

INDIVIDUAL WATER QUALITY ASSESSMENT REPORT

Site Name/Facility: Murphy Canyon Channel

**Master Program
Map No.:** 58

Date: October 28, 2013

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Registered Civil Engineer Number & Expiration Date RCE No. 56042, Exp. 12/31/2014
(place stamp here):

***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 Murphy Canyon 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 implement within the San Diego River Watershed.

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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 stormwater 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 Murphy Canyon 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 proposed maintenance activities would occur within a portion of the Murphy Canyon channel located between the Qualcomm Stadium parking lot to the west and Interstate 15 to the east, and north of Interstate 8. See Figure 1 in Attachment 1 for the general project location. Murphy Canyon channel (commonly known as Murphy Creek) is a part of the San Diego watershed and lower San Diego Hydrological Unit, (Project Clean Water, 2012). For the purposes of this assessment, The Murphy Canyon channel drainage facilities (MMP Maps 58 and 58a) have been broken into four channel reaches (Attachment 1, Figure 2). Reaches 1 and 2 are included on MMP Map 58 and Reaches 3 and 4 are included on MMP Map 58a. Based on the current Individual Hydrologic and Hydraulic Assessment (IHHA) results, the City is proposing to routinely maintain the southern portion of Murphy Canyon, consisting of Reaches 1 and 2, through periodic removal of trash, debris, vegetation and accumulated sediment. The northern portion of Murphy Canyon consists of Reaches 3 and 4, which are potential maintenance areas, and not proposed for maintenance during the September 2013 – March 2014 maintenance window.

Although brief descriptions for all potential maintenance areas (i.e., Reaches 1 through 4) have been included below, it is important to note that Reach 1 and Reach 2 are the focal drainage facilities (i.e., proposed maintenance areas) of this assessment. The detailed technical assessments pertaining to Reaches 3 and 4 will be prepared as maintenance activities are proposed.

Further discussion of Reaches 1 through 4 is provided below.

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Reaches 1 & 2

Reaches 1 and 2 are a combination of earthen (Reach 1) and concrete (Reach 2) trapezoidal channel types that parallel I-15 to the east and Qualcomm Stadium and the Mission Valley Terminal (MVT), a fuel tank facility, to the west. The Qualcomm parking lot has a history of flooding issues by stormwater flows from the channel, most recently in 2010. The upstream portion of Reach 2 is within the Caltrans right-of-way and will not be maintained as part of the project. The City maintained portion of Reach 2 extends from 110 feet north of San Diego Mission Road to 96 feet south of San Diego Mission Road for a length of approximately 206 feet. Reach 1 has a length of approximately 1,662 feet from the downstream end of the concrete channel to the property line located approximately 40 feet south of the Stadium Road bridge.

Reaches 3 & 4

Reaches 3 and 4 are the upstream continuation of the Murphy Canyon Channels north of the southern box culvert. These reaches are bounded by industrial and golf facilities to the west and Murphy Canyon Road to the east.

Conditions of Reaches 3 and 4 were assessed during a site visit in March 2013. Reach 3 is approximately 610 feet of concrete channel with little vegetation in the concrete lining but is vegetated along the banks above the concrete lining. Reach 4 is an earthen channel that is approximately 1,530 feet in length and is densely vegetated with mature trees and shrubs. The City holds a drainage easement covering approximately 220 feet immediately south of the northern box culvert in Reach 4. Based on field observations and discussions with biology staff, Reach 4 is considered to be in its ultimate vegetated condition. The sediment deposition observed in Reaches 3 and 4 are considered minimal in the earthen channels and not present in the concrete portion. There will be no channel maintenance within these reaches.

The overall project area is mapped within the Federal Emergency Management Agency's (FEMA) flood areas; Reaches 1 and 2 and the adjacent stadium parking lot area are within the FEMA Special Flood Hazard Areas Subject to Inundation by the 1-percent Annual Chance Flood (100-year floodplain) designated Zone A. Reaches 3 and 4 and the adjacent area are within the FEMA Special Flood Hazard Areas Subject to Inundation by the 1-percent Annual Chance Flood (100-year floodplain) designated Zone AE. Reaches 1, 2 and 3 are not mapped within the FEMA Special Flood Hazard Areas Subject to Inundation by the 1-percent Annual Chance Flood (100-year floodplain). however, Reach 4 is within the limits of the 100-year storm event floodplain.

The project area is located in the Mission Valley Planning District (MVPD) within the City's Municipal Code and specific land-use designations are described in the Mission

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Valley Community Plan. The potential maintenance areas associated with Reaches 3 and 4 are zoned MV-I (Industrial) and IL-2-I (Industrial-Light). The potential maintenance areas associated with Reaches 1 and 2 are zoned MV-CV (Mission Valley Commercial Visitor) and MV-I (Industrial).

The project area is not located within the City's Multiple Species Conservation Program's Multi-Habitat Planning Area (MHPA). The nearest MHPA boundary is located immediately south of the Reach 1 maintenance area associated with the San Diego River corridor.

The channelization and maintenance of the four reaches have been previously permitted and periodically maintained since initial construction of the channel in 1965. Maintenance of the reaches has been inconsistent since 1965, including a redesign in 1978 to include a berm along the west bank of Reaches 1 and 2. The City was conducting as-needed maintenance to these reaches up until 2003. Since 2003, the City received an emergency maintenance authorization (i.e., Regional General Permit 63) for maintenance activities which were conducted in 2005 (200500753-GS). In 2011, the City applied for additional emergency authorizations; however, only a Streambed Alteration Agreement (SAA1600-2010-0269-R5) from the California Department of Fish and Wildlife (CDFW) was issued. Maintenance activities to date have not been conducted under this agreement and the SAA remains valid until December 2015.

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

The maintenance activities proposed for the designated extents of Reaches 1 and 2 of Murphy Canyon include possible sediment removal, vegetation trimming, and the removal of approximately 8,000 to 11,500 cubic yards of material (i.e., sediment and vegetation debris). The impact acreage includes the maintenance, access/loading, and staging/stockpiling areas which accumulate to approximately 2.66 acres.

Description of creek/channel geometry:

Reach 1

Murphy Creek – earthen channel (MMP Map 58): Reach 1 extends from approximately 150 feet north of the confluence to the San Diego River, upstream approximately 1,662 feet to Reach 2. This proposed maintenance area is approximately 1,662 feet (length) x 32 feet (width) x 5-7 feet (depth), occupying approximately 2.57 acres. Initial channel

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construction was performed in 1965 and redesign as-built drawings were approved in 1978. As prescribed by the MMP's Individual Hydrology and Hydraulics Assessment (IHHA) requirements, Reach 1 requires dredging and vegetation removal to retain the as-built stormwater conveyance capacity.

Reach 2

Murphy Creek – concrete channel (MMP Map 58): Reach 2 was constructed as a concrete-lined trapezoidal channel. It extends from the upstream end of Reach 1 northward through Murphy Canyon. The proposed maintenance area is approximately 206 feet (length) x 20 feet (width) x 1-4 feet (depth), occupying approximately 0.09 acres.

Existing Conditions:

Reaches 1 and 2 of the Murphy Canyon channel are located in the San Diego River Watershed Management Area (WMA), Hydrological Area (HA) 907.1 (Lower San Diego), Hydrological Sub Area (HSA) 907.11 (Mission San Diego) (City of San Diego, 2008). Henceforth "Reach 2" will only refer to the City maintained portion of Reach 2 (i.e. the downstream most 206 feet) unless otherwise stated. Surface waters in the San Diego River WMA, and elsewhere in the County, 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 and establishes water quality objectives. The San Diego River Watershed Urban Runoff Management Plan (SDR-WURMP, City of San Diego, 2008) identifies the following priority pollutants as being recommended for pollutant loading reductions:

- Bacteria Indicators
- Phosphorous
- Total Dissolved Solids (TDS)
- Low Dissolved Oxygen
- Turbidity

The SDR-WURMP identifies residential, park/municipal, commercial and industrial land uses as suspected contributors to discharges of these priority pollutants within the Lower San Diego HA (City of San Diego, 2008).

Murphy Canyon is a tributary to the lower San Diego River. In accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (SWRCB, 2004), the lower San Diego River is 303(d) listed as an impaired water body, in which standards are not met and a Total Maximum Daily Load (TMDL) is required, but not yet completed, for at least one of the pollutants listed for the segment

(SWRCB, 2010). The pollutants listed for the lower San Diego River on the 303(d) list are indicated in Table 1.

Table 1. 303(d) Listed Pollutants for the lower San Diego River

Pollutant	Current TMDL (Yes or No)	Current or Anticipated TMDL Date
Enterococcus	No	2021
Fecal Coliform	Yes	2009
Low Dissolved Oxygen (lower 6 miles)	No	2019
Manganese	No	2021
Nitrogen	No	2021
Phosphorous	No	2019
Total Dissolved Solids (TDS)	No	2019

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 the San Diego River 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 reviewed during the background investigation for this IWQA. Under this historical monitoring, dry weather flow concentrations of total phosphorous, dissolved phosphorous and TDS exceeded water quality benchmarks established in the Basin Plan at least once between January 2010 and May 2012 (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 stormwater flow reduction benefits over the course of the program lifecycle. This adaptive 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.

Reach 2 is adjacent to the MVT located at 9950 San Diego Mission Road, San Diego, California (Geotracker # SL607392800). The MVT is the site of on-going groundwater remediation to address the presence of pure-phase and dissolved petroleum hydrocarbons and fuel oxygenates in the groundwater beneath and south of the MVT (Arcadis, 2013a). As part of this remediation, up to 1.26 million gallons per day (mgd) of groundwater are currently extracted via pumping, treated, and discharged to Murphy Canyon Creek at a discharge point approximately 2,800 ft. north (upstream) of the confluence with the San Diego River (Arcadis, 2013b). This groundwater treatment system (GWTS) effluent is subject to water quality standards under NPDES Permit No. CAG919002. However, this permit does not specify a limitation for or require monitoring of TDS. In September 2011, the RWQCB issued Time Schedule Order (TSO) No. R9-2011-0052, which sets an interim TDS limitation of 2,400 milligrams per liter (mg/L) on the GWTS effluent. The TSO also mandates that effluent TDS concentrations comply with the water quality benchmark of 1,500 mg/L established in the Basin Plan no later than November 30, 2015 (San Diego RWQCB, 2011).

In November 2010, samples collected both upstream and downstream of the MVT were analyzed for TDS. Both upstream and downstream samples exhibited TDS concentrations greater than 2,000 mg/L (San Diego RWQCB, 2011). In accordance with the TSO, the responsible party monitors five locations within Murphy Canyon channel and the San Diego River for field parameters (temperature, pH, salinity, dissolved oxygen, oxidative/reductive potential and conductivity), visual parameters (color, turbidity, sedimentation and erosion) and TDS (Arcadis, 2013b). Monitoring began in January 2012, and has continued on a roughly biweekly basis through the present. Between January 9, 2012 and January 14, 2013, TDS at the sampling location upstream of the discharge point ranged from 743 mg/L to 2,440 mg/L (Arcadis, 2013b). Between September 20, 2011 and January 8, 2013, TDS concentrations in the treated effluent ranged from 1,900 mg/L to 2,100 mg/L (Arcadis, 2013b). The responsible party performed a site-specific water quality and aquatic habitat assessment of Murphy Canyon Creek in 2003; however, this document was not accessible at the time of IWQA preparation.

During the preliminary site visit conducted on April 18, 2013, and sampling activities carried out on April 22, 2013, it was observed that Reaches 1 and 2 are heavily vegetated except under bridge and overpass crossings. Discernible flow was observed at the downstream portion of Reach 1. Water was observed along the full length of Reaches 1

and 2. As described in the Individual Biological Assessment (IBA), both native and non-native freshwater marsh (FWM), southern riparian forest (SRF) and southern willow scrub (SWS) habitat was observed in Reach 1 and native freshwater marsh habitat was observed in Reach 2.

Description of Sediment Sampling Activities:

In accordance with the SOP, a single sample location was selected for every 1,000 cubic yards (yd³) of estimated accumulated sediment to be removed within the proposed maintenance area in Reaches 1 and 2 of the Murphy Canyon channel. Using upper limit estimates of maintenance sediment removal volume, one sediment sample location was selected for Reach 2 and 10 sediment sample locations were selected for Reach 1. Due to limited access, only nine samples were collected from Reach 1. However, nine samples is likely to be representative of field conditions, assuming the actual amount of sediment removal from Reach 1 will be approximately 8,500 yd³. 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 1 and 2. The sample locations (R-58-1 through R-58-10) are indicated on Figure 3 in Attachment 1.

Sediment sampling activities were conducted by personnel on April 22, 2013 in accordance with EPA SOP #2016 (USEPA 1994). Due to limited access to the channel within Reaches 1 and 2, a stainless-steel hand auger was used to advance all ten sediment borings from which samples were collected. Water ranging from approximately one half to three feet in depth was noted at the sediment sampling locations. These sediment depths are consistent with those estimated for Reaches 1 and 2 in the IHHA. Borings were advanced until refusal or until borehole wall collapse, with borehole depths ranging from 1 to 3 ft. The depth of each boring was estimated in the field based on best professional judgment of sediment accumulation in the channel. The location of each boring was marked with a hand-held GPS device. A photo log is included in Attachment 2.

The sediment from each boring was placed in a clean, dedicated five gallon bucket. The sediment was monitored for the presence of organic vapors using a Photo Ionization Detector (PID) held approximately one inch from the sediment in the bucket. Following PID reading, the sediment was homogenized using a clean stainless steel spoon. Homogenized sediment was 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-58-8 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.

Sediment chemical analyses were conducted by Pat-Chem Laboratories, Inc. of Moorpark, California, a state-accredited laboratory. 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 22, 2013, field personnel measured instantaneous flow (flow) during low flow conditions at two sections in the Murphy Canyon Channel. Following SOP guidelines, locations upstream and downstream of the proposed maintenance area were selected for flow measurements. A site under the on-ramp to the I-15 S from Friars Road westbound was selected as the upstream measurement point. This location is approximately 200 feet upstream of the point where effluent from the MVT GWTS is discharged to Murphy Canyon. Due to limited access, this location was the closest feasible upstream sample location to the scheduled maintenance area. As a result of this location being adjacent to the Caltrans right-of-way, permission to access the location was obtained from the City of San Diego prior to conducting flow measurement activities. The downstream flow measurement location was situated in the channel in line with the trolley tracks that run along the southern edge of the Qualcomm Stadium parking lot. 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 21 feet wide at the upstream measurement location. Twelve flow measurements were recorded along the channel at approximately two foot horizontal spacing. At the downstream location the total wetted channel width was 16.4 feet, where fourteen 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 2.12 cubic feet per second (cfs) was determined for the upstream location and a discharge of 2.67 cfs was determined for the downstream location. An example of the excel model used to calculate them can be found 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 Murphy Canyon.

The greater total flow observed downstream may be due to the discharge of the MVT GWTS effluent between the two measurement locations. However, if this effluent is discharged to the channel at the maximum allowed rate of 1.26 mgd (Arcadis, 2013b) a larger difference in upstream versus downstream discharge would be expected than that which was observed. Downstream water loss may occur through infiltration within Reach 1 and evapotranspiration by the thick vegetation within Reaches 1 and 2. Another possibility is that the daily GWTS effluent discharge rate is often less than the maximum allowed.

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 Murphy Canyon Channel 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 Murphy Canyon Channel 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 Reaches 1 and 2 of Murphy Canyon channel 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 Reaches 1 and 2 of Murphy Canyon Channel is estimated to be approximately 440 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 Reaches 1 and 2 or the Murphy Canyon Channel system as a whole.

Description of Volume Measurement Activities:

A site visit to Murphy Canyon was conducted by personnel in March 2013 to evaluate the current channel conditions from a hydrologic and hydraulic perspective. Due to high vegetation density, the current geometry of Reach 1 was not able to be thoroughly assessed during this visit. Therefore water volume within Reaches 1 and 2 was estimated using as-built trapezoidal dimensions supplemented by topography, aerial photos and field observations listed in Table 2. Detailed measurement of channel dimensions was hindered due to thick vegetation within Reaches 1 and 2.

Table 2. Parameters used in approximating Murphy Canyon Channel volume, Reaches 1 and 2

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
1 (except downstream)	Earthen	1,237	20	50	2	1
1 (downstream)	Earthen	425	20	50	2	2.7
2	Concrete	206	20	40	1	0.7

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 Reaches 1 and 2 and multiplying this area by length. Reach 1 was broken into two sections due to the observation that water depth was greater at the downstream end than throughout the majority of the Reach. The water volumes of the three sections (Reach 2 and two sections of Reach 1) were summed, resulting in an approximate water volume estimate of 60,367 cubic feet (ft³). 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 combined length of Reaches 1 and 2, 1868 ft., by the average measured upstream velocity of 0.131 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 3.96 hours was determined. It should be noted that these velocities represent one-time instantaneous measurements, and may not characterize overall ambient flow velocities within Murphy Canyon.

Description of Water Quality Sampling Activities:

On April 22, 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-58-U) and downstream of the maintenance area (R-58-D) in Murphy Canyon Channel. 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 6. 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) were conducted by Pat-Chem Laboratories, Inc. of Moorpark, California, a state-accredited laboratory. The bacterial indicators were analyzed by the City of San Diego Environmental Monitoring & Technical Services (EMTS) Division Marine Microbiology Laboratory in San Diego, California. Bacterial indicators were selected due to their being listed as pollutants in the lower San Diego

River 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 selenium and enterococcus bacteria. The upstream concentration of TDS (1,524 mg/L) exceeds the water quality benchmark of 1,500 mg/L established by the Basin Plan. This TDS concentration is consistent with those previously measured near the upstream sampling location as discussed above. Both the upstream (0.011 mg/L) and downstream (0.010 mg/L) concentrations of selenium exceed the water quality benchmark of 0.005 mg/L (40 CFR 131.38). The downstream concentration of enterococcus bacteria, 240 colony forming units (CFU) per 100 mL, is an estimated value as it fell outside of the expected range. It exceeds the water quality benchmark of 151 CFU/100 mL.

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 22, 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, hydrosol 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 1	Reach 2	Overall
Vegetation	2.3	2.3	2.3
Hydrosol	2.3	2.0	2.3
Hydroperiod	1.8	2.0	1.8
Overall Existing Wetland Score			6.4

Because Reach 1 is an earthen channel and Reach 2 a concrete lined channel, the two reaches were scored separately. The Overall Score represents the combined score for both reaches. Following the SOP, this Overall Score is necessary to evaluate potential water quality impacts as described in the Evaluation of Benefits/Impacts Section below. The scores presented in Table 3 were determined using the procedure identified below.

Vegetation

The Murphy Canyon IBA presents the acreage of each vegetation community or land cover type surveyed that will be impacted by maintenance activities in Reaches 1 and 2. Three vegetation communities, undisturbed and disturbed freshwater marsh (FWM), undisturbed and disturbed southern riparian forest (SRF) and disturbed southern

willow scrub (dSWS), and two land cover types, Open Water/Natural Flood Channel and Developed/Concrete Channel, are identified in Table 2 of the IBA. A score of 0 – 3 was assigned to each of the 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 1 Coverage (acre)	Reach 2 Coverage (acre)	Scoring Rationale
Freshwater Marsh*	3	0.65	0.07	>75% coverage of wet areas, both submerged and emergent wetland species, abundant cattail (<i>Typha</i> sp.)
Southern Riparian Forest*	1	0.21	0	Presence of woody, terrestrial species (non-wetland species), relatively low surface area coverage
Disturbed Southern Willow Scrub	2	0.24	0	Mature wetland population, presence of emergent wetland species
Open Water/Natural Flood Channel	0	0.04	0	No visible vegetation in wet areas
Developed/Concrete Channel	0	0	0.02	No visible vegetation in wet areas
Total Acreage		1.14	0.09	-
Overall Existing Vegetation Score				2.3

* 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 1 and Reach 2 in Table 3 above represents the area-weighted average of these individual vegetation scores for Reaches 1 and 2.

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-58-1	2	1,250	2	Heterogeneous mix of sand and fines
R-58-2	1	944	3	Primarily fines and organic carbon, H ₂ S odor
R-58-3	1	944	3	Primarily fines and organic carbon, H ₂ S odor
R-58-4	1	944	3	Primarily fines and organic carbon, H ₂ S odor
R-58-5	1	944	3	Primarily fines and organic carbon, H ₂ S odor
R-58-6	1	944	3	Primarily fines and organic carbon, H ₂ S odor
R-58-7	1	944	2	Heterogeneous mix of sand and fines
R-58-8	1	944	2	Sands and cobbles, H ₂ S odor
R-58-9	1	944	1	Sands and cobbles
R-58-10	1	944	1	Sands and cobbles
Overall Existing Hydrosoil Score			2.3	-

An existing hydrosoil score of 3 was assigned to R-58-2 through R-58-6, based primarily on the visible deposition of fines and organic carbon with very little sand and the presence of hydrogen sulfide (H₂S) odor indicative of sulfate reducing conditions (ORP < -100 mV). A hydrosoil score of 2 was assigned to R-58-1 and R-58-7 based primarily upon the visible deposition of a heterogeneous mix of sands and fines. A hydrosoil score of 2 was also assigned to R-58-8 based upon the visible deposition of a mix consisting primarily of sands and cobbles combined with a noticeable hydrogen sulfide odor. A hydrosoil score of 1 was assigned to R-58-9 and R-58-10 due to visible deposition of a mix consisting primarily of sands and cobbles.

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 1 and 2. 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-58-1	2	0.7*	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-2	1	1.5	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-3	1	1	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-4	1	1	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-5	1	0.5	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-6	1	0.8	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-7	1	1	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
R-58-8	1	3	1	Deep water (> 2 ft.), HRT < 12 hrs
R-58-9	1	3.5	1	Deep water (> 2 ft.), HRT < 12 hrs
R-58-10	1	1.5	2	Shallow water (0.5 – 1 ft.), HRT < 12 hrs, some deposition of fines
Overall Existing Hydroperiod Score			1.8	-

* Water Depth based on values recorded during upstream instantaneous flow measurement activities.

Under the SOP scoring system, the overall wetland assessment score of 6.4 is comparable to good wetland quality and health. 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 Murphy Canyon Channel, exhibit aspects of hydrosol, hydroperiod and vegetation that resemble wetland conditions. However, Murphy Canyon Channel was 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 1 and 2, 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 1 and 2 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, hydrossoil and hydroperiod in Reaches 1 and 2 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 1	Reach 2	Overall
Vegetation	2.4	3.0	2.4
Hydrossoil	2	2	2
Hydroperiod	3	3	3
Overall Recovery Wetland Score			7.4

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 1 Coverage (acre)	Reach 2 Coverage (acre)	Scoring Rationale
Freshwater Marsh*	3	0.65	0.07	Emergent wetland species will exhibit re-growth within 1 year
Southern Riparian Forest*	1	0.21	0	Recovery of trees and woody species will take longer than 5 years
Disturbed Southern Willow Scrub	2	0.24	0	Recovery of mixed population of woody and leafy vegetation will take 1 – 5 years
Total Acreage		1.10	0.07	-
Overall Recovery Vegetation Score				2.4

* Includes disturbed form

Hydrossoil

A single recovery hydrossoil score of 2 was assigned to Reaches 1 and 2 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 1 and 2 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 3 was assigned to Reaches 1 and 2 following the SOP criteria in Attachment 10 and best professional judgment. This assignment is based primarily on the fact that the water depth in Reaches 1 and 2 was generally observed to be 0.5 – 1 ft. and that 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 8,500 yd³ and 1,250 yd³ are scheduled to be removed from Reaches 1 and 2 respectively. These removal volumes were distributed among the 10 sediment samples in the following manner: The 1,250 yd³ for Reach 2 was allocated to the only sediment sample collected in Reach 2 (R-58-1) and the 8,500 yd³ for Reach 1 was divided evenly among the remaining nine sediment samples collected in Reach 1 (R-58-2 through R-58-10). Total load removal estimates for each pollutant were determined by taking the sum of the estimates for each sediment sampling location. Load removal estimates from R-58-8, R-58-9 and R-58-10 were corrected for the presence of cobble larger than 1.5 inches in accordance with the SOP. This correction was not applied to R-58-1 through R-58-7 as no cobble was observed at these sediment sampling locations. 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 estimated load removal at 5,901 lbs. Nitrate, nitrite, cadmium, antimony and the organophosphorous pesticides (malathion, chlorpyrifos and diazinon) 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*

* See discussion of nitrogen in the following section
 An evaluation of the water quality benefits versus impacts of the proposed channel maintenance in Reaches 1 and 2 of Murphy Canyon channel 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-58-U) was determined. The proposed maintenance period for Reaches 1 and 2 of Murphy Canyon

Channel is approximately three years. The annual existing pollutant removal load capacity 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 steps outlined in 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. While biomass plays a key role in the pollution uptake capacity of most wetland species, studies have also shown that pollutant removal may be enhanced during the growth phase of wetland vegetation, and that periodic harvesting of the vegetation prevents the release of absorbed pollutants during biomass decomposition (e.g. Lee *et al.*, 1976; Kouki et al., 2012).

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. The resulting NTS removal estimates were compared to the sediment pollutant load removal estimates in Attachment 13. An example of the Excel model used to calculate the NTS removal estimates is provided as Attachment 14.

Cadmium, antimony and the organophosphorous pesticides were not detected above laboratory RLs in the sediment or water samples. Of the three constituents analyzed in water samples that exceeded their respective water quality benchmarks, only selenium participates in the SOP-prescribed impact/benefit estimates described above. These estimates indicate that the proposed maintenance would not result in a water quality impact with respect to selenium. For the remaining constituents analyzed in both matrices, the estimated maintained pollutant removal exceeds the estimated existing pollutant removal, with the exception of nitrate. However, as discussed below, a potential temporary increase in water column nitrate concentrations does not represent a significant impact to the water quality in Reaches 1 and 2 of Murphy Canyon Channel.

The anaerobic sediments typical of wetland environments allow for the microbially-mediated process of denitrification, in which nitrate is converted to nitrogen gases that are released to the atmosphere. Removal of sediment and vegetation from Reaches 1 and 2 of Murphy Canyon channel will temporarily disturb this denitrification process and nitrate assimilation by wetland plants, potentially resulting in a temporary increase to water column nitrate concentrations. However, as the measured water column nitrate and total nitrogen concentrations are below the suggested benchmarks established in the Basin Plan at both the upstream and downstream sampling locations (Attachment 9), this temporary disruption does not pose a risk to the water quality in Reaches 1 and 2 of Murphy Canyon Channel.

Given the low aqueous nitrate concentrations, combined with the short term nature of the disruption to denitrification and assimilation, a potential temporary water quality impact with respect to nitrate is out-weighed by the water quality benefit of removing over 2,000 lbs of sediment-bound nitrogen (Attachment 11). Under existing conditions, this nitrogen can be transported downstream through sediment re-suspension during high flow events and released as dissolved, bioavailable nitrogen species through decomposition of organic matter. The proposed removal of sediment and senescent vegetation therefore eliminates a large nitrogen reservoir and a potential source of bioavailable nitrogen to the water column, thereby providing a water quality benefit to performing the maintenance activity.

In addition to nitrogen, removal of sediments from Reaches 1 and 2 of Murphy Canyon Channel would also eliminate over 3,000 lbs of total phosphorous (Attachment 11) thereby preventing downstream transport of phosphorous and potential release of bioavailable forms of phosphorous to the water column. The absence of phosphorous in both the upstream and downstream Murphy Canyon water samples (Attachment 9) is consistent with phosphorous being the limiting nutrient for primary production in the wetland-like environment, as is thought to be typical for many inland surface waters (Hem, 1985). With limited availability of phosphorous, any potential slight increase in water column nitrate concentrations is not likely to incur an undesired biostimulatory effect within Murphy Canyon Channel.

These results of the water quality impact analysis outlined by the SOP suggest that overall the proposed sediment removal during maintenance of Reaches 1 and 2 will remove a larger pollutant load than that which is theoretically removed under existing conditions during dry weather flow by NTS processes over three years. The proposed maintenance will therefore provide an overall water quality benefit. Sediment excavation will prevent the re-suspension and downstream transport of sediment-bound pollutants during wet weather, and regrowth of fresh water marsh species within one year will further enhance pollutant removal from the channel.

Nevertheless, the City, in accordance with the 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 measures are necessary. Nevertheless, the City will implement water quality improvement activities, as required by the SDP. SDP additional requirement 19 requires that for every maintained area one of four improvement options must be implemented. For the Murphy Canyon Maintenance Activities, option c-4 was chosen, which requires the City to restore 100 square feet of wetlands for every 200 linear feet of vegetation removed per fiscal year per WMA. It is estimated that 909 square feet of wetlands will be required to be restored. Wetland restoration activities include the stabilization of eroded drainage and the planting of native riparian vegetation.

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:

- Arcadis, 2013a. Groundwater Monitoring and Remedial Progress Report, Fourth Quarter of 2012. Mission Valley Terminal, San Diego, California. January 30, 2013.
- Arcadis, 2013b. Semiannual Status Report for Time Schedule Order (TSO) No. R9-2011-0052, Mission Valley Terminal, San Diego, California. February 12, 2013.
- Caltrans, 2011. Biofiltration Swale Design Guidance. Sacramento, California. June 2011.
- City of San Diego, 2008. San Diego Watershed Urban Runoff Management Plan, San Diego River Watershed, San Diego County, California. March 2008.
- Gersberg, R.M., *et al.*, 1986. Role of aquatic plants in wastewater treatment by artificial wetlands. *Water Res.* 20(3) 363-368.
- Hem, J.D. 1985. Study and Interpretation of the Chemical Characteristics of Natural Water. Third Edition. U.S. Geological Survey Water-Supply Paper 2254
- Kouki, S., *et al.*, 2012. Potential of polyculture of *Arundo donax* and *Typha latifolia* for growth and phytotreatment of wastewater pollution. *African Journal of Biotechnology* 11 15341-15352
- Lee *et al.*, 1976. Dredged Material Research Program, Feasibility of the Functional use of Vegetation to Filter, Dewater, and Remove Contaminants from Dredged Material. U.S. Army Corps of Engineers Technical Report D-76-4.
- NCDC, 2013. NOAA National Climatic Data Center, <http://www.ncdc.noaa.gov/cdo-web/#t=secondTabLink>, Climatic Data Online: Text & Map Search, accessed May 6, 2013.
- Project Clean Water. 2012. San Diego County Watersheds. Accessed April 2013. <http://projectcleanwater.org/>
- San Diego RWQCB, 1994. Water Quality Control Plan for the San Diego Basin (9), September 8, 1994 with amendments effective on or before April 4, 2011.
- San Diego RWQCB, 2011. Time Schedule Order No. R9-2011-0052, An Order Prescribing a time schedule for the Kinder Morgan Energy Partners to comply with discharge prohibition No. IV.C. of Order No. R9-2008-0002 (NPDES Permit No. CAG919002) for its Mission Valley Terminal remediation dewatering

discharge to Murphy Canyon Creek, September 14, 2011.

San Diego RWQCB, 2007. Order No. R9-2007-0001, NPDES No. CAS0108757, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority, January 2007

San Diego RWQCB, 2013. Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region. May 2013.

Syracuse Research Corporation, 2003. SOP #EH-01, Surface Water Collect, September 2003

SWRCB, 2004. Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, September, 2004/

SWRCB, 2010. 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
May 2013

USEPA 1994. Sediment Sampling. SOP #: 2016. November 17, 1994

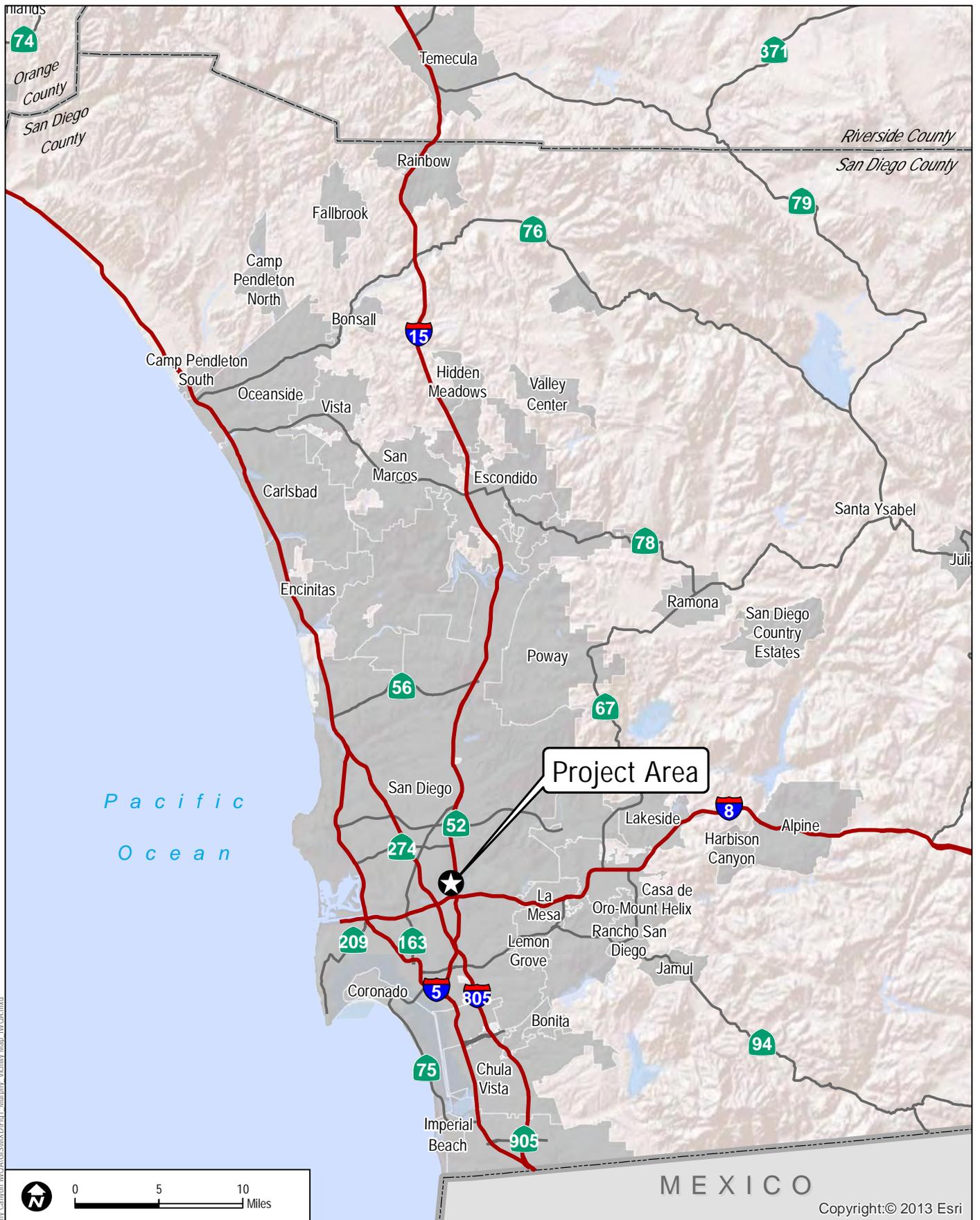
USGS, 1976. Techniques of Water-Resources Investigations of the United States Geological Survey, Chapter A8 Discharge Measurements at Gaging Stations

ATTACHMENT 1

Figure 1 – Vicinity Map

Figure 2 – Project Area

Figure 3 – Sample Locations



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DUDEK

NOVEMBER 2013

MURPHY INDIVIDUAL WATER QUALITY ASSESSMENT (IWQA)

**FIGURE 1
Regional Map**

Copyright © 2013 Esri



LEGEND

-  Sediment Sample
-  Water Quality Sample and Flow Measurement Location
-  Channel Survey Area



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

FIGURE 3
Sample Locations

P:\400_Hydro\Technology\2165_Murphy_Canyon_IWQA\GIS\KDD\Figure 3_Murphy_Sample_Locations.mxd

ATTACHMENT 2
Photographic Log

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No.: 27679954.146000
Photo No.: 1	Date: 4/22/13		
Direction Photo Taken: R-58-D			
Description: Sampler collecting water quality sample at downstream water quality sample location R-58-D, under trolley tracks			

Photo No.: 2	Date: 4/22/13		
Direction Photo Taken: North			
Description: Upstream water quality sample location R-58-U looking upstream.			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No. 27679954.146000
Photo No. 3	Date: 4/22/13		
Direction Photo Taken: East			
Description: R-58-1 sediment sampling location with heavy vegetation			

Photo No. 4	Date: 4/22/13		
Direction Photo Taken: East			
Description: R-58-2 sediment sample location with heavy vegetation			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No.: 27679954.146000
Photo No.: 5	Date: 4/22/13		
Direction Photo Taken: South			
Description: R-58-3 sediment sampling location with heavy vegetation			

Photo No.: 6	Date:		
Direction Photo Taken: South			
Description: R-58-4 sediment sampling location			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No.: 27679954.146000
Photo No.: 7	Date: 4/22/13		
Direction Photo Taken: Southeast			
Description: Accessing sediment sampling location R-58-5 through heavy vegetation			

Photo No.: 8	Date: 4/22/13		
Direction Photo Taken: South			
Description: R-58-6 sediment sampling location with heavy vegetation			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No. 27679954.146000
Photo No. 9	Date: 4/22/13		
Direction Photo Taken: East			
Description: R-58-7 sediment sampling location with evidence of homeless encampment. Milk crates (lower left corner of image) create bridge over channel			

Photo No. 10	Date: 4/22/13		
Direction Photo Taken: North			
Description: R-58-8 sediment sampling location, area of open water under overpassing bridge near downstream extent of maintenance area			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No. 27679954.146000
Photo No. 11	Date: 4/22/13		
Direction Photo Taken: North			
Description: R-58-9 sediment sampling location, area of open water under overpassing bridge near downstream extent of maintenance area			

Photo No. 12	Date:		
Direction Photo Taken: South			
Description: R-58-10 Sediment sampling location, area of open water just beyond overpassing bridge near downstream extent of maintenance area			

Client Name: City of San Diego, O&M		Site Location: Murphy Canyon Channel	Project No. 27679954.146000
Photo No. 13	Date: 4/22/13		
Direction Photo Taken: East			
Description: Sediment samplers within Murphy Canyon Channel, Reach 1, showing thick vegetation			

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

Project Name: City of San Diego OEM IWOA Murphy Campus
Job Number: 7165
Sampled by: Lydia Roach, Jan Martin, Laura Bell, Elizabeth Childers
Sampler Signature: *[Signature]*

Laboratory: PAT CHEM Lab Job #: _____
Lab Contact: Theresa Shipping Method: Carrier
Project Manager: Bryan Evans PM Email: elizabeth.childers@dudek.com

Sample ID	Sample Collection		Matrix			Method Preserved			Number of Sample Containers					VOCs	SVOCs	OCPs / Pesticides	TPH (GRO, DRO, Motor Oil)	TDS (1/1000000 L/L)	Metals (Total)	Percent Solids	Tot-P, NO ₂ , NO ₃ , TKN	Metals (Dissolved)	Dissolved P	TSS	Standard Turn-Around Time	Other:	Special Instructions
	Date	Time	Water	Vapor	Soil	HCl	HNO ₃	NONE	Filtered (Y/N)	40 mL glass	VOA	8 oz. Glass Jar	1 L Amber														
R-58-0	4-22-2017	9:30	X				X					1		2			X	X	X	X	X	X	X	X			Please refer to attached Constituent Limits.
R-58-1		10:00	X				X					1		2			X	X	X	X	X	X	X	X			
R-58-2		13:00			X		X					2					X	X	X								
R-58-3		14:00			X		X					2															
R-58-4		14:20			X		X					2															
R-58-5		14:40			X		X					2															
R-58-6		15:10			X		X					2															
R-58-7		15:40			X		X					2															
R-58-8		16:00			X		X					2															
R-58-9		16:10			X		X					2															
R-58-10		16:20			X		X					2															
R-58-10		16:40			X		X					2															

Type of Analysis to be Performed	TAT	Special Instructions
EPA 8260B		Please refer to attached Constituent Limits.
EPA 8270		
EPA 8081		
EPA m8015		
TPH (GRO, DRO, Motor Oil)		
TDS (1/1000000 L/L)		
Metals (Total)		
Percent Solids		
Tot-P, NO ₂ , NO ₃ , TKN		
Metals (Dissolved)		
Dissolved P		
TSS		
Standard Turn-Around Time	24 hr 48 hr 72 hr	
Other:		

Total # of containers per type: 20 2 4 Total # of containers: 26 Please return original COC to Dudek

Relinquished by:	Company	Date	Time	Received by:	Company	Date	Time	Sample Receipt
<u>Lydia Roach</u>	<u>DUDEK</u>	<u>4/22</u>	<u>17:26</u>	<u>Paul G. Cold</u>	<u>SC</u>	<u>4/22</u>	<u>17:26</u>	<input type="checkbox"/> Samples Intact
								<input type="checkbox"/> Cooler Temp: _____ °C
								<input type="checkbox"/> Conforms to COC

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: 4/27/2013

CHAIN OF CUSTODY RECORD

Project/Client: <u>SWPP</u>	Sampler(s): <u>LR + LPR</u>	Type of sampling equipment / How sample obtained / Other sampling notes: <u>ASEPTIC</u>
Contact Name: <u>J. Erickson</u>	Contact Name: <u>"</u>	
Phone: <u>619 541-4312</u>	Phone: <u>"</u>	

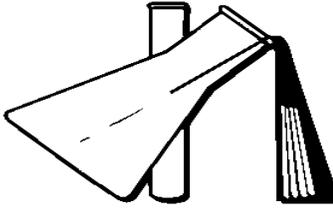
Time	Initials	SAMPLE		ANALYSES						COMMENTS (grab, comp., etc.)
		Source / I.D.	Matrix (water, bio-solid, etc.)	Total Coliform	Fecal Coliform	E. coli	Enterococcus	Coliphage	Other	
0830	LR	R-58-D	Water	X	X	X				MF/MTF
1000	LR	R-58-U	Water	X	X	X				↓

CHAIN-OF-CUSTODY

COMMENTS

Relinquished by(print): <u>Lydia Roach 1148</u>	Relinquished by(print): <u>Relin'd</u>	NON REC Waters - do NOT Report to DEH
Sign: <u>Lydia Roach</u>	Sign: <u>Sign</u>	
Received by(print): <u>Katharine Jocelyn 1148</u>	Received by(print): <u>Received:</u>	
Sign: <u>[Signature]</u>	Sign: <u>Sign</u>	
Date/Time: <u>4/27/13 1148</u>	Date/Time: <u>Date/Time</u>	
Location: <u>Deming Canyon Murphy</u>	Location: <u>Locat:</u>	

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

Page 1 of 28

Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

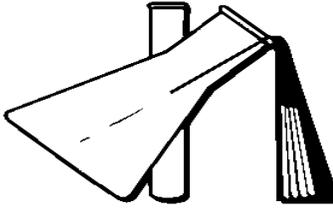
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-D (Sample I.D.# : 1304266-01) Collected: 22-Apr-13 By Dudek						
Arsenic	EPA 200.8	AD32303	0.5	23-Apr-13 (AF)	4.4 ug/l	
Cadmium	EPA 200.8	AD32303	0.2	23-Apr-13 (AF)	< 0.2 ug/l	
Chromium	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	4.7 ug/l	
Copper	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	2.2 ug/l	
Manganese	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	6.2 ug/l	
Nickel	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	6.9 ug/l	
Lead	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Antimony	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Selenium	EPA 200.8	AD32303	2.0	23-Apr-13 (AF)	10 ug/l	
Zinc	EPA 200.8	AD32303	5.0	23-Apr-13 (AF)	7.3 ug/l	
Arsenic - Dissolved	EPA 200.8	AD32303	0.5	23-Apr-13 (AF)	4.4 ug/l	
Cadmium - Dissolved	EPA 200.8	AD32303	0.2	23-Apr-13 (AF)	< 0.2 ug/l	
Chromium - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	4.6 ug/l	
Copper - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	2.2 ug/l	
Manganese - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	5.2 ug/l	
Nickel - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	6.6 ug/l	
Lead - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Antimony - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Selenium - Dissolved	EPA 200.8	AD32303	2.0	23-Apr-13 (AF)	10 ug/l	
Zinc - Dissolved	EPA 200.8	AD32303	5.0	23-Apr-13 (AF)	6.6 ug/l	
Chlorpyrifos	EPA 8141	AD32301	1.0	23-Apr-13 (SJ)	< 1.0 ug/l	
Diazinon	EPA 8141	AD32301	0.2	23-Apr-13 (SJ)	< 0.2 ug/l	
Malathion	EPA 8141	AD32301	1.0	23-Apr-13 (SJ)	< 1.0 ug/l	
Total Hardness	SM 2340	AD32317	2	23-Apr-13 (LL)	880 mg/l	
Phosphorus, Dissolved as P	EPA 365.3	AD32307	0.03	23-Apr-13 (LL)	< 0.03 mg/l	
Total Kjeldahl Nitrogen	EPA 351.3	AD32306	0.10	23-Apr-13 (JA)	0.89 mg/l	
Phosphorus, Total as P	EPA 365.3	AD32307	0.03	23-Apr-13 (LL)	< 0.03 mg/l	
Total Nitrogen	varies	[CALC]	0.30	23-Apr-13 (JA)	0.89 mg/l	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

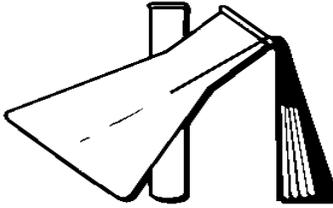
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-D (Sample I.D.# : 1304266-01) Collected: 22-Apr-13 By Dudek						
Total Suspended Solids	EPA 160.2	AD32311	1	23-Apr-13 (EA)	2 mg/l	
Total Dissolved Solids	EPA 160.1	AD32310	1	23-Apr-13 (EA)	1480 mg/l	
Nitrite as N	EPA 353.2	AD32316	0.10	23-Apr-13 (JA)	< 0.10 mg/l	
Nitrate as N	EPA 353.3	AD32316	0.10	23-Apr-13 (JA)	< 0.10 mg/l	
R-58-U (Sample I.D.# : 1304266-02) Collected: 22-Apr-13 By Dudek						
Arsenic	EPA 200.8	AD32303	0.5	23-Apr-13 (AF)	5.1 ug/l	
Cadmium	EPA 200.8	AD32303	0.2	23-Apr-13 (AF)	< 0.2 ug/l	
Chromium	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	5.1 ug/l	
Copper	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	2.3 ug/l	
Manganese	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	23 ug/l	
Nickel	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	7.3 ug/l	
Lead	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Antimony	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Selenium	EPA 200.8	AD32303	2.0	23-Apr-13 (AF)	11 ug/l	
Zinc	EPA 200.8	AD32303	5.0	23-Apr-13 (AF)	5.4 ug/l	
Arsenic - Dissolved	EPA 200.8	AD32303	0.5	23-Apr-13 (AF)	4.8 ug/l	
Cadmium - Dissolved	EPA 200.8	AD32303	0.2	23-Apr-13 (AF)	< 0.2 ug/l	
Chromium - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	5.0 ug/l	
Copper - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	2.1 ug/l	
Manganese - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	22 ug/l	
Nickel - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	7.2 ug/l	
Lead - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Antimony - Dissolved	EPA 200.8	AD32303	1.0	23-Apr-13 (AF)	< 1.0 ug/l	
Selenium - Dissolved	EPA 200.8	AD32303	2.0	23-Apr-13 (AF)	11 ug/l	
Zinc - Dissolved	EPA 200.8	AD32303	5.0	23-Apr-13 (AF)	< 5.0 ug/l	
Chlorpyrifos	EPA 8141	AD32301	1.0	23-Apr-13 (SJ)	< 1.0 ug/l	
Diazinon	EPA 8141	AD32301	0.2	23-Apr-13 (SJ)	< 0.2 ug/l	
Malathion	EPA 8141	AD32301	1.0	23-Apr-13 (SJ)	< 1.0 ug/l	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

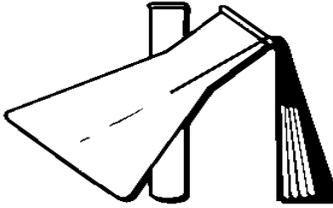
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-U (Sample I.D.# : 1304266-02) Collected: 22-Apr-13 By Dudek						
Total Hardness	SM 2340	AD32317	2	23-Apr-13 (LL)	902 mg/l	
Phosphorus, Dissolved as P	EPA 365.3	AD32307	0.03	23-Apr-13 (LL)	< 0.03 mg/l	
Total Kjeldahl Nitrogen	EPA 351.3	AD32306	0.10	23-Apr-13 (JA)	0.63 mg/l	
Phosphorus, Total as P	EPA 365.3	AD32307	0.03	23-Apr-13 (LL)	< 0.03 mg/l	
Total Nitrogen	varies	[CALC]	0.30	23-Apr-13 (JA)	0.80 mg/l	
Total Suspended Solids	EPA 160.2	AD32311	1	23-Apr-13 (EA)	2 mg/l	
Total Dissolved Solids	EPA 160.1	AD32310	1	23-Apr-13 (EA)	1524 mg/l	
Nitrite as N	EPA 353.2	AD32316	0.10	23-Apr-13 (JA)	< 0.10 mg/l	
Nitrate as N	EPA 353.3	AD32316	0.10	23-Apr-13 (JA)	0.18 mg/l	
R-58-1 (Sample I.D.# : 1304266-03) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	4.3 mg/kg	
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)	140 mg/kg	
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)	3.8 mg/kg	
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	38 mg/kg	
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	4.0 mg/kg	
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	< 0.2 mg/kg	
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.6 mg/kg	
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	3.4 mg/kg	
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Surrogate: 1,3-Dimethyl-2-nitrobenze.	EPA 8141	AD32302		24-Apr-13 (SJ)	46.9 % (30-120)	
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)	170 mg/kg	
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)	169 mg/kg	
% Solids	% calculation	AD32312		23-Apr-13 (EA)	69.8 %	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

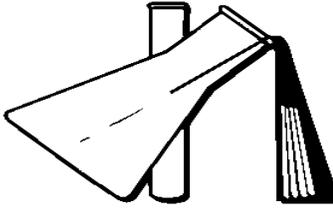
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-1 (Sample I.D.# : 1304266-03) Collected: 22-Apr-13 By Dudek						
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-2 (Sample I.D.# : 1304266-04) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		7.3 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		230 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		6.7 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		53 mg/kg
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.6 mg/kg
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	<	0.2 mg/kg
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.6 mg/kg
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		3.1 mg/kg
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)		1.1 mg/kg
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>49.9 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		160 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		145 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		63.0 %
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-3 (Sample I.D.# : 1304266-05) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		5.4 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		210 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		5.7 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		44 mg/kg

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

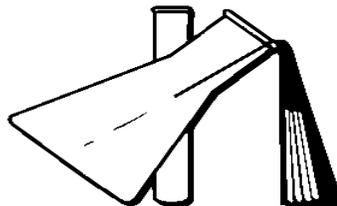
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-3 (Sample I.D.# : 1304266-05) Collected: 22-Apr-13 By Dudek						
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	5.3 mg/kg	
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	< 0.2 mg/kg	
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.7 mg/kg	
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	4.0 mg/kg	
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>						
Total Kjeldahl Nitrogen	EPA 8141	AD32302		24-Apr-13 (SJ)	47.7 % (30-120)	
Phosphorus, Total as P	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)	310 mg/kg	
% Solids	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)	159 mg/kg	
Nitrite as N	% calculation	AD32312		23-Apr-13 (EA)	69.2 %	
Nitrate as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	< 0.5 mg/kg	
	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	< 0.5 mg/kg	
R-58-4 (Sample I.D.# : 1304266-06) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	4.5 mg/kg	
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)	170 mg/kg	
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)	4.3 mg/kg	
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	41 mg/kg	
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.9 mg/kg	
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	< 0.2 mg/kg	
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.2 mg/kg	
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	3.1 mg/kg	
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

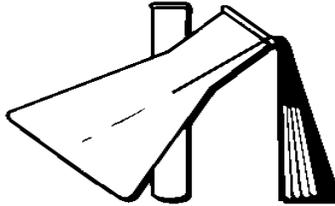
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-4 (Sample I.D.# : 1304266-06) Collected: 22-Apr-13 By Dudek						
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>44.2 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		140 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		157 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		74.0 %
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-5 (Sample I.D.# : 1304266-07) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.3 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		110 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		3.0 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		29 mg/kg
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.4 mg/kg
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	<	0.2 mg/kg
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		2.6 mg/kg
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		2.6 mg/kg
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>45.7 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		120 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		135 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		72.3 %

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
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Subject: Murphy Canyon 7165

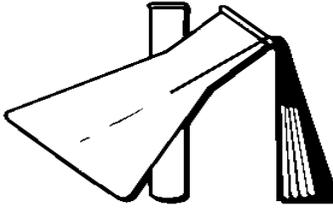
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-5 (Sample I.D.# : 1304266-07) Collected: 22-Apr-13 By Dudek						
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-6 (Sample I.D.# : 1304266-08) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		5.2 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		490 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		3.5 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		43 mg/kg
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.8 mg/kg
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	<	0.2 mg/kg
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.8 mg/kg
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		4.1 mg/kg
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>49.0 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		77 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		152 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		70.0 %
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-7 (Sample I.D.# : 1304266-09) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		5.3 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		400 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		4.5 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		47 mg/kg

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

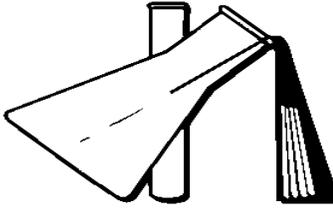
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-7 (Sample I.D.# : 1304266-09) Collected: 22-Apr-13 By Dudek						
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.1 mg/kg	
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	< 0.2 mg/kg	
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	4.5 mg/kg	
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	4.4 mg/kg	
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	< 50.0 ug/kg	
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>						
Total Kjeldahl Nitrogen	EPA 8141	AD32302		24-Apr-13 (SJ)	48.9 % (30-120)	
Phosphorus, Total as P	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)	130 mg/kg	
% Solids	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)	176 mg/kg	
Nitrite as N	% calculation	AD32312		23-Apr-13 (EA)	67.8 %	
Nitrate as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	< 0.5 mg/kg	
	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	< 0.5 mg/kg	
R-58-8 (Sample I.D.# : 1304266-10) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.7 mg/kg	
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)	130 mg/kg	
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)	2.8 mg/kg	
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	32 mg/kg	
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	3.1 mg/kg	
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	< 0.2 mg/kg	
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	2.2 mg/kg	
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)	2.3 mg/kg	
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	< 1.0 mg/kg	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

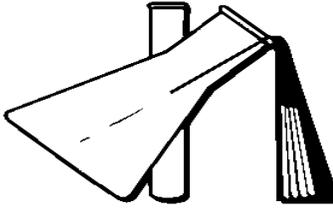
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-8 (Sample I.D.# : 1304266-10) Collected: 22-Apr-13 By Dudek						
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>48.0 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		98 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		124 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		74.9 %
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-9 (Sample I.D.# : 1304266-11) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		4.0 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		230 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		3.0 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		34 mg/kg
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.2 mg/kg
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	<	0.2 mg/kg
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		2.2 mg/kg
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		2.4 mg/kg
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>50.2 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		110 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		106 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		72.6 %

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

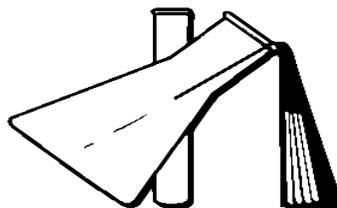
Project/P.O.#: City of San Diego O&M IWQA

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
R-58-9 (Sample I.D.# : 1304266-11) Collected: 22-Apr-13 By Dudek						
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
R-58-10 (Sample I.D.# : 1304266-12) Collected: 22-Apr-13 By Dudek						
Copper	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		4.0 mg/kg
Manganese	EPA 200.8	AD32304	10	23-Apr-13 (AF)		140 mg/kg
Lead	EPA 6020	AD32304	0.02	23-Apr-13 (AF)		3.4 mg/kg
Zinc	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		28 mg/kg
Arsenic	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		5.6 mg/kg
Cadmium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)	<	0.2 mg/kg
Chromium	EPA 6020	AD32304	0.2	23-Apr-13 (AF)		3.2 mg/kg
Nickel	EPA 6020	AD32304	0.5	23-Apr-13 (AF)		2.6 mg/kg
Antimony	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Selenium	EPA 6020	AD32304	1.0	23-Apr-13 (AF)	<	1.0 mg/kg
Chlorpyrifos	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Diazinon	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
Malathion	EPA 8141	AD32302	50.0	24-Apr-13 (SJ)	<	50.0 ug/kg
<i>Surrogate: 1,3-Dimethyl-2-nitrobenze.</i>	<i>EPA 8141</i>	<i>AD32302</i>		<i>24-Apr-13 (SJ)</i>		<i>47.4 % (30-120)</i>
Total Kjeldahl Nitrogen	EPA 351.3	AD32305	1.5	23-Apr-13 (JA)		30 mg/kg
Phosphorus, Total as P	EPA 365.3	AD32308	0.5	23-Apr-13 (LL)		318 mg/kg
% Solids	% calculation	AD32312		23-Apr-13 (EA)		80.0 %
Nitrite as N	EPA 354.1	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg
Nitrate as N	EPA 353.3	AD32313	0.5	23-Apr-13 (JA)	<	0.5 mg/kg

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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
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Batch AD32303 - EPA 200 Series

Blank (AD32303-BLK1)

Prepared & Analyzed: 23-Apr-13

Copper	ND	1.0	ug/l							
Selenium	ND	2.0	"							
Arsenic	ND	0.5	"							
Nickel	ND	1.0	"							
Lead	ND	1.0	"							
Chromium	ND	1.0	"							
Cadmium	ND	0.2	"							
Manganese	ND	1.0	"							
Zinc	ND	5.0	"							
Antimony	ND	1.0	"							

LCS (AD32303-BS1)

Prepared & Analyzed: 23-Apr-13

Chromium	51.2	1.0	ug/l	50.0		102	85-115			
Selenium	50.9	2.0	"	50.0		102	85-115			
Antimony	48.8	1.0	"	50.0		97.6	85-115			
Manganese	53.3	1.0	"	50.0		107	85-115			
Arsenic	49.1	0.5	"	50.0		98.3	80-120			
Copper	51.6	1.0	"	50.0		103	85-115			
Nickel	51.9	1.0	"	50.0		104	85-115			
Zinc	51.7	5.0	"	50.0		103	80-120			
Lead	47.0	1.0	"	50.0		93.9	85-115			
Cadmium	50.0	0.2	"	50.0		100	85-115			

LCS Dup (AD32303-BSD1)

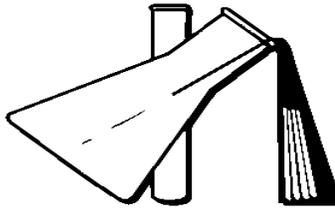
Prepared & Analyzed: 23-Apr-13

Antimony	49.1	1.0	ug/l	50.0		98.2	85-115	0.592	20	
Arsenic	49.0	0.5	"	50.0		98.0	80-120	0.265	20	
Nickel	52.1	1.0	"	50.0		104	85-115	0.481	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

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

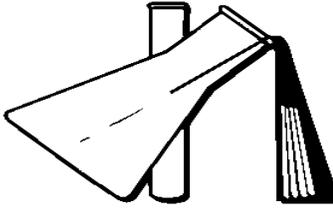
Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Note
Batch AD32303 - EPA 200 Series										
LCS Dup (AD32303-BSD1)				Prepared & Analyzed: 23-Apr-13						
Manganese	53.9	1.0	"	50.0	108	85-115	1.21	20		
Zinc	51.4	5.0	"	50.0	103	80-120	0.485	20		
Lead	47.6	1.0	"	50.0	95.2	85-115	1.37	20		
Chromium	51.4	1.0	"	50.0	103	85-115	0.468	20		
Copper	51.4	1.0	"	50.0	103	85-115	0.427	20		
Cadmium	50.1	0.2	"	50.0	100	85-115	0.0400	20		
Selenium	50.2	2.0	"	50.0	100	85-115	1.38	20		
Duplicate (AD32303-DUP1)				Source: 1304260-02			Prepared & Analyzed: 23-Apr-13			
Manganese	1.10	1.0	ug/l		1.11		0.905	20		
Lead	0.130	1.0	"		0.140		7.41	20		
Nickel	2.67	1.0	"		2.78		4.04	20		
Selenium	ND	2.0	"		ND			20		
Copper	3.91	1.0	"		3.94		0.764	20		
Cadmium	ND	0.2	"		ND			20		
Zinc	3.66	5.0	"		3.42		6.78	20		
Arsenic	0.200	0.5	"		0.230		14.0	20		
Chromium	0.660	1.0	"		0.710		7.30	20		
Antimony	ND	1.0	"		ND			20		
Matrix Spike (AD32303-MS1)				Source: 1304260-02			Prepared & Analyzed: 23-Apr-13			
Chromium	47.2	1.0	ug/l	50.0	0.710	93.0	80-120			
Lead	48.3	1.0	"	50.0	0.140	96.3	80-120			
Zinc	49.2	5.0	"	50.0	3.42	91.6	80-120			
Selenium	49.2	2.0	"	50.0	ND	98.5	80-120			
Cadmium	47.3	0.2	"	50.0	ND	94.7	80-120			
Antimony	50.3	1.0	"	50.0	ND	101	80-120			

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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
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Batch AD32303 - EPA 200 Series

Matrix Spike (AD32303-MS1)

Source: 1304260-02

Prepared & Analyzed: 23-Apr-13

Manganese	49.4	1.0	"	50.0	1.11	96.7	80-120			
Arsenic	49.3	0.5	"	50.0	0.230	98.1	80-120			
Copper	51.0	1.0	"	50.0	3.94	94.1	80-120			
Nickel	49.1	1.0	"	50.0	2.78	92.7	80-120			

Matrix Spike Dup (AD32303-MSD1)

Source: 1304260-02

Prepared & Analyzed: 23-Apr-13

Copper	51.1	1.0	ug/l	50.0	3.94	94.2	80-120	0.157	20	
Cadmium	47.7	0.2	"	50.0	ND	95.4	80-120	0.779	20	
Nickel	49.1	1.0	"	50.0	2.78	92.6	80-120	0.163	20	
Lead	48.4	1.0	"	50.0	0.140	96.4	80-120	0.186	20	
Arsenic	49.6	0.5	"	50.0	0.230	98.6	80-120	0.506	20	
Zinc	49.4	5.0	"	50.0	3.42	92.0	80-120	0.426	20	
Manganese	49.5	1.0	"	50.0	1.11	96.8	80-120	0.121	20	
Selenium	49.5	2.0	"	50.0	ND	99.0	80-120	0.547	20	
Antimony	50.9	1.0	"	50.0	ND	102	80-120	1.30	20	
Chromium	47.0	1.0	"	50.0	0.710	92.7	80-120	0.382	20	

Batch AD32304 - EPA 3050B

Blank (AD32304-BLK1)

Prepared & Analyzed: 23-Apr-13

Manganese	ND	1.0	mg/kg							
Zinc	ND	0.5	"							
Lead	ND	0.02	"							
Copper	ND	0.2	"							

LCS (AD32304-BS1)

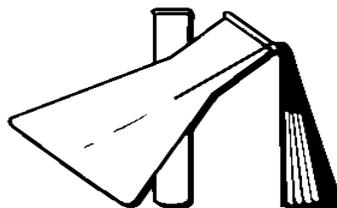
Prepared & Analyzed: 23-Apr-13

Manganese	2.39	1.0	mg/kg	2.50		95.6	85-115			
Copper	2.47	0.2	"	2.50		98.9	85-115			
Zinc	2.72	0.5	"	2.50		109	85-115			

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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

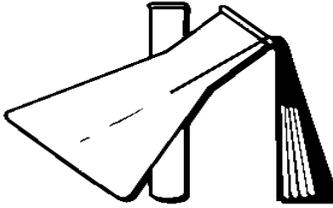
Metals by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32304 - EPA 3050B										
LCS (AD32304-BS1)				Prepared & Analyzed: 23-Apr-13						
Lead	2.31	0.02	"	2.50		92.4	85-115			
LCS Dup (AD32304-BSD1)				Prepared & Analyzed: 23-Apr-13						
Zinc	2.71	0.5	mg/kg	2.50		108	85-115	0.295	20	
Manganese	2.39	1.0	"	2.50		95.5	85-115	0.147	20	
Copper	2.48	0.2	"	2.50		99.0	85-115	0.101	20	
Lead	2.35	0.02	"	2.50		94.0	85-115	1.72	20	
Duplicate (AD32304-DUP1)				Source: 1304266-03			Prepared & Analyzed: 23-Apr-13			
Lead	3.61	0.02	mg/kg		3.82			5.78	20	
Zinc	36.1	0.5	"		37.5			3.86	20	
Copper	4.16	0.2	"		4.32			3.89	20	
Manganese	139	10	"		143			2.66	20	
Matrix Spike (AD32304-MS1)				Source: 1304266-03			Prepared & Analyzed: 23-Apr-13			
Manganese	163	10	mg/kg	25.0	143	82.2	80-120			
Copper	27.6	0.2	"	25.0	4.32	93.2	80-120			
Lead	26.6	0.02	"	25.0	3.82	91.3	80-120			
Zinc	60.7	0.5	"	25.0	37.5	92.6	80-120			
Matrix Spike Dup (AD32304-MSD1)				Source: 1304266-03			Prepared & Analyzed: 23-Apr-13			
Manganese	164	10	mg/kg	25.0	143	84.4	80-120	0.336	20	
Copper	28.0	0.2	"	25.0	4.32	94.8	80-120	1.46	20	
Zinc	67.4	0.5	"	25.0	37.5	119	80-120	10.4	20	
Lead	27.3	0.02	"	25.0	3.82	93.9	80-120	2.45	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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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
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Batch AD32303 - EPA 200 Series

Blank (AD32303-BLK1)

Prepared & Analyzed: 23-Apr-13

Manganese - Dissolved	ND	1.0	ug/l							
Lead - Dissolved	ND	1.0	"							
Chromium - Dissolved	ND	1.0	"							
Arsenic - Dissolved	ND	0.5	"							
Nickel - Dissolved	ND	1.0	"							
Copper - Dissolved	ND	1.0	"							
Zinc - Dissolved	ND	5.0	"							
Antimony - Dissolved	ND	1.0	"							
Cadmium - Dissolved	ND	0.2	"							
Selenium - Dissolved	ND	2.0	"							

LCS (AD32303-BS1)

Prepared & Analyzed: 23-Apr-13

Arsenic - Dissolved	49.1	0.5	ug/l	50.0		98.3	85-115			
Cadmium - Dissolved	50.0	0.2	"	50.0		100	85-115			
Lead - Dissolved	47.0	1.0	"	50.0		93.9	85-115			
Chromium - Dissolved	51.2	1.0	"	50.0		102	85-115			
Zinc - Dissolved	51.7	5.0	"	50.0		103	80-120			
Antimony - Dissolved	48.8	1.0	"	50.0		97.6	85-115			
Copper - Dissolved	51.6	1.0	"	50.0		103	85-115			
Nickel - Dissolved	51.9	1.0	"	50.0		104	85-115			
Manganese - Dissolved	53.3	1.0	"	50.0		107	85-115			
Selenium - Dissolved	50.9	2.0	"	50.0		102	85-115			

LCS Dup (AD32303-BSD1)

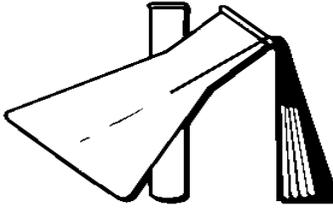
Prepared & Analyzed: 23-Apr-13

Manganese - Dissolved	53.9	1.0	ug/l	50.0		108	85-115	1.21	20	
Selenium - Dissolved	50.2	2.0	"	50.0		100	85-115	1.38	20	
Copper - Dissolved	51.4	1.0	"	50.0		103	85-115	0.427	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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Customer: **URS Corporation (San Diego) - Vendor # 112052**
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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

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

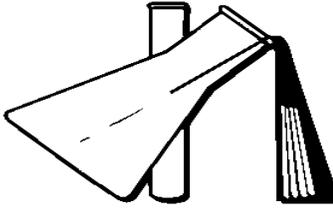
Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Note
Batch AD32303 - EPA 200 Series										
LCS Dup (AD32303-BSD1)				Prepared & Analyzed: 23-Apr-13						
Zinc - Dissolved	51.4	5.0	"	50.0	103	80-120	0.485	20		
Chromium - Dissolved	51.4	1.0	"	50.0	103	85-115	0.468	20		
Cadmium - Dissolved	50.1	0.2	"	50.0	100	85-115	0.0400	20		
Antimony - Dissolved	49.1	1.0	"	50.0	98.2	85-115	0.592	20		
Arsenic - Dissolved	49.0	0.5	"	50.0	98.0	85-115	0.265	20		
Lead - Dissolved	47.6	1.0	"	50.0	95.2	85-115	1.37	20		
Nickel - Dissolved	52.1	1.0	"	50.0	104	85-115	0.481	20		
Duplicate (AD32303-DUP1)				Source: 1304260-02		Prepared & Analyzed: 23-Apr-13				
Zinc - Dissolved	3.66	5.0	ug/l		3.42		6.78	20		
Copper - Dissolved	3.91	1.0	"		3.94		0.764	20		
Lead - Dissolved	0.130	1.0	"		0.140		7.41	20		
Antimony - Dissolved	ND	1.0	"		ND			20		
Selenium - Dissolved	ND	2.0	"		ND			20		
Chromium - Dissolved	0.660	1.0	"		0.710		7.30	20		
Cadmium - Dissolved	ND	0.2	"		ND			20		
Arsenic - Dissolved	0.200	0.5	"		0.230		14.0	20		
Manganese - Dissolved	1.10	1.0	"		1.11		0.905	20		
Nickel - Dissolved	2.67	1.0	"		2.78		4.04	20		
Matrix Spike (AD32303-MS1)				Source: 1304260-02		Prepared & Analyzed: 23-Apr-13				
Chromium - Dissolved	47.2	1.0	ug/l	50.0	0.710	93.0	80-120			
Zinc - Dissolved	49.2	5.0	"	50.0	3.42	91.6	80-120			
Antimony - Dissolved	50.3	1.0	"	50.0	ND	101	80-120			
Arsenic - Dissolved	49.3	0.5	"	50.0	0.230	98.1	75-125			
Manganese - Dissolved	49.4	1.0	"	50.0	1.11	96.7	80-120			
Lead - Dissolved	48.3	1.0	"	50.0	0.140	96.3	80-120			

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Subject: Murphy Canyon 7165

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

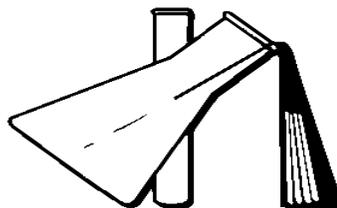
Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32303 - EPA 200 Series										
Matrix Spike (AD32303-MS1)		Source: 1304260-02			Prepared & Analyzed: 23-Apr-13					
Nickel - Dissolved	49.1	1.0	"	50.0	2.78	92.7	80-120			
Copper - Dissolved	51.0	1.0	"	50.0	3.94	94.1	80-120			
Cadmium - Dissolved	47.3	0.2	"	50.0	ND	94.7	80-120			
Selenium - Dissolved	49.2	2.0	"	50.0	ND	98.5	80-120			
Matrix Spike Dup (AD32303-MSD1)		Source: 1304260-02			Prepared & Analyzed: 23-Apr-13					
Antimony - Dissolved	50.9	1.0	ug/l	50.0	ND	102	80-120	1.30	20	
Nickel - Dissolved	49.1	1.0	"	50.0	2.78	92.6	80-120	0.163	20	
Lead - Dissolved	48.4	1.0	"	50.0	0.140	96.4	80-120	0.186	20	
Arsenic - Dissolved	49.6	0.5	"	50.0	0.230	98.6	75-125	0.506	20	
Zinc - Dissolved	49.4	5.0	"	50.0	3.42	92.0	80-120	0.426	20	
Cadmium - Dissolved	47.7	0.2	"	50.0	ND	95.4	80-120	0.779	20	
Manganese - Dissolved	49.5	1.0	"	50.0	1.11	96.8	80-120	0.121	20	
Chromium - Dissolved	47.0	1.0	"	50.0	0.710	92.7	80-120	0.382	20	
Copper - Dissolved	51.1	1.0	"	50.0	3.94	94.2	80-120	0.157	20	
Selenium - Dissolved	49.5	2.0	"	50.0	ND	99.0	80-120	0.547	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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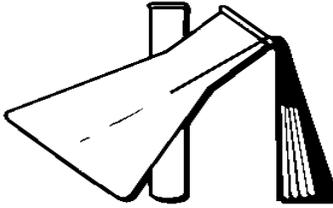
Metals by SM 3500 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Note
Batch AD32304 - EPA 3050B										
Blank (AD32304-BLK1)				Prepared & Analyzed: 23-Apr-13						
Chromium	ND	0.2	mg/kg							
Antimony	ND	1.0	"							
Selenium	ND	1.0	"							
Nickel	ND	0.5	"							
Arsenic	ND	0.2	"							
Cadmium	ND	0.2	"							
LCS (AD32304-BS1)				Prepared & Analyzed: 23-Apr-13						
Arsenic	2.50	0.2	mg/kg	2.50		99.9	85-115			
Nickel	2.40	0.5	"	2.50		96.0	85-115			
Chromium	2.26	0.2	"	2.50		90.6	85-115			
Cadmium	2.47	0.2	"	2.50		98.6	85-115			
Selenium	2.72	1.0	"	2.50		109	85-115			
Antimony	2.42	1.0	"	2.50		96.9	85-115			
LCS Dup (AD32304-BSD1)				Prepared & Analyzed: 23-Apr-13						
Arsenic	2.49	0.2	mg/kg	2.50		99.5	85-115	0.421	20	
Selenium	2.69	1.0	"	2.50		108	85-115	1.18	20	
Antimony	2.45	1.0	"	2.50		97.9	85-115	0.965	20	
Nickel	2.38	0.5	"	2.50		95.3	85-115	0.732	20	
Chromium	2.24	0.2	"	2.50		89.8	85-115	0.909	20	
Cadmium	2.46	0.2	"	2.50		98.3	85-115	0.305	20	
Duplicate (AD32304-DUP1)				Source: 1304266-03		Prepared & Analyzed: 23-Apr-13				
Antimony	ND	1.0	mg/kg		0.110				20	
Arsenic	3.84	0.2	"		3.98			3.58	20	
Cadmium	ND	0.2	"		ND				20	
Selenium	ND	1.0	"		ND				20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

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

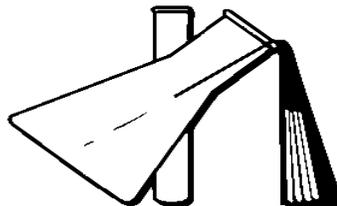
Metals by SM 3500 Series Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32304 - EPA 3050B										
Duplicate (AD32304-DUP1)		Source: 1304266-03			Prepared & Analyzed: 23-Apr-13					
Nickel	3.28	0.5	"		3.36			2.26	20	
Chromium	3.46	0.2	"		3.58			3.40	20	
Matrix Spike (AD32304-MS1)		Source: 1304266-03			Prepared & Analyzed: 23-Apr-13					
Antimony	23.9	1.0	mg/kg	25.0	0.110	95.0	80-120			
Cadmium	24.6	0.2	"	25.0	ND	98.5	80-120			
Arsenic	28.2	0.2	"	25.0	3.98	96.8	80-120			
Selenium	25.9	1.0	"	25.0	ND	104	80-120			
Chromium	26.3	0.2	"	25.0	3.58	90.8	80-120			
Nickel	26.7	0.5	"	25.0	3.36	93.3	80-120			
Matrix Spike Dup (AD32304-MSD1)		Source: 1304266-03			Prepared & Analyzed: 23-Apr-13					
Antimony	23.7	1.0	mg/kg	25.0	0.110	94.3	80-120	0.778	20	
Arsenic	28.1	0.2	"	25.0	3.98	96.4	80-120	0.373	20	
Selenium	25.9	1.0	"	25.0	ND	103	80-120	0.270	20	
Cadmium	24.4	0.2	"	25.0	ND	97.5	80-120	1.04	20	
Chromium	26.0	0.2	"	25.0	3.58	89.5	80-120	1.24	20	
Nickel	26.2	0.5	"	25.0	3.36	91.5	80-120	1.66	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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
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Batch AD32301 - Solvent Extraction

Blank (AD32301-BLK1)

Prepared & Analyzed: 23-Apr-13

Chlorpyrifos	ND	1.0	ug/l							
Diazinon	ND	0.2	"							
Malathion	ND	1.0	"							

LCS (AD32301-BS1)

Prepared & Analyzed: 23-Apr-13

Surrogate: 1,3-Dimethyl-2-nitrobenzene	5.63		ug/l	10.0		56.3	30-120			
Malathion	4.02	1.0	"	5.00		80.5	50-130			

LCS Dup (AD32301-BSD1)

Prepared & Analyzed: 23-Apr-13

Surrogate: 1,3-Dimethyl-2-nitrobenzene	6.23		ug/l	10.0		62.3	30-120			
Malathion	4.58	1.0	"	5.00		91.7	50-130	13.0	30	

Matrix Spike (AD32301-MS1)

Source: 1304001-15

Prepared & Analyzed: 23-Apr-13

Surrogate: 1,3-Dimethyl-2-nitrobenzene	5.86		ug/l	10.0		58.6	30-120			
Malathion	4.50	1.0	"	5.00	ND	89.9	50-130			

Matrix Spike Dup (AD32301-MSD1)

Source: 1304001-15

Prepared & Analyzed: 23-Apr-13

Surrogate: 1,3-Dimethyl-2-nitrobenzene	5.88		ug/l	10.0		58.8	30-120			
Malathion	4.56	1.0	"	5.00	ND	91.3	50-130	1.55	40	

Batch AD32302 - Solvent Extraction

Blank (AD32302-BLK1)

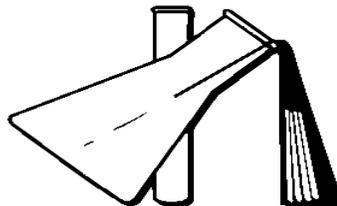
Prepared & Analyzed: 23-Apr-13

Surrogate: 1,3-Dimethyl-2-nitrobenzene	1380		ug/kg	2000		69.0	30-120			
Chlorpyrifos	ND	50.0	"							
Diazinon	ND	50.0	"							
Malathion	ND	50.0	"							

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Attention: Bryn Evans
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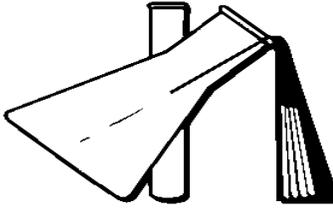
Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32302 - Solvent Extraction										
LCS (AD32302-BS1)				Prepared & Analyzed: 23-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	1300		ug/kg	2000		64.9	30-120			
Malathion	1020	50.0	"	1000		102	60-130			
LCS Dup (AD32302-BSD1)				Prepared & Analyzed: 23-Apr-13						
Surrogate: 1,3-Dimethyl-2-nitrobenzene	1210		ug/kg	2000		60.3	30-120			
Malathion	951	50.0	"	1000		95.1	60-130	6.51	30	
Matrix Spike (AD32302-MS1)				Source: 1304001-16		Prepared & Analyzed: 23-Apr-13				
Surrogate: 1,3-Dimethyl-2-nitrobenzene	1090		ug/kg	2000		54.7	30-120			
Malathion	928	50.0	"	1000	ND	92.8	40-130			
Matrix Spike Dup (AD32302-MSD1)				Source: 1304001-16		Prepared & Analyzed: 23-Apr-13				
Surrogate: 1,3-Dimethyl-2-nitrobenzene	1060		ug/kg	2000		53.0	30-120			
Malathion	893	50.0	"	1000	ND	89.3	40-130	3.84	40	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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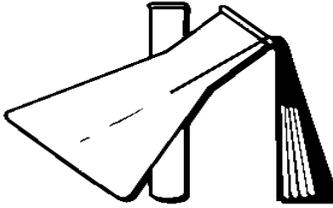
General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD RPD	Limit	Note
Batch AD32305 - General Preparation										
Blank (AD32305-BLK1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	ND	1.5	mg/kg							
LCS (AD32305-BS1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	100	1.5	mg/kg	100		101	80-120			
LCS Dup (AD32305-BSD1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	97	1.5	mg/kg	100		97.0	80-120	4.04	20	
Duplicate (AD32305-DUP1)				Source: 1304266-08 Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	73	1.5	mg/kg			77		5.31	20	
Matrix Spike (AD32305-MS1)				Source: 1304266-08 Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	180	1.5	mg/kg	100	77	97.7	75-125			
Matrix Spike Dup (AD32305-MSD1)				Source: 1304266-08 Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	180	1.5	mg/kg	100	77	99.7	75-125	1.14	35	
Batch AD32306 - General Preparation										
Blank (AD32306-BLK1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	ND	0.10	mg/l							
LCS (AD32306-BS1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	0.97	0.10	mg/l	1.00		96.7	80-120			
LCS Dup (AD32306-BSD1)				Prepared & Analyzed: 23-Apr-13						
Total Kjeldahl Nitrogen	0.92	0.10	mg/l	1.00		92.2	80-120	4.76	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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

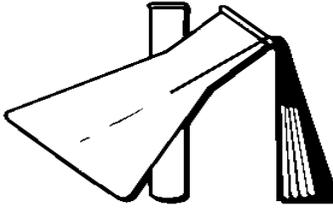
General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32306 - General Preparation										
Duplicate (AD32306-DUP1) Source: 1304266-01 Prepared & Analyzed: 23-Apr-13										
Total Kjeldahl Nitrogen	0.91	0.10	mg/l		0.89			2.45	20	
Matrix Spike (AD32306-MS1) Source: 1304266-01 Prepared & Analyzed: 23-Apr-13										
Total Kjeldahl Nitrogen	1.97	0.10	mg/l	1.00	0.89	108	80-120			
Matrix Spike Dup (AD32306-MSD1) Source: 1304266-01 Prepared & Analyzed: 23-Apr-13										
Total Kjeldahl Nitrogen	1.93	0.10	mg/l	1.00	0.89	104	80-120	2.05	20	
Batch AD32307 - General Preparation										
Blank (AD32307-BLK1) Prepared & Analyzed: 23-Apr-13										
Phosphorus, Dissolved as P	ND	0.03	mg/l							
Phosphorus, Total as P	ND	0.03	"							
LCS (AD32307-BS1) Prepared & Analyzed: 23-Apr-13										
Phosphorus, Dissolved as P	0.5830	0.03	mg/l	0.500		117	80-120			
Phosphorus, Total as P	0.4800	0.03	"	0.500		96.0	80-120			
LCS Dup (AD32307-BSD1) Prepared & Analyzed: 23-Apr-13										
Phosphorus, Dissolved as P	0.5310	0.03	mg/l	0.500		106	80-120	9.34	20	
Phosphorus, Total as P	0.5030	0.03	"	0.500		101	80-120	4.68	20	
Duplicate (AD32307-DUP1) Source: 1304266-01 Prepared & Analyzed: 23-Apr-13										
Phosphorus, Dissolved as P	ND	0.03	mg/l		ND				20	
Phosphorus, Total as P	ND	0.03	"		ND				20	
Matrix Spike (AD32307-MS1) Source: 1304266-01 Prepared & Analyzed: 23-Apr-13										
Phosphorus, Total as P	0.4850	0.03	mg/l	0.500	ND	97.0	80-120			
Phosphorus, Dissolved as P	0.5320	0.03	"	0.500	ND	106	80-120			

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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

Page 24 of 28

Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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 AD32307 - General Preparation

Matrix Spike Dup (AD32307-MSD1)		Source: 1304266-01		Prepared & Analyzed: 23-Apr-13						
Phosphorus, Total as P	0.5250	0.03	mg/l	0.500	ND	105	80-120	7.92	20	
Phosphorus, Dissolved as P	0.5280	0.03	"	0.500	ND	106	80-120	0.755	20	

Batch AD32308 - General Preparation

Blank (AD32308-BLK1)		Prepared & Analyzed: 23-Apr-13								
Phosphorus, Total as P	ND	0.5	mg/kg							

Duplicate (AD32308-DUP1)		Source: 1304266-03		Prepared & Analyzed: 23-Apr-13						
Phosphorus, Total as P	160	0.5	mg/kg		169			5.47	20	

Matrix Spike (AD32308-MS1)		Source: 1304266-03		Prepared & Analyzed: 23-Apr-13						
Phosphorus, Total as P	313	0.5	mg/kg	167	169	86.4	75-125			

Matrix Spike Dup (AD32308-MSD1)		Source: 1304266-03		Prepared & Analyzed: 23-Apr-13						
Phosphorus, Total as P	322	0.5	mg/kg	167	169	91.8	75-125	2.83	80	

Batch AD32312 - General Preparation

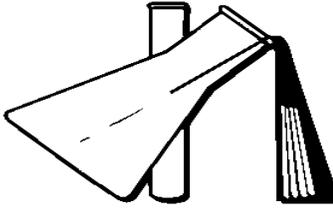
Blank (AD32312-BLK1)		Prepared & Analyzed: 23-Apr-13								
% Solids	0.00		%							

Duplicate (AD32312-DUP1)		Source: 1304266-03		Prepared & Analyzed: 23-Apr-13						
% Solids	70.5		%		69.8			1.05	15	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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4225 Executive Square, Suite 1600
La Jolla CA, 92037

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
Subject: Murphy Canyon 7165

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

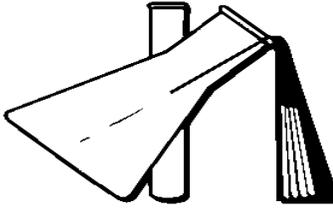
General Inorganic Nonmetallic Chemistry by Standard Methods/EPA Methods - Quality Control

Parameter	Result	Rep. Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Note
Batch AD32317 - General Preparation										
Blank (AD32317-BLK1)				Prepared & Analyzed: 23-Apr-13						
Total Hardness	ND	2	mg/l							
LCS (AD32317-BS1)				Prepared & Analyzed: 23-Apr-13						
Total Hardness	240	2	mg/l	250		96.0	80-120			
Duplicate (AD32317-DUP1)				Source: 1304266-01 Prepared & Analyzed: 23-Apr-13						
Total Hardness	884	2	mg/l		880			0.454	20	

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



PAT-CHEM LABORATORIES

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

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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 AD32310 - General Preparation

Blank (AD32310-BLK1)

Prepared & Analyzed: 23-Apr-13

Total Dissolved Solids ND 1 mg/l

LCS (AD32310-BS1)

Prepared & Analyzed: 23-Apr-13

Total Dissolved Solids 1020 1 mg/l 989 103 85-115

Duplicate (AD32310-DUP1)

Source: 1304266-01

Prepared & Analyzed: 23-Apr-13

Total Dissolved Solids 1480 1 mg/l 1480 0.270 15

Batch AD32311 - General Preparation

Blank (AD32311-BLK1)

Prepared & Analyzed: 23-Apr-13

Total Suspended Solids ND 1 mg/l

LCS (AD32311-BS1)

Prepared & Analyzed: 23-Apr-13

Total Suspended Solids 848 1 mg/l 803 106 85-115

Duplicate (AD32311-DUP1)

Source: 1304266-01

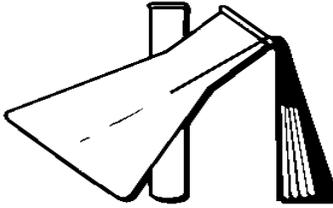
Prepared & Analyzed: 23-Apr-13

Total Suspended Solids 2.00 1 mg/l 2.00 0.00 15

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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Customer: **URS Corporation (San Diego) - Vendor # 112052**
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La Jolla CA, 92037

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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	%REC Limits	RPD RPD	RPD Limit	Note
-----------	--------	------------	-------	-------------	---------------	-----------	-------------	---------	-----------	------

Batch AD32313 - General Preparation

Blank (AD32313-BLK1)

Prepared & Analyzed: 23-Apr-13

Nitrate as N	ND	0.5	mg/kg							
Nitrite as N	ND	0.5	"							

LCS (AD32313-BS1)

Prepared & Analyzed: 23-Apr-13

Nitrate as N	18.8	0.5	mg/kg	16.7		113	80-120			
Nitrite as N	16.9	0.5	"	16.7		101	85-115			

LCS Dup (AD32313-BSD1)

Prepared & Analyzed: 23-Apr-13

Nitrate as N	17.8	0.5	mg/kg	16.7		107	80-120	5.29	20	
Nitrite as N	16.2	0.5	"	16.7		97.2	85-115	4.23	20	

Duplicate (AD32313-DUP1)

Source: 1304266-03

Prepared & Analyzed: 23-Apr-13

Nitrate as N	ND	0.5	mg/kg		ND				20	
Nitrite as N	ND	0.5	"		ND				20	

Matrix Spike (AD32313-MS1)

Source: 1304266-03

Prepared & Analyzed: 23-Apr-13

Nitrite as N	16.3	0.5	mg/kg	16.7	ND	97.8	85-115			
Nitrate as N	18.0	0.5	"	16.7	ND	108	75-125			

Matrix Spike Dup (AD32313-MSD1)

Source: 1304266-03

Prepared & Analyzed: 23-Apr-13

Nitrite as N	16.1	0.5	mg/kg	16.7	ND	96.8	85-115	1.03	20	
Nitrate as N	17.5	0.5	"	16.7	ND	105	75-125	2.81	20	

Batch AD32316 - General Preparation

Blank (AD32316-BLK1)

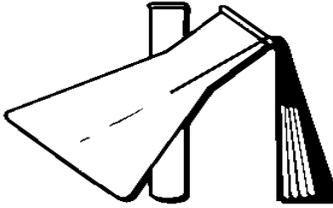
Prepared & Analyzed: 23-Apr-13

Nitrate as N	ND	0.10	mg/l							
Nitrite as N	ND	0.10	"							

Respectfully Submitted,

Pat Brueckner
Laboratory Director

4/24/2013



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

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Attention: Bryn Evans
Report Date: 24-Apr-13 13:59
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 AD32316 - General Preparation										
LCS (AD32316-BS1)				Prepared & Analyzed: 23-Apr-13						
Nitrate as N	0.535	0.10	mg/l	0.500		107	80-120			
Nitrite as N	0.505	0.10	"	0.500		101	80-120			
LCS Dup (AD32316-BSD1)				Prepared & Analyzed: 23-Apr-13						
Nitrate as N	0.504	0.10	mg/l	0.500		101	80-120	5.97	20	
Nitrite as N	0.485	0.10	"	0.500		97.0	80-120	4.04	20	
Duplicate (AD32316-DUP1)				Source: 1304266-01			Prepared & Analyzed: 23-Apr-13			
Nitrate as N	0.0762	0.10	mg/l		0.0706			7.63	20	
Nitrite as N	ND	0.10	"		ND				20	
Matrix Spike (AD32316-MS1)				Source: 1304266-01			Prepared & Analyzed: 23-Apr-13			
Nitrate as N	0.581	0.10	mg/l	0.500	0.0706	102	80-120			
Nitrite as N	0.479	0.10	"	0.500	ND	95.8	80-120			
Matrix Spike Dup (AD32316-MSD1)				Source: 1304266-01			Prepared & Analyzed: 23-Apr-13			
Nitrite as N	0.473	0.10	mg/l	0.500	ND	94.6	80-120	1.26	20	
Nitrate as N	0.577	0.10	"	0.500	0.0706	101	80-120	0.691	20	

Notes and Definitions

- 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
Laboratory Director

4/24/2013

Chain - of - Custody Form

1304260

Sample ID	Date	Time	Sample Collection			Method Preserved			Number of Sample Containers				Type of Analysis to be Performed	TAT	Special Instructions	
			Water	Vapor	Soil	HCl	HNO ₃	NONE	Filtered (Y/N)	40 mL glass	8 oz. Glass Jar	2 L Amber				250 mL Poly
R-58-D	4-22-2013	8:30	X													
R-58-U1		10:00	X													
R-58-1		13:00		X												
R-58-2		14:00		X												
R-58-3		14:20		X												
R-58-4		14:40		X												
R-58-5		15:10		X												
R-58-6		15:40		X												
R-58-7		16:00		X												
R-58-8		16:10		X												
R-58-9		16:20		X												
R-58-10		16:40		X												
Total # of containers per type									207	4	Total # of containers		20	Please return original COC to Dudek		
Relinquished by:			Company	Date	Time	Received by:			Company	Date	Time	Sample Receipt				
Lydia Posik Hydropon			DUDEK	4/22	17:26	Paula G. O'Dell			REL	4/22	17:00	<input type="checkbox"/> Samples Intact				
L. O'Dell			REL	4/22	9:45	Paula G. O'Dell			REL	4/22	9:45	<input type="checkbox"/> Cooler Temp: _____ °C				
													<input type="checkbox"/> Conforms to COC			

Job Number: 7165
 City of San Diego O & M IWSGA Murphy Canyon
 Sampled by: Lydin Ranch Jon Martin
 Laura Pell Elizabeth Chilman

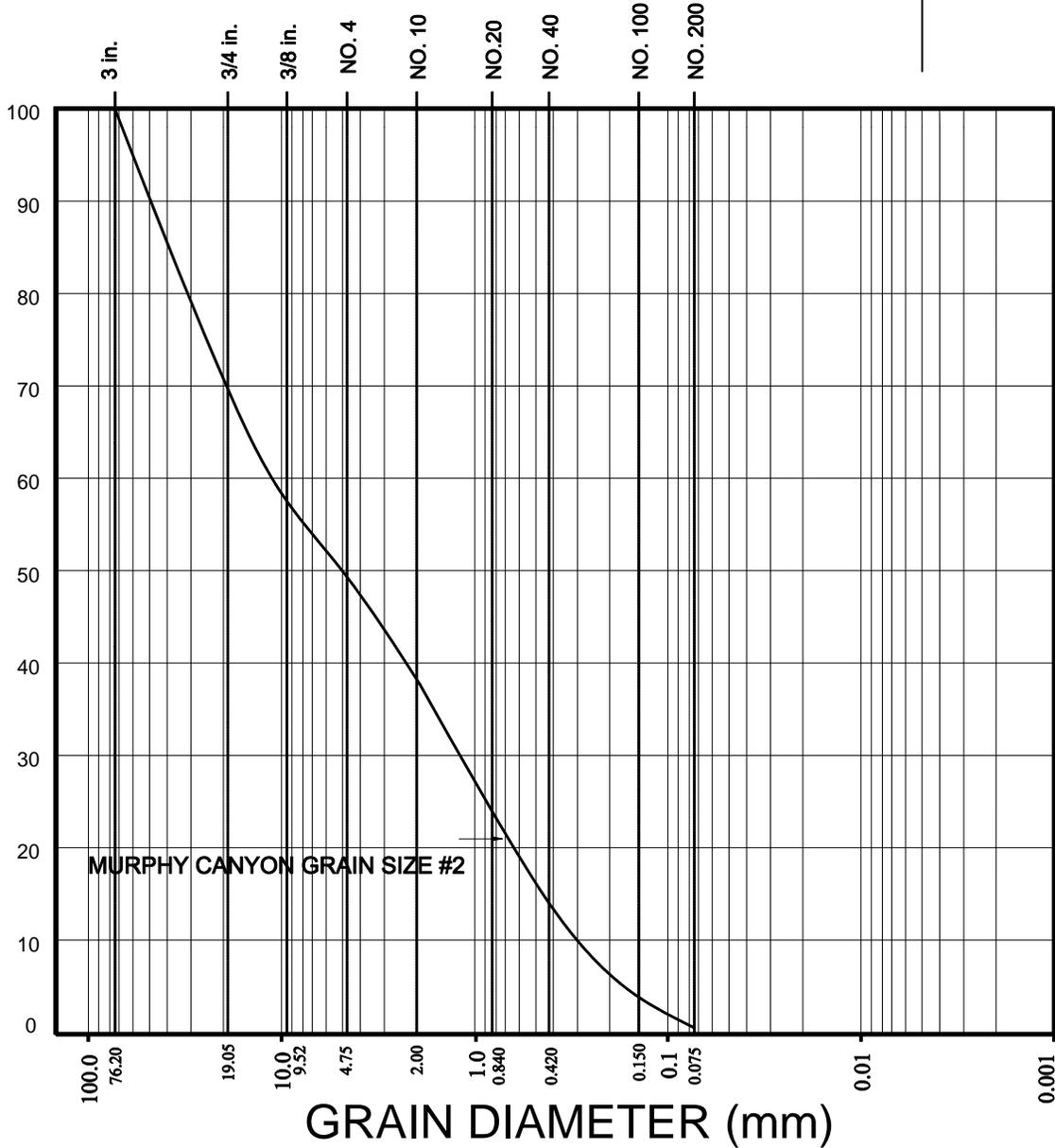
Laboratory: PAT CHEM
 Lab Job #:
 Shipping Method: Carrier
 Project Manager: Theresa
 PM Email: (LDD) WVS
 elizabeth.chilman@dudek.com

Type of Analysis to be Performed
 EPA 8260B VOCs
 EPA 8270 SVOCs
 EPA 8081H OCPs / Pesticides
 EPA m8015 TPH (GRO, DRG, Motor Oil)
 TDS + Hardness (Total)
 Metals (Total)
 Percent Solids
 Tot-P, NO₂, NO₃, TKM
 Metals (Dissolved)
 Dissolved P
 TSS
 Other: 24 hr 48 hr 72 hr

Special Instructions
 Please refer to attached constituent lists

GRAVEL	SAND		SILT	CLAY
	MEDIUM TO COARSE	FINE		
U.S. Standard Sieve Sizes				
	3 in.	3/4 in.	3/8 in.	NO. 4
				NO. 10
				NO. 20
				NO. 40
				NO. 100
				NO. 200

PERCENT PASSING BY WEIGHT



SAMPLE	UNIFIED SOIL CLASSIFICATION
1- MURPHY CANYON GRAIN SIZE #2	---

GEOCON
WEST, INC.



ENVIRONMENTAL GEOTECHNICAL MATERIALS
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504
PHONE (818) 841-8388 - FAX (818) 841-1704

TL	8000
----	------

GRAIN SIZE DISTRIBUTION

PAT-CHEM LABORATORIES
TJ RIVER VALLEY

MAY 16, 2013	PROJECT NO. A8798-06-01	FIG. 1
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Project Name: Pat-Chem Lab **Sampled By:** Client **Date:** 04/23/13
Project No.: A8798-06-01 **Set Up By:** SI **Date:** 4/23/2013
Location: - **Tested By:** SI/CC **Date:** 4/24/2013
Sample # 1 **Depth:** - **Engineer/ Geologist:** NDB
Soil Description: Murphy Canyon Grainsize #2

Total Wet Weight in Use/Dry Weight	23770.7	20024.4		
Total Wet Weight Retain No. 4	23770.7			
Moisture Content of Retained No. 4	16.48%			
Container Weight/ Pan Number	0	-		
Wt. of Wet Gravel Retain No. 4	22240.5		Dry Weight After Washed	18094.3
Wt. of Dry Gravel Retain No. 4	19094.2			
Moisture Content of Passing No. 4	16.48%			
Container Weight/ Pan Number	0	-		
Wt of Wet Soil +Cont. Pass No4	471.16			
Wt.of Dry Soil+Cont. Pass No4	404.5			
Total Dry Weight of Sample	19094.2			

U.S. SIEVE SIZE	CUMULATIVE WEIGHT RETAINED			
	Plus No. 4	Minus No.4	% Retained	% Passing
3"	0		0.00%	100.00%
2"	1594.7		8.35%	91.65%
1½"	2735.1		14.32%	85.68%
1"	4503.9		23.59%	76.41%
¾"	5823.7		30.50%	69.50%
½"	7247.8		37.96%	62.04%
⅜"	8118.5		42.52%	57.48%
No. 4	9146.8		47.90%	52.10%
Pan	19092.4		99.99%	0.01%
No. 10		25.1	51.14%	48.86%
No. 20		46.4	53.88%	46.12%
No. 40		169.2	69.70%	30.30%
No. 100		374.8	96.17%	3.83%
No. 200		404.4	99.47%	0.53%
Pan		404.5	100.00%	0.00%

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

ATTACHMENT 5 - Sediment Sampling Results

Analyte	Concentration (mg/kg)										Human Health	
											CHHSL / RSL (mg/kg)	
	R-58-1	R-58-2	R-58-3	R-58-4	R-58-5	R-58-6	R-58-7	R-58-8	R-58-9	R-58-10	Residential	Commerical/Industrial
General Physical												
% Solids	69.8	63	69.2	74	72.3	70	67.8	74.9	72.6	80	NA	NA
Inorganic Non-Metals												
Nitrate as N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	29,355	361,290
Nitrite as N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2,374	30,435
Phosphorus, Total as P	169	145	159	157	135	152	176	124	106	318	NA	NA
Total Kjeldahl Nitrogen	170	160	310	140	120	77	130	98	110	30	NA	NA
Metals												
Manganese	140	230	210	170	110	490	400	130	230	140	1,800	23,000
Arsenic	4	3.6	5.3	3.9	3.4	3.8	3.1	3.1	3.2	5.6	0.07	0.24
Cadmium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.7	7.5
Chromium*	3.6	3.6	3.7	3.2	2.6	3.8	4.5	2.2	2.2	3.2	100,000	100,000
Copper	4.3	7.3	5.4	4.5	3.3	5.2	5.3	3.7	4	4	3,000	38,000
Nickel	3.4	3.1	4	3.1	2.6	4.1	4.4	2.3	2.4	2.6	1,600	16,000
Lead	3.8	6.7	5.7	4.3	3	3.5	4.5	2.8	3	3.4	80	320
Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	30	380
Selenium	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	380	4,800
Zinc	38	53	44	41	29	43	47	32	34	28	23,000	100,000
Organics												
Malathion	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	1,200	12,000
Chlorpyrifos	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	61	620
Diazinon	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	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

ATTACHMENT 6 - Constituent Lists

AQUEOUS				
Constituent	Analytical Method	Units	Maximum Hold Time	Source
303(d) listed for Lower San Diego River				
Total Dissolved Solids	EPA 160.1	mg/L	7 days	303(d) list
Phosphorous, Total as P	EPA 365.3	mg/L	28 days	303(d) list
Nitrogen, Total as N	Calculated	mg/L	-	303(d) list
Manganese, total	EPA 200.8	ug/L	6 months	303(d) list
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
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, 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
Nickel	EPA 200.8	mg/L	6 months	PEIR
Selenium	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
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

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: 4-22-2013 9:50
 Location: MURPHY - DOWNSTREAM
near (R-58-D)

Cross-section measurements

Δx - from left bank (ft)	Δy - channel depth (ft)	Velocity (ft/sec)	Notes
0.7	1.33	0.015	LWB - undercut 5" matted w/roots SD=0.029
1.5	1.5	0.032	SD = 0.009 Sandy bottom w/ rocks/cobbles
2.5	1.63	0.029 0.025	SD = 0.007 SD = 0.019 Sandy/cobbly
3.5	1.73	0.037	SD = 0.064 Sandy/cobbly
4.5	1.74	0.199	SD = 0.105 Sandy/cobbly
5.5	1.54	0.079	SD = 0.075
		0.052	SD = 0.021 cobbly
6.5	1.13	0.394	SD = 0.039 Cobble w/ algal mats
7.5	0.83	0.174	SD = 0.101
8.5	0.67	0.001 0.000	SD = 0.051 In long eddy from upstream boulder
9.5	0.54	0.113	SD = 0.027 In long eddy from upstream boulder
10.5	0.54	0.236	SD = 0.074 Out of eddy
11.5	0.54	0.854	SD = 0.050
12.5	0.54	0.617	SD = 0.114
13.5	0.5	0.600	SD = 0.067
14.5	0.44	0.449	SD = 0.045 COBBLY w/ ALGAL MAT
15.3	0.40	0.336	SD = 0.029 COBBLY & WOODY DEBRIS
16.4	0	0	RWB

NOTES Flow measured 100' upstream toilly tracks.

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
 Project Name: 7165 Murphy Canyon/Sorrento Canyon IWQAs
 Field Crew: Jon Martin/Laura Roll/Lydia Roach/Elizabeth Chilman

Date - Time: 4/22/2013
 Location: Murphy - upstream
near P-58-U

Cross-section measurements

Δx - from left bank (ft)	Δy - channel depth (ft)	Velocity (ft/sec)	Notes
0.2	0	0	trapezoidal concrete channel LWB
0.8	0.70	0.191	SD=0.007 well coming upstream and blowing
2.0	0.70	0.184	SD=0.009 surface of flow upstream
4.0	0.80	0.157	SD=0.047 5-10mph Still pool *Sand and cobbles
6.0	0.75	0.178	SD=0.010 sand and cobbles
8.0	0.65	0.129	SD=0.013 Sandy bottom
10.0	0.65	0.177	SD=0.012 Sandy/Silty
12.0	0.65	0.192	SD=0.007 "
14.0	0.70	0.112	SD=0.010 " "downstream Shopping cart
16.0	0.70	0.108	SD=0.009 Sandy/Silty
18.0	0.70	0.138	SD=0.011 " "
20.0	0.65	0.135	SD=0.011 " "
21.0	0	0	RWB

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 80i 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.

ATTACHMENT 8

*Total Flow Calculation Example
(See Attached CD)*

ATTACHMENT 9
Water Quality Sampling Results

ATTACHMENT 9 - Water Quality Sampling Results

Analyte	Sample Date	Concentration		Water Quality Benchmark	Benchmark Source	Units
		Upstream (R-58-U)	Downstream (R-58-D)			
Wet Chemistry						
Total Dissolved Solids	4/22/2013	1,524	1,480	1,500	Basin Plan	mg/L
Total Suspended Solids	4/22/2013	2	2	NA	NA	mg/L
Total Hardness	4/22/2013	902	880	NA	NA	mg/L
Phosphorus, Dissolved as P	4/22/2013	<0.03	<0.03	0.1	Basin Plan	mg/L
Phosphorus, Total as P	4/22/2013	<0.03	<0.03	0.1	Basin Plan	mg/L
Total Kjeldahl Nitrogen	4/22/2013	0.63	0.89	NA	NA	mg/L
Nitrite as N	4/22/2013	<0.10	<0.10	1	Basin Plan	mg/L
Nitrate as N	4/22/2013	0.18	<0.10	10	Basin Plan	mg/L
Total Nitrogen	4/22/2013	0.8	0.89	1	Basin Plan	mg/L
Total Metals						
Arsenic	4/22/2013	0.0051	0.0044	0.01	Basin Plan	mg/L
Antimony	4/22/2013	<0.001	<0.001	0.006	Basin Plan	mg/L
Cadmium	4/22/2013	<0.0002	<0.0002	0.005	Basin Plan	mg/L
Chromium*	4/22/2013	0.0051	0.0047	0.05	Basin Plan	mg/L
Copper	4/22/2013	0.0023	0.0022	1	Basin Plan	mg/L
Lead	4/22/2013	<0.001	<0.001	0.065 / 0.0025	40 CFR 131.38	mg/L
Manganese	4/22/2013	0.023	0.0062	0.05	Basin Plan	mg/L
Nickel	4/22/2013	0.0073	0.0069	0.1	CA-MCL	mg/L
Selenium	4/22/2013	0.011	0.010	0.005	40 CFR 131.38	mg/L
Zinc	4/22/2013	0.0054	0.0073	5	Basin Plan	mg/L
Dissolved Metals						
Antimony - Dissolved	4/22/2013	<0.001	<0.001	0.006	Basin Plan	mg/L
Arsenic - Dissolved	4/22/2013	0.0048	0.0044	0.34 / 0.15	40 CFR 131.38	mg/L
Cadmium - Dissolved	4/22/2013	<0.0002	<0.0002	Calculated	40 CFR 131.38	mg/L
Chromium - Dissolved*	4/22/2013	0.005	0.0046	Calculated	40 CFR 131.38	mg/L
Copper - Dissolved	4/22/2013	0.0021	0.0022	Calculated	40 CFR 131.38	mg/L
Lead - Dissolved	4/22/2013	<0.001	<0.001	Calculated	40 CFR 131.38	mg/L
Manganese - Dissolved	4/22/2013	0.022	0.0052	0.05	Basin Plan	mg/L
Nickel - Dissolved	4/22/2013	0.0072	0.0066	Calculated	40 CFR 131.38	mg/L
Selenium - Dissolved	4/22/2013	0.011	0.010	NA	NA	mg/L
Zinc - Dissolved	4/22/2013	<0.005	0.0066	Calculated	40 CFR 131.38	mg/L
Organics						
Malathion	4/22/2013	<0.001	<0.001	0.43 / 0.1	40 CFR 131.38	mg/L
Chlorpyrifos	4/22/2013	<0.001	<0.001	0.02 / 0.014	40 CFR 131.38	mg/L
Diazinon	4/22/2013	<0.0002	<0.0002	0.08 / 0.05	40 CFR 131.38	mg/L
Bacteriological						
Enterococcus	4/22/2013	<20	240e	151	Basin Plan	CFU/100 mL
Fecal Coliform	4/22/2013	45	45	400	Basin Plan	MPN/100 mL
Total Coliform	4/22/2013	700	33,000	NA	NA	MPN/100 mL

Notes

mg/L - milligrams per liter

mL - milliliters

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-58-D or R-58-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-58-D or R-58-U does not exceed the 40 CFR 131.38 benchmark for chromium (VI)

ATTACHMENT 10
Wetland Assessment Criteria

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

Attachment 10 - Wetland Assessment Criteria

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 overlying 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

ATTACHMENT 11 - Sediment Pollutant Loading Calculations

Equations:

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

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

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

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

where

$$\rho_{solid} = 165.4\ lbs/ft^3$$

and

$$\rho_{water} = 62.4\ lbs/ft^3$$

and

$\%_{Finer}$ = fraction passing through 1.5-inch sieve based on grain size analysis (1 for R-58-1 through R-58-7 and 0.8568 for R-58-8 through R-58-10)

Reach 1 Removal Volume = 8,500 cyd
 Reach 2 Removal Volume = 1,250 cyd

Sample ID	Reach	Type	% Solid	$\rho_{dry\ insitu}$ (lbs/ft ³)	CF_{cobble}	Sediment Mass (lbs)
R-58-1	2	Concrete	69.8	77.0	1	2.60E+06
R-58-2	1	Earthen	63	64.7	1	1.65E+06
R-58-3	1	Earthen	69.2	75.9	1	1.93E+06
R-58-4	1	Earthen	74	85.6	1	2.18E+06
R-58-5	1	Earthen	72.3	82.1	1	2.09E+06
R-58-6	1	Earthen	70	77.4	1	1.97E+06
R-58-7	1	Earthen	67.8	73.2	1	1.87E+06
R-58-8	1	Earthen	74.9	87.6	0.92	2.05E+06
R-58-9	1	Earthen	72.6	82.7	0.92	1.95E+06
R-58-10	1	Earthen	80	99.5	0.91	2.31E+06

The approximated sediment removal volume for the entire maintenance project is expected to be approximately 9,750 cyd, with approximately 8,500 cubic yards (cyd) to be removed from the earthen section of the maintenance area (Reach 1) and the remaining 1,250 cyd to be removed from the concrete section of the maintenance area (Reach 2). The 8,500 cubic yards from Reach 1 was distributed evenly amongst the nine analyzed sediment sample locations. The 1,250 cyd for Reach 2 was assigned to the single analyzed sediment sample location from this section.

Sediment Pollutant Loading Results

Analyte	Load Removal (lbs) at Sediment Sampling Locations										Total
	R-58-1	R-58-2	R-58-3	R-58-4	R-58-5	R-58-6	R-58-7	R-58-8	R-58-9	R-58-10	
Manganese	1762	379	406	371	230	968	747	267	448	323	5,901
Total Kjeldahl Nitrogen	442	264	600	306	251	152	243	201	214	69	2,742
Nitrate as N	-	-	-	-	-	-	-	-	-	-	-
Nitrite as N	-	-	-	-	-	-	-	-	-	-	-
Total Nitrogen	442	264	600	306	251	152	243	201	214	69	2,742
Phosphorus, Total as P	439	239	308	343	283	300	329	254	206	733	3,434
Arsenic	10	5.9	10	8.5	7.1	7.5	5.8	6.4	6.2	13	80
Cadmium	-	-	-	-	-	-	-	-	-	-	-
Chromium	9.4	5.9	7.2	7	5.4	7.5	8.4	4.5	4.3	7.4	67
Copper	11	12	10	9.8	6.9	10	9.9	7.6	7.8	9.2	94
Nickel	8.8	5.1	7.7	6.8	5.4	8.1	8.2	4.7	4.7	6	66
Lead	9.9	11	11	9.4	6.3	6.9	8.4	5.7	5.8	7.8	82
Antimony	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	1.8	-	-	-	-	-	-	-	-	1.8
Zinc	99	87	85	90	61	85	88	66	66	65	792
Malathion	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	-	-	-	-	-	-	-	-	-	-	-
Diazinon	-	-	-	-	-	-	-	-	-	-	-

- Not detected above laboratory 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*

ATTACHMENT 13 - Comparison of Existing and Maintained Load Removal Estimates

Analyte	Estimated Sediment Pollutant Load Removal (lbs)	Estimated Annual Existing Pollutant Load Removal Capacity (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	80	1.5	3	4.4	3.5	80
Cadmium	ND	ND	3	ND	ND	--
Chromium	67	1.5	3	4.4	3.5	66
Copper	94	0.4	3	1.3	1.0	94
Manganese	5,901	6.6	3	20	16	5,897
Nickel	66	2.1	3	6.3	5.0	64
Lead	82	ND	3	ND	ND	82
Antimony	ND	ND	3	ND	ND	--
Selenium	1.8	3.1	3	9.4	7.6	0.0
Zinc	792	1.3	3	4.0	3.2	791
Total Kjeldahl Nitrogen	2,742	43	3	129	103	2,717
Nitrite as N	ND	ND	3	ND	ND	--
Nitrate as N	ND	55	3	164	132	-32
Total Nitrogen	2,742	145	3	435	350	2,657
Phosphorus, Total as P	3,434	ND	3	ND	ND	3,434
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

-- Analyte 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

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.