One Michael Owens Way, Plaza 1
Perrysburg OH 43551-2999
Telephone 567-336-8682

August 13, 2014

Mr. Jerry Wickham
Alameda County Health Care Services Agency
Environmental Health Department
1131 Harbor Bay Parkway Ste. 250
Alameda, CA 94502-6577

Subject: **RO0000289**
GROUNDWATER TREATMENT BIOBARRIER DESIGN,
OWENS-BROCKWAY GLASS CONTAINER FACILITY.
3600 ALAMEDA AVENUE, OAKLAND, CALIFORNIA.

Dear Mr. Wickham,

Owens-Brockway Glass Container Corporation is pleased to submit the attached Groundwater Treatment Biobarrier Design for the above site.

I declare under penalty of perjury that the information and recommendations contained in the attached report are true and correct to the best of my knowledge.

If you need further information feel free to call me at (567) 336-8682.

Sincerely,

Mark Tussing
Environmental Administrator

CKG Environmental, Inc.

P.O. Box 246 St. Helena CA 94574
Phone (707) 967-8080 Fax: (707) 967-8080
ckennedy@geologist.com

August 13, 2014

Mr. Jerry Wickham
County of Alameda Health Care Services Agency
Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **GROUNDWATER TREATMENT BIOBARRIER DESIGN, OWENS-BROCKWAY GLASS CONTAINER FACILITY, 3600 ALAMEDA AVENUE, OAKLAND, CALIFORNIA.**

Dear Mr. Wickham:

CKG Environmental, Inc. (CKG) is pleased to present this conceptual design for the groundwater treatment element of the Revised Corrective Action Plan (CAP). The Revised CAP (dated January 17, 2014) has been partially implemented with the two excavations completed in July 2014. A report describing that work will be submitted under separate cover. The following document describes a rationale and design of a groundwater treatment process planned for the south property boundary of the site.

RECENT INTERIM REMEDIATION ACTIVITIES AND PREFERRED REMEDY EVALUATION

A groundwater treatment trench with applied ozone was proposed in the Revised CAP. The Revised CAP also included targeted excavations, a treatability study, and a site survey. These three activities have been completed and are summarized below as the basis for selection of the preferred groundwater treatment remedy.

Targeted Excavations

The targeted excavations were conducted in June 2014 at Excavation Area C, the former Fuel Oil Tank area, and Excavation E the former Brick Bunker area. Impacted groundwater was observed approximately six feet below ground surface at Excavation C and approximately 12 feet below ground surface at Excavation E. Free product impacts were observed at the maximum depth of the excavation, 16 feet below ground surface in the former brick bunker area. The vertical extent of these impacts is uncertain, and as such, the desired depth of a groundwater treatment trench is uncertain.

Treatability Study
The treatability study was completed in May 2014. The purpose of the study was to evaluate the remediation of dissolved phase site constituents via ozonation and aeration, and estimate the contact time required to achieve satisfactory remediation.

A 10-gallon glass tank approximately 20 inches long, 10 inches wide, and 12 inches tall was filled with pea gravel and used to simulate an in-situ ozone (O3) treatment trench. Site groundwater was applied into one end of the tank and extracted from the other end, while gaseous ozone was injected into the upgradient side of the reactor. Once the ozone tests were complete, the tank was drained to the extent possible and refilled with fresh influent groundwater before conducting air-only tests. A description of the testing methods, results, and conclusions are included in the Report of Findings, Bench-Scale Evaluation of COC Destruction via Ozonation and Aeration (PRIMA Environmental, 2014) included as Attachment 1.

The results indicate that an ozone trench or an air-only biobarrier can be effective at the Site. Testing showed that the total petroleum hydrocarbons (TPHs) were susceptible to both chemical oxidation via ozone and aerobic biodegradation (via exposure to air and air injection). An application of 0.1 g O3/L water decreased diesel range organics (DRO) concentrations by about 70% while application of 0.2 g O3/ L water decreased DRO by nearly 90%. DRO and oil range organics (ORO) concentrations decreased by about 50% within 3 days when the influent groundwater was exposed to air during transport and storage within the sampling buckets. In addition, DRO decreased by about 50% within 9 days when air was injected into the bench-scale reactor at a rate of approximately 200 L air/L water. Based on these results, ozone and aeration are viable remediation technologies at the Site.

Site Survey
A site survey and topographic mapping were prepared for the targeted excavations design drawings as well as for the final groundwater remedy design. The mapping indicated that buried utilities were more prevalent than originally thought. In addition, the density of trees is greater than anticipated in the vicinity of MW-6 and MW-7 outside the facility boundary on City of Oakland property.

Based on the above findings of the t utility investigations, treatability study, and observations made during excavations, it appears that the use of a trench may be prohibitively costly and difficult to install for the following reasons:

- Subsurface utilities including water, electricity and natural gas are concentrated along the south property boundary. Also the concrete paving berm and property fencing are located in this area. As a result the available corridor for a trench is not sufficiently wide to accommodate the excavation width at the top of the trench.

- The western extent of the treatment area extends onto City of Oakland property where a number of larger trees are located. Installing a trench would likely damage or kill these trees.

- Observations made during excavations and through soil borings installed to collect samples for profiling show that the greatest impacts by fuel oil are visible from 15-25 feet below grade. This suggests that the fuel oil that was used may have had a specific gravity greater than 1 and has sunk in the subsurface instead of floating. Given this observation it may be beneficial to

apply treatment deeper than 20 feet which again makes installing a trench that much more difficult.

- The treatability study, showed that actual soluble concentrations of petroleum hydrocarbons in groundwater are not very high and that they can be readily treated by injecting air.

- Subsurface geology shows the presence of a pervasive layer of fine sand starting at 12-14 feet below grade. The sand in some locations is only a few feet thick but in others grades into a coarse gravelly sand, particularly toward the southwest corner of the property. This material would be conducive to facilitating air injection.

The results of the treatability study and details of the groundwater treatment design are discussed below.

PREFERRED REMEDY

Based on the above considerations CKG is proposing to modify the groundwater treatment plan originally proposed in the Revised CAP. A series of injection wells can provide a biobarrier remedy that accomplishes similar objectives as a treatment trench. The biobarrier approach may not be as thorough as a trench, but the overall coverage and downgradient migration of oxygenated water is able to provide a treatment zone similar to the treatment that could occur within the confines of a trench. As such, the selected remedy is to create a biobarrier with air injection.

REMEDY DESIGN

The biobarrier system requires injection wells, monitoring wells, distribution piping, and an air supply system, as described below.

Air Injection Wells

Based on the current understanding of the Site geology and lithology interpretations from investigation boring logs, it is anticipated that 19 air injection wells will be needed as shown on Plates 2 and 3 to form a biobarrier remedy. The proposed injection wells are 2-inch diameter wells per Alameda County requirements, and spaced 30 feet on center with screen/injection intervals across the higher permeability layers. The wells are designed with 3-foot screen intervals and 5-foot sand intervals beneath a bentonite seal and a grout seal to the ground surface. The 5-foot air injection interval is anticipated to cover a seven to ten foot vertical interval. A group of clustered wells with varying depth screen intervals will be used where the permeable layer is substantially greater than ten feet. As shown on Plate 3, A-Interval and B-Interval wells are anticipated with the A-Interval injection zone being approximately 15 to 20 feet below ground surface and the B-Interval injection zone being approximately 23 to 28 feet below ground surface. The final selection of screen intervals will be based on the field geologist's interpretation of the boring lithology at each well.

Monitoring Wells

Three new monitoring wells are also proposed as part of the remedy. These include replacement wells MW-2R and MW-3R and a well across Alameda Avenue, MW-21. It is anticipated that these wells

will be constructed prior to the air injection wells. A pilot boring to 30 to 50 feet below ground surface will be drilled for MW-2R and MW-3R to provide vertical delineation of site lithology and constituent impacts. The monitoring well boring logs will be used to determine initial drilling depths and anticipated screen intervals for the air injection wells.

Air Supply System and Distribution Piping

The design basis air injection flow rate to each well is five cubic feet per minute (cfm) at 10 to 20 pounds per square inch (psi). A rotary-screw air compressor system and buried distribution piping will be used to supply air to the injection wells. The air compressor will have an operating flow capacity of approximately 50 to 60 cfm at an operating injection pressure of approximately 30 psi. A portable and temporary compressor may be needed at startup to inject lower flow rates at 50 to 75 psi to create breakthrough micro-channels in the tighter soils. The air compressor system will be similar to Calcon Systems AirProTM SK60A, as shown in Attachment 2.

A controls system will be provided with the air compressor to deliver air to approximately five to ten wells at a time. Air will be injected to a group of wells for approximately 15 to 30 minutes and then the air supply will be rotated to the next group of wells. This allows the micro-channels of air flow to be established and then refilled with groundwater when the air is shut off. The starting and stopping action provides greater mixing of the air with the groundwater. It addition, new micro-channels are able to form with each new rotation and thereby increase the oxygen distribution within the subsurface.

The proposed locations of the air compressor system, distribution piping, and air injection wells are shown on Plate 2. A buried air injection pipeline/manifold will be constructed with tee connections to each wellhead. The wellheads will be completed below grade in concrete utility vaults with traffic rated covers. Inside each vault will be control valves, pressure gauges, and flow meters connected back to the air compressor control system. A separate buried conduit will be installed to each wellhead vault for the control wiring.

During initial startup, air will be injected into one well at a time until breakthrough is achieved to verify that each well is operational. Once breakthrough occurs, air injection will be cycled through groups of wells based on a selected strategy of grouping similar wells together and maximizing the spacing of operating injection wells across the site horizontally and vertically. Wellhead pressures and air injection flow rates will be monitored by the control system under normal operations.

PERFORMANCE MONITORING

The biobarrier remediation system will be monitored to verify that the system is injecting an adequate amount of air into the groundwater and to assess the remediation effectiveness. Daily checks of the automated controls and routine site visits will be conducted to verify that the air compressor and delivery system are working. The automated control system will also store flow and pressure data that can be downloaded periodically to evaluate the injected air quantities to each well.

Groundwater wells will be monitored to evaluate biological conditions and concentrations of site constituents. The ultimate goal is to remove TPH compounds from the groundwater. Therefore, a

noticeable decline in GRO, DRO, and ORO concentrations in downgradient monitoring wells will be considered a successful implementation of the bio-barrier. The following wells will be monitored on a quarterly basis for the first year following startup of the bio-barrier:

MW-2R (upgradient)
MW-3R (within the bio-barrier)
MW-5 (upgradient)
MW-6 (within the bio-barrier)
MW-7 (within the bio-barrier)
MW-10 (upgradient)
MW-15 (within the bio-barrier)
MW-19 (downgradient)
MW-21 (downgradient)

To evaluate treatment performance, the collected groundwater samples will be tested for TPH compounds by EPA Method 8015; benzene, toluene, ethylbenzene and total xylenes (BTEX), naphthalene, methyl-tert butyl ether (MTBE), and lead scavengers (ethylene dibromide and 1,2-dichlorethane) by EPA Method 8260B. To evaluate the subsurface conditions for biodegradation to occur, the collected groundwater samples will be tested for dissolved oxygen (DO), pH, and oxygen reduction potential (ORP) in the field. In addition, heterotrophic plate counts by Standard Method (SM) 9215, alkalinity by EPA 310.1, and nitrate and nitrite, and sulfate by EPA 300.0 will be performed by a certified laboratory. Groundwater levels will also be measured to understand groundwater flow direction and gradient.

Following one year of monitoring, each well will be reviewed for its relevance in the monitoring program. The monitoring frequency may be maintained, reduced to semi-annually, or a well may be eliminated from the performance monitoring program with approval from Alameda County. Similarly, the monitoring parameters will be evaluated for their usefulness and certain parameters may be eliminated from the program.

The collected data and the bio-barrier remediation performance will be evaluated with each round of monitoring. The results will be reported with the routine groundwater monitoring reports for the site, or under a separate cover when warranted.

IMPLEMENTATION

Upon approval of this design report, CKG will coordinate with the property owners and subcontractors, and secure the necessary building and encroachment permits from the City of Oakland to implement the proposed Groundwater Remedy. Plates 2 and 3 illustrate the locations and configurations of the proposed work.

PREPARE REPORT OF CORRECTIVE ACTIONS

After construction of the biobarrier is finished, CKG will write a brief report of implementation and startup to be submitted to the ACEHD. This report will document the implementation activities and a plan for continued operation of the groundwater biobarrier. The effectiveness of the combined remediation effort will be evaluated through ongoing groundwater monitoring.

SCHEDULE

CKG plans to complete a full set of detailed design and specification documents by mid-September 2014 with bid packages to be delivered to prospective contractors soon after. Bids will be due in early October 2014. CKG expects to start implementing the groundwater treatment in November 2014 with completion by the end of the report.

If you need further information or would like more details regarding this groundwater treatment design please feel free to call me at (707) 967-8080.

Sincerely,

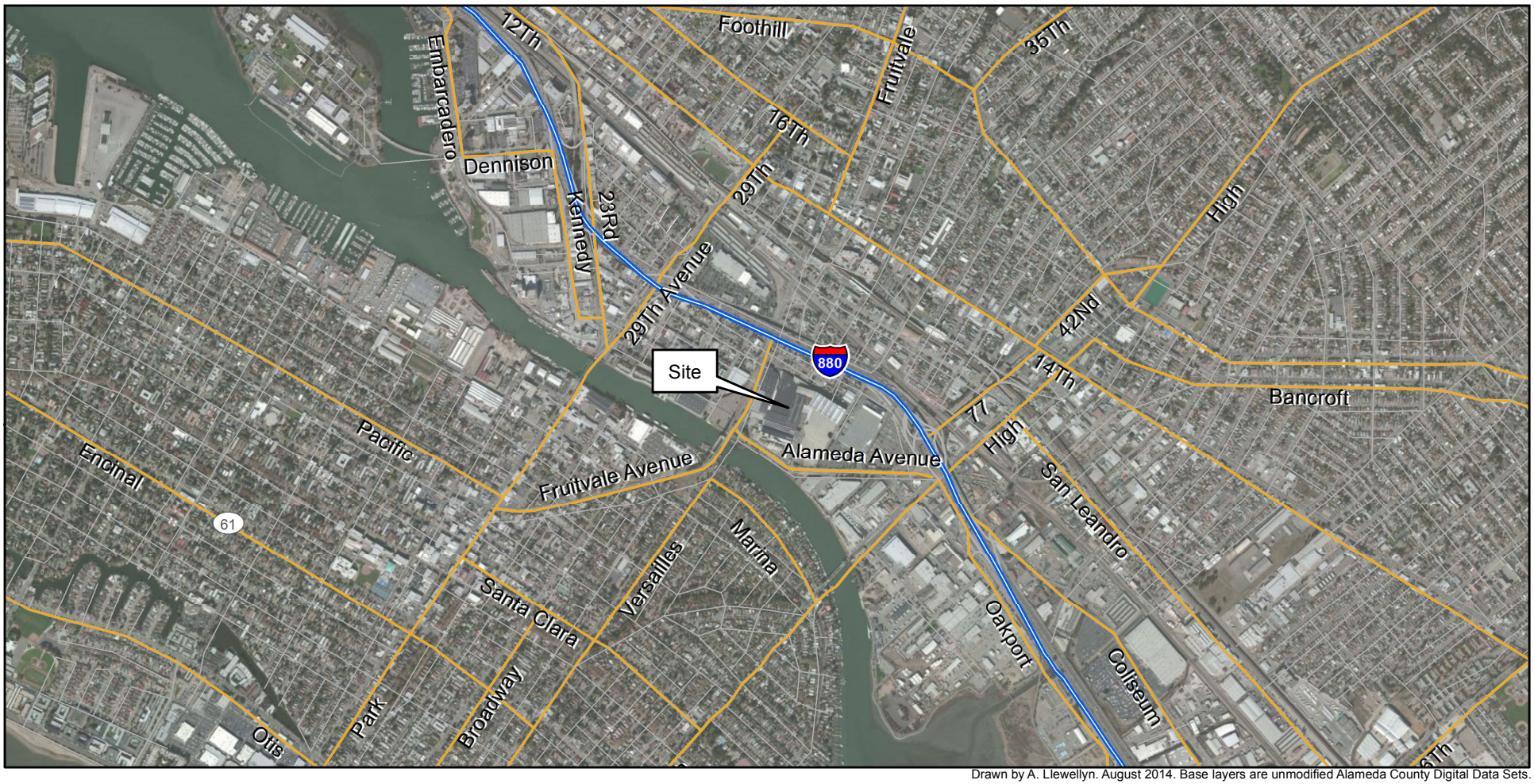
CKG Environmental, Inc.

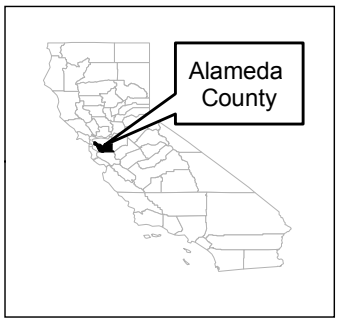
Christina J. Kennedy R.G.
Principal

Attachments – Plates
Plate 1 Site location Map
Plate 2 Biobarrier Plan Layout
Plate 3 Biobarrier Cross Section

Attachment 1 – Prima Environmental Treatability Study
Attachment 2 – Description of Air Sparging System

cc Mr. Mark Tussing – Owens-Brockway Glass Container, Inc.





0 1,000 2,000

Scale in Feet

CKG Environmental, Inc.

Site Location Map
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland, California

PLATE
1

Drawn by A. Llewellyn. August 2014. Base layers are ArcGIS Online's Bing Aerial Imagery.

EXPLANATION

- Proposed New Groundwater Monitoring Well
- Monitoring Well
- Destroyed Well
- Proposed Air Injection Well
- B-E Excavation Area
- Buried Air Supply, Controls, and Power Conduits
- Concrete Curb and Edge of Pavement
- Existing Fence
- Proposed Location for Air Compressor and Controls
- Sausal Creek Culvert

0 50 100

Scale in Feet

N

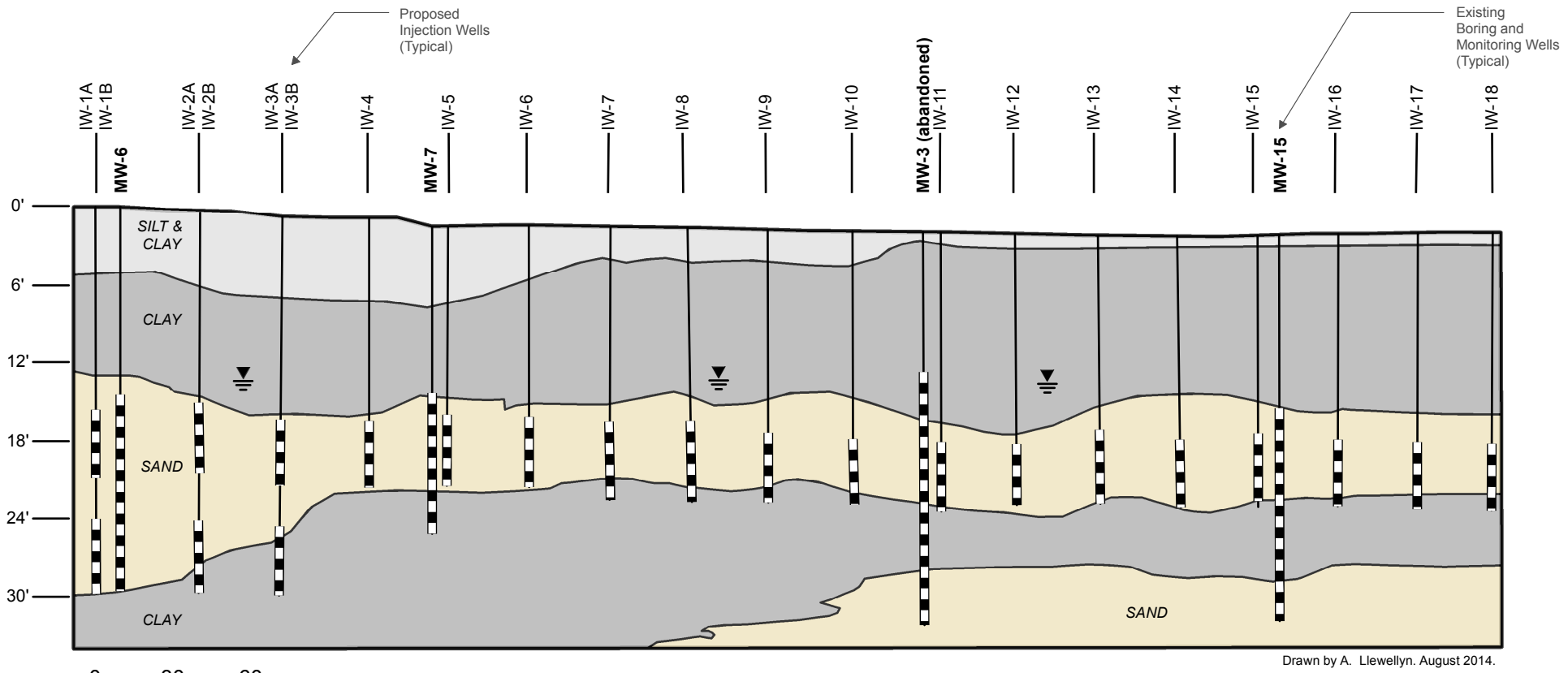
S

CKG Environmental, Inc.

Biobarrier Plan Layout

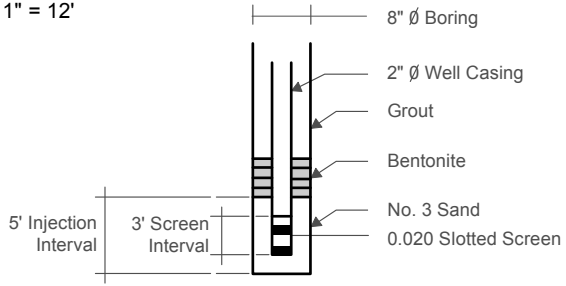
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE 2



0 30 60

Horizontal 1" = 60'
Vertical 1" = 12'



Typical Air Injection Well Configuration

Notes:
1. Air Injection wells to deliver 5 cfm at 10 to 20 psi.
2. Screen intervals are 3 feet. Injection interval is 5 feet.
3. B-Interval Wells are anticipated to be from 23 feet to 28 feet bgs.
4. A-Interval Wells are anticipated to be from 15 feet to 20 feet bgs.
5. Final screen intervals to be determined by field geologist based on boring logs.
6. Horizontal well spacing is generally 30 feet.

CKG Environmental, Inc.

Biobarrier Cross Section
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE
3

ATTACHMENT 1

August 8, 2014

Jeff Bensch
Sierra West Consultants
4227 Sunrise Blvd
Fair Oaks, CA 95628

RE: Report of findings for COC Removal via Ozonation and Aeration; Owens Brockway Glass Container Manufacturing Facility, Oakland, California

Dear Jeff:

Enclosed is the final report of findings "Bench-scale Evaluation of COC Destruction via Ozonation and Aeration" that describes testing conducted on groundwater from the Owens Brockway site located in Oakland, California. If you have any questions, please give me a call. Thank you for the opportunity to be of service.

Sincerely,
PRIMA Environmental, Inc.

Cindy G. Schreier, Ph.D.
President and Chief Scientist

5070 Robert J. Mathews Parkway, Suite 300, El Dorado Hills, CA 95762
Ph (916) 939-7300 • Fax (916) 939-7398
www.primaenvironmental.com

Report of Findings

Bench-Scale Evaluation of COC Destruction via Ozonation and Aeration

Owens Brockway Glass Container Corporation
3600 Alameda Avenue
Oakland, California

August 8, 2014

Submitted to

Sierra West Consultants
4227 Sunrise Blvd
Fair Oaks, CA 95628
and
CKG Environmental, Inc.
P.O. Box 246
St. Helena, CA 94574

Submitted by

5070 Robert J Mathews Parkway, Suite 300
El Dorado Hills, CA 95762

Cindy G. Schreier, Ph.D., President **Date** Aug 8, 2014

EXECUTIVE SUMMARY

Bench-scale treatability testing was conducted on groundwater from the Owens Brockway Glass Container Manufacturing Facility, located in Oakland, California. Testing was conducted to evaluate destruction of dissolved phase chemicals of concern (COCs) via ozonation and aeration, and estimate the contact time required to achieve destruction. The primary COCs at this site were gasoline range organics (GRO), diesel range organics, (DRO), and oil range organics (ORO).

It was found that suspended solids contribute significantly to the total DRO and ORO concentrations in water. Dissolved GRO ranged from < 0.05 to 0.16 mg/L while DRO ranged from 0.32 to 0.55 mg/L; ORO was not detected above the reporting limit of 0.5 mg/L. In contrast, when suspended solids were included in the water sample, DRO was found to be 1.5 mg/L and ORO was 0.69 mg/L (GRO was not measured). Thus, PRIMA recommends noting the presence of suspended solids when collecting future samples to assist in data interpretation.

Laboratory testing demonstrated that COCs in site water are susceptible to both chemical oxidation (via ozone) and aerobic biodegradation. In tests simulating an ozone sparge curtain, application of 0.1 g O_3/L water decreased DRO concentrations by about 76% while application of 0.2 g O_3/ L water decreased DRO by about 90%. GRO was completely removed during the ozone curtain study, but losses could not be conclusively attributed to oxidation by ozone because GRO was aerobically biodegraded in the influent tank.

Several lines of evidence indicate that COCs are susceptible to aerobic biodegradation. First, both DRO and ORO decreased by about 50% within 3 days in preliminary tests where site groundwater and suspended solids were exposed to headspace air in the sample buckets. In addition, DRO decreased by about 45% in 3 days when the ozone curtain was shut down. Finally, DRO decreased by about 50% in 9 days when sparged with air in a manner similar to sparging with ozone.

Based on the results of this study, PRIMA recommends that an ozone and/or air-sparging curtain be considered for use at this site. It is likely that nearly complete oxidation of DRO can be achieved with an ozone dose of about 0.2 mg O_3/L water. However, a lower

ozone dose may be applied if an aerobic treatment zone is included. This zone should be located after the ozonation zone so that oxygen derived from the ozone system can stimulate biodegradation of the COCs. Note that a higher dose of ozone may be required initially to overcome the ozone demand of impacted sediments that become entrained in the ozone curtain upon installation, but once this demand is met the ozone application rates discussed above should be adequate.

Satisfactory COC degradation is likely via air-sparging alone, given the COC removal observed in the air-only bench tests. The total amount of air delivered in the air-only test was approximately 200 L air/L water, although it is likely that aerobic conditions can be maintained using less air once an oxygenated environment is established. In addition, the laboratory test was run for nine days, which may not have been sufficient time for the aerobic microbial population to become fully established. Remediation performance is expected to increase with an established microbial population or longer contact times under field conditions.

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ACRONYMS and ABBREVIATIONS

COCs	chemicals of concern
DRO	diesel range organics
g	grams
GRO	gasoline range organics
kg	kilograms
L	liters
mg	milligrams
ORO	oil range organics

CHEMICAL FORMULAE

C_8H_{18}	n-octane
$C_{16}H_{34}$	n-hexadecane
CO_2	carbon dioxide
H_2O	water
O_3	ozone

1.0 INTRODUCTION

Bench-scale treatability testing was conducted on groundwater from the Owens Brockway Glass Container Manufacturing Facility, located in Oakland, California to evaluate destruction of dissolved phase chemicals of concern (COCs) via ozonation and aeration and estimate the contact time required to achieve destruction. The primary COCs at this site were gasoline range organics (GRO) and diesel range organics. If ozone or aeration is applied in the field, it will most likely be in the form of a "curtain" in which ozone (or air) is sparged into a gravel-filled trench installed perpendicular to groundwater flow. Laboratory testing simulated this intended design.

1.1 Technology Background

Ozone is an established technology for the oxidation of a wide range of organic compounds including petroleum hydrocarbons. **Equations 1** and **2** show theoretical reactions for conversion of n-octane (a surrogate for GRO) and n-hexadecane (a surrogate for DRO) to carbon dioxide (CO_2) and water (H_2O) by ozone (O_3). The stoichiometric ozone requirements based on these reactions are given in **Table 1**. In practice, a greater-than-stoichiometric dose of ozone may be required because ozone is a non-selective oxidant that will react with natural organic matter and other non-target compounds.

$$25O_3 + \underset{\text{n-octane}}{C_8H_{18}} \rightarrow 8CO_2 + 25O_2 + 9H_2O \qquad \text{Eqn. 1}$$

$$49O_3 + \underset{\text{n-hexadecane}}{C_{16}H_{34}} \rightarrow 16CO_2 + 49O_2 + 17H_2O \qquad \text{Eqn. 2}$$

Table 1. Theoretical Stoichiometric Ozone Requirement.

COC	Ozone
	g O_3 /g COC
n-octane (surrogate for GRO)	10
n-hexadecane (surrogate for DRO)	10

1.2 Study Objectives

The goals of the bench testing were to:

- Estimate the ozone demand of site water
- Build a reactor that could simulate anticipated field application of ozone
- Estimate the amount of ozone needed to achieve COC destruction under simulated field application conditions.
- Determine whether COCs could be destroyed by aeration alone.

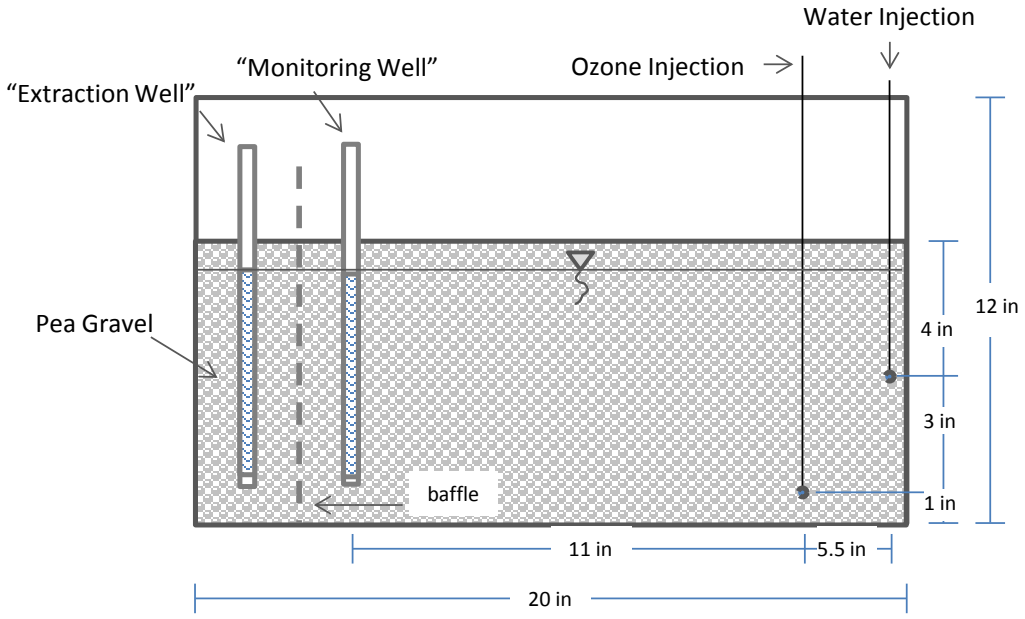
The specific tests conducted to achieve these goals are described in **Section 2.0** of this report. Results and Summary/Conclusions are presented in **Sections 3.0 and 4.0**, respectively.

2.0 MATERIALS and METHODS

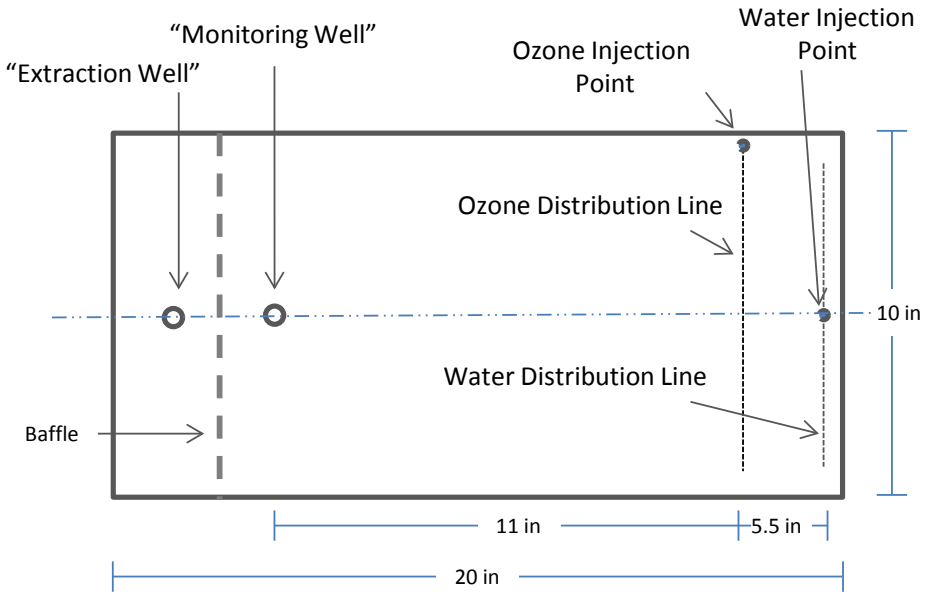
2.1 Materials and Equipment

Ozone. Ozone was generated using a Clearwater CD10 corona discharge ozone generator with concentrated atmospheric oxygen (DeVilbiss 5L oxygen concentrator with OSD, DeVilbiss, Somerset, PA) as the feed gas. Under the conditions used in the laboratory, the amount of ozone generated was approximately 45 mg O_3/L oxygen (3% w/w).

Simulated Ozone Curtain Reactor. A 10 gallon glass tank approximately 20 inches long, 10 inches wide and 12 inches tall was used as the ozone curtain reactor. The tank was filled to a depth of about 8 inches will pea gravel purchased from a local home improvement store. Influent water was injected through inert FEP (fluorinated ethylene propylene) tubing with internal diameter of 1/16 inches. The tubing was placed horizontally across the width of tank at a depth of about 4 inches below the surface. Groundwater was injected at this depth to reduce the potential for channeling along the bottom of the tank. (A preliminary testing using a dye indicated that water added about 6 inches below the water surface mixed reasonably well, but some channeling along the bottom of the tank was observed.) Slits were made in the tubing with a utility knife along the horizontal length of the tubing to distribute water across the width of the tank. Ozone was injected through the same type of slit tubing. The ozone distribution tubing was placed about 5.5 inches from the influent water distributer at a depth of about 7 inches. A "monitoring well" consisting of slotted ½ inch diameter PVC pipe was installed approximately 11 inches from the ozone distribution tubing. An "extraction well" (also made from slotted ½ diameter PVC pipe) was installed near the far end of the tank. A baffle (a sheet of Lexan plastic into which holes had been drilled) was installed using silicone sealant between the monitoring and extraction wells in an effort to more evenly distribute water. **A s**chematic of the reactor is shown in **Figure 1. Figure 2** shows steps in the tank construction and **Figure 3** shows the completed tank.



SIDE VIEW



PLAN VIEW

Figure 1. Schematic Diagram of Ozone Curtain Reactor.

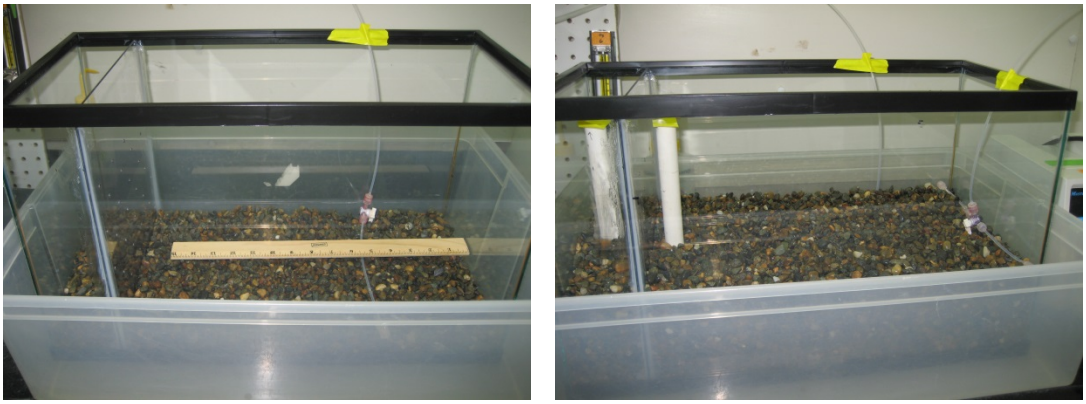


Figure 2. Construction of Simulated Ozone Curtain. *Left*: Installation of the ozone injection system. *Right*: Installation of the water distribution system and extraction and monitoring wells.

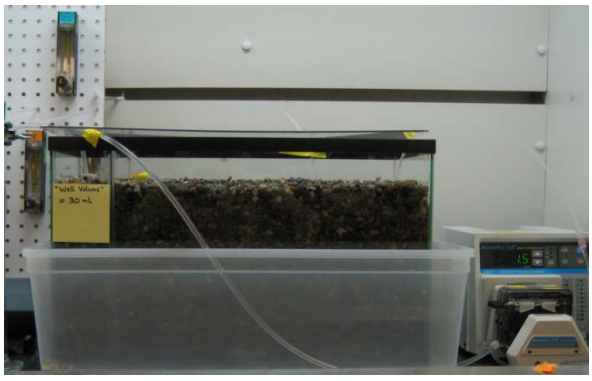


Figure 3. Complete Simulated Ozone Curtain.

2.2 Preparation and Characterization of Groundwater

Six groundwater samples (MW-20 "clean", MW-13 "clean", MW-10 "impacted", MW-5 "impacted", MW-6 "FP" and MW-7 "FP") were received on March 21, 2014. Samples identified as "clean" were comprised of one 5-gallon bucket of water, while all other samples were comprised of three 5-gallon buckets. Samples identified as "FP" were expected to contain free product.

Prior to evaluating COC removal, subsamples were collected from each groundwater sample and analyzed for GRO, DRO (**Section 2.5**) to determine which samples should be composited for the COC removal tests (see **Section 2.3**). In addition, ozone demand

(**Section 2.5)** was measured for samples MW-5, MW-6, MW-7 and MW-10. For each sample consisting of multiple buckets, a composite sample was created by combining about 300 mL of water from each bucket. Water samples were collected by siphoning water from near the middle of the bucket, with care taken to avoid sediment or free product. Sediment was avoided because sediment is not expected to be present within the ozone curtain during full-scale treatment, while free product, when present, was avoided to ensure measurement of dissolved COCs.

Observations made during the compositing process are noted in **Table 2**. MW-5, MW-6, and MW-7 had a hydrocarbon odor and sheen in at least some of the sample containers. MW-5 and MW-6 also had free product residue on the sides of the buckets above the water line (**Figure 4**); this residue was not mobile. MW-10, MW-13 and MW-20 had no sheen or odor.

Table 2. Observations Made during Sample Compositing.

Sample	Number of Containers	Sheen Present in Bucket(s)	Odor	Sediment Present	Water Color ^
MW-5 "impacted"	3	Yes*	low	yes	clear, colorless
MW-6 ""FP"	3	Yes**	low	yes	clear, colorless
MW-7 "FP"	3	yes - slight	slight	yes	clear, colorless
MW-10	3	no	none	yes	clear, colorless
MW-13	1	no	none	yes	clear, colorless
MW-20	1	no	none	yes	clear, colorless

NOTES

* Sheen present, free product on sides of buckets above waterline.

** Sheen present and free product present in two buckets. Third bucket only had slight sheen.

^ Water color after sediments allowed to settle for about 3 days.

Figure 4. Example of Free Phase Residue above Waterline (MW-6).

2.3 Ozone Application Test

Testing was conducted to simulate a full-scale application of ozone for the remediation of COCs. If applied in the field, ozone will be sparged into a trench installed perpendicular to the direction of groundwater flow. The trench will be filled with gravel or similar high permeability material. Therefore, laboratory testing utilized a glass tank filled with pea gravel and fitted with tubing to allow sparging below the water surface and movement of water through the pea gravel to simulate groundwater flow. Construction of the tank is described in **Section 2.1**.

The water used in this study was a composite of MW-5 and MW-6. The contents (including easily suspended solids) of the 6 buckets comprising these two samples were combined in a 30-gallon influent reservoir fitted with a Teflon® liner and floating lid. Sediments were included as they are a continuing source of COCs (see **Section 3.1**); a floating lid was used to minimize volatilization of GRO and exposure to oxygen. The tank was filled with influent water until the water just reached the gravel surface (approximately 11 L). Groundwater was pumped in at a flowrate of 1.5 mL/min, which resulted in a residence time **within the ozone treatment zone** (the area between the

ozone injection line and the monitoring well) of approximately 3 days. Water was extracted from the extraction well at the same rate in order to maintain constant water level in the system.

Ozone (1.3-1.7 mg O3/L air) was sparged into the tank at a flowrate of 100 mL/min. This flowrate was chosen because preliminary testing showed this was the minimum flowrate required to obtain distribution of ozone across the entire length of the distributor tube. Note that ozone gas from the ozone generator was mixed with air to obtain the injection ozone concentration and flowrate.

Immediately prior to starting groundwater and ozone flow, a Time 0 sample was collected from the monitoring well and analyzed for GRO and DRO. Samples were then collected approximately daily thereafter for 10 days. On Day 11, both ozone and influent water were shut off. All samples were collected by first removing (via siphoning) and discarding 60 mL of water (approximately 2 well volumes) then collecting the sample into appropriately preserved VOA vials.

The test was resumed on Day 14. All conditions were the same except that the ozone concentration was increased to 2.8-3.2 mg O3/L air. A baseline sample was collected from the monitoring well immediately prior to re-starting the ozone and water flows and analyzed for DRO only since GRO was not detected at Day 10 (see **Section 3.2**). After 3 days (Day 17 from start of test), another sample was collected and analyzed for DRO. Samples were collected as described above**.** The tests are summarized in **Table 3.** A more detailed discussion of the amount of ozone delivered is presented in **Section 3.2.**

Table 3. Summary of Ozone Tests.

Parameter	Units	Value			Total
		Days 0-11	Days 12-13	Days 14-17	
Groundwater flowrate	mL/min	1.5	0	1.5	n.a.
Residence time treatment zone	days	3	n.a.	3	n.a.
Pore volume of treatment zone	L	6.3	6.3	6.3	n.a.
Pore volumes put through treatment zone	#	3.8	0	1	4.8
Ozone flowrate	L/min	0.1	0	0.1	n.a.
Ozone concetration (average)	mg O3/L air	1.5	0	3	n.a.
Ozone delivered	g	2.4	0	1.3	3.7
Ozone applied per L of water in treatment zone	g O3/L GW	0.10	0	0.20	n.a.

2.4 Air-Only Application Test

2.4.1 Preliminary Tests

A preliminary test was conducted to determine whether aerobic biodegradation may have occurred between the time samples were collected at the site and the time sub-samples were initially collected for COC analyses in the laboratory. In this test, 500 mL of water (including suspended solids since most bacteria would likely be associated with the solids) from one of the MW5 buckets was placed into each of two glass reactors. The headspace in each reactor was about 200 mL. One of the reactors (Sterile Control) was treated with sodium azide to inhibit microbial activity. After three days, the aqueous phases were analyzed for DRO. The results are shown and discussed in **Section 3.3**.

2.4.2 Air Sparging Test

Water from the reactor used for the ozonation test was drained to the extent possible, then refilled with fresh influent water that had been well mixed to re-suspend settled sediments. The water was allowed to settle overnight, after which a baseline sample was collected from the monitoring well in the same method described in **Section 2.3** and analyzed for COCs. The system was sparged with air at a flowrate of 100 mL/min for 9 days, after which a final sample was collected from the monitoring well and analyzed for COCs.

2.5 Analytical Methods

GRO and DRO were analyzed by Alpha Analytical (Sparks, NV) using EPA Method 8260B and 8015M, respectively. Ozone demand was measured by PRIMA. The ozone demand of each sample was estimated by adding 50 mL of groundwater to 0.95 L of ozone-saturated deionized (DI) water, then measuring the concentration of ozone over time using the indigo method (SW 4500-O_3). Controls in which no groundwater was added were also performed. Each test was conducted in duplicate. The ozone demand is taken to be the maximum difference in ozone consumption in the presence and absence of site material.

3.0 RESULTS and DISCUSSION

3.1 Untreated Groundwater

3.1.1 COCs

The concentrations of COCs in the untreated water are shown in **Table 4**. Complete analytical reports are provided in **Appendix B**. Untreated composited groundwater contained lower than expected concentrations given that most samples had a sheen on the water surface prior to creating the composites (see **Section 2.2**). No COCs were detected in MW-13 or MW-20, as expected because these wells were identified as "clean" on the chain of custody.

Because COCs were lower than expected in the composite samples, water with and without suspended solids was analyzed for DRO/ORO from one of the MW-5 buckets. The results are shown in **Table 5**. As can be seen, the concentration of DRO was over four times greater when suspended solids were present, indicating that significant COCs are present on these particles and that these particles may serve as a reservoir for COCs.

Table 43. COCs in Untreated Groundwater.

Analyte	Units	MW-5 Comp	MW-6 Comp	MW-7 Comp	MW-10 Comp	MW-13	MW-20
GRO	mg/L	0.067	0.052	0.16	< 0.05	< 0.05	< 0.05
DRO	mg/L	0.35	0.42	0.32	0.55	< 0.05	< 0.05
ORO	mg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

NOTES

-- "Comp" is a composite of the three buckets that comprised each sample. Approximately 300 mL from each bucket was used in the composite.

Table 5. COCs in Water in the Presence and Absence of Suspended Solids.

Analyte	Units	MW-5	
		No solids*	with Solids^
DRO	mg/L	0.34	1.5
ORO	mg/L	< 0.50	0.69

* Water was collected from one of the buckets after settling for several days; water was not filtered but few solids present - water was nearly clear and colorless.

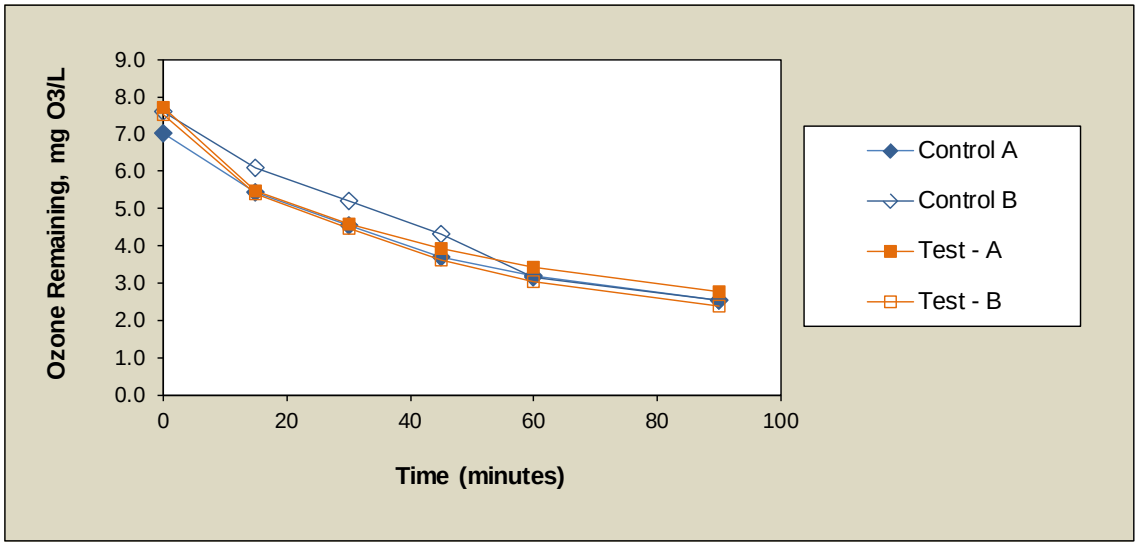
^ Settled sediment was mixed in well before sampling. Water was black, opaque.

3.1.2 Ozone Demand

The measured ozone demand of the composite water samples are given in **Figures 5** through **8**. The ozone demands were similar for all four composites, ranging from 17 to 32 mg O_3/L GW. These demands are somewhat higher than the theoretical demands (**Table 6**) based on the concentrations of COCs in water (**Table 4**) and the stoichiometric ozone requirements (**Table 1**) indicating that some non-target compounds are also reacting with ozone.

Time (min)	Ozone Remaining (mg/L soln.)				Ozone Consumed (mg/L GW)	
	Control A (no GW)	Control B (no GW)	Test - A 25 mL GW/L	Test - B 25 mL GW/L	Test - A 25 mL GW/L	Test - B 25 mL GW/L
0	7.01	7.60	7.73	7.53	0	0
15	5.45	6.10	5.47	5.41	29	23
30	4.55	5.19	4.60	4.46	28	25
45	3.71	4.30	3.94	3.64	19	24
60	3.20	3.17	3.44	3.02	7	15
90	2.53	2.53	2.77	2.39	7	15

GW = groundwater



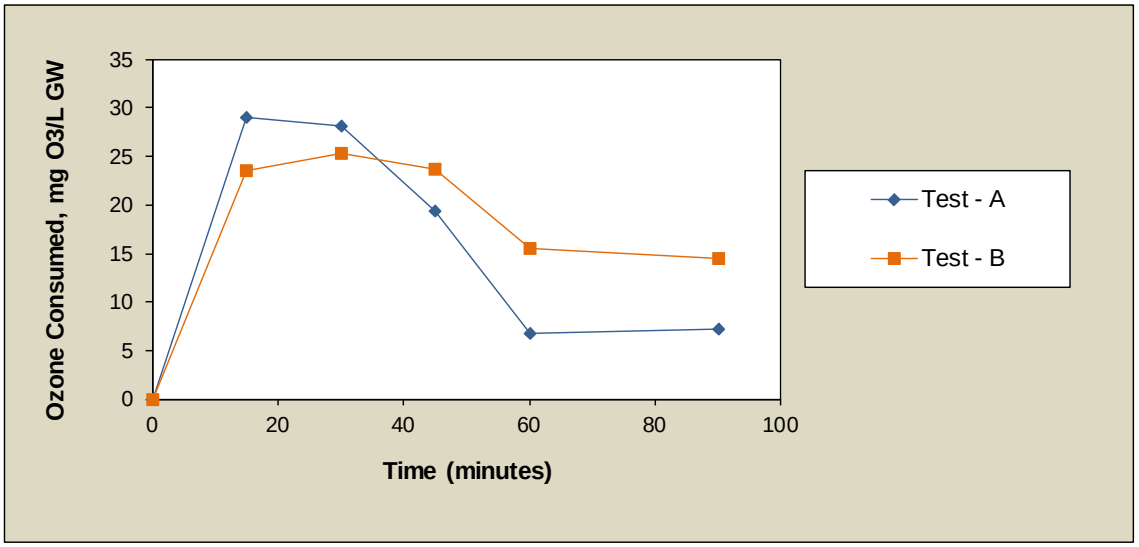
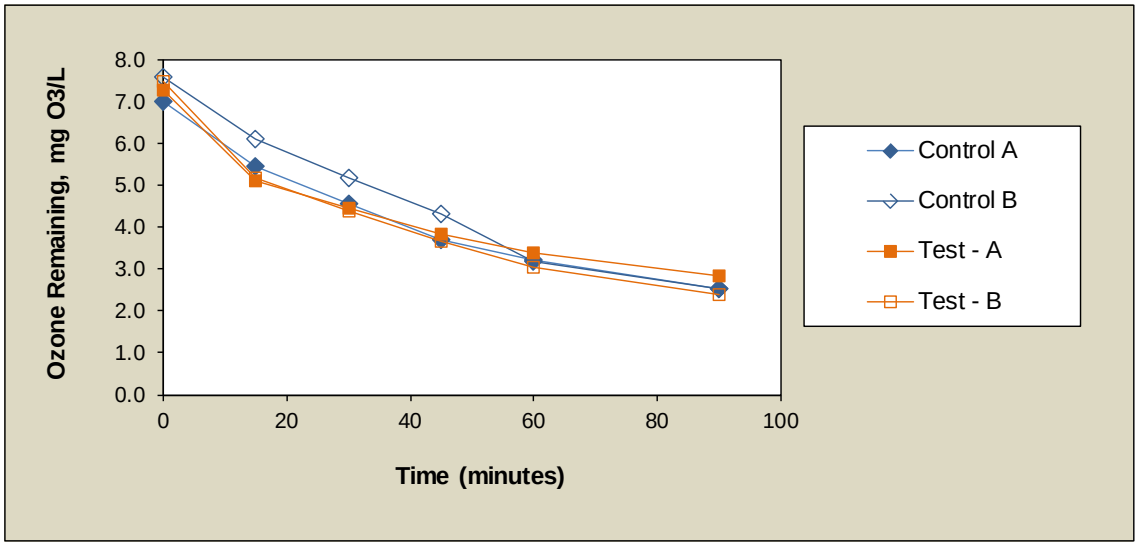


Figure 5. Ozone Demand – MW-5 Comp.

Time (min)	Ozone Remaining (mg/L soln.)				Ozone Consumed (mg/L GW)	
	Control A (no GW)	Control B (no GW)	Test - A 25 mL GW/L	Test - B 25 mL GW/L	Test - A 25 mL GW/L	Test - B 25 mL GW/L
0	7.01	7.60	7.28	7.49	0	0
15	5.45	6.10	5.09	5.19	26	31
30	4.55	5.19	4.46	4.39	15	27
45	3.71	4.30	3.82	3.66	6	21
60	3.20	3.17	3.39	3.06	-9	12
90	2.53	2.53	2.84	2.38	-14	13

GW = groundwater



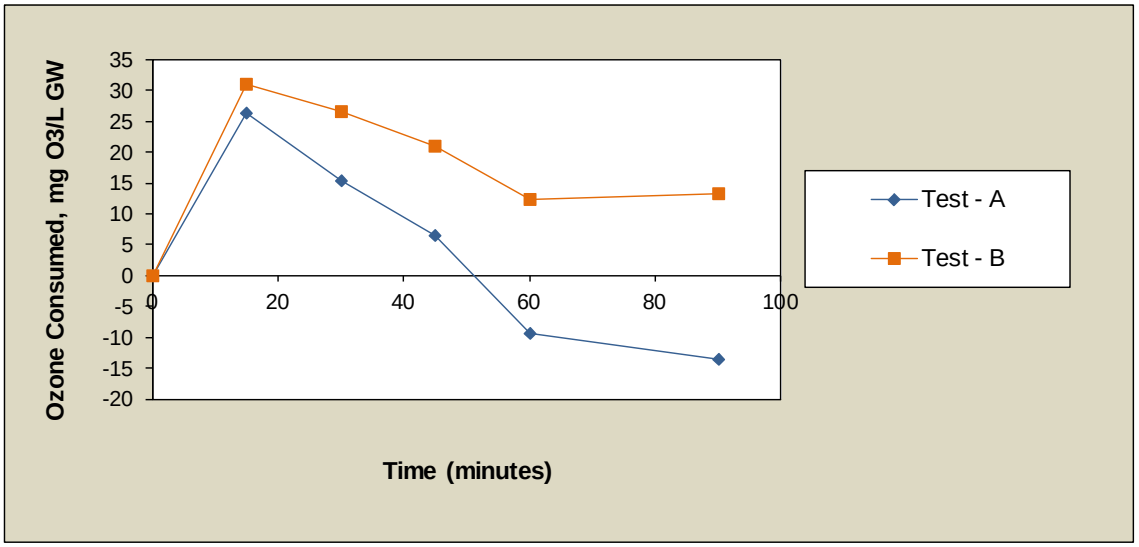
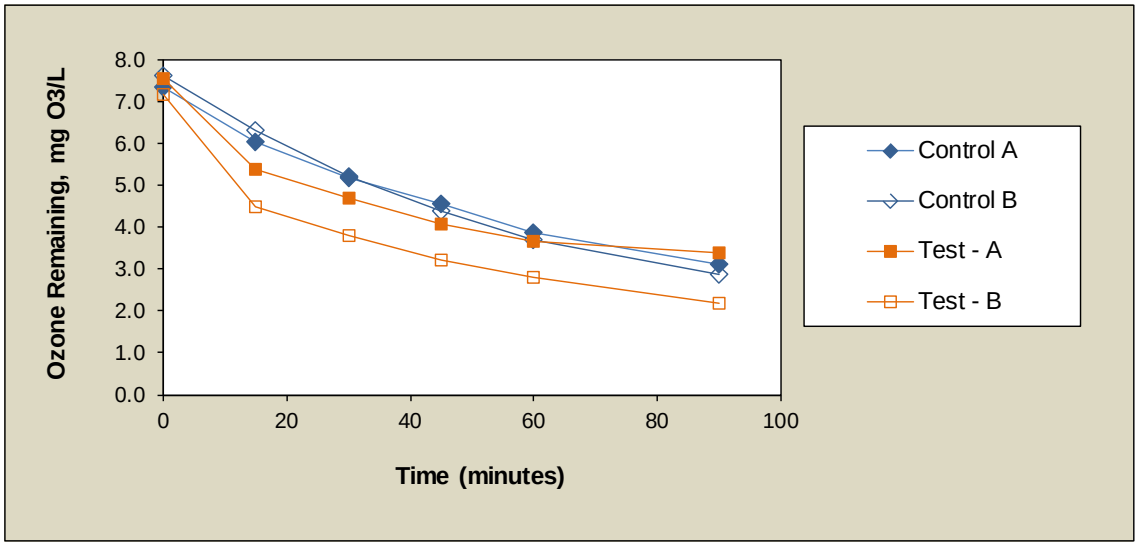


Figure 6. Ozone Demand – MW-6 Comp.

Time (min)	Ozone Remaining (mg/L soln.)				Ozone Consumed (mg/L GW)	
	Control A (no GW)	Control B (no GW)	Test - A 50 mL GW/L	Test - B 50 mL GW/L	Test - A 50 mL GW/L	Test - B 50 mL GW/L
0	7.32	7.62	7.55	7.17	0	0
15	6.03	6.29	5.39	4.48	17	28
30	5.18	5.21	4.68	3.81	12	22
45	4.54	4.40	4.07	3.20	10	19
60	3.87	3.69	3.65	2.79	4	14
90	3.11	2.88	3.39	2.17	-6	10

GW = groundwater



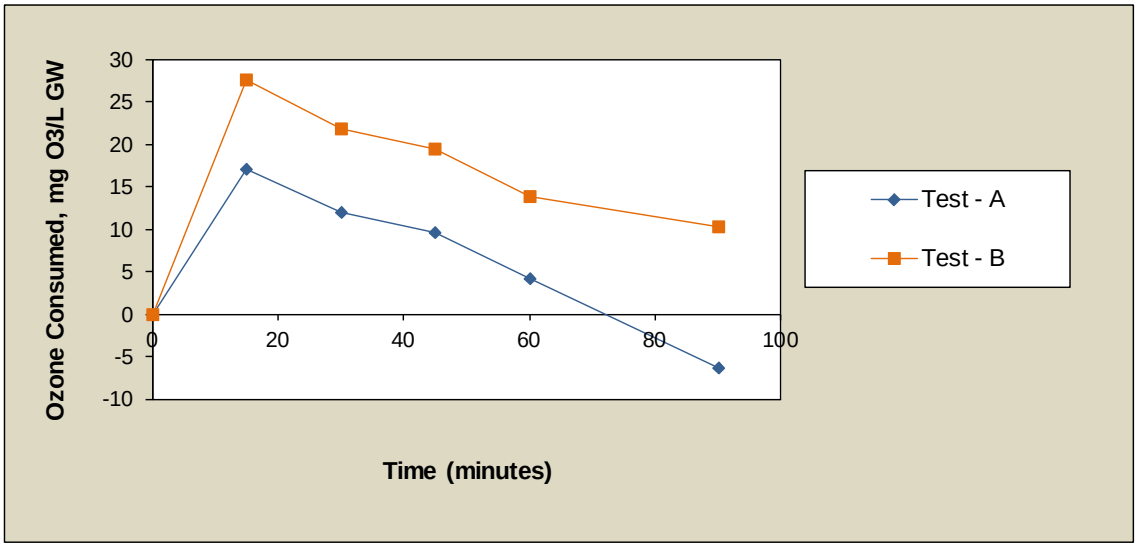
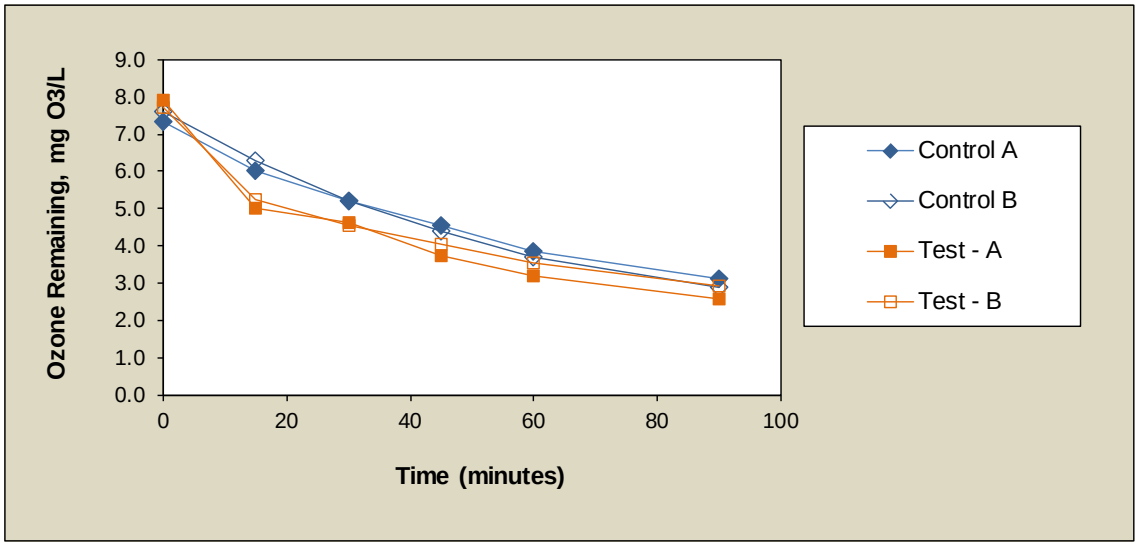


Figure 7. Ozone Demand – MW-7 Comp.

Time (min)	Ozone Remaining (mg/L soln.)				Ozone Consumed (mg/L GW)	
	Control A (no GW)	Control B (no GW)	Test - A 50 mL GW/L	Test - B 50 mL GW/L	Test - A 50 mL GW/L	Test - B 50 mL GW/L
0	7.32	7.62	7.90	7.73	0	0
15	6.03	6.29	5.00	5.25	32	23
30	5.18	5.21	4.63	4.57	20	18
45	4.54	4.40	3.72	4.03	23	14
60	3.87	3.69	3.18	3.55	21	10
90	3.11	2.88	2.57	2.91	17	7

GW = groundwater



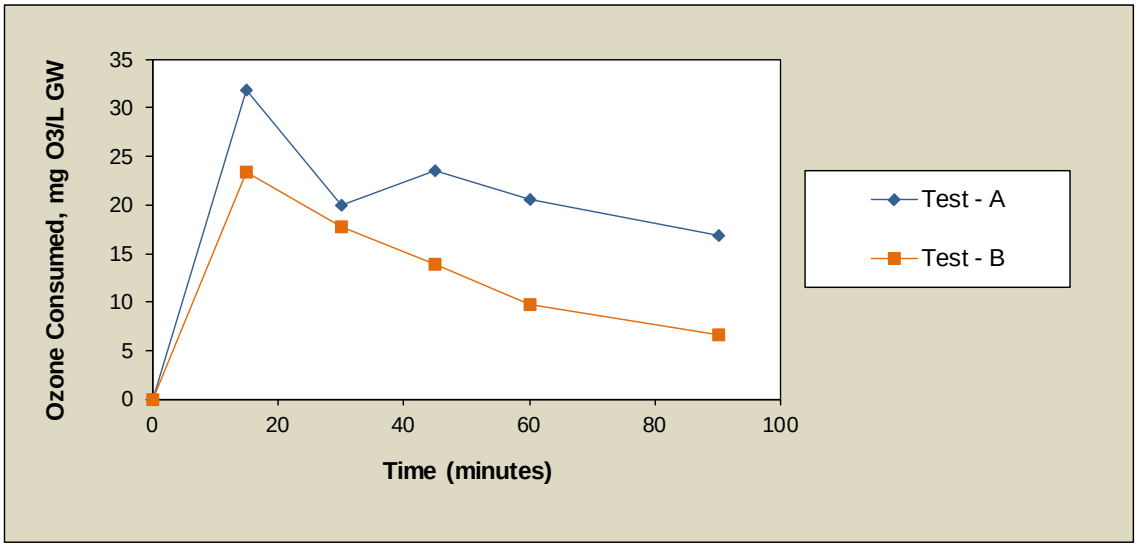


Figure 8. Ozone Demand – MW-10 Comp.

Table 6. Theoretical Oxidant Demand due to COCs in Groundwater.

COC	mg O3/ mg COC	Theoretical Demand due to COCs*, mg O3/L GW			
		MW-5 Comp	MW-6 Comp	MW-7 Comp	MW-10 Comp
GRO	10	0.67	0.52	1.6	0
DRO	10	3.5	4.2	3.2	5.5
TOTAL mg O3/ L GW:		4.2	4.7	4.8	5.5

3.2 Evaluation of Ozone

The concentrations of COCs in ozone treated water taken from the monitoring well in the reactor are shown in **Table 7. Figure 9** depicts these data, as well as the cumulative amounts of ozone applied and the number of pore volumes put through the ozone treatment zone.

Effluent GRO concentrations decreased rapidly, from 0.18 mg/L at Time 0 to < 0.02 mg/L by Day 6. The concentration of effluent DRO also decreased over time, from 0.45 mg/L at Time 0 to 0.13 mg/L by Day 6. The DRO concentration was steady between Days 6 and 10, suggesting that the rate of DRO input from the influent water was in equilibrium with the rate of oxidation due to the applied ozone. For this reason, the ozone test was stopped on Day 11 (see **Section 2.3**), and was resumed on Day 14 using a higher ozone concentration. The higher ozone dose (0.2 g O_3/L water versus 0.1 g O_3/L) decreased the DRO concentration to 0.052 mg/L on Day 17 (3 days of treatment).

Influent concentrations were also monitored during the test. The influent GRO concentration declined to < 0.05 mg/L in the influent tank on Day 11. Since the tank was fitted with a floating lid to prevent the formation of headspace, it is expected that the decrease in the influent GRO was due to biodegradation rather than volatilization. The influent DRO concentration increased during the pilot test from 0.45 mg/L to 0.65 mg/L. This is considered a relatively constant influent concentration and the uncertainty is due to normal sampling and analytical variations.

The concentration of DRO in the monitoring well at Day 14 was 0.072 mg/L after the three day shutdown and prior to resuming the test. This is a decline from 0.13 mg/L on Day 11, and is likely due to continuing biodegradation following the temporary shutdown of the ozone system.

The ozone test was resumed with an average influent DRO concentration between 0.45 mg/L (the Time 0 value in the monitoring well) and 0.65 mg/L, the concentration in the influent tank at Day 11. Assuming an influent DRO concentration of 0.55 mg/L (the average of the Time 0 and Day 11 values), 76% of the DRO was destroyed when ozone was applied at a rate of 0.1 g O_3/L water, while 90% was destroyed when the rate was 0.2 g O_3/L water.

Table 7. Ozone Curtain Results – DRO and GRO.

Analyte	Units	Ozone Curtain					
		Time 0	Day 3	Day 6	Day 10 **	Day 14^	Day 17
DRO	mg/L	0.45	0.66	0.13	0.13	0.073	0.052
GRO	mg/L	0.18	0.08	< 0.02	< 0.05	n.m.	n.m.

** Influent water collected on Day 11 contained 0.65 mg/L DRO and < 0.05 mg/L GRO; Test SHUT DOWN after collection of sample.

^ Sample collected IMMEDIATELY PRIOR to resuming test. All conditions same except O3 concentration increased by factor of about 2.

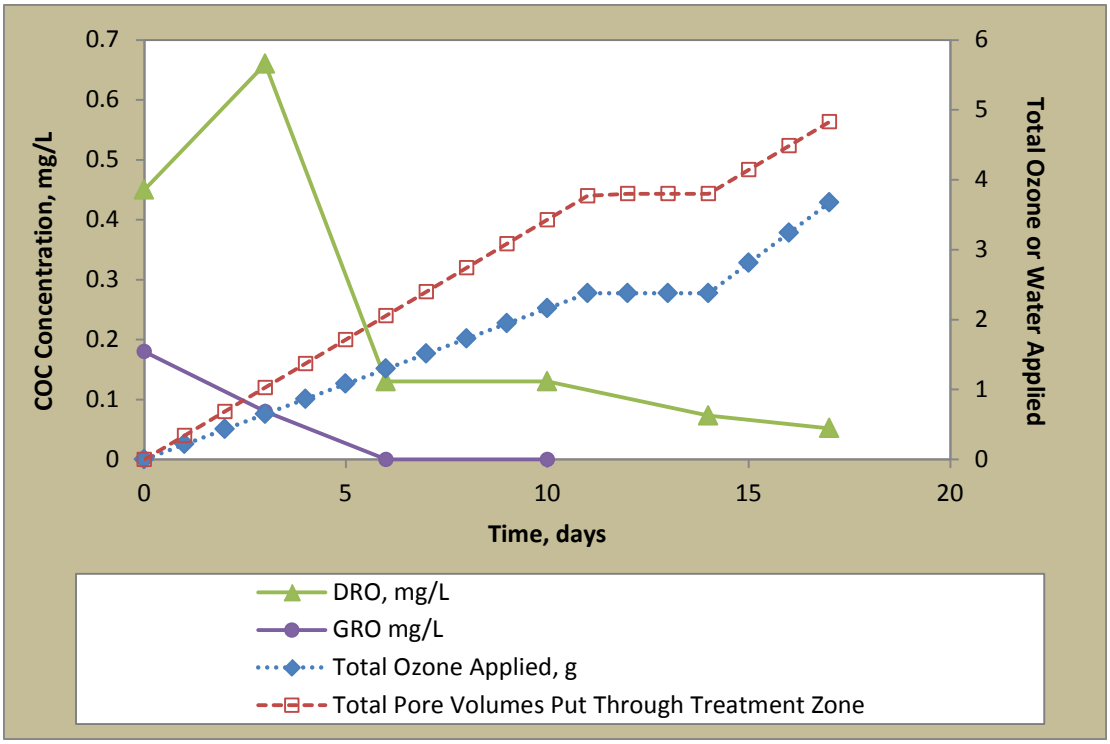


Figure 9. Ozone Curtain Results – COCs, Ozone and Pore Volumes.

3.3 Evaluation of Aerobic Biodegradation

Several lines of evidence indicate that COCs are susceptible to aerobic biodegradation. The first is the preliminary test (**Section 2.4.1**) in which site water was exposed to headspace air for three days in the sample buckets. As shown in **Table 8**, both DRO and ORO concentrations decreased relative to a sterile control—DRO decreased from 2.0 to 1.2 mg/L (40%) while ORO decreased from 1.1 to 0.58 mg/L (42%). The second line of evidence is the decrease in GRO in the influent tank during the ozone tests (**Section 3.2**). In these tests, GRO was 0.18 mg/L at the start of the test and < 0.05 mg/L by Day 11 in a holding tank with no headspace, while DRO in the reactor decreased from 0.13 mg/L at Day 10 to 0.072 mg/L at Day 14 while the ozone was turned off.

The final line of evidence is the aeration study conducted using the same system as the ozone curtain, but with air sparging rather than ozone sparging (**Section 2.4.2**). In this test, water was sparged with air for 9 days. DRO decreased from 0.19 mg/L in the monitoring well to 0.081 mg/L (57% reduction). Neither ORO nor GRO were detected at either the beginning or end of this test.

Laboratory testing demonstrated that aerobic degradation can occur, but the treatment conditions were not optimized. The total amount of air delivered in the air-sparging test was approximately 200 L air/L water because the test used the same gas flowrate as the ozone study. It is likely, however, that aerobic conditions can be maintained using less air. The treatment time required to achieve 57% destruction in the lab was 9 days. However, 9 days may be insufficient time for microorganisms to reach their full capacity, so improved removal may occur in the same time frame once microorganism populations are fully established.

Table 8. Preliminary Biodegradation Results.

Analyte	Units	Biodegradation Test*	
		Sterile Control	Test
DRO	mg/L	2.0	1.2
ORO	mg/L	1.1	0.58

* Used water from with solids from MW-5 bucket. Solids included in test.

4.0 SUMMARY and CONCLUSIONS

It was found that suspended solids contribute significantly to the total DRO and ORO concentrations in groundwater samples from this site. DRO ranged from 0.32 to 0.55 mg/L in settled samples, and 1.5 mg/L when suspended solids were included in the water sample. Thus, PRIMA recommends noting the presence of suspended solids when collecting future samples to assist in interpretation of data.

Laboratory testing demonstrated that COCs in site water are susceptible to both chemical oxidation (via ozone) and aerobic biodegradation. In tests simulating an ozone sparge curtain, application of 0.1 g O_3/L water decreased DRO concentrations by about 76% while application of 0.2 g O_3/ L water decreased DRO by about 90%. GRO was completely removed during the ozone curtain study, but losses could not be conclusively attributed to oxidation by ozone because GRO was aerobically biodegraded in the influent tank.

Several lines of evidence indicate that COCs are susceptible to aerobic biodegradation. First, both DRO and ORO decreased by about 50% within 3 days in preliminary tests where site groundwater and suspended solids were exposed to headspace air in the sample buckets. In addition, DRO decreased by about 45% in 3 days when the ozone curtain was shut down. Finally, DRO decreased by about 50% in 9 days when sparged with air in a manner similar to sparging with ozone.

Based on the results of this study, PRIMA recommends that an ozone and/or air-sparging curtain be considered for use at this site. It is likely that nearly complete oxidation of DRO can be achieved with an ozone dose of about 0.2 mg O_3/L water. However, a lower ozone dose may be applied if an aerobic treatment zone is included. This zone should be located after the ozonation zone so that oxygen derived from the ozone system can stimulate biodegradation of the COCs. Note that a higher dose of ozone may be required initially to overcome the ozone demand of impacted sediments that become entrained in the ozone curtain upon installation, but once this demand is met the ozone application rates discussed above should be adequate.

Adequate COC destruction may be possible via air-sparging alone, though field pilot testing is recommended to confirm this and determine optimal treatment conditions. The

total amount of air delivered in the air-sparging test was approximately 200 L air/L water, but it is likely that aerobic conditions can be maintained using less air. In addition, the laboratory test was run for 9 days, which may not have been sufficient time for microorganism populations to become fully established.

APPENDIX A
(Chains of Custody)

CHAIN OF CUSTODY

PRIMA Environmental, Inc.
5070 Robert J. Mathews Parkway, Suite 300, El Dorado Hills, CA 95762
(916) 939-7300 * (916) 939-7398 FAX

Project Manager Jeff Bensch
Project Name CKS - Owens Brockway Oakland
Job Number
Date 3/21/2014
Phone: 916-207-5706
Email: jbensch@sierra-west.net

Lab Name
Address:
Phone
Turnaround Time

SAMPLE ID	Date	Time	Matrix	# containers	Analysis: TPH-D/TPH-M	Comments
MW-20 "clean"	3/21/14	12:10	GW			
MW-13 "clean"		12:30				
MW-10 "impacted"		12:55				
MW-15 "impacted"		13:25				Dirtiest in appearance
MW-8 "FP"		14:10				
MW-7 "FP"	"	14:40	"			

Special Instructions

Relinquished by:		Received by:
Company Sierra West	Date 3/21/2014	Company PRIMA
Printed Name Jeff Bensch	Time 19:20	Printed Name Cindy Schreier
Signature		Signature
Relinquished by:		**Received by:**
Company	Date	Company
Printed Name	Time	Printed Name
Signature		Signature

APPENDIX B
(Analytical Reports)

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 03/26/14

Job: SWC-03

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SWC-MW-7 Comp**					
Lab ID :	PES14032621-01A	TPH-E (DRO)	0.32	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	0.16	0.10 mg/L	03/27/14	03/27/14
Client ID :	**SWC-MW-6 Comp**					
Lab ID :	PES14032621-02A	TPH-E (DRO)	0.42	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	0.052	0.050 mg/L	03/27/14	03/27/14
Client ID :	**SWC-MW-5 Comp**					
Lab ID :	PES14032621-03A	TPH-E (DRO)	0.35	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	0.067	0.050 mg/L	03/27/14	03/27/14
Client ID :	**SWC-MW-10 Comp**					
Lab ID :	PES14032621-04A	TPH-E (DRO)	0.55	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	ND	0.050 mg/L	03/27/14	03/27/14
Client ID :	**SWC-MW-13**					
Lab ID :	PES14032621-05A	TPH-E (DRO)	ND	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	ND	0.050 mg/L	03/27/14	03/27/14
Client ID :	**SWC-MW-20**					
Lab ID :	PES14032621-06A	TPH-E (DRO)	ND	0.050 mg/L	03/26/14	03/26/14
Date Sampled	03/24/14 16:30	TPH-E (ORO)	ND	0.50 mg/L	03/26/14	03/26/14
		TPH-P (GRO)	ND	0.050 mg/L	03/27/14	03/27/14

Diesel Range Organics (DRO) C13-C22
Gasoline Range Organics (GRO) C4-C13
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

ACCREDITED DoD ELAP

NELAP ACCREDITED LABORATORY

3/27/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Apr-14*

QC Summary Report

Work Order: 14032621

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03201466.D** Batch ID: **32645** Analysis Date: **03/26/2014 10:12**

Sample ID: **MBLK-32645** Units : **mg/L** Run ID: **FID_2_140326A** Prep Date: **03/26/2014 10:03**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.125		0.15		83	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03201467.D** Batch ID: **32645** Analysis Date: **03/26/2014 10:38**

Sample ID: **LCS-32645** Units : **mg/L** Run ID: **FID_2_140326A** Prep Date: **03/26/2014 10:03**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.21	0.05	2.5		88	70	130			
Surr: Nonane	0.145		0.15		97	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03201488.D** Batch ID: **32645** Analysis Date: **03/26/2014 21:35**

Sample ID: **14032450-14AMS** Units : **mg/L** Run ID: **FID_2_140326A** Prep Date: **03/26/2014 10:03**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.17	0.05	2.5	0	87	51	151			
Surr: Nonane	0.066		0.15		44	53	145			S52

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03201489.D** Batch ID: **32645** Analysis Date: **03/26/2014 22:00**

Sample ID: **14032450-14AMSD** Units : **mg/L** Run ID: **FID_2_140326A** Prep Date: **03/26/2014 10:03**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.16	0.05	2.5	0	86	51	151	2.171	0.6(40)	
Surr: Nonane	0.087		0.15		58	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

S52 = Surrogate recovery was above laboratory acceptance limits. Probable matrix effect.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Apr-14*

QC Summary Report

Work Order: 14032621

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14032705.D** Batch ID: **MS08W0327B** Analysis Date: **03/27/2014 13:12**

Sample ID: **MBLK MS08W0327B** Units : **mg/L** Run ID: **MSD_08_140327A** Prep Date: **03/27/2014 13:12**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.00931		0.01		93	70	130			
Surr: Toluene-d8	0.0113		0.01		113	70	130			
Surr: 4-Bromofluorobenzene	0.00924		0.01		92	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14032704.D** Batch ID: **MS08W0327B** Analysis Date: **03/27/2014 12:41**

Sample ID: **GLCS MS08W0327B** Units : **mg/L** Run ID: **MSD_08_140327A** Prep Date: **03/27/2014 12:41**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.368	0.05	0.4		92	70	130			
Surr: 1,2-Dichloroethane-d4	0.00905		0.01		91	70	130			
Surr: Toluene-d8	0.00908		0.01		91	70	130			
Surr: 4-Bromofluorobenzene	0.012		0.01		120	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14032728.D** Batch ID: **MS08W0327B** Analysis Date: **03/27/2014 22:47**

Sample ID: **14032450-02AGS** Units : **mg/L** Run ID: **MSD_08_140327A** Prep Date: **03/27/2014 22:47**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.99	0.25	2	0	99	54	143			
Surr: 1,2-Dichloroethane-d4	0.0482		0.05		96	70	130			
Surr: Toluene-d8	0.0443		0.05		89	70	130			
Surr: 4-Bromofluorobenzene	0.0608		0.05		122	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14032729.D** Batch ID: **MS08W0327B** Analysis Date: **03/27/2014 23:13**

Sample ID: **14032450-02AGSD** Units : **mg/L** Run ID: **MSD_08_140327A** Prep Date: **03/27/2014 23:13**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.66	0.25	2	0	83	54	143	1.989	18.3(23)	
Surr: 1,2-Dichloroethane-d4	0.0418		0.05		84	70	130			
Surr: Toluene-d8	0.0468		0.05		94	70	130			
Surr: 4-Bromofluorobenzene	0.0594		0.05		119	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14032621

Report Due By : 5:00 PM On : 27-Mar-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : C. Schreier

PO :

Client's COC # : 16458 Job : SWC-03

Cooler Temp	Samples Received	Date Printed
1 °C	26-Mar-14	26-Mar-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W							Sample Remarks
PES14032621-01A	SWC-MW-7 Comp	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							
PES14032621-02A	SWC-MW-6 Comp	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							
PES14032621-03A	SWC-MW-5 Comp	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							
PES14032621-04A	SWC-MW-10 Comp	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							
PES14032621-05A	SWC-MW-13	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							
PES14032621-06A	SWC-MW-20	AQ	03/24/14 16:30	4	0	1	TPH/E_C	GAS-C							

Comments: 24 HR TAT. Security seals intact. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	3/25/14

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Company: _____
Attn: _____
Address: _____
City, State, Zip: _____
Phone Number: _____ Fax: _____

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431
Phone: 775-355-1044
Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848

16458

Page # 1 of _____

Consultant/ Client Info:
Company: PRIMA
Address: 5070 Robert J Mathews Ste 300
City, State, Zip: EDH, CA 95762

Job and Purchase Order Info:
Job #: SWC-03
Job Name:
P.O. #:

Report Attention/Project Manager:
Name: Cindy Schreier
Email Address: cstaf@primaenvironmental.com
Phone #: 916-939-7300
Cell #:

QC Deliverable Info:
EDD Required? Yes (No) EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR (CA) KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Analysis Requested: Field Filtered? Yes	Field Filtered? No	GRO	DRO/ORO	Remarks
1630	3.24	AQ	PES1403262 1-01	SWC-MW-7 Comp	48h	4V		X	X	X	
			02	SWC-MW-6 Comp				X	X	X	
			03	SWC-MW-5 Comp				X	X	X	
			04	SWC-MW-10 Comp				X	X	X	
			05	SWC-MW-13				X	X	X	
			06	SWC-MW-20	V			X	X	X	

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: CS

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
CS / PRIMA	3-25-14	1720	Melissa T	3-25-14	1420
			E Hernandez	3/26/14	0915

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/01/14

Job: SCW-03Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SCW-Ster Con**					
Lab ID :	PES14040142-01A	TPH-E (DRO)	2.0	0.050 mg/L	04/01/14	04/01/14
Date Sampled	03/31/14 17:00	TPH-E (ORO)	1.1	0.50 mg/L	04/01/14	04/01/14
Client ID :	**SCW-Aerobic**					
Lab ID :	PES14040142-02A	TPH-E (DRO)	1.2	0.050 mg/L	04/01/14	04/01/14
Date Sampled	03/31/14 17:00	TPH-E (ORO)	0.58	0.50 mg/L	04/01/14	04/01/14
Client ID :	**SCW-5B-Mid**					
Lab ID :	PES14040142-03A	TPH-E (DRO)	0.34	0.050 mg/L	04/01/14	04/01/14
Date Sampled	03/31/14 16:40	TPH-E (ORO)	ND	0.50 mg/L	04/01/14	04/01/14
Client ID :	**SCW-5B-SS**					
Lab ID :	PES14040142-04A	TPH-E (DRO)	1.5	0.050 mg/L	04/01/14	04/01/14
Date Sampled	03/31/14 16:50	TPH-E (ORO)	0.69	0.50 mg/L	04/01/14	04/01/14

Diesel Range Organics (DRO) C13-C22
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

NELAP ACCREDITED LABORATORY

✓
4/2/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/01/14

Job: SCW-03Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SCW-5B-KW Blank**					
Lab ID :	PES14040142-05A	TPH-E (DRO)	42	4.0 µg	04/02/14	04/02/14
Date Sampled	03/28/14 00:00	TPH-E (ORO)	71	20 µg	04/02/14	04/02/14
Client ID :	**SCW-5B-KW+Res**					
Lab ID :	PES14040142-06A	TPH-E (DRO)	95	40 µg	04/02/14	04/02/14
Date Sampled	03/28/14 00:00	TPH-E (ORO)	350	200 µg	04/02/14	04/02/14

Diesel Range Organics (DRO) C13-C22
Oil Range Organics (ORO) C22-C40+
Reported in micrograms per wipe.

ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

NELAP ACCREDITED TNI LABORATORY

4/2/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *07-Apr-14*

QC Summary Report

Work Order: 14040142

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03271503.D** Batch ID: **32672** Analysis Date: **04/02/2014 09:03**

Sample ID: **MBLK-32672** Units : **mg/L** Run ID: **FID_2_140401A** Prep Date: **04/01/2014 10:04**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.147		0.15		98	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03271476.D** Batch ID: **32672** Analysis Date: **04/01/2014 12:47**

Sample ID: **LCS-32672** Units : **mg/L** Run ID: **FID_2_140401A** Prep Date: **04/01/2014 10:04**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.27	0.05	2.5		91	70	130			
Surr: Nonane	0.158		0.15		105	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03271497.D** Batch ID: **32672** Analysis Date: **04/01/2014 21:54**

Sample ID: **14040140-02AMS** Units : **mg/L** Run ID: **FID_2_140401A** Prep Date: **04/01/2014 10:04**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.33	0.05	2.5	0	93	51	151			
Surr: Nonane	0.131		0.15		87	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A03271498.D** Batch ID: **32672** Analysis Date: **04/01/2014 22:20**

Sample ID: **14040140-02AMSD** Units : **mg/L** Run ID: **FID_2_140401A** Prep Date: **04/01/2014 10:04**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.08	0.05	2.5	0	83	51	151	2.333	11.3(40)	
Surr: Nonane	0.138		0.15		92	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14040142

Report Due By : 5:00 PM On : 02-Apr-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 16462 Job : SCW-03Curt

Cooler Temp	Samples Received	Date Printed
1 °C	01-Apr-14	01-Apr-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_S	TPH/E_W							Sample Remarks
PES14040142-01A	SCW-Ster Con	AQ	03/31/14 17:00	2	0	1		TPH/E_C							
PES14040142-02A	SCW-Aerobic	AQ	03/31/14 17:00	2	0	1		TPH/E_C							
PES14040142-03A	SCW-5B-Mid	AQ	03/31/14 16:40	2	0	1		TPH/E_C							
PES14040142-04A	SCW-5B-SS	AQ	03/31/14 16:50	2	0	1		TPH/E_C							
PES14040142-05A	SCW-5B-KW Blank	WP	03/28/14 00:00	1	0	1	TPH/E_C								
PES14040142-06A	SCW-5B-KW+Res	WP	03/28/14 00:00	1	0	1	TPH/E_C								

Comments: 24hr TAT. No security seals. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:			Alpha Analytical, Inc.	4/1/14 0940

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Company:	PRIMA ENVIRONMENTAL, Inc.
Attn:	5070 Robert J. Mathews Parkway, Suite 300
Address:	El Dorado Hills, CA 95762
City, State	PH: 916-939-7300 FAX: 916 939 7398
Phone Nui	data@primaenvironmental.com

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 — Phone: 775-355-1044, Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 — Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 — Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 — Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 — Phone: 702-281-4848

16462

Page # 1 of 1

Consultant/ Client Info:
Company:
Address:
City, State, Zip:

Job and Purchase Order Info:
Job # SCW-03 Curt
Job Name:
P.O. #:

Report Attention/Project Manager:
Name:
Email Address:
Phone #:
Cell #:

QC Deliverable Info:
EDD Required? Yes / No EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	Analysis Requested: DRO/ORO, TPH	Remarks
1700	3.31	AQ	PES1403/0142-01A	SCW-Ster Con	24h	2V		X	X	
1700	331	AQ	02A	SCW-Aerobic	↓	↓		X	X	
1640	3.28	AQ	03A	SCW-5B-MID				X	X	
1650	3.28	AQ	04A	SCW-5B-SS				X	X	
	3.28	OT	05A	SCW-5B-KW Blank		1S		X	X	
	3.28	OT	06A	SCW-5B-KW+Res	↓	1S		X	X	

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By:

Relinquished by: (Signature/Affiliation): PRIMA	Date: ~1852 3.31	Time: 1.14	Received by: (Signature/Affiliation): Fed Ex	Date:	Time:
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation): Alpha	Date: 4/1/14	Time: 0929
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/08/14

Job: SWC-03 Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SWC Curt D3**					
Lab ID :	PES14040843-01A	TPH-E (DRO)	0.66	0.050 mg/L	04/08/14	04/08/14
Date Sampled	04/06/14 13:30	TPH-E (ORO)	ND	0.50 mg/L	04/08/14	04/08/14
		TPH-P (GRO)	0.080	0.050 mg/L	04/08/14	04/08/14
Client ID :	**SWC Curt T0**					
Lab ID :	PES14040843-02A	TPH-E (DRO)	0.45	0.050 mg/L	04/08/14	04/08/14
Date Sampled	04/04/14 16:25	TPH-E (ORO)	ND	0.50 mg/L	04/08/14	04/08/14
		TPH-P (GRO)	0.18	0.050 mg/L	04/08/14	04/08/14

Diesel Range Organics (DRO) C13-C22
Gasoline Range Organics (GRO) C4-C13
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

4/8/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *10-Apr-14*

QC Summary Report

Work Order: 14040843

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A04031484.D** Batch ID: **32710** Analysis Date: **04/08/2014 10:17**

Sample ID: **MBLK-32710** Units : **mg/L** Run ID: **FID_2_140408A** Prep Date: **04/08/2014 09:09**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.149		0.15		99	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A04031483.D** Batch ID: **32710** Analysis Date: **04/08/2014 09:49**

Sample ID: **LCS-32710** Units : **mg/L** Run ID: **FID_2_140408A** Prep Date: **04/08/2014 09:09**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.15	0.05	2.5		86	70	130			
Surr: Nonane	0.138		0.15		92	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A04031509.D** Batch ID: **32710** Analysis Date: **04/08/2014 21:03**

Sample ID: **14040741-01AMS** Units : **mg/L** Run ID: **FID_2_140408A** Prep Date: **04/08/2014 09:09**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.14	0.05	2.5	0	86	51	151			
Surr: Nonane	0.128		0.15		85	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A04031510.D** Batch ID: **32710** Analysis Date: **04/08/2014 21:29**

Sample ID: **14040741-01AMSD** Units : **mg/L** Run ID: **FID_2_140408A** Prep Date: **04/08/2014 09:09**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.27	0.05	2.5	0	91	51	151	2.139	5.9(40)	
Surr: Nonane	0.127		0.15		85	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *10-Apr-14*

QC Summary Report

Work Order: 14040843

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140408\14040804.D** Batch ID: **MS10W0408B** Analysis Date: **04/08/2014 11:46**

Sample ID: **MBLK MS10W0408B** Units : **mg/L** Run ID: **MSD_10_140408A** Prep Date: **04/08/2014 11:46**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0102		0.01		102	70	130			
Surr: Toluene-d8	0.00997		0.01		99.7	70	130			
Surr: 4-Bromofluorobenzene	0.00949		0.01		95	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140408\14040803.D** Batch ID: **MS10W0408B** Analysis Date: **04/08/2014 11:20**

Sample ID: **GLCS MS10W0408B** Units : **mg/L** Run ID: **MSD_10_140408A** Prep Date: **04/08/2014 11:20**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.418	0.05	0.4		105	70	130			
Surr: 1,2-Dichloroethane-d4	0.0109		0.01		109	70	130			
Surr: Toluene-d8	0.00931		0.01		93	70	130			
Surr: 4-Bromofluorobenzene	0.0094		0.01		94	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140408\14040817.D** Batch ID: **MS10W0408B** Analysis Date: **04/08/2014 16:24**

Sample ID: **14040704-01AGS** Units : **mg/L** Run ID: **MSD_10_140408A** Prep Date: **04/08/2014 16:24**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.72	0.25	2	0	86	54	143			
Surr: 1,2-Dichloroethane-d4	0.0519		0.05		104	70	130			
Surr: Toluene-d8	0.0466		0.05		93	70	130			
Surr: 4-Bromofluorobenzene	0.0499		0.05		99.9	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140408\14040818.D** Batch ID: **MS10W0408B** Analysis Date: **04/08/2014 16:46**

Sample ID: **14040704-01AGSD** Units : **mg/L** Run ID: **MSD_10_140408A** Prep Date: **04/08/2014 16:46**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.89	0.25	2	0	95	54	143	1.72	9.4(23)	
Surr: 1,2-Dichloroethane-d4	0.0518		0.05		104	70	130			
Surr: Toluene-d8	0.0467		0.05		93	70	130			
Surr: 4-Bromofluorobenzene	0.0492		0.05		98	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14040843

Report Due By : 5:00 PM On : 08-Apr-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 16463 Job : SWC-03 Curt

Cooler Temp	Samples Received	Date Printed
0 °C	08-Apr-14	08-Apr-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W							Sample Remarks
PES14040843-01A	SWC Curt D3	AQ	04/06/14 13:30	4	0	0	TPH/E_C	GAS-C							
PES14040843-02A	SWC Curt T0	AQ	04/04/14 16:25	4	0	0	TPH/E_C	GAS-C							

Comments: ASAP TAT. Security seals intact. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:		Susan Nicri	Alpha Analytical, Inc.	4/8/14 0940

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Compl PRIMA ENVIRONMENTAL, Inc.
Attn: 5070 Robert J. Mathews Parkway, Suite 300
Addre El Dorado Hills, CA 95762
City, S PH: 916-939-7300 FAX: 916 939 7398
Phone data@primaenvironmental.com

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431
Phone: 775-355-1044
Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848

16463

Page # 1 of 1

Consultant/ Client Info:
Company:
Address:
City, State, Zip:

Job and Purchase Order Info:
Job # SWC - 03 Curt
Job Name:
P.O. #:

Report Attention/Project Manager:
Name:
Email Address:
Phone #:
Cell #:

QC Deliverable Info:
EDD Required? Yes / No
EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	Analysis Requested: GRO	Analysis Requested: DRO/ORO	Remarks
1330	4.6	AQ	PES14040843-01A	SWC Curt D3	24h	4V		X	X	X	
1625	4.4	AQ	QA	SWC Curt T6	24h	4V		X	X	X	

CAS

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By:

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
/PRIMA	4-6-14	1420	Melissa T	4-6-14	1420
			Alpha	4/8/14	0935

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/11/14

Job: SWC-03 Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B

		Parameter	Concentration		Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**03 Curt D6**						
Lab ID :	PES14041120-01A	TPH-E (DRO)	0.13		0.050 mg/L	04/11/14	04/11/14
Date Sampled	04/10/14 15:30	TPH-E (ORO)	ND		0.50 mg/L	04/11/14	04/11/14
		TPH-P (GRO)	ND	O	0.20 mg/L	04/14/14	04/14/14

Diesel Range Organics (DRO) C13-C22
Gasoline Range Organics (GRO) C4-C13
O = Reporting Limits were increased due to sample foaming.
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

NELAP ACCREDITED TNI LABORATORY

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

4/14/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Apr-14*

QC Summary Report

Work Order: 14041120

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111406.D** Batch ID: **32735** Analysis Date: **04/11/2014 14:26**

Sample ID: **MBLK-32735** Units : **mg/L** Run ID: **FID_7_140411A** Prep Date: **04/11/2014 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.125		0.15		83	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111407.D** Batch ID: **32735** Analysis Date: **04/11/2014 14:52**

Sample ID: **LCS-32735** Units : **mg/L** Run ID: **FID_7_140411A** Prep Date: **04/11/2014 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.28	0.05	2.5		91	70	130			
Surr: Nonane	0.16		0.15		107	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111422.D** Batch ID: **32735** Analysis Date: **04/11/2014 21:26**

Sample ID: **14041140-10AMS** Units : **mg/L** Run ID: **FID_7_140411A** Prep Date: **04/11/2014 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.58	0.05	2.5	0	103	51	151			
Surr: Nonane	0.076		0.15		51	53	145			S53

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111423.D** Batch ID: **32735** Analysis Date: **04/11/2014 21:53**

Sample ID: **14041140-10AMSD** Units : **mg/L** Run ID: **FID_7_140411A** Prep Date: **04/11/2014 11:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.59	0.05	2.5	0	103	51	151	2.578	0.3(40)	
Surr: Nonane	0.145		0.15		97	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

S53 = Surrogate recovery was below laboratory acceptance limits. Probable matrix effect.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Apr-14*

QC Summary Report

Work Order: 14041120

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14041404.D** Batch ID: **MS15W0414B** Analysis Date: **04/14/2014 11:30**

Sample ID: **MBLK MS15W0414B** Units : **mg/L** Run ID: **MSD_15_140414A** Prep Date: **04/14/2014 11:30**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0111		0.01		111	70	130			
Surr: Toluene-d8	0.00978		0.01		98	70	130			
Surr: 4-Bromofluorobenzene	0.011		0.01		110	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14041403.D** Batch ID: **MS15W0414B** Analysis Date: **04/14/2014 10:27**

Sample ID: **GLCS MS15W0414B** Units : **mg/L** Run ID: **MSD_15_140414A** Prep Date: **04/14/2014 10:27**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.439	0.05	0.4		110	70	130			
Surr: 1,2-Dichloroethane-d4	0.0111		0.01		111	70	130			
Surr: Toluene-d8	0.0095		0.01		95	70	130			
Surr: 4-Bromofluorobenzene	0.0115		0.01		115	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14041430.D** Batch ID: **MS15W0414B** Analysis Date: **04/14/2014 20:54**

Sample ID: **14041141-23AGS** Units : **mg/L** Run ID: **MSD_15_140414A** Prep Date: **04/14/2014 20:54**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.68	0.25	2	0	84	54	143			
Surr: 1,2-Dichloroethane-d4	0.0456		0.05		91	70	130			
Surr: Toluene-d8	0.0496		0.05		99	70	130			
Surr: 4-Bromofluorobenzene	0.054		0.05		108	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **14041431.D** Batch ID: **MS15W0414B** Analysis Date: **04/14/2014 21:16**

Sample ID: **14041141-23AGSD** Units : **mg/L** Run ID: **MSD_15_140414A** Prep Date: **04/14/2014 21:16**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.69	0.25	2	0	85	54	143	1.679	0.9(23)	
Surr: 1,2-Dichloroethane-d4	0.0464		0.05		93	70	130			
Surr: Toluene-d8	0.0498		0.05		99.6	70	130			
Surr: 4-Bromofluorobenzene	0.054		0.05		108	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14041120

Report Due By : 5:00 PM On : 14-Apr-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : C. Schreier

PO :

Client's COC # : 16465 Job : SWC-03 Curt

Cooler Temp	Samples Received	Date Printed
0 °C	11-Apr-14	**11-Apr-14**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W							Sample Remarks
PES14041120-01A	03 Curt D6	AQ	04/10/14 15:30	4	0	1	TPH/E_C	GAS-C							

Comments: 24 HR TAT. No security seals. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	4/11/14 0940

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Comp: PRIMA ENVIRONMENTAL, Inc.
Attn: 5070 Robert J. Mathews Parkway, Suite 300
Addre: El Dorado Hills, CA 95762
City, : PH: 916-939-7300 FAX: 916 939 7398
Phon: data@primaenvironmental.com

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044 Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848

16465

Page # 1 of 1

Consultant/ Client Info:
Company:
Address:
City, State, Zip:

Job and Purchase Order Info:
Job # SWC - 03 Cant
Job Name:
P.O. #:

Report Attention/Project Manager:
Name:
Email Address:
Phone #:
Cell #:

QC Deliverable Info:
EDD Required? Yes / No EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	GRO	DRO/ORO	Remarks
~~1520~~	4.10	AQ	PES14041120-01	03Cant DL	24h	~~4~~ 3V		X	X	X	
1530	4.10										
C&S											

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: C&S

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
C&S / PRIMA	4.10.14	~1800	FedEx		
			K Murray/AAI	4/11/14	0940

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/16/14

Job: SWC 03 Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SWC Curt D10**					
Lab ID :	PES14041620-01A	TPH-E (DRO)	0.13	0.050 mg/L	04/16/14	04/16/14
Date Sampled	04/14/14 17:00	TPH-E (ORO)	ND	0.50 mg/L	04/16/14	04/16/14
		TPH-P (GRO)	ND	0.050 mg/L	04/16/14	04/16/14
Client ID :	**SWC Curt Tank**					
Lab ID :	PES14041620-02A	TPH-E (DRO)	0.65	0.050 mg/L	04/16/14	04/16/14
Date Sampled	04/14/14 15:45	TPH-E (ORO)	ND	0.50 mg/L	04/16/14	04/16/14
		TPH-P (GRO)	ND	0.050 mg/L	04/16/14	04/16/14

Diesel Range Organics (DRO) C13-C22
Gasoline Range Organics (GRO) C4-C13
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

4/16/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *21-Apr-14*

QC Summary Report

Work Order: 14041620

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111476.D** Batch ID: **32753** Analysis Date: **04/16/2014 12:39**

Sample ID: **MBLK-32753** Units : **mg/L** Run ID: **FID_7_140416A** Prep Date: **04/16/2014 10:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.149		0.15		99	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111475.D** Batch ID: **32753** Analysis Date: **04/16/2014 12:14**

Sample ID: **LCS-32753** Units : **mg/L** Run ID: **FID_7_140416A** Prep Date: **04/16/2014 10:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.28	0.05	2.5		91	70	130			
Surr: Nonane	0.124		0.15		83	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111482.D** Batch ID: **32753** Analysis Date: **04/16/2014 15:16**

Sample ID: **14041601-04AMS** Units : **mg/L** Run ID: **FID_7_140416A** Prep Date: **04/16/2014 10:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.3	0.05	2.5	0	92	51	151			
Surr: Nonane	0.131		0.15		87	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **7A04111483.D** Batch ID: **32753** Analysis Date: **04/16/2014 15:43**

Sample ID: **14041601-04AMSD** Units : **mg/L** Run ID: **FID_7_140416A** Prep Date: **04/16/2014 10:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.43	0.05	2.5	0	97	51	151	2.303	5.3(40)	
Surr: Nonane	0.093		0.15		62	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *21-Apr-14*

QC Summary Report

Work Order: 14041620

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140416\14041604.D** Batch ID: **MS10W0416B** Analysis Date: **04/16/2014 11:36**

Sample ID: **MBLK MS10W0416B** Units : **mg/L** Run ID: **MSD_10_140416A** Prep Date: **04/16/2014 11:36**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0111		0.01		111	70	130			
Surr: Toluene-d8	0.00986		0.01		99	70	130			
Surr: 4-Bromofluorobenzene	0.00952		0.01		95	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140416\14041603.D** Batch ID: **MS10W0416B** Analysis Date: **04/16/2014 10:58**

Sample ID: **GLCS MS10W0416B** Units : **mg/L** Run ID: **MSD_10_140416A** Prep Date: **04/16/2014 10:58**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.41	0.05	0.4		103	70	130			
Surr: 1,2-Dichloroethane-d4	0.0117		0.01		117	70	130			
Surr: Toluene-d8	0.00899		0.01		90	70	130			
Surr: 4-Bromofluorobenzene	0.00972		0.01		97	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140416\14041618.D** Batch ID: **MS10W0416B** Analysis Date: **04/16/2014 16:42**

Sample ID: **14040805-07AGS** Units : **mg/L** Run ID: **MSD_10_140416A** Prep Date: **04/16/2014 16:42**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.74	0.25	2	0	87	54	143			
Surr: 1,2-Dichloroethane-d4	0.0579		0.05		116	70	130			
Surr: Toluene-d8	0.0449		0.05		90	70	130			
Surr: 4-Bromofluorobenzene	0.0469		0.05		94	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140416\14041619.D** Batch ID: **MS10W0416B** Analysis Date: **04/16/2014 17:04**

Sample ID: **14040805-07AGSD** Units : **mg/L** Run ID: **MSD_10_140416A** Prep Date: **04/16/2014 17:04**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.09	0.25	2	0	105	54	143	1.74	18.4(23)	
Surr: 1,2-Dichloroethane-d4	0.0575		0.05		115	70	130			
Surr: Toluene-d8	0.0449		0.05		90	70	130			
Surr: 4-Bromofluorobenzene	0.0463		0.05		93	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14041620

Report Due By : 5:00 PM On : 16-Apr-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : C. Schreier

PO :

Client's COC # : 16466 Job : SWC 03 Curt

Cooler Temp	Samples Received	Date Printed
2 °C	16-Apr-14	16-Apr-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W							Sample Remarks
PES14041620-01A	SWC Curt D10	AQ	04/14/14 17:00	4	0	0	TPH/E_C	GAS-C							
PES14041620-02A	SWC Curt Tank	AQ	04/14/14 15:45	4	0	0	TPH/E_C	GAS-C							

Comments: ASAP TAT. No security seals. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	4/16/14 0925

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Company:	PRIMA ENVIRONMENTAL, Inc.
Attn:	5070 Robert J. Mathews Parkway, Suite 300
Address:	El Dorado Hills, CA 95762
City, State,	PH: 916-939-7300 FAX: 916 939 7398
Phone Num	data@primaenvironmental.com

Alpha Analytical, Inc.

Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 — Phone: 775-355-1044, Fax: 775-355-0406

Satellite Service Centers:

Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 — Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 — Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 — Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 — Phone: 702-281-4848

16466

Page # 1 of 1

Consultant/ Client Info:

Company:
Address:
City, State, Zip:

Job and Purchase Order Info:

Job # SWC 03 Curt
Job Name:
P.O. #:

Report Attention/Project Manager:

Name: Cindy Schreier
Email Address:
Phone #:
Cell #:

QC Deliverable Info:

EDD Required? Yes / No EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	Analysis Requested: AR0/oRO	Analysis Requested: GRO	Remarks
1700	4.14	AQ	PES1404162O-01	SWC Curt D10	ASAP	4V		X	X	X	
1545	4.15	AQ	02	SWC Curt Tank	ASAP	4V		X	X	X	

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By:

	Date	Time		Date	Time
Relinquished by: (Signature/Affiliation): PRIMA	~1850 4/15/14		Received by: (Signature/Affiliation): FedEx		
Relinquished by: (Signature/Affiliation):			Received by: (Signature/Affiliation):	4/16/14	0920
Relinquished by: (Signature/Affiliation):			Received by: (Signature/Affiliation):		

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 04/22/14

Job: SWC-03 Curt

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SWC Curt D14**					
Lab ID :	PES14042220-01A	TPH-E (DRO)	0.073	0.050 mg/L	04/22/14	04/22/14
Date Sampled	04/18/14 13:20	TPH-E (ORO)	ND	0.50 mg/L	04/22/14	04/22/14
Client ID :	**SWC Curt D17**					
Lab ID :	PES14042220-02A	TPH-E (DRO)	0.052	0.050 mg/L	04/22/14	04/22/14
Date Sampled	04/21/14 11:05	TPH-E (ORO)	ND	0.50 mg/L	04/22/14	04/22/14

Diesel Range Organics (DRO) C13-C22
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

NELAP ACCREDITED TNI LABORATORY

4/23/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-Apr-14*

QC Summary Report

Work Order: 14042220

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **1A04174186.D** Batch ID: **32783** Analysis Date: **04/22/2014 13:20**

Sample ID: **MBLK-32783** Units : **mg/L** Run ID: **FID_1_140422A** Prep Date: **04/22/2014 12:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.149		0.15		99	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **1A04174187.D** Batch ID: **32783** Analysis Date: **04/22/2014 13:45**

Sample ID: **LCS-32783** Units : **mg/L** Run ID: **FID_1_140422A** Prep Date: **04/22/2014 12:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.3	0.05	2.5		92	70	130			
Surr: Nonane	0.137		0.15		91	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **1A04174194.D** Batch ID: **32783** Analysis Date: **04/22/2014 16:40**

Sample ID: **14041803-05AMS** Units : **mg/L** Run ID: **FID_1_140422A** Prep Date: **04/22/2014 12:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.46	0.05	2.5	0	98	51	151			
Surr: Nonane	0.133		0.15		89	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **1A04174195.D** Batch ID: **32783** Analysis Date: **04/22/2014 17:05**

Sample ID: **14041803-05AMSD** Units : **mg/L** Run ID: **FID_1_140422A** Prep Date: **04/22/2014 12:02**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.4	0.05	2.5	0	96	51	151	2.462	2.5(40)	
Surr: Nonane	0.132		0.15		88	53	145			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14042220

Report Due By : 5:00 PM On : 23-Apr-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : Cindy Schreier

PO :

Client's COC # : 16467 Job : SWC-03 Curt

Cooler Temp	Samples Received	Date Printed
0 °C	22-Apr-14	22-Apr-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W								Sample Remarks
PES14042220-01A	SWC Curt D14	AQ	04/18/14 13:20	2	0	1	TPH/E_C								
PES14042220-02A	SWC Curt D17	AQ	04/21/14 11:05	2	0	1	TPH/E_C								

Comments: 24 HR TAT. No security seals. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	4/22/14 0930

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Company:	PRIMA ENVIRONMENTAL, Inc.
Attn:	
Address:	5070 Robert J. Mathews Parkway, Suite 300
City, State,	El Dorado Hills, CA 95762
Phone Nun	PH: 916-939-7300 FAX: 916 939 7398
	data@primaenvironmental.com

Alpha Analytical, Inc.

Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 — Phone: 775-355-1044, Fax: 775-355-0406

Satellite Service Centers:

Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 — Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 — Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 — Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 — Phone: 702-281-4848

16467

Page # 1 of 1

Consultant/ Client Info:

Company:
Address:
City, State, Zip:

Job and Purchase Order Info:

Job # SWC-03 Curt
Job Name:
P.O. #:

Report Attention/Project Manager:

Name: Cindy Schreier
Email Address:
Phone #:
Cell #:

QC Deliverable Info:

EDD Required? Yes (No) EDF Required? Yes (No)
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR (CA) KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	DRO/ORO	Remarks
1320	4.18	AQ	PES1404222O-01	SWC Curt D14	24h	2V		X	X	
1105	4.21	AQ	02	SWC Curt D17	24h	2V		X	X	

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: CS

	Date	Time		Date	Time
Relinquished by: (Signature/Affiliation): CS / PRIMA	4.21.14	1730	Received by: (Signature/Affiliation): FedEx		
Relinquished by: (Signature/Affiliation):			Received by: (Signature/Affiliation): Kellway/AAL	4/22/14	0930
Relinquished by: (Signature/Affiliation):			Received by: (Signature/Affiliation):		

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762

Attn: Cindy Schreier
Phone: (916) 939-7300
Fax: (916) 393-7398
Date Received : 05/06/14

Job: SWC-03

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B

		Parameter	Concentration		Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**SWC-Aer-D9**						
Lab ID :	PES14050620-01A	TPH-E (DRO)	0.081		0.050 mg/L	05/06/14	05/06/14
Date Sampled	05/05/14 11:40	TPH-E (ORO)	ND		0.50 mg/L	05/06/14	05/06/14
		TPH-P (GRO)	ND	O	0.10 mg/L	05/06/14	05/06/14
Client ID :	**SWC-Aer-T0**						
Lab ID :	PES14050620-02A	TPH-E (DRO)	0.19		0.050 mg/L	05/06/14	05/06/14
Date Sampled	04/26/14 17:30	TPH-E (ORO)	ND		0.50 mg/L	05/06/14	05/06/14
		TPH-P (GRO)	ND	O	0.10 mg/L	05/06/14	05/06/14

Diesel Range Organics (DRO) C13-C22
Gasoline Range Organics (GRO) C4-C13
O = Reporting Limits were increased due to sample foaming.
Oil Range Organics (ORO) C22-C40+
ND = Not Detected

ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

NELAP ACCREDITED LABORATORY

5/7/14
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *12-May-14*

QC Summary Report

Work Order: 14050620

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A05061405.D** Batch ID: **32849** Analysis Date: **05/06/2014 11:54**

Sample ID: **MBLK-32849** Units : **mg/L** Run ID: **FID_2_140506A** Prep Date: **05/06/2014 09:56**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	0.135		0.15		90	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A05061406.D** Batch ID: **32849** Analysis Date: **05/06/2014 12:20**

Sample ID: **LCS-32849** Units : **mg/L** Run ID: **FID_2_140506A** Prep Date: **05/06/2014 09:56**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.12	0.05	2.5		85	70	130			
Surr: Nonane	0.129		0.15		86	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A05061424.D** Batch ID: **32849** Analysis Date: **05/06/2014 20:14**

Sample ID: **14050123-01AMS** Units : **mg/L** Run ID: **FID_2_140506A** Prep Date: **05/06/2014 09:56**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.59	0.05	2.5	0	104	51	151			
Surr: Nonane	0.148		0.15		99	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A05061425.D** Batch ID: **32849** Analysis Date: **05/06/2014 20:40**

Sample ID: **14050123-01AMSD** Units : **mg/L** Run ID: **FID_2_140506A** Prep Date: **05/06/2014 09:56**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.2	0.05	2.5	0	88	51	151	2.593	16.4(40)	
Surr: Nonane	0.066		0.15		44	53	145			S53

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

S53 = Surrogate recovery was below laboratory acceptance limits. Probable matrix effect.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *12-May-14*

QC Summary Report

Work Order: 14050620

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140506\14050606.D** Batch ID: **MS10W0506B** Analysis Date: **05/06/2014 13:32**

Sample ID: **MBLK MS10W0506B** Units : **mg/L** Run ID: **MSD_10_140506A** Prep Date: **05/06/2014 13:32**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0119		0.01		119	70	130			
Surr: Toluene-d8	0.00992		0.01		99	70	130			
Surr: 4-Bromofluorobenzene	0.00903		0.01		90	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140506\14050603.D** Batch ID: **MS10W0506B** Analysis Date: **05/06/2014 11:03**

Sample ID: **GLCS MS10W0506B** Units : **mg/L** Run ID: **MSD_10_140506A** Prep Date: **05/06/2014 11:03**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.433	0.05	0.4		108	70	130			
Surr: 1,2-Dichloroethane-d4	0.0121		0.01		121	70	130			
Surr: Toluene-d8	0.00892		0.01		89	70	130			
Surr: 4-Bromofluorobenzene	0.00943		0.01		94	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140507\14050709.D** Batch ID: **MS10W0506B** Analysis Date: **05/07/2014 13:12**

Sample ID: **14050502-01AGS** Units : **mg/L** Run ID: **MSD_10_140506A** Prep Date: **05/07/2014 13:12**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.22	0.25	2	0	111	54	143			
Surr: 1,2-Dichloroethane-d4	0.0625		0.05		125	70	130			
Surr: Toluene-d8	0.0439		0.05		88	70	130			
Surr: 4-Bromofluorobenzene	0.044		0.05		88	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\140507\14050710.D** Batch ID: **MS10W0506B** Analysis Date: **05/07/2014 13:34**

Sample ID: **14050502-01AGSD** Units : **mg/L** Run ID: **MSD_10_140506A** Prep Date: **05/07/2014 13:34**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.03	0.25	2	0	101	54	143	2.218	9.1(23)	
Surr: 1,2-Dichloroethane-d4	0.061		0.05		122	70	130			
Surr: Toluene-d8	0.0439		0.05		88	70	130			
Surr: 4-Bromofluorobenzene	0.0463		0.05		93	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA RUSH

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES14050620

Report Due By : 5:00 PM On : 07-May-14

Client:
Prima Environmental
5070 Robert J. Mathews Parkway
Suite 300
El Dorado Hills, CA 95762

Report Attention	Phone Number	EMail Address
Cindy Schreier	(916) 939-7300 x	data@primaenvironmental.com

EDD Required : **No**

Sampled by : C Schreier

PO :

Client's COC # : 16469 Job : SWC-03

Cooler Temp	Samples Received	Date Printed
0 °C	06-May-14	06-May-14

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W							Sample Remarks
PES14050620-01A	SWC-Aer-D9	AQ	05/05/14 11:40	4	0	1	TPH/E_C	GAS-C							
PES14050620-02A	SWC-Aer-T0	AQ	04/26/14 17:30	4	0	1	TPH/E_C	GAS-C							

Comments: 24 HR TAT. No security seals. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	5/6/14 0930

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Comp: PRIMA ENVIRONMENTAL, Inc.
Attn: 5070 Robert J. Mathews Parkway, Suite 300
Addre: El Dorado Hills, CA 95762
City, S PH: 916-939-7300 FAX: 916 939 7398
Phone data@primaenvironmental.com

Alpha Analytical, Inc. Environmental Lab

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044 Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901
Northern NV: 1250 Lamoille Hwy., #310, Elko, NV 89801 Phone: 775-388-7043
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848

16469

Page # 1 of 1

Consultant/ Client Info:
Company:
Address:
City, State, Zip:

Job and Purchase Order Info:
Job # SWC.03
Job Name:
P.O. #:

Report Attention/Project Manager:
Name: Cindy Schreyer
Email Address:
Phone #:
Cell #:

QC Deliverable Info:
EDD Required? Yes / No EDF Required? Yes / No
Global ID:
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	# Containers** (See Key Below)	Field Filtered? Yes	Field Filtered? No	Analysis Requested: GRO	Analysis Requested: DRO/ORO	Remarks
11:40	5.5	AQ	PES14050620-01	SWC-Aer-DG	24h	4V		X	X	X	
1730	4.26	AQ	02	SWC-Aer-TG	24h	4V		X	X	X	

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By:

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
PRIMA	5.5.14	1800	FedEx		
			Killmaster/AAA	5/6/14	0925

* Key: AQ - Aqueous WA - Waste OT - Other So-Soil ** L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

ATTACHMENT 2

System Specifications

AirPro™ Air Sparge System

Model
AirPro™ SK60A

Description
Automated Air Sparge System **Skid Mounted** **60 CFM**

Specifications	
System Configuration	Skid mount (optional trailer or cargo container configuration avail.)
Skid Material	Stainless Steel
Max Air Flow Rate	58 CFM
Max Injection Pressure	23.5 PSI
Max Flow Per Well	20 CFM
Air Compressor Type	Rotary Claw, Continuous Duty, Outdoor Rated
Air Compressor Motor	7.5 HP
Compressed Air Filtration	Included
Compressed Air Tank	None required
Control System	PLC with HMI (programmable settings and viewable status data)
Telemetry	Internet remote control and/or auto-dialer available optionally.
Automated Output Valves	Specify when ordering (user determined)
Output Features (each)	Pressure Indication, Flow Control/Indication, Solenoid Valve
Output Connections	1” NPTF
System Power Requirement	230VAC 3-phase
Breaker Requirement	60A
Approx. Continuous Power Consumption	~7500 Watts
Skid Base Dimensions:	
L	40”
W	42”
H	69”
Approx. Weight	1,200 lbs

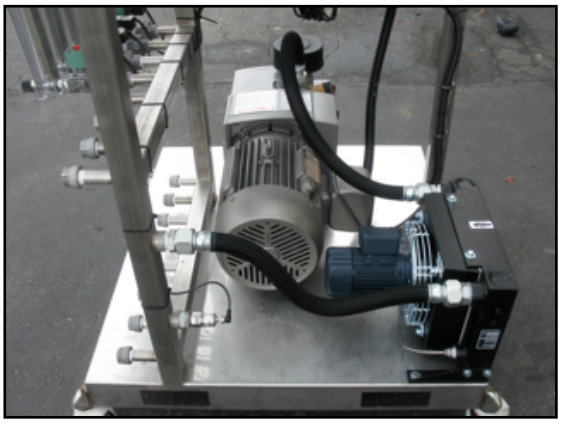
Calcon Systems, Inc.
www.calcon.com
12919 Alcosta Blvd Ste 9
San Ramon, CA 94583
Phone (925) 277-0665
Fax (925) 277-9647

System Specifications

AirPro™ Air Sparge System

Features and Standard Equipment Included	
Overpressure Safety Alarming	PLC Controller
Overpressure Relief Valve	6” Touch Screen HMI With Alarms, Hour Meter, Runtime Displays and System Set Point Controls
Main Sparge Pressure Regulator	User Selectable Well Cycle Times
Individual Well Air Flow Rotameters	Permissive Input – Can be synced with SVE system run
Individual Well Air Sparge Pressure Gauges	Non-volatile Program Memory (not lost in power outages)
Compressor Hour Meter	Alarm Relay
Well Sparge Hour Meters	Optional Alarm Dialer (Standard Telephone or Cellular)
Optional Internet Telemetry	O&M Manual
1-Year Warranty	

Available Cargo Container configuration with roll-up door.



Integrated heat exchanger, stainless steel manifold and pressure transmitter.

Control panel interior, shown with optional cellular dialer and VFD.

Touch-screen HMI is mounted on a swing-out door behind exterior panel door.

Calcon Systems, Inc.
www.calcon.com

12919 Alcosta Blvd Ste 9
San Ramon, CA 94583

Phone (925) 277-0665
Fax (925) 277-9647