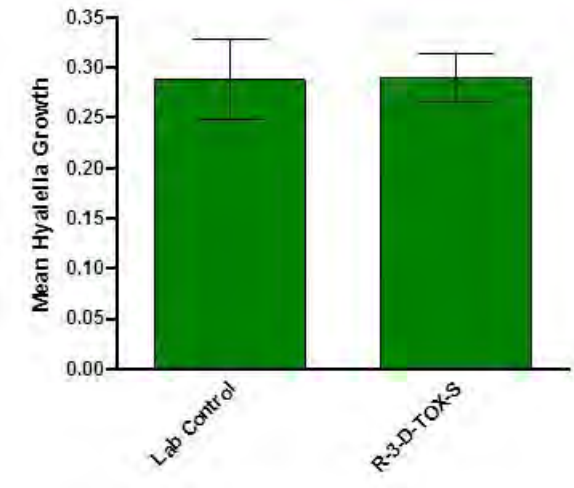


Figure 2. Summary of 10-Day *Hyalella* Growth (± 95% Confidence Interval; n=5).

Quality Assurance

Water Sample

The samples were received within appropriate temperature range, and the tests were initiated within the required 36-hour holding time. The toxicity tests met acceptability criteria for performance of control organisms. Statistical analysis followed standard USEPA flowchart selections and the dose-response relationships were reviewed to ensure the validity of the data. Based on the dose responses observed during testing, the calculated effect concentrations for the tests reported are deemed reliable.

Percent minimum significance difference (PMSD) values are calculated as a measure of test variability. The PMSD value for Ceriodaphnia reproduction was within the appropriate range. The PMSD value for Selenastrum growth was 7.2, which is below the acceptable range of 9.1 to 29, indicating statistics may be over-sensitive in detecting a response due to low variability. The percent difference between the control and the low observed effect concentration (LOEC) was 18.4, which is above the lower bound limit. The calculated NOEC and LOEC were therefore deemed accurate according to EPA (2000b).

Minor deviations in temperature from the recommended protocol range of 25 ± 1°C occurred at 24 and 48 hours during the Selenastrum test. Corrective actions were taken, and no negative impacts on test results were observed.

The unfiltered blank of the green algae test, which was not inoculated with Selenastrum, showed a measurable value on the flourometer, indicating the possible presence of native algae in the sample. Manual microscope counts were performed on the unfiltered sample replicates to determine the actual density of Selenastrum, while accounting for the presence of any native algae; microscope counts are reported herein.

Sediment Sample

The sample R-3-U-TOX-S was collected by URS and delivered to the Nautilus laboratory. However, the sample consisted almost entirely of river rock and contained very little sediment. The *Hyalella* protocol calls for sieving sediment samples in order remove native organisms and large debris that may interfere with the survival and recovery of test organisms. For this round of testing samples were sieved through a 1mm screen. The R-3-U-TOX-S sample did not contain a sufficient amount of sediment to perform the test after sieving; therefore, this sample was not tested.

The laboratory control met all test acceptability criteria and water quality measurements were within recommended ranges.

Ammonia is a potential confounding factor in sediment tests. The sample porewater ammonia concentration was 1.0 mg/L upon sample receipt, and overlying water ammonia concentrations for the sample were <0.5 mg/L at test initiation and termination. These values are extremely low and well below levels at which effects to Hyalella have been observed (USEPA 2000a). Additionally, no effects were observed in the test, therefore ammonia is not a factor.

A list of qualifier codes used to indicate QA issues and minor deviations on datasheets is provided in Appendix D.

References

GraphPad Software Inc. 1992-2004. GraphPad Prism, Version 4.02.

Tidepool Scientific Software. 2001-2002. CETIS Comprehensive Toxicity Data Analysis and Database Software, Version 1.8.4.23.

USEPA. 2000a. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. EPA/600/R-99/064. US EPA Office of Water, Washington, DC.

USEPA. 2000b. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System. United States Environmental Protection Agency Office of Wastewater Management (EPA-833-R-00-003).

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition (EPA-821-R-02-013). US EPA Office of Water, Washington DC.

Appendix A

Raw Data and Statistical Summaries

Selenastrum capricornutum

CETIS Summary Report

Selenastrum Growth Test — Nautilus Environmental (CA)

Batch ID:	02-9465-6565	Test Type:	Cell Growth	Analyst:	
Start Date:	24 Apr-13 13:15	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Nutrient Enriched 8:2
Ending Date:	28 Apr-13 13:10	Species:	Selenastrum capricornutum	Brine:	Not Applicable
Duration:	96h	Source:	In-House Culture	Age:	6d

Sample ID:	10-5435-0900	Code:	13-0423	Client:	URS Corp
Sample Date:	23 Apr-13 09:00	Material:	Ambient Water	Project:	
Receive Date:	23 Apr-13 15:10	Source:	URS		
Sample Age:	28h (20.5 °C)	Station:	Upstream (R3-U-TOX)		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-3812-3071	Cell Density	50	100	70.71	7.23%	2	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-6422-0947	Cell Density	IC25	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC50	>100	N/A	N/A	<1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-6422-0947	Cell Density	Control CV	0.04057	NL - 0.2	Yes	Passes Acceptability Criteria
13-3812-3071	Cell Density	Control CV	0.04057	NL - 0.2	Yes	Passes Acceptability Criteria
07-6422-0947	Cell Density	Control Resp	3.14E+6	1.00E+6 - NL	Yes	Passes Acceptability Criteria
13-3812-3071	Cell Density	Control Resp	3.14E+6	1.00E+6 - NL	Yes	Passes Acceptability Criteria
13-3812-3071	Cell Density	PMSD	0.07231	0.091 - 0.29	Yes	Below Acceptability Criteria Q1a

Cell Density Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Control	4	3.141E+6	3.093E+6	3.189E+6	2.965E+6	3.247E+6	6.371E+4	1.274E+5	4.06%	0.0%
6.25		4	3.249E+6	3.202E+6	3.296E+6	3.069E+6	3.362E+6	6.287E+4	1.257E+5	3.87%	-3.44%
12.5		4	3.152E+6	3.098E+6	3.207E+6	2.966E+6	3.315E+6	7.314E+4	1.463E+5	4.64%	-0.36%
25		4	3.211E+6	3.148E+6	3.275E+6	2.960E+6	3.329E+6	8.532E+4	1.706E+5	5.31%	-2.24%
50		4	3.148E+6	3.105E+6	3.191E+6	2.979E+6	3.241E+6	5.791E+4	1.158E+5	3.68%	-0.21%
100		4	2.563E+6	2.524E+6	2.602E+6	2.428E+6	2.657E+6	5.213E+4	1.043E+5	4.07%	18.4%
~~101~~ 100/unfiltered		4	1.600E+6	1.547E+6	1.653E+6	1.390E+6	1.690E+6	7.083E+4	1.417E+5	8.85%	49.06%

Cell Density Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Control	3.247E+6	3.221E+6	2.965E+6	3.131E+6
6.25		3.286E+6	3.279E+6	3.362E+6	3.069E+6
12.5		2.966E+6	3.315E+6	3.201E+6	3.127E+6
25		3.251E+6	3.329E+6	2.960E+6	3.305E+6
50		3.196E+6	3.175E+6	3.241E+6	2.979E+6
100		2.657E+6	2.428E+6	2.535E+6	2.632E+6
~~101~~ 100/unfiltered		1.680E+6	1.640E+6	1.390E+6	1.690E+6

Q1a. the percent difference between the control and the LOEC is above the lower bound PMSD limit and therefore significant according to EPA 2000.

CETIS Analytical Report

Test Code: 1304-S043 | 08-7820-2341

Selenastrum Growth Test — Nautilus Environmental (CA)

Analysis ID: 13-3812-3071 Endpoint: Cell Density CETIS Version: CETISv1.8.4
Analyzed: 13 May-13 9:05 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	NA	C > T	NA	NA	50	100	70.71	2	7.23%

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Control		6.25	23	10	0	6	0.9966	Asymp	Non-Significant Effect
		12.5	18	10	0	6	0.8333	Asymp	Non-Significant Effect
		25	22	10	0	6	0.9908	Asymp	Non-Significant Effect
		50	18	10	0	6	0.8333	Asymp	Non-Significant Effect
		100*	10	10	0	6	0.0417	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.306265E+12	2.612531E+11	5	14.67	<0.0001	Significant Effect
Error	3.205502E+11	17808350000	18			
Total	1.626816E+12		23			

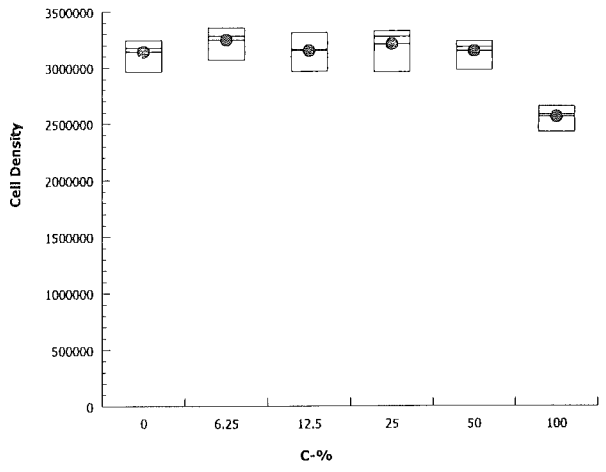
Distributional Tests

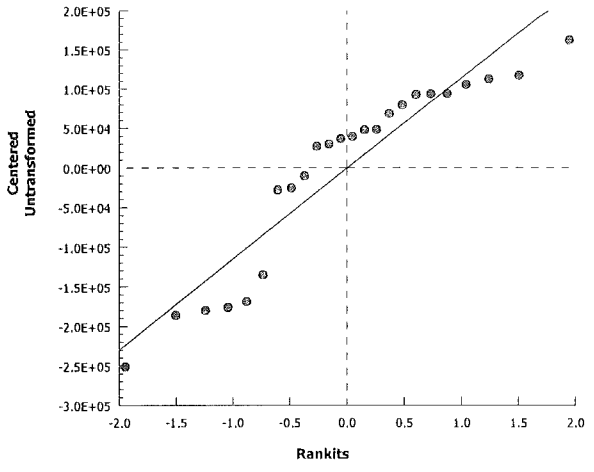
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	0.8312	15.09	0.9750	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8796	0.884	0.0082	Non-normal Distribution

Cell Density Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	4	3.141E+6	2.938E+6	3.344E+6	3176000	2.965E+6	3.247E+6	6.371E+4	4.06%	0.0%
6.25		4	3.249E+6	3.049E+6	3.449E+6	3283000	3.069E+6	3.362E+6	6.287E+4	3.87%	-3.44%
12.5		4	3.152E+6	2.919E+6	3.385E+6	3164000	2.966E+6	3.315E+6	7.314E+4	4.64%	-0.36%
25		4	3.211E+6	2.940E+6	3.483E+6	3278000	2.960E+6	3.329E+6	8.532E+4	5.31%	-2.24%
50		4	3.148E+6	2.963E+6	3.332E+6	3186000	2.979E+6	3.241E+6	5.791E+4	3.68%	-0.21%
100		4	2.563E+6	2.397E+6	2.729E+6	2584000	2.428E+6	2.657E+6	5.213E+4	4.07%	18.4%

Graphics





Analyst: KPP QA: 5/13/13

CETIS Analytical Report

Selenastrum Growth Test — Nautilus Environmental (CA)

Analysis ID:	07-6422-0947	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.8.4
Analyzed:	13 May-13 9:05	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1134240	1000	Yes	Two-Point Interpolation

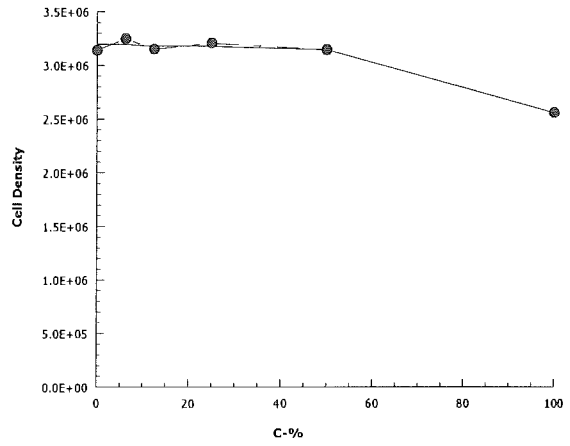
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Cell Density Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Control	4	3.141E+6	2.965E+6	3.247E+6	6.371E+4	1.274E+5	4.06%	0.0%
6.25		4	3.249E+6	3.069E+6	3.362E+6	6.287E+4	1.257E+5	3.87%	-3.44%
12.5		4	3.152E+6	2.966E+6	3.315E+6	7.314E+4	1.463E+5	4.64%	-0.36%
25		4	3.211E+6	2.960E+6	3.329E+6	8.532E+4	1.706E+5	5.31%	-2.24%
50		4	3.148E+6	2.979E+6	3.241E+6	5.791E+4	1.158E+5	3.68%	-0.21%
100		4	2.563E+6	2.428E+6	2.657E+6	5.213E+4	1.043E+5	4.07%	18.4%

Graphics



CETIS Analytical Report (Comparison of 100% unfiltered)

Report Date: 13 May-13 09:11 (p 1 of 1)
Test Code: 1304-S043 | 08-7820-2341

Selenastrum Growth Test — **Nautilus Environmental (CA)**

Analysis ID:	00-4872-0671	**Endpoint:**	Cell Density	**CETIS Version:**	CETISv1.8.4
Analyzed:	13 May-13 9:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result	PMSD
Untransformed	NA	C > T	NA	NA	Sample fails cell density endpoint	5.89%

Equal Variance t Two-Sample Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Control	KTP 101* 100% unfiltered		16.18	1.943	2E+05	6	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.749362E+12	4.749362E+12	1	261.6	<0.0001	Significant Effect
Error	1.08912E+11	18152000000	6			
Total	4.858274E+12		7			

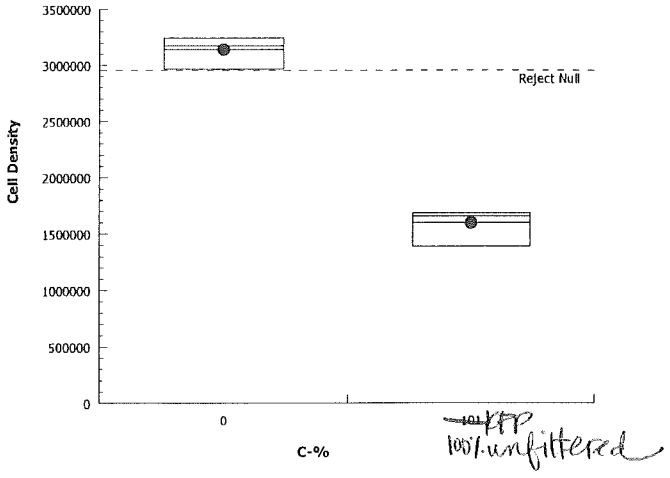
Distributional Tests

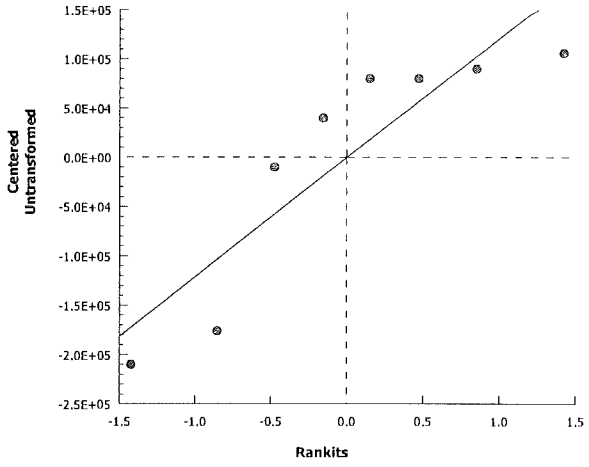
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.236	47.47	0.8659	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.7902	0.6451	0.0224	Normal Distribution

Cell Density Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	4	3.141E+6	2.938E+6	3.344E+6	3176000	2.965E+6	3.247E+6	6.371E+4	4.06%	0.0%
101		4	1.600E+6	1.375E+6	1.825E+6	1660000	1.390E+6	1.690E+6	7.083E+4	8.85%	49.06%

Graphics





Fluorometric & Microscopic Determination of Cell Density
Turner Fluorometer Model TD-700

Test Species: *S. capricornutum*

Client : URS Corporation

Start Date/Time: 4/24/2013 1315

Sample ID: Upstream

End Date/Time: 4/28/2013 1310

Test No: 1304-8043

Analyst: LN

Random Number	Cell Density (fluorometric) (cells/ml *10^5)	Dilution	Cell Density (microscopic) (cells/ml *10^4)
Blank		NA	
Cal Check 1 (NEW, Solid)	0.00, 3.61		
1	32.79		
2	30.69		
3	29.66		
4	29.79		
5	29.60		
6	32.01		
7	31.96		
8	31.27		
9	26.32		
10	26.57		
11	31.75		
12	32.47		
13	LN ~~19.28~~ 23.81		168
14	33.05		
Cal Check 2 (NEW, Solid)	0.00, 3.64		
15	29.65		
16	31.31		
17	24.28		
18	21.24		139
19	32.21		
20	32.51		
21	32.41		
22	33.29		
23	33.62		
24	33.15		
25	24.43		169
26	32.86		
27	21.99		164
28	29.35		
100% filtered blank	0.03		
100% unfiltered blank	4.70		

Comments: Microscope counts performed on 100% unfiltered replicates due to presence of native algae in unfiltered blank.

QC Check: [illegible] 5/10/13

Final Review: SS 5/13/13

CETIS Test Data Worksheet

Report Date: 23 Apr-13 15:36 (p 1 of 1)
Test Code: 1304-S043 ~~08-7820-2341/34584DE5~~ HTP

Selenastrum Growth Test				Nautilus Environmental (CA)
Start Date: 24 Apr-13	Species: Selenastrum capricornutum		Sample Code: ~~3ED81E34~~ HTP 13-0423	
End Date: 28 Apr-13	Protocol: EPA/821/R-02-013 (2002)		Sample Source: URS	
Sample Date: 23 Apr-13 ~~09:00~~ HTP	Material: ~~Effluent Sample~~ Ambient water		Sample Station: Upstream	

C-%	Code	Rep	Pos	Cell Density	Absorbance	Biomass	Chlorophyll a	Notes
0	LC	1	12					
0	LC	2	19					
0	LC	3	15					
0	LC	4	16					
6.25		1	26					
6.25		2	1					
6.25		3	23					
6.25		4	2					
12.5		1	3					
12.5		2	24					
12.5		3	6					
12.5		4	8					
25		1	20					
25		2	22					
25		3	5					
25		4	14					
50		1	7					
50		2	11					
50		3	21					
50		4	4					
100		1	10					
100		2	17					
100		3	28					
100		4	9					
101		1	13					
101		2	27					
101		3	18					
101		4	25					

100% unfilt.

QC: LN

Analyst: AG QA: 5/13/13

Freshwater Chronic Bioassay

Water Quality Measurements
Algal Growth Inhibition

Client : URS Corporation

Test Species: *S. capricornutum*

Sample ID: Upstream

Start Date/Time: 4/24/2013 1315

Sample Log No.: 13-0423

End Date/Time: 4/28/2013 1310

Dilutions made by: LN

Test No: 1304-S043

	Initial Readings				Final Readings	
Concentration (%)	D.O. (mg/L)	Conductivity (umhos-cm)	Alkalinity (mg/L)	Hardness (mg/L)	D.O. (mg/L)	Conductivity (umhos-cm)
LC	6.3	271	87	98	9.7	174
6.25	6.4	545	95	178	10.2	426
12.5	6.3	800	—	—	10.0	667
25	6.3	1282	129	396	9.9	1133
50	6.4	2220	—	—	10.2	2020
100 filt	6.6	3850	242	>1000	10.1	3610
100 unfilt	8.4	3890	237	>1000	9.4	3660

		0 Hour	24 Hour Q1	48 Hour Q1	72 Hour	96 Hour
pH/Temperature (°C):	LC	8.28/24.0	8.20/25.7	8.51/26.0	9.17/24.5	9.66/24.5
pH/Temperature (°C):	6.25	8.28/24.1	8.31/26.4	8.56/26.4	9.17/24.8	9.65/24.7
pH/Temperature (°C):	12.5	8.26/24.0	8.35/26.4	8.54/26.3	9.09/24.6	9.60/24.7
pH/Temperature (°C):	25	8.21/24.0	8.38/25.8	8.52/25.8	8.91/24.5	9.40/24.6
pH/Temperature (°C):	50	8.15/24.0	8.45/26.8	8.54/26.1	8.76/24.8	9.30/24.6
pH/Temperature (°C):	100 filt	8.07/24.0	8.51/26.3	8.50/26.3	8.53/24.6	9.03/24.6
pH/Temperature (°C):	100 unfilt	7.99/24.5	8.50/25.9	8.43/26.0	8.50/24.3	8.88/24.6
	Technician:	ML	LN	JF	JF	LN

Comments:

QC Check: KPP 5/10/13

Final Review: SO 5/13/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

Freshwater Chronic Bioassay **Algal Growth Inhibition Worksheet**

Client/Sample ID : URS Corporation **Test Species:** *S. capricornutum*

Test No: 1304-5043 **Start Date/Time:** 4/24/2013 1315

Analyst: LN **End Date/Time:** 4/28/2013 1310

Culture Used (circle one): (Nutrient Enriched DI Water (NEW)) / Very Hard Water (VHW)

Date Stock Culture Started: 4/18/13 Culture Age: 6d

Culture subsample inspected for algal cell health? LN (initials) bacteria/invasive algal species present? Y / (N)

Stock Cell Density Measurements:

2x 27.94 = 55.88

2x 27.64 = 55.28

2x 27.61 = 55.22

2x 27.53 = 55.06

2x 27.76 = 55.52

Mean: ~~27.70~~ 55.39 LN

(mean no. * 100,000)/(500,000) = x (dilution factor): 11.08

Prepare inoculum according to the dilution factor. This yields a solution with the desired cell density of 500,000 cells/ml.

dil. factor 11.08

-1.0 part Sele stock = 10 Sele

10.08 part(s) NEW = 100.8 NEW

Inoculate 1 ml into 3 initial count flasks containing 50 ml of NEW, stir and count on the hemacytometer. Flasks should contain a final density of 10,000 cells/ml ± 10%.

Inoculum Cell Density Confirmation Counts: 2, 0, 1 Mean: 1

Location in Environmental Chamber (All replicates in each test must be on the same shelf; do not split up tests among shelves):

Shelf Number	Measured Light Intensity Range (must be between 360 and 440 ft-c)	Random Number Range
1		
2		
3		
4		
5	389-427	1-28
6		

Are lights on 24 hour cycle? (Y) / N

Comments:

QC Check: VFP 5/10/13 Final Review: SD 5/13/13

Ceriodaphnia dubia

CETIS Summary Report

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental (CA)

Batch ID:	21-2315-3525	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	24 Apr-13 14:40	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Diluted Mineral Water (8:2)
Ending Date:	01 May-13 13:55	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 23h	**Source:**	In-House Culture	**Age:**	<8h

Sample ID:	01-2539-1927	**Code:**	13-0423	**Client:**	URS Corp
Sample Date:	23 Apr-13 09:00	**Material:**	~~Effluent Sample~~ Ambient water	**Project:**	
Receive Date:	23 Apr-13 15:10	**Source:**	URS		
Sample Age:	30h (20.5 °C)	**Station:**	Upstream (R3-U-TOX)		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
19-3283-3343	7d Survival Rate	100	>100	NA	NA	1	Fisher Exact Test
07-6190-9072	Reproduction	50	100	70.71	24.8%	2	Wilcoxon/Bonferroni Adj Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
18-5086-0552	Reproduction	IC25	61.03	46.8	68.9	1.639	Linear Interpolation (ICPIN)
		IC50	91.08	80.95	N/A	1.098	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
19-3283-3343	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
07-6190-9072	Reproduction	Control Resp	30.3	15 - NL	Yes	Passes Acceptability Criteria
18-5086-0552	Reproduction	Control Resp	30.3	15 - NL	Yes	Passes Acceptability Criteria
07-6190-9072	Reproduction	PMSD	0.2483	0.13 - 0.47	Yes	Passes Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Conductivity Co	10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	0.0%
0	Lab Control	10	1	1	1	1	1	0	0	0.0%	-25.0%
6.25		8	1	1	1	1	1	0	0	0.0%	-25.0%
12.5		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	-12.5%
25		10	1	1	1	1	1	0	0	0.0%	-25.0%
50		10	1	1	1	1	1	0	0	0.0%	-25.0%
100		10	1	1	1	1	1	0	0	0.0%	-25.0%

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Conductivity Co	10	12.6	9.586	15.61	0	20	2.553	8.072	64.06%	0.0%
0	Lab Control	10	30.3	28.55	32.05	22	39	1.484	4.692	15.48%	-140.5%
6.25		9	30.78	27.15	34.41	7	38	3.239	9.718	31.58%	-144.3%
12.5		10	28	24.27	31.73	4	37	3.162	10	35.71%	-122.2%
25		10	34	31.69	36.31	24	40	1.955	6.182	18.18%	-169.8%
50		10	25.9	24.18	27.62	18	32	1.456	4.606	17.78%	-105.6%
100		10	13.1	11.26	14.94	6	21	1.56	4.932	37.65%	-3.97%

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental (CA)

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Conductivity Co	1	1	1	1	1	0	0	1	1	1
0	Lab Control	1	1	1	1	1	1	1	1	1	1
6.25		1			1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	0	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Conductivity Co	7	19	8	17	19	0	0	19	20	17
0	Lab Control	39	34	29	33	30	27	29	33	22	27
6.25		26	31		37	38	7	33	32	35	38
12.5		18	37	34	32	36	31	27	32	4	29
25		29	38	40	40	24	35	39	30	39	26
50		18	29	30	27	20	30	32	24	23	26
100		13	19	15	11	17	7	10	12	21	6

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental (CA)**

Analysis ID:	19-3283-3343	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	11 May-13 16:51	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	100	>100	NA	1

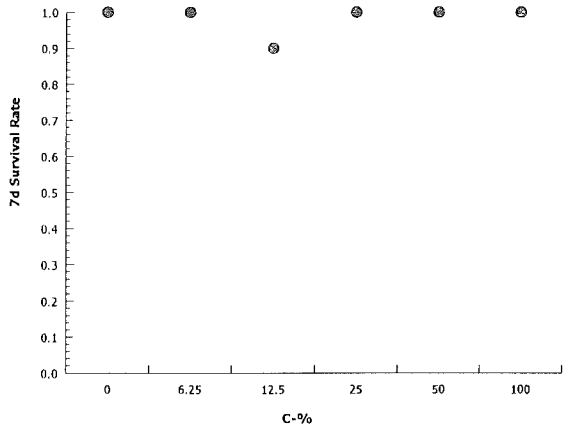
Fisher Exact Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Control		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	0.5	0.5000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	1	1.0000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Control	10	0	10	1	0	0.0%
6.25		8	0	8	1	0	0.0%
12.5		9	1	10	0.9	0.1	10.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

Graphics



CETIS Analytical Report

Test Code: 1304-S042 | 19-8354-2202

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental (CA)

Analysis ID: 07-6190-9072 | Endpoint: Reproduction | CETIS Version: CETISv1.8.4
Analyzed: 11 May-13 16:52 | Analysis: Nonparametric-Multiple Comparison | Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	NA	C > T	NA	NA	50	100	70.71	2	24.8%

Wilcoxon/Bonferroni Adj Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Control		6.25	101	NA	1	17	1.0000	Exact	Non-Significant Effect
		12.5	105.5	NA	3	18	1.0000	Exact	Non-Significant Effect
		25	123.5	NA	3	18	1.0000	Exact	Non-Significant Effect
		50	81	NA	3	18	0.1775	Exact	Non-Significant Effect
		100*	55	NA	0	18	<0.0001	Exact	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2681.392	536.2784	5	10.9	<0.0001	Significant Effect
Error	2607.456	49.19727	53			
Total	5288.848		58			

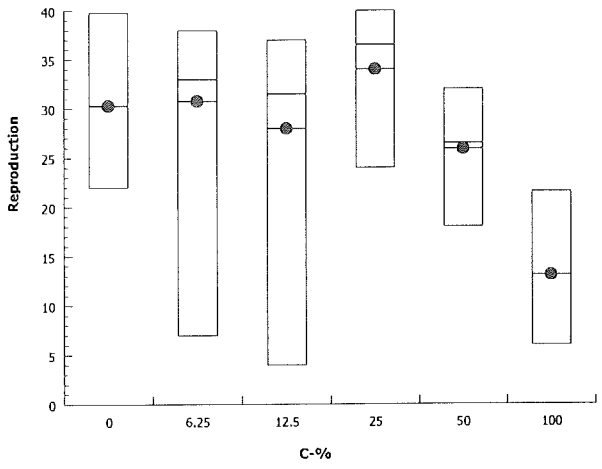
Distributional Tests

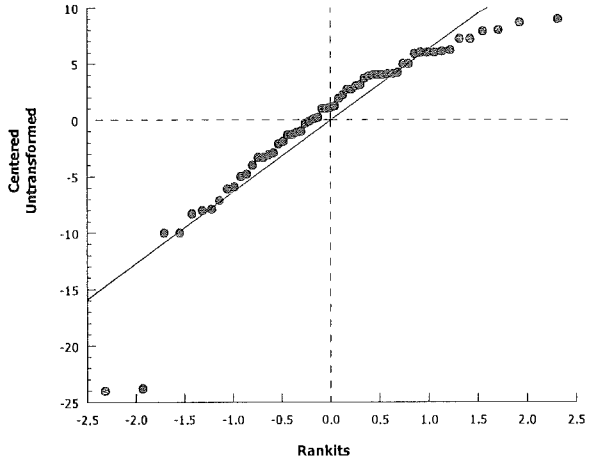
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	11.32	15.09	0.0454	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8757	0.9451	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	10	30.3	26.94	33.66	29.5	22	39	1.484	15.48%	0.0%
6.25		9	30.78	23.31	38.25	33	7	38	3.239	31.58%	-1.58%
12.5		10	28	20.85	35.15	31.5	4	37	3.162	35.71%	7.59%
25		10	34	29.58	38.42	36.5	24	40	1.955	18.18%	-12.21%
50		10	25.9	22.61	29.19	26.5	18	32	1.456	17.78%	14.52%
100		10	13.1	9.572	16.63	12.5	6	21	1.56	37.65%	56.77%

Graphics





Analyst: AP QA: SP 5/13/13

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental (CA)

Analysis ID:	18-5086-0552	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	11 May-13 16:52	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1288789	1000	Yes	Two-Point Interpolation

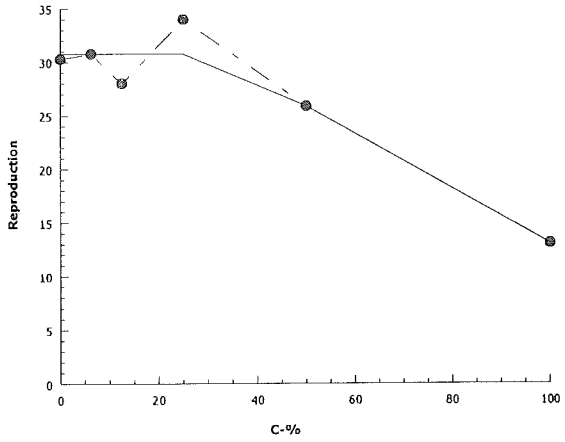
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	61.03	46.8	68.9	1.639	1.451	2.137
IC50	91.08	80.95	N/A	1.098	NA	1.235

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Control	10	30.3	22	39	1.484	4.692	15.48%	0.0%
6.25		9	30.78	7	38	3.239	9.718	31.58%	-1.58%
12.5		10	28	4	37	3.162	10	35.71%	7.59%
25		10	34	24	40	1.955	6.182	18.18%	-12.21%
50		10	25.9	18	32	1.456	4.606	17.78%	14.52%
100		10	13.1	6	21	1.56	4.932	37.65%	56.77%

Graphics



Analyst: AP QA: SP 5/13/13

CETIS Analytical Report

Lab Control vs Conductivity Control

Test Code: 1304-S042 | 19-8354-2202

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental (CA)**

Analysis ID:	15-6481-7310	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	13 May-13 8:46	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result
Untransformed		C > T	NA	NA	Sample passes 7d survival rate endpoint

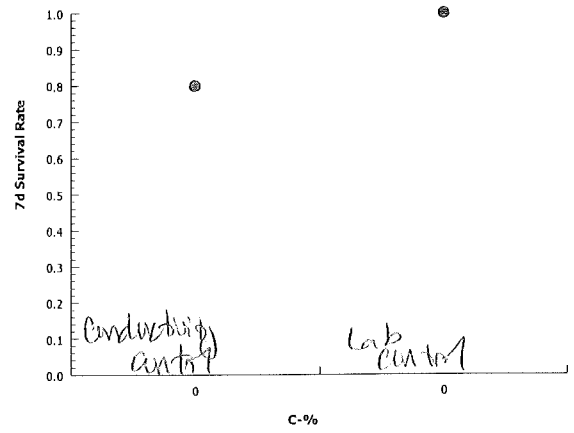
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Control		Conductivity Control	0.2368	0.2368	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Conductivity Co	8	2	10	0.8	0.2	20.0%
0	Lab Control	10	0	10	1	0	0.0%

Graphics



Analyst: SD QA: JE

CETIS Analytical Report

Lab Control vs. Conductivity Control

Report Date: 13 May-13 08:47 (p 1 of 1)
Test Code: 1304-S042 | 19-8354-2202

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental (CA)

Analysis ID:	12-1306-3903	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	13 May-13 8:46	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result	PMSD
Untransformed	NA	C > T	NA	NA	Sample fails reproduction endpoint	16.9%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Control		Conductivity Control	5.995	1.734	5.12	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1566.45	1566.45	1	35.94	<0.0001	Significant Effect
Error	784.5	43.58333	18			
Total	2350.95		19			

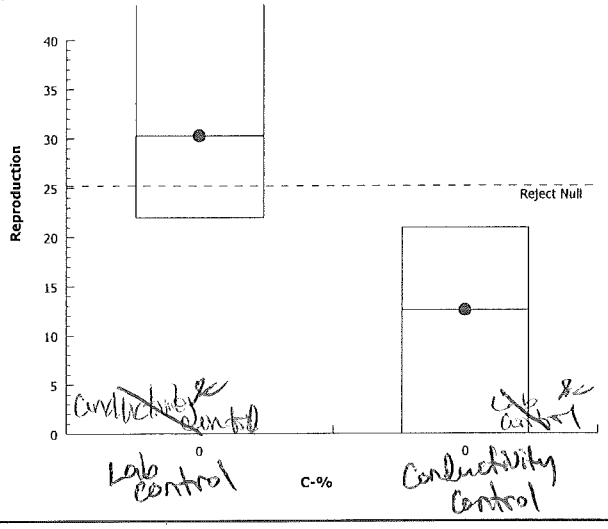
Distributional Tests

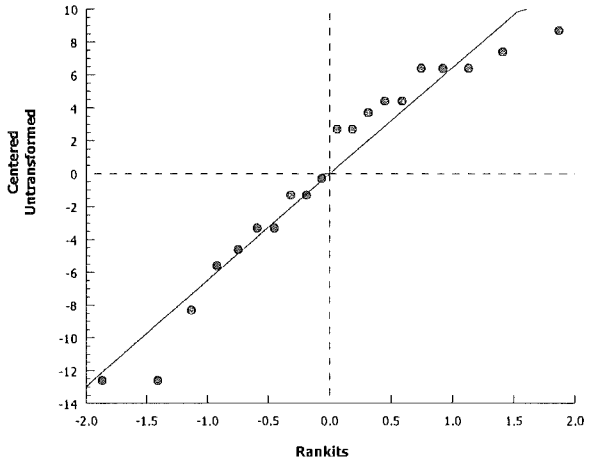
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	2.96	6.541	0.1216	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9298	0.866	0.1532	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	10	30.3	26.94	33.66	21	22	39	1.484	15.48%	0.0%
0	Conductivity Co	10	12.6	6.826	18.37	21	0	20	2.553	64.06%	58.42%

Graphics





Freshwater Chronic Bioassay

Daphnid Survival and Reproduction Datasheet

Test Species: *C. dubia*

Client/Sample ID: URS/Upstream

Test No: 1304 - 5042

Start Date/Time: 4/24/2013 1440

End Date/Time: ~~4/30~~ 5/1/2013 1355

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
LC	1	20	0	0	0	7	0	15	17		39	
	2	14	0	0	0	6	13	0	15		34	15
	3	13	0	0	0	5	0	13	11		29	
	4	33	0	0	0	5	0	14	14		33	
	5	9	0	0	0	5	0	11	14		30	
	6	37	0	0	0	6	7	0	14		27	
	7	49	0	0	0	6	0	11	12		29	
	8	50	0	0	0	6	0	10	17		33	
	9	39	0	0	0	5	9	0	8		22	
	10	6	0	0	0	4	0	10	13		27	
		Tech:	AG	AD	AP	SG	JA	LW	AP			BK
			Mean neonates/surviving female (for TAC):								32.3	

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
25%	1	28	0	0	0	5	11	0	13		29	
	2	15	0	0	6	5	13	0	19		38	
	3	36	0	0	0	5	0	16	18		40	
	4	11	0	0	0	7	13	0	20		40	
	5	18	0	0	0	6	12	0	12		24	
	6	22	0	0	0	7	12	0	16		35	
	7	1	0	0	0	7	0	12	20		39	
	8	55	0	0	0	5	0	11	15		30	
	9	21	0	0	0	5	0	14	20		39	
	10	48	0	0	0	5	0	11	0	15	26	15

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
6.25%	1	24	0	0	0	6	0	14	6		26	
	2	2	0	0	0	4	11	0	16		31	
	3	34	LIP	-	-	-	-	-	-	-	LIP	JA
	4	4	0	0	0	6	0	14	17		37	17
	5	54	0	0	0	6	0	14	18		38	
	6	31	0	0	0	7	0	0	0		7	
	7	23	0	0	0	5	0	11	17		33	
	8	40	0	0	0	5	0	10	17		32	
	9	45	0	0	0	5	7	12	16		33	
	10	59	0	0	0	5	0	15	18		38	

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
50%	1	57	0	0	0	4	0	3	11		18	
	2	17	0	0	0	6	12	0	11		29	
	3	26	0	0	0	5	0	8	17		30	
	4	47	0	0	0	4	0	9	14		27	
	5	58	0	0	0	4	9	0	11		20	
	6	38	0	0	0	5	11	0	14		30	
	7	5	0	0	0	4	0	12	16		32	
	8	16	0	0	0	5	8	0	11		24	11
	9	43	0	0	0	6	0	0	17		23	
	10	35	0	0	0	5	0	8	13		26	

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
12.5%	1	51	0	0	0	6	5	13	0		18	
	2	60	0	0	0	7	0	11	19		37	
	3	19	0	0	0	6	13	0	15		34	15
	4	7	0	0	0	5	10	0	17		32	
	5	30	0	0	0	4	0	14	18		36	
	6	29	0	0	0	7	12	0	12		31	
	7	25	0	0	0	6	0	8	13		27	
	8	46	0	0	0	5	0	13	19		37	
	9	3	0	0	0	4d	-	-	-	-	4d	
	10	27	0	0	0	5	13	0	11		29	

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
100%	1	41	0	0	0	0	0	6	7		13	7
	2	52	0	0	0	0	0	5	12		19	
	3	32	0	0	0	0	0	4	8		15	
	4	8	0	0	0	0	0	0	8		11	
	5	42	0	0	0	0	3	0	4	10	17	
	6	10	0	0	0	0	0	0	0	7	7	
	7	56	0	0	0	0	0	0	0	7	7	
	8	12	0	0	0	0	0	0	6	6	12	
	9	44	0	0	0	0	4	5	12		21	
	10	53	0	0	0	0	0	6	0		6	

Neonates for each replicate were blocked across concentrations at test initiation

Rep:	1	~~2~~	3	4	5	6	7	8	9	10
Board:	43	~~20~~	43	43	45	45	45	45	44	44
Cup:	14	20	26	29	14	50	53	54	6	13

Initiated By: AG Verified By: AP

Notes: d = dead; M = male; LIP = lost in progress;
B = 4th brood (only the first 3 broods are included in total)

Time Fed/Test Solution Renewed (day): (0) 1440 (1) 0905 (2) 1005 (3) 0955 (4) 1325 (5) 1110 (6) 0945 (7) _____

Comments: _____

QC Check: AP 5/3/13

Final Review: SD 5/13/13

Freshwater Chronic Bioassay

Daphnid Survival and Reproduction Datasheet

Test Species: ***C. dubia***

Client/Sample ID: URS

Test Number: 1304-5092

Start Date/Time: 4/24/2013 1440

End Date/Time: 5/1/2013 1355

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
CC	1	A	0	0	0	0	4	3	0		7	
	2	B	0	0	0	1	0	8	10		19	10
	3	C	0	0	0	0	0	5	3		8	
	4	D	0	0	0	2	0	10	5		17	
	5	E	0	0	0	4	0	5	10		19	
	6	F	0	0	0	old	-	-	-	-	0 | d	
	7	G	0	0	0	0	old	-	-	-	0 | d	
	8	H	0	0	0	2	0	5	12		19	
	9	I	0	0	0	3	0	11	10		20	
	10	J	0	0	0	1	0	6	10		17	
	Tech:		AG	AD	AF	SC	JA	LN	AD			BK

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											

Conc.	Rep	Rand #	Daily Reproduction/ Survival 1	2	3	4	5	6	7	8	Total	QC
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											

Neonates for each replicate were blocked across concentrations at test initiation

Rep:	1	2	3	4	5	6	7	8	9	10
Board:	43	43	43	43	45	45	45	45	44	44
Cup:	14	20	26	29	14	50	53	59	6	13

Initiated By: AG **Verified By:** JF

Time Fed/Test Solution Renewed (day):

(0) 1440 (1) 0905 (2) 1005 (3) 0955 (4) 1325 (5) 1110 (6) 0945 (7) _____

Notes: d = dead; M = male; LIP = lost in progress; B = 4th brood (only the first 3 broods are included in total)

QC Check: AD 5/8/13

Final Review: SO 5/13/13

Freshwater Chronic Bioassay

Water Quality Measurements

Client: URS

Sample ID: Upstream

Test No: 1304-5042

Test Species: *C. dubia*

Start Date/Time: 4/24/13 1440

End Date/Time: ~~4/30~~ 5/1/13 1355

Lab Control

Concentration	Lab Control							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.20	8.12	8.16	8.14	8.15	8.15	8.12	
DO (mg/L)	8.1	7.8	7.8	8.0	8.0	8.4	8.7	
Cond. (µmhos/cm)	189	198	193	189	200	189	186	
Temp (°C)	24.7	24.8	25.1	25.0	25.0	24.7	24.1	
Final								
pH		8.22	8.10	8.03	8.02	8.18	8.13	8.09
DO (mg/L)		7.8	~~8.5~~ 7.6	7.6	8.3	8.3	8.0	7.8
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

6.25%

Concentration	6.25%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.22	8.18	8.16	8.14	8.16	8.18	8.13	
DO (mg/L)	8.1	7.8	7.8	8.2	7.8	8.6	8.9	
Cond. (µmhos/cm)	479	481	480	448	486	486	~~489~~	
Temp (°C)	24.8	24.9	25.3	25.1	25.2	24.4	24.2	
Final								
pH		8.31	8.19	8.14	8.215	8.23	8.20	8.17
DO (mg/L)		8.0	~~8.4~~ 7.7	7.5	8.2	8.4	8.1	7.8
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

12.5%

Concentration	12.5%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.21	8.15	8.16	8.13	8.15	8.16	8.13	
DO (mg/L)	8.1	7.9	7.9	8.2	7.9	8.7	8.9	
Cond. (µmhos/cm)	736	742	752	701	759	719	696	
Temp (°C)	24.9	24.9	25.1	25.5	25.4	24.8	24.3	
Final								
pH		8.30	8.25	8.19	8.21	8.27	8.26	8.14
DO (mg/L)		8.0	~~8.4~~ 7.6	7.5	8.1	8.4	8.1	7.6
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

25%

Concentration	25%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.16	8.13	8.13	8.11	8.14	8.16	8.15	
DO (mg/L)	8.2	8.0	8.0	8.3	8.1	8.7	9.0	
Cond. (µmhos/cm)	1253	1244	1251	1168	1270	1180	1166	
Temp (°C)	25.0	25.0	25.2	25.3	25.4	24.8	24.5	
Final								
pH		8.36	~~8.33~~ 8.28	8.28	8.27	~~8.34~~ 8.31	8.31	8.23
DO (mg/L)		7.9	~~8.1~~ 7.7	7.7	8.1	8.4	8.1	7.7
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

50%

Concentration	50%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.10	8.08	8.08	8.08	8.11	8.08	8.14	
DO (mg/L)	8.3	8.3	8.2	8.6	8.5	8.8	8.9	
Cond. (µmhos/cm)	2170	2210	2200	2110	2170	2080	2100	
Temp (°C)	24.9	25.4	25.4	25.3	25.4	25.0	24.8	
Final								
pH		8.38	~~8.39~~ 8.39	8.35	8.39	8.39	8.40	8.33
DO (mg/L)		7.9	~~8.1~~ 7.7	7.7	8.1	8.4	8.1	7.8
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

100%

Concentration	100%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.03	8.03	8.00	8.03	8.03	8.09	8.08	
DO (mg/L)	8.4	8.4	8.6	8.8	8.9	8.7	8.9	
Cond. (µmhos/cm)	3810	3810	3800	3800	3810	3850	3790	
Temp (°C)	24.8	25.3	25.7	25.6	25.4	25.7	25.5	
Final								
pH		8.20	~~8.15~~ 8.19	8.19	8.15	8.14	8.17	8.17
DO (mg/L)		8.0	~~8.4~~ 7.4	7.4	8.1	8.5	8.1	7.8
Temp (°C)		25.8	24.1	24.3	24.0	24.0	24.3	24.2

	0	1	2	3	4	5	6	7
Analysts: Initial:	ML	LN	~~DF~~	JF	LN	ML	BG	
Final:		LN	CL	ML	LN	JA	JA	ML
Dilutions made by:	ML	AG	BG	JF	SG	AG	CL	
Sample Used (A, B, C):	A	A	A	A	A	A	A	

Animal Source/Date Received: Internal/N/A

Animal Age at Initiation: <8hours

Sample Log-in Numbers: A: 13-0423 C: —

B: —

Comments:

QC Check: AD 5/8/13

Final Review: SO 5/13/13

Freshwater Chronic Bioassay **Water Quality Measurements**

Client: URS Test Species: *C. dubia*

Sample ID: Upstream Start Date/Time: 4/24/2013 1440

Test No: 1304-5042 End Date/Time: 5/1/2013 1355

Concentration	Conductivity Control							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.09	8.11	8.13	8.09	8.10	8.10	8.07	
DO (mg/L)	8.0	7.8	7.8	8.1	8.1	8.4	8.9	
Cond. (µmhos/cm)	3800	3810	3810	3800	3810	3810	3770	
Temp (°C)	24.1	24.8	25.3	25.0	25.2	24.6	25.1	
Final								
pH		8.11	8.14	7.98	8.21	8.13	8.14	8.12
DO (mg/L)		7.5	8.5	7.4	8.1	8.4	8.2	8.0
Temp (°C)		25.8	24.1	24.3	24.1	24.0	24.3	24.2

Concentration								
Day	0	1	2	3	4	5	6	7
Initial								
pH								
DO (mg/L)								
Cond. (µmhos/cm)								
Temp (°C)								
Final								
pH								
DO (mg/L)								
Temp (°C)								

Concentration								
Day	0	1	2	3	4	5	6	7
Initial								
pH								
DO (mg/L)								
Cond. (µmhos/cm)								
Temp (°C)								
Final								
pH								
DO (mg/L)								
Temp (°C)								

	0	1	2	3	4	5	6	7
Analysts: Initial:	AG	LN	JF	JF	LN	ML	BG	
Final:		LN	CL	ML	LN	JA	JA	ML
Dilutions made by:	AG	AG	JF	JF	SG	AG	CL	
Sample Used (A, B, C):	–	–	–	–	–	–	–	

Comments:

Animal Source/Date Received: Internal / N/A Animal Age at Initiation: < 8 hrs

Sample Log-in Numbers: A: 13-0423 B: – C: –

QC Check: AD 5/8/13 Final Review: AD 5/13/13

Hyalella azteca

Appendix Table A-1
10-Day *Hyalella* Survival and Growth Bioassay
URS Corporation
Project: Sorrento Water Quality
Sample Collected 4/23/13 ; Test Initiated 4/26/13

Site ID	Rep	Random #	Number Alive	Percent Survival	Biomass (mg)	Growth (mg/org)	Mean Percent Survival	Mean Growth	Survival Standard Deviation	Growth Standard Deviation
Lab Control	A	9	10	100	3.28	0.328	100	0.288	0.0	0.32
	B	1	10	100	2.40	0.240				
	C	8	10	100	2.80	0.280				
	D	6	10	100	2.92	0.292				
	E	3	10	100	2.99	0.299				
R-3-D-TOX-S	A	7	10	100	2.81	0.281	100	0.290	0.0	0.19
	B	5	10	100	3.20	0.320				
	C	4	10	100	2.75	0.275				
	D	10	10	100	2.98	0.298				
	E	2	10	100	2.76	0.276				

Analysis of *Hyalella* Survival
URS
Sorrento Water Quality
Test Initiated: April 26, 2013

Table Analyzed	Excel Transform Survival
Column A	Lab Control
vs	vs
Column B	R-3-D-TOX-S
Unpaired t test	
P value	0.5000
P value summary	ns
Are means signif. different? (P < 0.05)	No
One- or two-tailed P value?	One-tailed
t, df	t=0.0000 df=8
How big is the difference?	
Mean ± SEM of column A	1.412 ± 0.0002000 N=5
Mean ± SEM of column B	1.412 ± 0.0002000 N=5
Difference between means	0.0000 ± 0.0002828
95% confidence interval	-0.0006522 to 0.0006522
R squared	0.0000
F test to compare variances	
F,DFn, Dfd	1.000, 4, 4
P value	1.0000
P value summary	ns
Are variances significantly different?	No

Analysis of *Hyalella* Growth
URS
Sorrento Water Quality
Test Initiated: April 26, 2013

Table Analyzed	Growth
Column A	Lab Control
vs	vs
Column B	R-3-D-TOX-S
Unpaired t test	
P value	0.4492
P value summary	ns
Are means signif. different? (P < 0.05)	No
One- or two-tailed P value?	One-tailed
t, df	t=0.1318 df=8
How big is the difference?	
Mean ± SEM of column A	0.2878 ± 0.01433 N=5
Mean ± SEM of column B	0.2900 ± 0.008562 N=5
Difference between means	-0.002200 ± 0.01669
95% confidence interval	-0.04069 to 0.03629
R squared	0.002167
F test to compare variances	
F,DFn, Dfd	2.800, 4, 4
P value	0.3426
P value summary	ns
Are variances significantly different?	No

Freeshwater Sediment Bioassay **Organism Survival**

Client: URS **Test Species:** *H. azteca*

Project ID: Sorrento Water Quality **Start Date/Time:** 4/26/2013 1100

Initiated by: BK **End Date/Time:** 5/6/2013 1150

Initial No. Organisms: 10 **Test No.:** 1309-5045

Random Number	Number Alive	10% QC Check of final counts	Random Number	Number Alive	10% QC Check of final counts
1	10	10			
2	10				
3	10	10			
4	10				
5	10				
6	10				
7	10	10			
8	10				
9	10	10			
10	10				
Tech Initials:	BG	JVV	**Tech Initials:**		

Initiation QC Check Initials:

Organism Counts JA/CL **Organism Count QC** BK **All Jars initiated** BK **Time Zero pans** JA

Animal Source/Date Received: Aquatic Indicators / 4/23/13 **Age at Initiation:** 14d

QC Check: BG 5/13/13 **Final Review:** YS 5/13/13

Freshwater Chronic Bioassay **Amphipod 10-Day Weights**

Client: URS **Test Species:** *Hyalella azteca*

Sample ID: R-3-D-TOX -S **Start Date/Time:** 4/26/13 11:00

Test No.: *1304-S045* **End Date/Time:** 5/6/13 11:50

Site ID ~~Conc.~~ (____)	Rep.	pan weight (mg)	pan + organism weight (mg)	Weight Difference (mg)
Lab Control	a	469.09	472.37	3.28
	b	481.25	483.65	2.40
	c	490.68	493.48	2.80
	d	488.20	491.12	2.92
	e	463.58	466.57	2.99
R-3-D-Tox-S	a	534.41	537.22	2.81
	b	500.20	503.4	3.20
	c	482.16	484.91	2.75
	d	524.66	527.64	2.98
	e	490.20	492.96	2.76
Tech Initials:		BG	LN	
Date/Time:		5/6/13 1120	5/12/2013 1125	

QC Check: SO 5/13/13

Final Review: YS 5/13/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

Freshwater Chronic Bioassay **Amphipod Time Zero Weights**

Client: URS Test Species: *Hyalella azteca*

Sample ID: R-3-D-TOX-S Start Date/Time: 4/26/13 11:00

Test No.: *1304-S045* End Date/Time: 5/6/13 11:50

Conc. (____)	Rep.	No. Organisms per Pan	Pan Weight (mg)	Pan + Org. Weight (mg)	Biomass (mg)	Mean Biomass (mg)
Time zero	a	10	533.6	535.54	**0.194**	
	b	10	535.35	537.25	**0.19**	
	c	10	493.76	495.75	**0.199**	**0.198**
	d	10	586.45	588.35	**0.19**	
	e	10	509.15	511.32	**0.217**	
Control Data	a	10	469.09	472.37	**0.328**	
Day 10	b	10	481.25	483.65	**0.24**	
	c	10	490.68	493.48	**0.28**	**0.288**
	d	10	488.2	491.12	**0.292**	
	e	10	463.58	466.57	**0.299**	
					Mean % Growth:	**45.35**

QC Check: BO 5/13/13 Final Review: YS 5/13/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

10-Day Freshwater Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: URS

Test Species: *H. azteca*

Site ID: Lab Control

Start Date/Time: 4/26/2013 1100

Test No.: 1304-8045

End Date/Time: 5/6/2013 1150

Test Day	Conductivity (µmhos/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	811	22.0	8.4	8.31	JF	✓ Collect Ammonia
1	815	22.0	8.5	8.34	JF	
2	811	22.6	7.8	8.29	LN	
3	813	22.1	7.8	8.14	ML	
4	823	22.4	8.3	8.18	BG	
5	832	22.5	7.8	8.22	EC	
6	831	22.3	7.5	8.11	AG	
7	831	22.1	7.8	8.12	BG	
8	834	22.4	7.4	8.18	AG	
9	835	22.2	7.4	8.17	LN	
10	834	22.1	7.4	8.14	SO	✓ Collect Ammonia

QC Check: SO 5/13/13

Final Review: YS 5/13/13

10-Day Freshwater Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: URS

Test Species: *H. azteca*

Site ID: R-3-D-Tox-~~5~~ KS S

Start Date/Time: 4/26/2013 1100

Test No.: 1304-5045

End Date/Time: 5/6/2013 1150

Test Day	Conductivity (µmhos/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	924	22.0	OF ~~8.0~~ 7.3	8.30	JF	✓ Collect Ammonia
1	914	22.0	7.5	8.09	JF	
2	855	22.3	7.3	8.14	LN	
3	852	22.0	6.7	7.98	ML	
4	834	22.4	7.6	8.08	BG	
5	838	22.5	7.4	8.20	EC	
6	839	22.3	6.7	8.12	AG	
7	847	22.2	6.5	8.36	BG	
8	851	22.1	6.0	8.42	AG	
9	848	22.1	6.8	8.40	LN	
10	854	22.0	6.0	8.44	SD	✓ Collect Ammonia

QC Check: 5/13/13

Final Review: KS 5/13/13

10-Day Freshwater Sediment Bioassay
Static Conditions

Renewal Water Quality Measurements

Client: URS

Site ID: Renewal water for LA-3-D-Tox-SS test

Test No.: 1304-5045

Test Species: *H. azteca*

Start Date/Time: 4/26/2013 1100

End Date/Time: 5/6/2013 1150

Test Day	Conductivity (µmhos/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0						
1	808	22.4	8.6	8.42	JF	
2	806	22.9	8.2	8.36	LN	
3	815	22.9	9.0	8.35	ML	
4	834	22.8	9.0	8.31	BG	
5	833	22.9	8.7	8.40	EZ	
6	834	22.7	8.2	8.32	AG	
7	835	22.7	8.8	8.35	BG	
8	836	22.8	8.4	8.42	AG	
9	838	22.7	8.3	8.40	LN	
10						

QC Check: SS 5/13/13

Final Review: KS 5/13/13

Total Ammonia Analysis
Freshwater

Overlying Water

Client: URS
Project: Sorrento Water Quality
Test Type: 10 day Hyalella Survival + Growth

DI Blank: 0.0
Test Start Date: 4/26/2013

Analyst: LN
Analysis Date: 5/12/13

Sample ID	Nautilus ID	Sub-Sample Date	Test Day	pH (units)	NH3-N (mg/L)	N x 1.22 Ammonia (mg/L)
Blank Spike (10 mg/L NH_3)		NA	NA	NA	8.0	9.8
Lab Control	1	4/26/2013	0	8.31	0.4	0.5
R-3-D-Tox-SS	2	4/26/2013	0	8.30	0.3	0.4 (<0.5)
Lab Control	3	5/6/2013	10	8.14	0.2	0.2 (<0.5)
R-3-D-Tox-SS	4	5/6/2013	10	8.44	0.1	0.1 (<0.5)
Spike Check (10 mg/L NH_3)		NA	NA		8.0	9.8
Sample Duplicate[a]					0.1	0.1
Sample Duplicate + Spike[a]					8.3	10.1
Spike Check (10 mg/L NH_3)		NA	NA		8.0	9.8

Relative Percent Difference (RPD) = [sample] (mg/L) - [sample duplicate] (mg/L) / [average ammonia] (mg/L) x 100 — **Acceptable Range: 0-20%**

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) / nominal [spike] (mg/L) x 100 — **Acceptable Range: 80-120%[b]**

QC Sample ID	[NH_3]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank	0.0	NA	9.8	10	NA	98%
R-3-D-Tox-SS	0.1	0.1	10.1	10	0	100%

Comments:

Notes: [a]Unless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

[b] Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only.

Method Detection Limit = 0.5 mg/L

QC Check: SD 5/13/13

Final Review: JL 5/14/13

Total Ammonia Analysis
Freshwater

Pore Water

Client: URS
Project: ~~10-day hyalella~~ Sacramento Water Quality
Test Type: 10-day hyalella, survival + growth

DI Blank: 0.0
Test Start Date: 4/24/13

Analyst: LN
Analysis Date: 5/12/13

Sample ID	Nautilus ID	Sub-Sample Date	Test Day	pH (units)	NH3-N (mg/L)	N x 1.22 Ammonia (mg/L)
Blank Spike (10 mg/L NH_3)		NA	NA	NA	8.1	9.9
R-3-D-Tox -5	-	4/23/2013	check-in	7.77	0.8	1.0 (~~0.9~~)
Spike Check (10 mg/L NH_3)		NA	NA		8.0	9.8
Sample Duplicate[a]					0.7	0.9
Sample Duplicate + Spike[a]					8.5	10.4
Spike Check (10 mg/L NH_3)		NA	NA		8.0	9.8

Relative Percent Difference (RPD) = [sample] (mg/L) - [sample duplicate] (mg/L) / [average ammonia] (mg/L) x 100 — **Acceptable Range: 0-20%**

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) / nominal [spike] (mg/L) x 100 — **Acceptable Range: 80-120%[b]**

QC Sample ID	[NH_3]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank	0.0	NA	9.9	10	NA	99%
R-3-D-Tox	1.0	0.9	10.4	10	10.5	94%

Comments:

Notes: [a]Unless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

[b] Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only.

Method Detection Limit = 0.5 mg/L

QC Check: SD 5/13/13

Final Review: 5-14-13

Appendix B

Sample Check-In Information

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Client: URS Corporation
Sample ID: R-3 Upstream and Downstream
Test ID No(s).: 1304-5042, -5043

	(A) R-3-D-TOX	R-3-U-TOX		
Sample (A, B, C):	Downstream	upstream		
Log-in No. (13-xxxx):	0422	0423		
Sample Collection Date & Time:	4/23/13 0800	4/23/13 0900		
Sample Receipt Date & Time:	4/23/13 1510	4/23/13 1510		
Number of Containers & Container Type:	2-4L cubi	2-4L cubi		
Approx. Total Volume Received (L):	~8	~8		
Check-in Temperature (°C)	20.5	20.5		
Temperature OK? [1]	(Y) N	(Y) N	Y N	Y N
DO (mg/L)	9.6	8.0		
pH (units)	7.91	7.86		
Conductivity (µS/cm)	3790	3800		
Salinity (ppt)	2.0	2.0		
Alkalinity (mg/L)*	207	237		
Hardness (mg/L)* [a]	>1000	>1000		
Total Chlorine (mg/L)	0.05	0.010		
Technician Initials	CL/AG	CL/BG		

Test Performed: Ceriod Chronic — Control/Dilution Water: (8:2) / Lab SW / Lab ART Other: _____
Alkalinity: 81 Hardness or Salinity: 88
Additional Control? Y (N) = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: Sele Chronic — Control/Dilution Water: (Laboratory Enriched) 8:2 / Lab SW / Lab ART Other: _____
Alkalinity: 87 Hardness or Salinity: 98
Additional Control? Y (N) = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ — Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____
Alkalinity: _____ Hardness or Salinity: _____
Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Notes: [1] Temperature of sample should be 0-6°C, if received more than 24 hours past collection time.
* = mg/L as CaCO3, a = Measured for freshwater samples only, NA = Not Applicable

Additional Comments: (A) Downstream Sample not tested

Sample Check-In Information

Sample Description:
Down: colorless, clear, no odor, no debris
Up: colorless, clear, no odor, some debris

COC Complete (Y/N)?
A___ B___ C___

Filtration? (Y) N
Pore Size: 1.45 um
Organisms or Debris FOR SELE CHRONIC

Salinity Adjustment? Y (N)
Artificial Salts: target ppt: _____
Hypersaline Brine: target ppt: _____
Tests: _____

pH Adjustment? Y (N)

	A	B	C
Initial pH:			
Amount of HCl added:			
Final pH:			

Cl_2 Adjustment? Y (N)

	A	B	C
Initial Free Cl_2:			
STS added:			
Final Free Cl_2:			

Sample Aeration? Y (N)

	A	B	C
Initial D.O.			
Duration & Rate			
Final D.O.			

Subsamples for Additional Chemistry Required? Y (N)
NH3 Other _____
Tech Initials A___ B___ C___

QC Check: KFP 5/10/13
Final Review: SO 5/13/13

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Sediment Sample Check-In Information

Client: URS Corporation

Log-in Nos.: 13-3049 + 13-3050

Project: Sorrento Water Quality

Test Type(s): H. azteca 10 day

Test IDs: 1304-5044 to -5045

Sample ID	Collection Date & Time	Receipt Date & Time	Receipt Temp. (°C)	No. Containers	Container Type	Approx. Total Volume Received (L)	Sample Description	Tech Intials
R-3-D-Tox-5	4/23/13 0800	4/23/13 1510	20.5	1	plastic bag	2L	Sediment	JA
R-3-U-Tox-5	4/23/13 0900	4/23/13 1510	20.5	1	↓	2L	Sediment	JA

Samples Shipped Via: hand

COC Present? (Y) N

Sieving Required? (Y) N Screen Size: 1mm

Lab Control Sediment: Scripps Sand

Sub-samples for additional chemistry:

R-3-D - NH_3 PW collected

Test Organism:	Hyalella azteca				
Supplier:	Aquatic Indicators				
Receipt Date:	4/23/13				
Condition:	Good				

Comments: R-3-U-Tox 5 - river rock - very little sediment, no PW collected for NH_3. Sample not tested due to lack of sediment in appropriate size range.

QC Check: SO 5/13/13

Final Review: YS 5/13/13

Appendix C

Chain of Custody Form

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120
Phone 858.587.7333
Fax 858.587.3961

Chain of Custody

Date 4/23/13 Page 1 of 1

Sample Collection By: Lydia Roach, Laura Roll, Elizabeth Chilman

Report to:
- Company: URS Corp
- Address:
- City/State/Zip:
- Contact:
- Phone:
- Email:

Invoice To:
- Company: URS Corp
- Address: 4225 Executive Sq Suite 1600
- City/State/Zip: La Jolla, CA 92037
- Contact: Elizabeth Chilman
- Phone: 858-812-8371
- Email: Elizabeth_chilman@urs.com

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	ANALYSES REQUIRED: Cerio-daphnia	Selenastrum	Hyalella 10d	Receipt Temperature (°C)
1	R-3-D-TOX-S	4/23/13	0830	Sediment	plastic bag	1				X	20.5
2	R-3-U-TOX-S	↓	0900	↓	↓	1				X	↓
3	R-3-U-TOX	4/23/13	0900	water	CUBitainer	2		X	X		↓
4	R-3-D-TOX	↓	0800	↓	↓	2		X	X		↓
5											
6											
7											
8											
9											
10											

PROJECT INFORMATION
- Client:
- PO No.:
- Shipped Via:

SAMPLE RECEIPT
- Total No. of Containers:
- Received Good Condition?
- Matches Test Schedule?

SPECIAL INSTRUCTIONS/COMMENTS:
R-3-D-TOX and R-3-U-TOX-5 not tested.

1) RELINQUISHED BY (CLIENT)
(Signature) Elizabeth C. Chilman (Time) 1510
(Printed Name) Elizabeth C Chilman (Date) 4/23/13
(Company) URS Corporation

2) RECEIVED BY (COURIER)
(Signature) (Time)
(Printed Name) (Date)
(Company)

3) RELINQUISHED BY (COURIER)
(Signature) (Time)
(Printed Name) (Date)
(Company)

4) RECEIVED BY (LABORATORY)
(Signature) (Time) 1510
(Printed Name) Ming Lai (Date) 4/23/13
(Company) Nautilus

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

www.nautilusenvironmental.com

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

ID: 13-0422 to ~~0425~~
13-~~04~~3049 to -0423 0250 mL

Appendix D

Qualifier Code Glossary

Nautilus Environmental

Glossary of Qualifier Codes:

Laboratory Procedures

Q1 - Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log

Q2 - Temperatures out of recommended range; no action taken, test terminated same day

Q3 - Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L

Q4 - Test aerated; D.O. levels dropped below 4.0 mg/L

Q5 - Test initiated with aeration due to an anticipated drop in D.O.

Q6 - Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred

Q7 - Salinity out of recommended range; refer to QA section of report

Q8 - Spilled test chamber/ Unable to recover test organism(s)

Q9 - Inadequate sample volume remaining, 50% renewal performed

Q10 - Inadequate sample volume remaining, no renewal performed

Q11 - Sample out of holding time; refer to QA section of report

Q12 - Replicate(s) not initiated; excluded from data analysis

Q13 - Survival counts not recorded due to poor visibility or heavy debris

Q14 - D.O. percent saturation was checked and was ≤ 110%

Data Analysis/Reporting

Q15 - Did not meet minimum test acceptability criteria. Refer to QA section of report.

Q16 - Percent minimum significant difference (PMSD) was below the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.

Q17 - Percent minimum significant difference (PMSD) was above the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.

Q18 - Reference toxicant test warning and control limits were recalculated based on 75th percentile inter-laboratory coefficient of variation, as defined in EPA 833-R-00-003, due to higher than recommended variability among LC_{50}/EC_{50}/IC_{50} data points included in the control chart.

Sample Date	Station	Time	Entero CFU/100 mL	Total MPN/100 mL	Fecal MPN/100 mL
22-Apr-2013	R-58-D	830	240e	33000	45
22-Apr-2013	R-58-U	1000	<20	700	45
23-Apr-2013	R-3-D	855	80e	120	20
23-Apr-2013	R-3-U	1058	20e	1700	45

ATTACHMENT 5

Sediment Sampling Results

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ATTACHMENT 5 - Sediment Sampling Results

ANALYTE	Concentration (mg/kg)				Human Health CHHSL / RSL (mg/kg)	
	R-3-1	R-3-2	R-3-3	R-7-1	Residential	Commerical/Industrial
General Physical						
% Solids	70.9	74.3	65.4	60	NA	NA
Inorganic Non-Metals						
Nitrate as N	<0.5	<0.5	<0.5	<0.5	29,355	361,290
Nitrite as N	<0.5	<0.5	<0.5	<0.5	2,374	30,435
Phosphorus, Total as P	171	42.3	109	241	NA	NA
Total Kjeldahl Nitrogen	100	19	83	270	NA	NA
Metals						
Manganese	230	60	140	230	1,800	23,000
Arsenic	5.2	2.8	3.4	6.7	0.07	0.24
Cadmium	<0.2	<0.2	<0.2	0.3	1.7	7.5
Chromium	5.7	1.7	3.6	14	100,000	100,000
Copper	9.3	2.5	8.4	21	3,000	38,000
Nickel	3.9	1.3	3.1	9.9	1,600	16,000
Lead	6.8	2.5	5.1	14	80	320
Antimony	<1.0	<1.0	<1.0	<1.0	30	380
Selenium	<1.0	<1.0	<1.0	<1.0	380	4,800
Zinc	58	21	51	110	23,000	100,000
Organics						
Malathion	<0.05	<0.05	<0.05	<0.05	1,200	12,000
Chlorpyrifos	<0.05	<0.05	<0.05	<0.05	61	620
Diazinon	<0.05	<0.05	<0.05	<0.05	43	430

Notes

* Human Health Standards for Chromium (III) listed

CHHSL - California Human Health Screening Level, January 2005

RSL - Regional Screening Level, USEPA Region 9

mg/kg - milligrams per kilogram

NA - No Human Health Level available

ATTACHMENT 6

Constituent Lists

AQUEOUS				
Constituent	**Analytical Method**	**Units**	**Maximum Hold Time**	**Source**
303(d) listed for Soledad Canyon and/or Los Penasquitos Creek				
Enterococcus	MF, EPA 1600	CFU/100 mL	6 hours	303(d) list
Fecal Coliform	MTF, SM 9221E	MPN/100 mL	6 hours	303(d) list
Selenium, total	EPA 200.8	mg/L	6 months	303(d) list
Total Dissolved Solids	EPA 160.1	mg/L	7 days	303(d) list
Nitrogen, Total as N	Calculated	mg/L	-	303(d) list
Toxicity	Multiple*	-	-	303(d) list
General Physical				
Total Suspended Solids	SM 2540 D	mg/L	7 days	PEIR
Inorganic Non-Metals				
Total Hardness	SM 2340 C	mg/L	6 months	PEIR
Phosphorous, Total as P	EPA 365.3	mg/L	28 days	PEIR
Phosphorous, Dissolved	EPA 365.3	mg/L	48 hours	Sampled-Dry Weather
Nitrate as N	EPA 353.3	mg/L	48 hours	PEIR
Nitrite as N	EPA 353.2	mg/L	48 hours	PEIR
Total Kjeldahl Nitrogen	EPA 351.3	mg/L	28 days	PEIR
Organics				
Diazinon	EPA 8141	mg/L	14 days	PEIR
Chlorpyrifos	EPA 8141	mg/L	14 days	PEIR
Malathion	EPA 8141	mg/L	14 days	PEIR
Metals - Total				
Antimony	EPA 200.8	mg/L	6 months	PEIR
Arsenic	EPA 200.8	mg/L	6 months	PEIR
Cadmium	EPA 200.8	mg/L	6 months	PEIR
Chromium	EPA 200.8	mg/L	6 months	PEIR
Copper	EPA 200.8	mg/L	6 months	PEIR
Lead	EPA 200.8	mg/L	6 months	PEIR
Manganese	EPA 200.8	mg/L	6 months	PEIR
Nickel	EPA 200.8	mg/L	6 months	PEIR
Zinc	EPA 200.8	mg/L	6 months	PEIR
Metals - Dissolved (Filtered)				
Antimony	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Arsenic	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Cadmium	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Chromium	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Copper	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Lead	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Manganese	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Nickel	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Selenium	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Zinc	EPA 200.8	mg/L	6 months	Sampled-Dry Weather
Bacteriological				
Total Coliform	MTF, SM 9221B	MPN/100 mL	6 hours	Sampled-Dry Weather

SEDIMENT				
Constituent	**Analytical Method**	**Units**	**Maximum Hold Time**	**Source**
303(d) listed for Soledad Canyon and/or Los Penasquitos Creek				
Sediment Toxicity	Multiple**	-	36 hours	303(d) list
General Physical				
Percent Solids	Percent Calculation	%		PEIR
Inorganic Non-Metals				
Phosphorous, Total as P	EPA 365.3	mg/kg	28 days	PEIR
Nitrate as N	EPA 353.3	mg/kg	48 hours	PEIR
Nitrite as N	EPA 354.1	mg/kg	48 hours	PEIR
Total Kjeldahl Nitrogen	EPA 351.3	mg/kg	28 days	PEIR
Organics				
Diazinon	EPA 8141	ug/kg	14 days	PEIR
Chlorpyrifos	EPA 8141	ug/kg	14 days	PEIR
Malathion	EPA 8141	ug/kg	14 days	PEIR
Metals				
Antimony	EPA 6020	mg/kg	6 months	PEIR
Arsenic	EPA 6020	mg/kg	6 months	PEIR
Cadmium	EPA 6020	mg/kg	6 months	PEIR
Chromium	EPA 6020	mg/kg	6 months	PEIR
Copper	EPA 6020	mg/kg	6 months	PEIR
Lead	EPA 6020	mg/kg	6 months	PEIR
Manganese	EPA 6020	mg/kg	6 months	PEIR
Nickel	EPA 6020	mg/kg	6 months	PEIR
Selenium	EPA 6020	mg/kg	6 months	PEIR
Zinc	EPA 6020	mg/kg	6 months	PEIR

Notes

mg/kg - milligrams per kilogram

ug/kg - micrograms per kilogram

mg/L - milligrams per liter

PEIR - Master Storm Water System Maintenance Program Programmatic Environmental Impact Report, City of San Diego, October 2011, Appendix F

MPN - Most Probable Number

CFU - Colony Forming Unit

303(d) list - 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) - Statewide, accessed from: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Sampled-Dry Weather - Constituent was analyzed during dry weather monitoring along the lower San Diego River

* Aqueous Toxicity Tests include:
Chronic toxicity test with *Selenastrum capricornutum* and *Ceriodaphnia dubia*

** Sediment Toxicity Tests Include
Chronic toxicity test with *Hyalella azteca*

ATTACHMENT 7

Flow Measurement Field Forms

Cross section measurement
Field Form

Client: City of San Diego
Project Name: 7165 Murphy Canyon/Sorrento Canyon IWQAs
Field Crew: Jon Martin/Laura Roll/Lydia Roach/Elizabeth Chilman

Date - Time: 4/23/13, 11:05
Location: R-3-V

Cross-section measurements

	Δx - from left bank (ft)	Δy - channel depth (ft)	Velocity (ft/sec)	Notes
	-4	0	0	4ft of standing water to LWB
60%	0	1.5	.043 ± .012	(.9ft)
20%	2.5ft	1.6	.071 ± .020	(.3ft)
80%	2.5	1.6	.028 ± .015	(1.3 ft)
60%	5	1.5	.085 ± .017	(0.9ft)
60%	7.5	1.45	.058 ± .013	(0.9ft)
60%	10	1.45	.057 ± .016	(0.9 ft)
60%	12.5	1.5	.007 ± .006	thick veg patty. From 12.5 → LWB, clear, + cobbly bottom
60%	15	1.4	.031 ± .009	(.8 ft) Branches floating upstream in veg patty
60%	17.5	1.3	.021 ± .009	(.8ft) " ↓ submerged limb from tree
	20	1.2	0.44 ± .017	out of veg patty, cobble bottom, significant tree limbs
	22.5	1.1	.044 ± .014	(.6 to .7) submerged upstream (.7ft) Gravelly bottom
	25.4	.2	.037 ± .015	(.1 ft) adjacent to cattails in channel.
				RWB is at 26.2 ft, 0 depth 0 flow
	26.2	0	0	RWB

NOTES Total width - 26.5ft, at edge of concrete

Left Bank and Right Bank are determined when looking downstream.

LWB = left wetted bank - where surface water terminates at the left bank

RWB = right wetted bank - where surface water terminates at the right bank

Δx = difference in horizontal distance from LWB

Δy = difference in vertical distance from channel bottom to surface of water

Velocity - measured with Valeport Model 801 Electromagnetic Flow Meter

Velocity measured at 60% depth for stage less than 1.5 feet.
Velocity measured at 20% and 80% depths for stages greater than 1.5 feet.

Cross section measurement
Field Form

Client:	City of San Diego	**Date - Time:**	4/23/13 - 9.00
Project Name:	7165 Murphy Canyon/Sorrento Canyon WQAs	**Location:**	R-3-D
Field Crew:	Jon Martin/Laura Roll/Lydia Roach/Elizabeth Chilman		

Cross-section measurements

	Δx - from left bank (ft)	Δy - channel depth (ft)	Velocity (ft/sec)	Notes
20%	0	1.5	.001 ± .005	(0.3 ft)
80%	0	1.5	.009 ± .015	(1.2 ft) (~3ft)
20%	1 ft	1.67	.023 ± 0.14	(.33 ft) Piece of concrete directly upstream of
80%	1 ft	1.67	.014 ± 0.019	(1.34 ft) sampling location
20%	2 ft	1.75	.033 ± .031	(0.35 ft) 3 ft downstream of 1.5 dia rock
80%	2 ft	1.75	.000 ± .016	(1.4 ft) "
20%	3 ft	1.71	.009 ± .03	(0.35 ft) 1ft dia rock directly in front of rock
80%	3 ft	1.71	.002 ± .015	(1.37 ft) no rock obstruction
60%	4 ft	1.29	.014 ± .004	(0.8 ft) location is on a small boulder
60%	5 ft	1.21	.055 ± .029	(0.7 ft) location is on a small
60%	6 ft	1.46	0.057 ± .026	(0.9 ft)
20%	7 ft	1.75	.084 ± .021	(0.35 ft) 1.5 dia boulder about a foot upstream
80%	7 ft	1.75	.103 ± .012	(1.4 ft) no rock obst
20%	8 ft	1.75	.142 ± .024	(0.35 ft) Visual flow appears to be in this area
80%	9 ft	1.75	.138 ± .044	(1.4 ft)
20%	9 ft	1.75	.113 ± .057	(0.35 ft)
80%	9 ft	1.75	.123 ± .040	(1.4 ft)
20%	10 ft	1.75	.041 ± .005	(0.35 ft)
80%	10 ft	1.75	.085 ± .018	(1.4 ft)

NOTES

Left Bank and Right Bank are determined when looking downstream.
LWB = left wetted bank - where surface water terminates at the left bank
RWB = right wetted bank - where surface water terminates at the right bank
Δx = difference in horizontal distance from LWB
Δy = difference in vertical distance from channel bottom to surface of water
Velocity - measured with Valeport Model 801 Electromagnetic Flow Meter
Velocity measured at 60% depth for stage less than 1.5 feet.
Velocity measured at 20% and 80% depths for stages greater than 1.5 feet.

20%	11 ft	1.92	.052 ± .007	(0.4 ft)
80%	11 ft	1.92	.045 ± .028	(1.5 ft) Next to several stalks of cattails
60%	12 ft	1.29	.064 ± .013	(.78 ft) upgainst grove of cattails, end of navigable channel, right wetted bank

ATTACHMENT 8

Total Flow Calculation Example
(See Attached CD)

ATTACHMENT 9

Water Quality Sampling Results

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ATTACHMENT 9 - Water Quality Sampling Results

Analyte	Sample Date	Concentration		Water Quality Benchmark	Benchmark Source	Units
		Upstream (R-3-U)	Downstream (R-3-D)			
Wet Chemistry						
Total Dissolved Solids	4/23/2013	2620	2472	1,500	Basin Plan	mg/L
Total Suspended Solids	4/23/2013	7	8	NA	NA	mg/L
Total Hardness	4/23/2013	1150	1290	NA	NA	mg/L
Phosphorus, Dissolved as P	4/23/2013	<0.03	<0.03	0.1	Basin Plan	mg/L
Phosphorus, Total as P	4/23/2013	<0.03	<0.03	0.1	Basin Plan	mg/L
Total Kjeldahl Nitrogen	4/23/2013	0.2	0.20	NA	NA	mg/L
Nitrite as N	4/23/2013	<0.10	0.22	1	Basin Plan	mg/L
Nitrate as N	4/23/2013	<0.10	1.10	5	Basin Plan	mg/L
Total Nitrogen	4/23/2013	<0.30	1.52	1	Basin Plan	mg/L
Total Metals						
Arsenic	4/23/2013	0.0034	0.0028	0	Basin Plan	mg/L
Antimony	4/23/2013	<0.001	<0.001	0.006	Basin Plan	mg/L
Cadmium	4/23/2013	<0.002	<0.0002	0.005	Basin Plan	mg/L
Chromium	4/23/2013	0.0069	0.0058	0.05	Basin Plan	mg/L
Copper	4/23/2013	0.0042	0.0038	1	Basin Plan	mg/L
Lead	4/23/2013	<0.001	<0.001	0.065 / 0.0025	40 CFR 131.38	mg/L
Manganese	4/23/2013	0.047	0.026	0.05	Basin Plan	mg/L
Nickel	4/23/2013	0.013	0.0099	0.1	CA-MCL	mg/L
Selenium	4/23/2013	0.0099	0.0092	0.005	40 CFR 131.38	mg/L
Zinc	4/23/2013	0.022	0.0082	5	Basin Plan	mg/L
Dissolved Metals						
Antimony - Dissolved	4/23/2013	<0.001	<0.001	0	Basin Plan	mg/L
Arsenic - Dissolved	4/23/2013	0.0026	0.0022	0.34 / 0.15	40 CFR 131.38	mg/L
Cadmium - Dissolved	4/23/2013	<0.002	<0.0002	Calculated	40 CFR 131.38	mg/L
Chromium - Dissolved	4/23/2013	0.0061	0.0035	Calculated	40 CFR 131.38	mg/L
Copper - Dissolved	4/23/2013	0.0033	0.0032	Calculated	40 CFR 131.38	mg/L
Lead - Dissolved	4/23/2013	<0.001	<0.001	Calculated	40 CFR 131.38	mg/L
Manganese - Dissolved	4/23/2013	0.032	0.018	0.05	Basin Plan	mg/L
Nickel - Dissolved	4/23/2013	0.0088	0.0075	Calculated	40 CFR 131.38	mg/L
Selenium - Dissolved	4/23/2013	0.0078	0.007	NA	NA	mg/L
Zinc - Dissolved	4/23/2013	0.019	0.008	Calculated	40 CFR 131.38	mg/L
Organics						
Malathion	4/23/2013	<0.001	<0.001	0.43 / 0.1	40 CFR 131.38	mg/L
Chlorpyrifos	4/23/2013	<0.001	<0.001	0.02 / 0.014	40 CFR 131.38	mg/L
Diazinon	4/23/2013	<0.0002	<0.0002	0.08 / 0.05	40 CFR 131.38	mg/L
Bacteriological						
Enterococcus	4/23/2013	20e	80e	151	Basin Plan	CFU/100 mL
Fecal Coliform	4/23/2013	45	20	400	Basin Plan	MPN/100 mL
Total Coliform	4/23/2013	1700	1700	NA	NA	MPN/100 mL

Notes

mg/L - milligrams per liter
CFU - Colony Forming Units
mL - milliliters
MPN - Most Probably Number
e - estimated value
NA - No benchmark set
0.43 / 0.1 - CMC / CCC (Acute / Chronic)
Basin Plan - Water Quality Control Plan for the San Diego Basin (9), September 8, 1994 (with amendments effective on or before April 4, 2011)
40 CFR 131.38 - Establishment of numeric criteria for priority toxic pollutants for the State of California
Calculated - alculated as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000.
Criteria Maximum Concentration (CMC) and Continuous Criteria Concentration (CCC) used,
no concentration measured in R-3-D or R-3-U exceeds the calculated CMC or CCC
* Chromium benchmarks based on total chromium (Basin Plan) or chromium (III) (40 CFR 131.38)
chromium concentration measured in R-3-D or R-3-U does not exceed the 40 CFR 131.38 benchmark for chromium (VI)

ATTACHMENT 10

Wetland Assessment Criteria

DRAFT Attachment 10 - Wetland Assessment Criteria

Wetland Assessment (Existing) Value Scoring System

Vegetation		Hydrosoil		Hydroperiod	
Score	**Description**	**Score**	**Description**	**Score**	**Description**
0	No visible vegetation	0	Storm water facility reach with little to no sediment and storm water facility is lined with concrete or other impermeable substrate	0	No visible surface water within the storm water facility reach
1	Very young population of woody, terrestrial species with an overall low surface area coverage	1	Hydrosoil consists of sand and cobble, with not visible deposition of fines, sediment pH is less than 6 or greater than 8, and redox within reach is positive (+100 mV)	1	Very deep (>2 feet) or very shallow (<0.5 feet) areas, fast flowing water and/or no deposition of fines and organic carbon in the storm water facility
2	Mature wetland population near carrying capacity, overgrown with both submerged and emergent wetland species	2	Heterogeneous mixture of sand and fines with hydrosoil, visible sedimentation, organics, neutral pH, and redox from (-100 mV to +100 mV)	2	Moderate water flow, intermediate pulsed flow depending on inputs and effects of storm water events, a moderate HRT* (less than 12 hours), shallow(0.5-1 foot deep), redox ranging from – 100 to +100 mV, and some deposition of fines
3	Young population of emergent and submerged wetland species which reproduce through tubers and/or rhizomes (Spartina, Typha, Scirpus, Phragmites)	3	System consisting of primarily fines and organic carbon, very little sand, and areas of high solids deposition, neutral pH, and redox less than -100 mV	3	Water 1 -2 feet deep, slow flow, with no evidence of scouring and/or channeling, a preferential HRT (>12Hours), and measurable/observable deposition of fines

*HRT- Hydraulic Retention Time

Wetland Assessment (Recovery) Value Scoring System

Vegetation		Hydrosoil		Hydroperiod	
Score	**Description**	**Score**	**Description**	**Score**	**Description**
0	Assumption that the current population will not recover to its current density after removal of the standing crop	0	High flow or no flow area with little to no deposition likely	0	No sediment deposition within the reach due to channel flow
1	The current population is comprised of trees and woody species and recovery would take greater than 5 years	1	Primarily sand deposition in the short-term. The likelihood of fines and/or organic carbon accumulating within the reach low within a 5 year period	1	Flow within the reach and thus some deposition of sand and other coarse grain materials
2	The current population is mature habitat with mix of woody and leafy vegetation. (Terrestrial and wetland species) Recovery would take 1 - 5 years	2	Heterogeneous mix of sand, organics, and fines depositing and accumulating in the next 1 – 5 years	2	Wide spot in the storm water facility after maintenance, resulting in some deposition of fines, and an overlaying water depth of less than 0.5 feet
3	Population comprised of primarily emergent and submerged wetland species and re-growth to the current density would take approximately 1 year	3	Heterogeneous mix of sand, organics, and fines depositing and accumulating within the reach in the next year	3	Flood control reach with an overlying water depth greater than 1- foot, typically a wide spot in the storm water facility after maintenance, and associated deposition of fines and organics

ATTACHMENT 11

Sediment Pollutant Loading Calculations

Equations:

$$\rho_{dry\ insitu} = \frac{\%_{solid} * \rho_{water} * \rho_{solid}}{\rho_{solid} - (\%_{solid} * \rho_{solid}) + (\%_{solid} * \rho_{water})}$$

$$CF_{cobble} = \frac{\%_{Finer}/\rho_{dry\ insitu}}{\%_{Finer}/\rho_{dry\ insitu} + (1-\%_{Finer})/\rho_{soild}}$$

$$Sediment\ Mass = Removal\ Volume * \rho_{dry\ insitu} * CF_{cobble}$$

$$Load\ Removal = Sediment\ Mass * Measured\ Concentration$$

where $\rho_{solid} =$ 165.4 lbs/ft^3 and $\rho_{water} =$ 62.4 lbs/ft^3 and $\%_{Finer}$ = fraction passing through 1.5-inch seive based on grain size analysis ($\%_{Finer}$ = 1 for all samples)

Reach 3 Removal Volume = 2,500 cyd
Reach 7 Removal Volume = 150 cyd

Sample ID	Reach	Type	% Solid	$\rho_{dry\ insitu}$ (lbs/ft^3)	CF_{cobble}	Sediment Mass (lbs)
R-3-1	3	Concrete	70.9	79.2	1	1.78E+06
R-3-2	3	Concrete	74.3	86.3	1	1.94E+06
R-3-3	3	Concrete	65.4	68.8	1	1.55E+06
R-7-1	7	Concrete	60	59.8	1	2.42E+05

The approximated removal volume for the entire maintenance project is expected to be approximately 2,650 cyd, with approximately 2,500 cyd to be removed from Reach 3 and the remaining 150 cyd to be removed from Reach 7. The 2,500 cubic yards from Reach 3 was distributed amongst the three analyzed sediment sample locations using after maintenance channel geometery. The 150 cyd for Reach 7 was assigned to the single analzyed sediment sample location from this section.

Sediment Pollutant Loading Results

Analyte	Load Removal (lbs) at Sediment Sampling Locations					Total
	Reach 3				Reach 7	
	R-3-1	R-3-2	R-3-3	Reach 3 Total	R-7-1	
Manganese	410	116	217	**743**	56	**799**
Total Kjeldahl Nitrogen	178	37	129	**344**	65	**409**
Nitrate as N	-	-	-	**-**	-	**-**
Nitrite as N	-	-	-	**-**	-	**-**
Total Nitrogen	178	37	129	**344**	65	**409**
Phosphorus, Total as P	305	82	169	**556**	58	**614**
Arsenic	9.3	5.4	5.3	**20**	1.6	**22**
Cadmium	-	-	-	**-**	0.1	**0.1**
Chromium	10	3.3	5.6	**19**	3.4	**22**
Copper	17	4.9	13	**35**	5.1	**40**
Nickel	7	2.5	4.8	**14**	2.4	**17**
Lead	12	4.9	7.9	**25**	3.4	**28**
Antimony	-	-	-	**-**	-	**-**
Selenium	-	-	-	**-**	-	**-**
Zinc	103	41	79	**223**	27	**250**
Malathion	-	-	-	**-**	-	**-**
Chlorpyrifos	-	-	-	**-**	-	**-**
Diazinon	-	-	-	**-**	-	**-**

- Not detected above laboraty reporting limits

see Attachment 5 for measured concentrations of each analyte at each sediment sampling location

ATTACHMENT 12

Sediment Pollutant Loading Calculations Example
(See Attached CD)

ATTACHMENT 13

Comparison of Existing and Maintained Pollutant Load Removal Estimates

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ATTACHMENT 13 - Comparison Existing and Maintained Pollutant Load Removal Estimates

Analyte	Estimated Sediment Polluntant Load Removal (lbs)	Estimated Existing Pollutant Load Removal Capcity per year (lbs)	Maintenance Period (yrs)	Estimated Existing Pollutant Load Removal Capacity per maintenance period (Existing Pollutant Removal) (lbs)	Estimated Maintained Pollutant Load Removal Capacity per maintenance period (Maintained Pollutant Removal) (lbs)	Maintained - Existing Load Removal (lbs)[1]
Arsenic	20	1.8	3	5.4	6.6	21
Cadmium	ND	ND	3	ND	ND	--
Chromium	19	3.7	3	11	13	21
Copper	35	1.4	3	4.2	5.2	36
Manganese	743	25	3	75	92	760
Nickel	14	6.9	3	21	25	19
Lead	25	ND	3	ND	ND	25
Antimony	ND	ND	3	ND	ND	--
Selenium	ND	5.3	3	16	19	3.6
Zinc	223	10	3	30	37	230
Total Kjeldahl Nitrogen	344	25	3	75	93	362
Nitrite as N	ND	ND	3	ND	ND	--
Nitrate as N	ND	ND	3	ND	ND	--
Total Nitrogen	344	ND	3	ND	ND	344
Phosphorus, Total as P	556	ND	3	ND	ND	556
Malathion	ND	ND	3	ND	ND	--
Chlorpyrifos	ND	ND	3	ND	ND	--
Diazinon	ND	ND	3	ND	ND	--

Notes

Metal concentration reflects that of total recoverable concentration

ND - Not detected above Laboratory Reporting Limit

-- Anaylte not detected in either sediment or water

1. Calculated by: (Estimated Sediment Pollutant Load + Maintained Pollutant Removal) - Existing Pollutant Removal

ATTACHMENT 14

Existing and Maintained NTS Pollutant Removal Estimate Example
(See Attached CD)

ATTACHMENT 15

Applicable PEIR Mitigation Measures

DRAFT - Attachment 15

Applicable PEIR Mitigation Measures

GENERAL

General Mitigation 1: Prior to commencement of work, the Assistant Deputy Director (ADD) Environmental Designee of the Entitlements Division shall verify that mitigation measures for impacts to biological resources (Mitigation Measures 4.3.1 through 4.3.20), historical resources (Mitigation Measures 4.4.1 and 4.4.2), land use policy (Mitigation Measures 4.1.1 through 4.1.13), paleontological resources (Mitigation Measure 4.7.1), and water quality (Mitigation Measures 4.8.1 through 4.8.3) have been included in entirety on the submitted maintenance documents and contract specifications, and included under the heading, "Environmental Mitigation Requirements." In addition, the requirements for a Pre-maintenance Meeting shall be noted on all maintenance documents.

General Mitigation 2: Prior to the commencement of work, a Pre-maintenance Meeting shall be conducted and include, as appropriate, the MMC, SWD Project Manager, Biological Monitor, Historical Monitor, Paleontological Monitor, Water Quality Specialist, and Maintenance Contractor, and other parties of interest.

General Mitigation 3: Prior to the commencement of work, evidence of compliance with other permitting authorities is required, if applicable. Evidence shall include either copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

General Mitigation 4: Prior to commencement of work and pursuant to Section 1600 et seq. of the State of California Fish & Game Code, evidence of compliance with Section 1605 is required, if applicable. Evidence shall include either copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

WATER QUALITY

Potential impacts to water quality would be reduced to below a level of significance through implementation of the following mitigation measures.

Mitigation Measure 4.8.1: Prior to commencement of any activity within a specific annual maintenance program, a qualified water quality specialist shall prepare an IWQA for each area proposed to be maintained. The IWQA shall be prepared in accordance with the specifications included in the Master Program. If the IWQA indicates that maintenance would impact a water pollutant where the existing level for that pollutant exceeds or is within 25 percent of the standard established by the San Diego Basin Plan, mitigation measures identified in Table 4.8-8 shall be incorporated into the IMP to reduce the impact to within the established standard for that pollutant.

Table 4.8-8 MITIGATION MEASURES FOR REDUCED POLLUTANT REMOVAL CAPACITY							
Mitigation Measure	**Pollutant Type**						
	Bacteria	**Metals**	**Nutrients**	**Pesticides**	**Sediment**	**TDS/Chloride Sulfates**	**Trash**
Remove kelp on beaches					●	●	
Sweep streets	●	●	●	●	●	●	●
Retrofit residential landscaping to reduce runoff	●	●	●		●		
Install artificial turf	●	●	●	●	●		●
Install inlet devices on storm drains		●	●		●		
Replace impermeable surfaces with permeable surfaces		●	●		●		●
Install modular storm water filtration systems		●	●	●	●	●	●
Install storm water retention basins		●	●	●	●	●	●
Install catch basin media filters		●	●		●	●	●
Create vegetated swales	●	●	●	●	●	●	●
Restore wetlands	●	●	●	●	●	●	●
Install check dams		●			●		●

Mitigation Measure 4.8.2: No maintenance activities within a proposed annual maintenance program shall be initiated before the City's ADD Environmental Designee and state and federal agencies with jurisdiction over maintenance activities have approved the IMPs and IWQAs including proposed mitigation and BMPs for each of the proposed activities. In their review, the ADD Environmental Designee and agencies shall also confirm that the appropriate maintenance protocols have been incorporated into each IMP.