Geosyntec consultants

621 SW Morrison St., Suite 600
Portland, OR 97205
PH 503.222.9518
www.geosyntec.com

Memorandum

Date: 1 April 2014

To: Mr. Bob Williams
Oregon Department of Environmental Quality

Copies to: John Cushing, Cascade Corp.
Charlie Andrews, SSPA
Chris Kimmel, Eric Weber, Landau Associates, Inc.
Ken Chaput, The Boeing Co.

From: Cindy Bartlett, Brent Miller, Geosyntec Consultants, Inc.

Subject: TGA Remedy: Results of Subsurface Investigation NE 201st Avenue Storm Sewer Line Backfill

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Geosyntec Consultants (Geosyntec) has prepared this technical memorandum on behalf of Cascade Corporation (Cascade) to document the results of a subsurface investigation conducted as part of the Cascade Troutdale Gravel Aquifer (TGA) project. The subsurface investigation consisted of groundwater sampling at two borings located along the west side of the NE 201st Avenue storm sewer utility line. The storm sewer utility line is located beneath the western edge of NE 201st Avenue, east of the Cascade Off-Site TGA remediation site. The Work Plan for Subsurface Investigation, NE 201st Ave Storm Sewer Line Backfill (Geosyntec, 2014), was approved by the Oregon Department of Environmental Quality (DEQ) on 12 February 2014. These results are provided to the DEQ in support of the request for closure of the Cascade TGA remedy that was included in the 2013 TGA Annual Report (Geosyntec, 2013).

SUBSURFACE INVESTIGATION

The objective of the subsurface investigation was to obtain groundwater samples to evaluate TCE concentrations in the storm sewer line backfill that runs parallel to and along the western side of NE 201st Avenue, with the intent of assessing potential TCE migration along the storm sewer line backfill. The proposed sampling was conducted along the western portion of the storm sewer line and targeted the backfill material. The two drilling locations were located north of the two manholes (manholes 17 and 18; Figure 1).

Prior to the investigation, a right-of-way permit was obtained from the City of Gresham for the western portion of NE 201st Avenue. Both a public and private utility locate were completed prior to drilling to verify the locations of the underground utility lines. The subsurface investigation was completed on 17 February 2014. Prior to drilling, the depths to groundwater were measured in five nearby monitoring wells, as listed below:

Well ID	Depth to Water (feet below top of casing)	Groundwater Elevation (mean sea level)
CMW-48b	8.3	108.86
B-6	7.35	106.82
CMW-45	17.47	88.31
CMW-49	6.32	109.32
CMW-35	8.28	111.92

Prior to commencing work, traffic signs and cones were placed around the work zone to implement the traffic control plan in accordance with the City of Gresham right-of-way permit. A vacuum truck equipped with an air knife was first positioned on boring UL-2 (north boring location) followed by boring UL-1. The ground surface at both UL-1 and UL-2 locations was gravel. The borings were advanced using a combination of the vacuum and air knife to remove material from the hole. A hand auger was also used to help advance the hole to the target sampling depth, and to obtain soil samples for characterization.

At UL-2, a white electrical line was located approximately 2 feet below ground surface (bgs). In addition, since both backfill and native material were encountered in the boring, the location of this boring was moved approximately 5 feet southeast of the first boring attempt (closer to manhole 17). Boring (UL-1) was completed in its original proposed location (Figure 1).

Subsurface Conditions

Due to the presence of the subsurface utility line, the borings were advanced from the surface to approximately 11 feet bgs by air knife and vacuum truck. Samples were obtained for general classification using a hand auger. In both borings (UL-1 and UL-2), dark grey, fine to coarse, moist, loose to medium dense sandy gravel/gravelly sand backfill material was encountered from the surface to 11 feet bgs. At approximately 11 feet bgs, backfill material was confirmed in both borings. Both UL-1 and UL-2 borings were widened to confirm the sampling location was completely within the backfill materials (rather than CU1) and to confirm the sampling point was not above the PVC storm sewer line, but next to it. Saturated conditions (wet soil) were encountered at approximately 10.5 feet bgs at both UL-1 and UL-2 locations. In the same hole,

direct push rods and screen were advanced to collect a groundwater sample. Boring logs were not produced as a continuous core was not obtained during this field work. A photolog documenting the field work is provided as Attachment 1.

Groundwater Sampling

Once the target depth was achieved with the vacuum truck and hand auger (approximately 11 feet bgs), the direct push track rig was positioned over the boring and a 3-inch diameter rod with a disposable tip was pushed from 11 to 15 feet bgs. Once the rod reached 15 feet bgs, the casing was pulled back to reveal the stainless steel screen at approximately 11 to 15 feet bgs.

Approximately one liter of groundwater was purged from each boring prior to sampling. Purging and sampling was conducted using disposable tubing inserted into the screen and connected to a peristaltic pump. Groundwater samples were collected in laboratory supplied containers, sealed, labeled, placed into a cooler with ice, and logged on a chain-of-custody. The samples were shipped overnight to ESC Lab Sciences (ESC) for testing of volatile organic compounds (VOCs) by EPA Method 8260.

Following completion of the sampling, the boring was backfilled with hydrated bentonite chips and the surface restored with gravel. Soil cuttings from the borings were placed in drums, labeled, and staged on-Site, pending analytical results and off-Site disposal.

ANALYTICAL RESULTS

Trichloroethene (TCE) was detected in the groundwater sample obtained at UL-1 at a concentration of 1.4 ug/L. Two groundwater samples were collected at UL-2. TCE was detected at a concentration of 1.0 ug/L in the initial sample and was not detected in the duplicate sample at a detection limit of 1.0 ug/L. No other VOCs were detected in these samples. VOCs were not detected in the trip blank. Groundwater analytical results and the data validation letter are provided in Attachment 2.

Sample ID	Trichloroethene (µg/L)
UL-1	1.4
UL-2	1.0
UL-2 (Duplicate)	<1.0

µg/L – micrograms per liter
< = not detected above the indicated laboratory reporting limit.

CONCLUSIONS

Borings were advanced in the backfill material of the storm sewer line that runs along the west side of NE 201st Avenue, nearest the TGA Off-Site Remedy area. Backfill material was clearly differentiated from native material (siltstone) in soil samples. Groundwater samples were collected at the edge of the backfill material next to the storm sewer. Analytical results indicate low concentrations of TCE (up to 1.4 ug/L) were present in the backfill. These results are consistent with other TGA monitoring wells nearby and indicate significant TCE concentrations are not present in groundwater the backfill material. Based on the low TCE concentrations, the backfill material is not acting as a preferential pathway/conduit for elevated TCE concentrations to migrate along the utility line and into the underlying TSA.

REFERENCES

Geosyntec, 2014. Work Plan for Subsurface Investigation, NE 201st Ave Storm Sewer Line Backfill, 30 January 2014.

Geosyntec, 2013. Troutdale Gravel Aquifer Remedy, 2013 Annual Performance Report, Cascade Corporation, Fairview, Oregon, 23 December 2013.

Oregon Department of Environmental Quality (DEQ), 2014. Email from B. Williams, Approval of Work Plan for Subsurface Investigation, NE 201st Ave Storm Sewer Line Backfill.

* * * * *

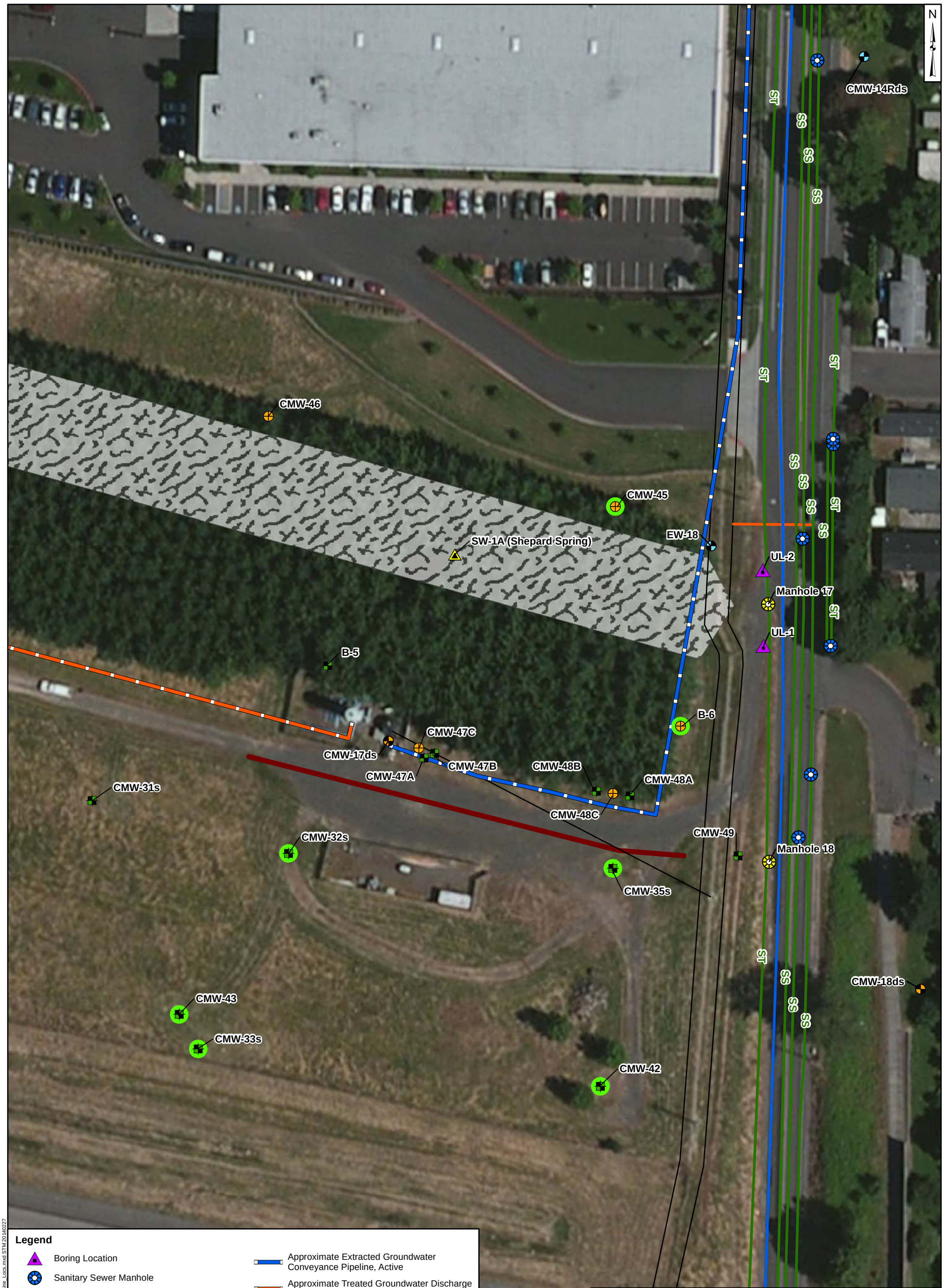
Attachments:
Figure 1: Boring Locations, Storm Sewer Line Backfill
Attachment 1: TGA Utility Line Sampling Photolog
Attachment 2: ESC Laboratory Report and Data Validation Memorandum

Reviewed and Approved by:

expires 5.31.14

Cindy Bartlett, RG
Geologist

Brent Miller, PE
Associate Engineer



Legend

- Boring Location
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- CU1 Monitoring Well
- Shepard Springs Sample Location
- TGA Monitoring Well
- Upper & Lower TSA Monitoring Well
- Upper TSA Monitoring Well
- Lower TSA Monitoring Well
- Monitoring Well Where Biosubstrate Previoulsy Added (2008 - 2010)
- Approximate Extracted Groundwater Conveyance Pipeline, Active
- Approximate Treated Groundwater Discharge Pipeline, Active
- SS — Sanitary Sewer Line
- ST — Storm Sewer Line
- Water Line
- Communication Line
- Overhead Powerline
- Bioremediation Treatment Wall
- CU1 Truncation
- Cascade Corporation Property Boundary

Notes

Utility Line Source: City of Gresham GIS, 1/22/2014

60 30 0 60 Feet

Boring Locations,
Storm Sewer Line Backfill, TGA Remedy

East Multnomah County

Geosyntec consultants

PNG0564G | February 2014

Figure 1

S:\antaBarbara-01\Data P\GIS\PNG0564 - Cascade\Projects\2014\TGA Misc\Fig01_Utility_Line_Locs.mxd STM 20140227

ATTACHMENT 1

TGA UTILITY LINE SAMPLING PHOTOLOG

GEOSYNTEC CONSULTANTS

Photographic Record

Client: Cascade Corporation Project Number: PNG0564G.14

Subject Site: Cascade Corporation TGA Off-Site Remedy Area, NE 201st Avenue Groundwater Sampling

Photograph 1

Date: 17 February 2014

Direction: North

Comments:
View of air-knife/vacuum truck set up over sample location UL-2. Storm sewer manhole MH-17 is visible in the foreground to right of the truck tire.

GEOSYNTEC CONSULTANTS

Photographic Record

Client: Cascade Corporation Project Number: PNG0564G.14

Subject Site: Cascade Corporation TGA Off-Site Remedy Area, NE 201st Avenue Groundwater Sampling

Photograph 2

Date: 17 February 2014

Direction: South

Comments: View of backfill material at the UL-2 sampling location. The backfill material was a coarse, moist, sandy gravel, and easily differentiated from light grey, siltstone obtained from side-by-side borings (shown in Photo 3).

Soil/backfill was removed from the subsurface using an air-knife/vacuum truck and hand-augers.

The groundwater sampler was placed into the sandy gravel backfill material.

GEOSYNTEC CONSULTANTS

Photographic Record

Client: Cascade Corporation Project Number: PNG0564G.14

Subject Site: Cascade Corporation TGA Off-Site Remedy Area, NE 201st Avenue Groundwater Sampling

Photograph 3

Date: 17 February 2014

Direction: South

Comment: View of light grey, dry to moist, fine, dense siltstone at the UL-2 sampling location. The native material was easily differentiated from storm sewer backfill material (sandy gravel) obtained from side-by-side borings (shown in Photo 2).

ATTACHMENT 2

ESC LABORATORY REPORT AND DATA VALIDATION MEMORANDUM

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 20 February 2014

To: Cindy Bartlett, RG, LG, Geosyntec Consultants, Portland, Oregon

From: Geosyntec Quality Assurance Group, Knoxville, Tennessee

Subject: Stage 2A Data Validation - Level II Data Deliverables – ESC Lab Sciences Work Orders: L683488

SITE: Cascade Corp, Oregon; Job No: PNG0564G14

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two groundwater samples, one field duplicate sample, and one trip blank, collected on February 17, 2014, as part of the site investigation activities for the Cascade, Oregon, site. Analytical testing was completed by ESC Lab Sciences (ESC), of Mt. Juliet, Tennessee.

The samples were analyzed for the following test:

- EPA Method 8260B (ESC) - Volatile Organic Compounds (VOCs)

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives, with the following exception. The non-detect values for 2-chloroethyl vinyl ether were rejected in the samples based on sample preservation (the compound degrades under acid conditions), historical data, and professional and technical judgment.

The organic data were reviewed based on USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed in the data set:

Laboratory ID	Sample ID
L683488-01	TRIPBLANK
L683488-02	UL2-021714

Laboratory ID	Sample ID
L683488-03	UL2-021714-DUP
L683488-04	UL1-021714

The samples were received at the laboratory within the criteria 0-6^{o}C.

The time was missing on the chain-of-custody for the trip blank. There was no impact on the data.

1.0 VOLATILE ORGANIC COMPOUND ANALSES

Two groundwater samples, one field duplicate sample, and one trip blank were analyzed for VOCs per EPA Method 8260B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment (Completeness)
✓ Holding Time
✓ Method Blank
⊗ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
⊗ Field Duplicate
✓ Trip Blank
✓ Sensitivity
✓ Electronic Data Deliverables Review

1.1 Overall Assessment (Completeness)

The VOC data reported in this package are considered to be usable for meeting project objectives, with the following exception. The non-detect values for 2-chloroethyl vinyl ether were R qualified as rejected in the samples based on sample preservation (the compound degrades under acid conditions), historical data, and professional and technical judgment. Therefore, the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 98.5%.

1.2 Holding Time

The holding time for the VOC analysis of a preserved water sample is 14 days from collection to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank (batch WG706636) was reported with the data sets. VOCs were not detected in the method blank above the detection limits (DL).

1.4 Matrix Spike/Matrix Spike Duplicate

Matrix spikes/matrix spike duplicate pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One batch MS/MSD pair was reported with the data set. The results of the batch MS/MSD pair had no impact on the samples. However, 2-chloroethyl vinyl ether was R qualified as rejected in all of the samples, based on sample preservation (the compound degrades under acid conditions), historical data, and professional and technical judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
TRIPBLANK	Vinyl 2-Chloroethyl ether	50	U	50	R	4
UL2-021714	Vinyl 2-Chloroethyl ether	50	U	50	R	4
UL2-021714-DUP	Vinyl 2-Chloroethyl ether	50	U	50	R	4
UL1-021714	Vinyl 2-Chloroethyl ether	50	U	50	R	4

µg/L-microgram per liter
U-not detected at the reported DL
*Validation qualifiers are defined in Attachment 1 at the end of this report
** Reason codes are defined in Attachment 2 at the end of this report

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCS duplicate (LCSD) pair was reported with the data sets. The results for the LCS/LCSD pair were within the laboratory specified acceptance criteria for recovery and RPD, with the following exception.

The RPD of acrolein (38.5%) was high and outside the laboratory specified acceptance criteria. Since acrolein was not detected in the associated samples; no qualifications were applied to the data.

1.6 Surrogates

Acceptable surrogate recoveries were reported for the sample analyses.

1.7 Field Duplicate

One field duplicate sample, UL2-021714-DUP, was analyzed with the data set. Acceptable precision (RPD ≤30%) was demonstrated between the field duplicate and the original sample, UL2-021714, with the following exception.

Trichloroethene was detected in the original sample but was not detected in the field duplicate, resulting in a noncalculable RPD. Therefore the detected concentration was J qualified as estimated and the non-detected value was UJ qualified as estimated less than the DL in the field duplicate pair.

Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	RPD	Validation Result (µg/L)	Validation Qualifier	Reason Code
UL2-021714	Trichloroethene (TCE)	1.0	NA	NC	1.0	J	7
UL2-021714-DUP	Trichloroethene (TCE)	1.0	U		1.0	UJ	7
UL2-021714	The other VOCs	ND	NA	0	NA	NA	NA
UL2-021714-DUP	The other VOCs	ND	NA		NA	NA	NA

µg/L-microgram per liter
U-not detected at the reported DL
NC-noncalculable
ND-not detected at the DL
NA-not applicable

1.8 Trip Blank

One trip blank accompanied the sample shipment. VOCs were not detected in the trip blank above DLs.

1.9 Sensitivity

The sample results were reported to the DLs. No elevated non-detect values were reported.

1.10 Electronic Data Deliverables (EDD) Review

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. It was noted that the samples were reported to the DL in the hardcopy laboratory reports; both the DL and the MDLs were listed in the EDDs. It was also noted that the data were reported using the units parts per million (mg/L) in the EDDs, while the sample data were reported using the units parts per billion (µg/L) and the QC samples to mg/L in the level II laboratory reports. This did not affect the quality of the data. No other discrepancies were identified between the level II reports and the EDDs.

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ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

Report Summary

Tuesday February 18, 2014

Report Number: L683488
Samples Received: 02/18/14
Client Project: PNG0564G14

Description: Cascade Corp - TGA Remedy

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Jarred Willis

Jarred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

ESC LAB SCIENCES
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12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : TRIPBLANK

Collected By : Barb Lary
Collection Date : 02/17/14 00:00

ESC Sample # : L683488-01

Site ID :

Project # : PNG0564G14

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	50.	ug/l	8260B	02/18/14	1
Acrolein	BDL	50.	ug/l	8260B	02/18/14	1
Acrylonitrile	BDL	10.	ug/l	8260B	02/18/14	1
Benzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromodichloromethane	BDL	1.0	ug/l	8260B	02/18/14	1
Bromoform	BDL	1.0	ug/l	8260B	02/18/14	1
Bromomethane	BDL	5.0	ug/l	8260B	02/18/14	1
n-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
sec-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
tert-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Carbon tetrachloride	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorodibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
Chloroethane	BDL	5.0	ug/l	8260B	02/18/14	1
2-Chloroethyl vinyl ether	BDL	50.	ug/l	8260B	02/18/14	1
Chloroform	BDL	5.0	ug/l	8260B	02/18/14	1
Chloromethane	BDL	2.5	ug/l	8260B	02/18/14	1
2-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
4-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dibromo-3-Chloropropane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	02/18/14	1
Dibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,4-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Dichlorodifluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
2,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
Di-isopropyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Hexachloro-1,3-butadiene	BDL	1.0	ug/l	8260B	02/18/14	1
Isopropylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
p-Isopropyltoluene	BDL	1.0	ug/l	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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(615) 758-5858
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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-01

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : TRIPBLANK

Collected By : Barb Lary
Collection Date : 02/17/14 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	10.	ug/l	8260B	02/18/14	1
Methylene Chloride	BDL	5.0	ug/l	8260B	02/18/14	1
4-Methyl-2-pentanone (MIBK)	BDL	10.	ug/l	8260B	02/18/14	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/14	1
n-Propylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Styrene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichlorotrifluoroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Tetrachloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Toluene	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,4-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Trichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Trichlorofluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichloropropane	BDL	2.5	ug/l	8260B	02/18/14	1
1,2,4-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,3-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3,5-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Vinyl chloride	BDL	1.0	ug/l	8260B	02/18/14	1
Xylenes, Total	BDL	3.0	ug/l	8260B	02/18/14	1
Surrogate Recovery						
Toluene-d8	102.		% Rec.	8260B	02/18/14	1
Dibromofluoromethane	96.5		% Rec.	8260B	02/18/14	1
4-Bromofluorobenzene	103.		% Rec.	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL2-021714

Collected By : Barb Lary
Collection Date : 02/17/14 11:30

ESC Sample # : L683488-02

Site ID :

Project # : PNG0564G14

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	50.	ug/l	8260B	02/18/14	1
Acrolein	BDL	50.	ug/l	8260B	02/18/14	1
Acrylonitrile	BDL	10.	ug/l	8260B	02/18/14	1
Benzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromodichloromethane	BDL	1.0	ug/l	8260B	02/18/14	1
Bromoform	BDL	1.0	ug/l	8260B	02/18/14	1
Bromomethane	BDL	5.0	ug/l	8260B	02/18/14	1
n-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
sec-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
tert-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Carbon tetrachloride	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorodibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
Chloroethane	BDL	5.0	ug/l	8260B	02/18/14	1
2-Chloroethyl vinyl ether	BDL	50.	ug/l	8260B	02/18/14	1
Chloroform	BDL	5.0	ug/l	8260B	02/18/14	1
Chloromethane	BDL	2.5	ug/l	8260B	02/18/14	1
2-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
4-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dibromo-3-Chloropropane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	02/18/14	1
Dibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,4-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Dichlorodifluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
2,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
Di-isopropyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Hexachloro-1,3-butadiene	BDL	1.0	ug/l	8260B	02/18/14	1
Isopropylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
p-Isopropyltoluene	BDL	1.0	ug/l	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-02

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL2-021714

Collected By : Barb Lary
Collection Date : 02/17/14 11:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	10.	ug/l	8260B	02/18/14	1
Methylene Chloride	BDL	5.0	ug/l	8260B	02/18/14	1
4-Methyl-2-pentanone (MIBK)	BDL	10.	ug/l	8260B	02/18/14	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/14	1
n-Propylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Styrene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichlorotrifluoroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Tetrachloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Toluene	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,4-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Trichloroethene	1.0	1.0	ug/l	8260B	02/18/14	1
Trichlorofluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichloropropane	BDL	2.5	ug/l	8260B	02/18/14	1
1,2,4-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,3-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3,5-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Vinyl chloride	BDL	1.0	ug/l	8260B	02/18/14	1
Xylenes, Total	BDL	3.0	ug/l	8260B	02/18/14	1
Surrogate Recovery						
Toluene-d8	102.		% Rec.	8260B	02/18/14	1
Dibromofluoromethane	97.8		% Rec.	8260B	02/18/14	1
4-Bromofluorobenzene	103.		% Rec.	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-03

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL2-021714-DUP

Collected By : Barb Lary
Collection Date : 02/17/14 11:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	50.	ug/l	8260B	02/18/14	1
Acrolein	BDL	50.	ug/l	8260B	02/18/14	1
Acrylonitrile	BDL	10.	ug/l	8260B	02/18/14	1
Benzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromodichloromethane	BDL	1.0	ug/l	8260B	02/18/14	1
Bromoform	BDL	1.0	ug/l	8260B	02/18/14	1
Bromomethane	BDL	5.0	ug/l	8260B	02/18/14	1
n-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
sec-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
tert-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Carbon tetrachloride	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorodibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
Chloroethane	BDL	5.0	ug/l	8260B	02/18/14	1
2-Chloroethyl vinyl ether	BDL	50.	ug/l	8260B	02/18/14	1
Chloroform	BDL	5.0	ug/l	8260B	02/18/14	1
Chloromethane	BDL	2.5	ug/l	8260B	02/18/14	1
2-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
4-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dibromo-3-Chloropropane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	02/18/14	1
Dibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,4-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Dichlorodifluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
2,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
Di-isopropyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Hexachloro-1,3-butadiene	BDL	1.0	ug/l	8260B	02/18/14	1
Isopropylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
p-Isopropyltoluene	BDL	1.0	ug/l	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-03

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL2-021714-DUP

Collected By : Barb Lary
Collection Date : 02/17/14 11:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	10.	ug/l	8260B	02/18/14	1
Methylene Chloride	BDL	5.0	ug/l	8260B	02/18/14	1
4-Methyl-2-pentanone (MIBK)	BDL	10.	ug/l	8260B	02/18/14	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/14	1
n-Propylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Styrene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichlorotrifluoroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Tetrachloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Toluene	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,4-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Trichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Trichlorofluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichloropropane	BDL	2.5	ug/l	8260B	02/18/14	1
1,2,4-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,3-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3,5-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Vinyl chloride	BDL	1.0	ug/l	8260B	02/18/14	1
Xylenes, Total	BDL	3.0	ug/l	8260B	02/18/14	1
Surrogate Recovery						
Toluene-d8	103.		% Rec.	8260B	02/18/14	1
Dibromofluoromethane	99.5		% Rec.	8260B	02/18/14	1
4-Bromofluorobenzene	103.		% Rec.	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-04

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL1-021714

Collected By : Barb Lary
Collection Date : 02/17/14 13:05

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	50.	ug/l	8260B	02/18/14	1
Acrolein	BDL	50.	ug/l	8260B	02/18/14	1
Acrylonitrile	BDL	10.	ug/l	8260B	02/18/14	1
Benzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Bromodichloromethane	BDL	1.0	ug/l	8260B	02/18/14	1
Bromoform	BDL	1.0	ug/l	8260B	02/18/14	1
Bromomethane	BDL	5.0	ug/l	8260B	02/18/14	1
n-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
sec-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
tert-Butylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Carbon tetrachloride	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Chlorodibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
Chloroethane	BDL	5.0	ug/l	8260B	02/18/14	1
2-Chloroethyl vinyl ether	BDL	50.	ug/l	8260B	02/18/14	1
Chloroform	BDL	5.0	ug/l	8260B	02/18/14	1
Chloromethane	BDL	2.5	ug/l	8260B	02/18/14	1
2-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
4-Chlorotoluene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dibromo-3-Chloropropane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	02/18/14	1
Dibromomethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,4-Dichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Dichlorodifluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,2-Dichloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
cis-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
trans-1,3-Dichloropropene	BDL	1.0	ug/l	8260B	02/18/14	1
2,2-Dichloropropane	BDL	1.0	ug/l	8260B	02/18/14	1
Di-isopropyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Hexachloro-1,3-butadiene	BDL	1.0	ug/l	8260B	02/18/14	1
Isopropylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
p-Isopropyltoluene	BDL	1.0	ug/l	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Barb Lary
GeoSyntec - Portland, OR
621 SW Morrison St., Suite 600
Portland, OR 97205

February 18,2014

ESC Sample # : L683488-04

Site ID :

Project # : PNG0564G14

Date Received : February 18, 2014
Description : Cascade Corp - TGA Remedy

Sample ID : UL1-021714

Collected By : Barb Lary
Collection Date : 02/17/14 13:05

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	10.	ug/l	8260B	02/18/14	1
Methylene Chloride	BDL	5.0	ug/l	8260B	02/18/14	1
4-Methyl-2-pentanone (MIBK)	BDL	10.	ug/l	8260B	02/18/14	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/14	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/14	1
n-Propylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Styrene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2,2-Tetrachloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichlorotrifluoroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Tetrachloroethene	BDL	1.0	ug/l	8260B	02/18/14	1
Toluene	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,4-Trichlorobenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,1-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
1,1,2-Trichloroethane	BDL	1.0	ug/l	8260B	02/18/14	1
Trichloroethene	1.4	1.0	ug/l	8260B	02/18/14	1
Trichlorofluoromethane	BDL	5.0	ug/l	8260B	02/18/14	1
1,2,3-Trichloropropane	BDL	2.5	ug/l	8260B	02/18/14	1
1,2,4-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,2,3-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
1,3,5-Trimethylbenzene	BDL	1.0	ug/l	8260B	02/18/14	1
Vinyl chloride	BDL	1.0	ug/l	8260B	02/18/14	1
Xylenes, Total	BDL	3.0	ug/l	8260B	02/18/14	1
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	02/18/14	1
Dibromofluoromethane	101.		% Rec.	8260B	02/18/14	1
4-Bromofluorobenzene	104.		% Rec.	8260B	02/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 02/18/14 15:14 Printed: 02/18/14 15:14

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L683488-01	WG706636	SAMP	Acrolein	R2885766	J3
L683488-02	WG706636	SAMP	Acrolein	R2885766	J3
L683488-03	WG706636	SAMP	Acrolein	R2885766	J3
L683488-04	WG706636	SAMP	Acrolein	R2885766	J3

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
02/18/14 at 15:14:51

TSR Signing Reports: 358
R1 - Rush: Sameday

Log ALL samples from Miltons Dry Cleaners under the *MILTONSWA* account.

Sample: L683488-01 Account: GEOSYNPOR Received: 02/18/14 09:30 Due Date: 02/18/14 00:00 RPT Date: 02/18/14 15:14

Sample: L683488-02 Account: GEOSYNPOR Received: 02/18/14 09:30 Due Date: 02/18/14 00:00 RPT Date: 02/18/14 15:14

Sample: L683488-03 Account: GEOSYNPOR Received: 02/18/14 09:30 Due Date: 02/18/14 00:00 RPT Date: 02/18/14 15:14

Sample: L683488-04 Account: GEOSYNPOR Received: 02/18/14 09:30 Due Date: 02/18/14 00:00 RPT Date: 02/18/14 15:14

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12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

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Est. 1970

GeoSyntec - Portland, OR
Barb Lary
621 SW Morrison St., Suite 600

Portland, OR 97205

Quality Assurance Report
Level II

L683488

February 18, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
1,1,1,2-Tetrachloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1,1-Trichloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1,2,2-Tetrachloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1,2-Trichloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1,2-Trichlorotrifluoroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1-Dichloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,1-Dichloroethene	< .001	mg/l			WG706636	02/18/14 11:15
1,1-Dichloropropene	< .001	mg/l			WG706636	02/18/14 11:15
1,2,3-Trichlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,2,3-Trichloropropane	< .001	mg/l			WG706636	02/18/14 11:15
1,2,3-Trimethylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,2,4-Trichlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,2,4-Trimethylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,2-Dibromo-3-Chloropropane	< .005	mg/l			WG706636	02/18/14 11:15
1,2-Dibromoethane	< .001	mg/l			WG706636	02/18/14 11:15
1,2-Dichlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,2-Dichloroethane	< .001	mg/l			WG706636	02/18/14 11:15
1,2-Dichloropropane	< .001	mg/l			WG706636	02/18/14 11:15
1,3,5-Trimethylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,3-Dichlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
1,3-Dichloropropane	< .001	mg/l			WG706636	02/18/14 11:15
1,4-Dichlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
2,2-Dichloropropane	< .001	mg/l			WG706636	02/18/14 11:15
2-Butanone (MEK)	< .01	mg/l			WG706636	02/18/14 11:15
2-Chloroethyl vinyl ether	< .05	mg/l			WG706636	02/18/14 11:15
2-Chlorotoluene	< .001	mg/l			WG706636	02/18/14 11:15
4-Chlorotoluene	< .001	mg/l			WG706636	02/18/14 11:15
4-Methyl-2-pentanone (MIBK)	< .01	mg/l			WG706636	02/18/14 11:15
Acetone	< .05	mg/l			WG706636	02/18/14 11:15
Acrolein	< .025	mg/l			WG706636	02/18/14 11:15
Acrylonitrile	< .01	mg/l			WG706636	02/18/14 11:15
Benzene	< .001	mg/l			WG706636	02/18/14 11:15
Bromobenzene	< .001	mg/l			WG706636	02/18/14 11:15
Bromodichloromethane	< .001	mg/l			WG706636	02/18/14 11:15
Bromoform	< .001	mg/l			WG706636	02/18/14 11:15
Bromomethane	< .005	mg/l			WG706636	02/18/14 11:15
Carbon tetrachloride	< .001	mg/l			WG706636	02/18/14 11:15
Chlorobenzene	< .001	mg/l			WG706636	02/18/14 11:15
Chlorodibromomethane	< .001	mg/l			WG706636	02/18/14 11:15
Chloroethane	< .005	mg/l			WG706636	02/18/14 11:15
Chloroform	< .005	mg/l			WG706636	02/18/14 11:15
Chloromethane	< .0025	mg/l			WG706636	02/18/14 11:15
cis-1,2-Dichloroethene	< .001	mg/l			WG706636	02/18/14 11:15
cis-1,3-Dichloropropene	< .001	mg/l			WG706636	02/18/14 11:15
Di-isopropyl ether	< .001	mg/l			WG706636	02/18/14 11:15
Dibromomethane	< .001	mg/l			WG706636	02/18/14 11:15
Dichlorodifluoromethane	< .005	mg/l			WG706636	02/18/14 11:15
Ethylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
Hexachloro-1,3-butadiene	< .001	mg/l			WG706636	02/18/14 11:15
Isopropylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
Methyl tert-butyl ether	< .001	mg/l			WG706636	02/18/14 11:15
Methylene Chloride	< .005	mg/l			WG706636	02/18/14 11:15
n-Butylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
n-Propylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
Naphthalene	< .005	mg/l			WG706636	02/18/14 11:15
p-Isopropyltoluene	< .001	mg/l			WG706636	02/18/14 11:15
sec-Butylbenzene	< .001	mg/l			WG706636	02/18/14 11:15
Styrene	< .001	mg/l			WG706636	02/18/14 11:15
tert-Butylbenzene	< .001	mg/l			WG706636	02/18/14 11:15

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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GeoSyntec - Portland, OR
Barb Lary
621 SW Morrison St., Suite 600

Portland, OR 97205

Quality Assurance Report
Level II

L683488

February 18, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Tetrachloroethene	< .001	mg/l			WG706636	02/18/14 11:15
Toluene	< .005	mg/l			WG706636	02/18/14 11:15
trans-1,2-Dichloroethene	< .001	mg/l			WG706636	02/18/14 11:15
trans-1,3-Dichloropropene	< .001	mg/l			WG706636	02/18/14 11:15
Trichloroethene	< .001	mg/l			WG706636	02/18/14 11:15
Trichlorofluoromethane	< .005	mg/l			WG706636	02/18/14 11:15
Vinyl chloride	< .001	mg/l			WG706636	02/18/14 11:15
Xylenes, Total	< .003	mg/l			WG706636	02/18/14 11:15
4-Bromofluorobenzene		% Rec.	104.0	71-126	WG706636	02/18/14 11:15
Dibromofluoromethane		% Rec.	98.80	78.3-121	WG706636	02/18/14 11:15
Toluene-d8		% Rec.	102.0	88.5-111	WG706636	02/18/14 11:15

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
1,1,1,2-Tetrachloroethane	mg/l	.025	0.0256	102.	74.2-124	WG706636
1,1,1-Trichloroethane	mg/l	.025	0.0240	95.9	73.2-123	WG706636
1,1,2,2-Tetrachloroethane	mg/l	.025	0.0227	90.6	70.7-122	WG706636
1,1,2-Trichloroethane	mg/l	.025	0.0243	97.0	77.7-118	WG706636
1,1,2-Trichlorotrifluoroethane	mg/l	.025	0.0259	103.	67.2-143	WG706636
1,1-Dichloroethane	mg/l	.025	0.0254	102.	70.7-126	WG706636
1,1-Dichloroethene	mg/l	.025	0.0216	86.2	67.8-129	WG706636
1,1-Dichloropropene	mg/l	.025	0.0254	101.	73.1-125	WG706636
1,2,3-Trichlorobenzene	mg/l	.025	0.0277	111.	64.9-135	WG706636
1,2,3-Trichloropropane	mg/l	.025	0.0236	94.4	71.8-121	WG706636
1,2,3-Trimethylbenzene	mg/l	.025	0.0209	83.8	72.3-116	WG706636
1,2,4-Trichlorobenzene	mg/l	.025	0.0290	116.	69.7-136	WG706636
1,2,4-Trimethylbenzene	mg/l	.025	0.0255	102.	75-123	WG706636
1,2-Dibromo-3-Chloropropane	mg/l	.025	0.0247	98.9	65.4-128	WG706636
1,2-Dibromoethane	mg/l	.025	0.0254	102.	76.6-121	WG706636
1,2-Dichlorobenzene	mg/l	.025	0.0255	102.	78.4-117	WG706636
1,2-Dichloroethane	mg/l	.025	0.0234	93.5	68.8-124	WG706636
1,2-Dichloropropane	mg/l	.025	0.0249	99.7	76.5-119	WG706636
1,3,5-Trimethylbenzene	mg/l	.025	0.0265	106.	75.6-124	WG706636
1,3-Dichlorobenzene	mg/l	.025	0.0271	108.	70.8-128	WG706636
1,3-Dichloropropane	mg/l	.025	0.0252	101.	77.4-117	WG706636
1,4-Dichlorobenzene	mg/l	.025	0.0248	99.1	78.8-115	WG706636
2,2-Dichloropropane	mg/l	.025	0.0235	94.1	62.4-133	WG706636
2-Butanone (MEK)	mg/l	.125	0.123	98.5	55-149	WG706636
2-Chloroethyl vinyl ether	mg/l	.125	0.127	102.	43.8-150	WG706636
2-Chlorotoluene	mg/l	.025	0.0258	103.	74.7-122	WG706636
4-Chlorotoluene	mg/l	.025	0.0252	101.	77.5-120	WG706636
4-Methyl-2-pentanone (MIBK)	mg/l	.125	0.121	96.5	70.5-133	WG706636
Acetone	mg/l	.125	0.115	91.6	35.6-163	WG706636
Acrolein	mg/l	.125	0.0818	65.5	10-190	WG706636
Acrylonitrile	mg/l	.125	0.122	97.3	55.2-130	WG706636
Benzene	mg/l	.025	0.0248	99.0	74.8-121	WG706636
Bromobenzene	mg/l	.025	0.0240	96.0	77.5-116	WG706636
Bromodichloromethane	mg/l	.025	0.0216	86.6	75.1-116	WG706636
Bromoform	mg/l	.025	0.0252	101.	67.5-130	WG706636
Bromomethane	mg/l	.025	0.0222	88.7	49.9-162	WG706636
Carbon tetrachloride	mg/l	.025	0.0248	99.4	70.2-123	WG706636
Chlorobenzene	mg/l	.025	0.0262	105.	78.1-119	WG706636
Chlorodibromomethane	mg/l	.025	0.0250	100.	74-121	WG706636
Chloroethane	mg/l	.025	0.0193	77.2	61.7-135	WG706636
Chloroform	mg/l	.025	0.0229	91.5	76-121	WG706636
Chloromethane	mg/l	.025	0.0263	105.	61.5-129	WG706636
cis-1,2-Dichloroethene	mg/l	.025	0.0239	95.7	76-119	WG706636
cis-1,3-Dichloropropene	mg/l	.025	0.0248	99.3	78.2-120	WG706636

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Portland, OR 97205

Quality Assurance Report
Level II

L683488

February 18, 2014

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Di-isopropyl ether	mg/l	.025	0.0241	96.3	65.6-132	WG706636
Dibromomethane	mg/l	.025	0.0241	96.3	79.5-118	WG706636
Dichlorodifluoromethane	mg/l	.025	0.0282	113.	54.8-135	WG706636
Ethylbenzene	mg/l	.025	0.0263	105.	78.8-122	WG706636
Hexachloro-1,3-butadiene	mg/l	.025	0.0274	109.	64.7-129	WG706636
Isopropylbenzene	mg/l	.025	0.0283	113.	78.6-132	WG706636
Methyl tert-butyl ether	mg/l	.025	0.0229	91.8	71.2-126	WG706636
Methylene Chloride	mg/l	.025	0.0242	96.9	70.3-120	WG706636
n-Butylbenzene	mg/l	.025	0.0260	104.	76.2-126	WG706636
n-Propylbenzene	mg/l	.025	0.0265	106.	78.2-122	WG706636
Naphthalene	mg/l	.025	0.0249	99.8	68.4-128	WG706636
p-Isopropyltoluene	mg/l	.025	0.0280	112.	74-131	WG706636
sec-Butylbenzene	mg/l	.025	0.0270	108.	74.4-127	WG706636
Styrene	mg/l	.025	0.0267	107.	80.4-126	WG706636
tert-Butylbenzene	mg/l	.025	0.0283	113.	75.3-126	WG706636
Tetrachloroethene	mg/l	.025	0.0275	110.	72.6-126	WG706636
Toluene	mg/l	.025	0.0240	96.2	79.7-116	WG706636
trans-1,2-Dichloroethene	mg/l	.025	0.0251	100.	72.6-121	WG706636
trans-1,3-Dichloropropene	mg/l	.025	0.0250	99.9	74.3-123	WG706636
Trichloroethene	mg/l	.025	0.0257	103.	77.7-118	WG706636
Trichlorofluoromethane	mg/l	.025	0.0229	91.8	63.5-135	WG706636
Vinyl chloride	mg/l	.025	0.0231	92.5	65.9-128	WG706636
Xylenes, Total	mg/l	.075	0.0786	105.	78.7-121	WG706636
4-Bromofluorobenzene				103.0	71-126	WG706636
Dibromofluoromethane				97.70	78.3-121	WG706636
Toluene-d8				102.0	88.5-111	WG706636

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
1,1,1,2-Tetrachloroethane	mg/l	0.0256	0.0256	102.	74.2-124	0.0400	20	WG706636
1,1,1-Trichloroethane	mg/l	0.0236	0.0240	94.0	73.2-123	1.69	20	WG706636
1,1,2,2-Tetrachloroethane	mg/l	0.0230	0.0227	92.0	70.7-122	1.54	20	WG706636
1,1,2-Trichloroethane	mg/l	0.0243	0.0243	97.0	77.7-118	0.310	20	WG706636
1,1,2-Trichlorotrifluoroethane	mg/l	0.0262	0.0259	105.	67.2-143	1.28	20	WG706636
1,1-Dichloroethane	mg/l	0.0251	0.0254	100.	70.7-126	1.17	20	WG706636
1,1-Dichloroethene	mg/l	0.0228	0.0216	91.0	67.8-129	5.81	20	WG706636
1,1-Dichloropropene	mg/l	0.0256	0.0254	102.	73.1-125	0.960	20	WG706636
1,2,3-Trichlorobenzene	mg/l	0.0285	0.0277	114.	64.9-135	2.87	20	WG706636
1,2,3-Trichloropropane	mg/l	0.0246	0.0236	98.0	71.8-121	4.27	20	WG706636
1,2,3-Trimethylbenzene	mg/l	0.0210	0.0209	84.0	72.3-116	0.220	20	WG706636
1,2,4-Trichlorobenzene	mg/l	0.0294	0.0290	118.	69.7-136	1.37	20	WG706636
1,2,4-Trimethylbenzene	mg/l	0.0256	0.0255	102.	75-123	0.380	20	WG706636
1,2-Dibromo-3-Chloropropane	mg/l	0.0246	0.0247	98.0	65.4-128	0.670	20	WG706636
1,2-Dibromoethane	mg/l	0.0254	0.0254	102.	76.6-121	0.190	20	WG706636
1,2-Dichlorobenzene	mg/l	0.0259	0.0255	104.	78.4-117	1.87	20	WG706636
1,2-Dichloroethane	mg/l	0.0233	0.0234	93.0	68.8-124	0.390	20	WG706636
1,2-Dichloropropane	mg/l	0.0257	0.0249	103.	76.5-119	2.97	20	WG706636
1,3,5-Trimethylbenzene	mg/l	0.0269	0.0265	108.	75.6-124	1.46	20	WG706636
1,3-Dichlorobenzene	mg/l	0.0268	0.0271	107.	70.8-128	1.16	20	WG706636
1,3-Dichloropropane	mg/l	0.0256	0.0252	102.	77.4-117	1.88	20	WG706636
1,4-Dichlorobenzene	mg/l	0.0249	0.0248	100.	78.8-115	0.480	20	WG706636
2,2-Dichloropropane	mg/l	0.0226	0.0235	90.0	62.4-133	4.13	20	WG706636
2-Butanone (MEK)	mg/l	0.129	0.123	103.	55-149	4.72	20	WG706636
2-Chloroethyl vinyl ether	mg/l	0.129	0.127	103.	43.8-150	1.36	20	WG706636
2-Chlorotoluene	mg/l	0.0257	0.0258	103.	74.7-122	0.190	20	WG706636
4-Chlorotoluene	mg/l	0.0254	0.0252	102.	77.5-120	0.770	20	WG706636
4-Methyl-2-pentanone (MIBK)	mg/l	0.126	0.121	101.	70.5-133	4.41	20	WG706636
Acetone	mg/l	0.124	0.115	100.	35.6-163	8.36	23.9	WG706636

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12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

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Est. 1970

GeoSyntec - Portland, OR
Barb Lary
621 SW Morrison St., Suite 600

Portland, OR 97205

Quality Assurance Report
Level II

L683488

February 18, 2014

Analyte	Units	Laboratory Control Sample Result	Ref	%Rec	Limit	Duplicate RPD	Limit	Batch
Acrolein	mg/l	0.121	0.0818	97.0	10-190	38.5*	28.1	WG706636
Acrylonitrile	mg/l	0.126	0.122	101.	55.2-130	3.43	20	WG706636
Benzene	mg/l	0.0250	0.0248	100.	74.8-121	0.800	20	WG706636
Bromobenzene	mg/l	0.0243	0.0240	97.0	77.5-116	1.15	20	WG706636
Bromodichloromethane	mg/l	0.0218	0.0216	87.0	75.1-116	0.800	20	WG706636
Bromoform	mg/l	0.0247	0.0252	99.0	67.5-130	2.05	20	WG706636
Bromomethane	mg/l	0.0213	0.0222	85.0	49.9-162	4.13	20	WG706636
Carbon tetrachloride	mg/l	0.0245	0.0248	98.0	70.2-123	1.23	20	WG706636
Chlorobenzene	mg/l	0.0261	0.0262	104.	78.1-119	0.450	20	WG706636
Chlorodibromomethane	mg/l	0.0247	0.0250	99.0	74-121	1.17	20	WG706636
Chloroethane	mg/l	0.0190	0.0193	76.0	61.7-135	1.75	20	WG706636
Chloroform	mg/l	0.0234	0.0229	94.0	76-121	2.32	20	WG706636
Chloromethane	mg/l	0.0265	0.0263	106.	61.5-129	0.800	20	WG706636
cis-1,2-Dichloroethene	mg/l	0.0239	0.0239	96.0	76-119	0.0	20	WG706636
cis-1,3-Dichloropropene	mg/l	0.0253	0.0248	101.	78.2-120	1.81	20	WG706636
Di-isopropyl ether	mg/l	0.0244	0.0241	98.0	65.6-132	1.24	20	WG706636
Dibromomethane	mg/l	0.0244	0.0241	98.0	79.5-118	1.54	20	WG706636
Dichlorodifluoromethane	mg/l	0.0275	0.0282	110.	54.8-135	2.61	20	WG706636
Ethylbenzene	mg/l	0.0266	0.0263	106.	78.8-122	1.22	20	WG706636
Hexachloro-1,3-butadiene	mg/l	0.0267	0.0274	107.	64.7-129	2.30	20	WG706636
Isopropylbenzene	mg/l	0.0284	0.0283	113.	78.6-132	0.100	20	WG706636
Methyl tert-butyl ether	mg/l	0.0230	0.0229	92.0	71.2-126	0.0500	20	WG706636
Methylene Chloride	mg/l	0.0245	0.0242	98.0	70.3-120	1.10	20	WG706636
n-Butylbenzene	mg/l	0.0258	0.0260	103.	76.2-126	0.720	20	WG706636
n-Propylbenzene	mg/l	0.0264	0.0265	106.	78.2-122	0.110	20	WG706636
Naphthalene	mg/l	0.0256	0.0249	102.	68.4-128	2.65	20	WG706636
p-Isopropyltoluene	mg/l	0.0277	0.0280	111.	74-131	1.21	20	WG706636
sec-Butylbenzene	mg/l	0.0269	0.0270	108.	74.4-127	0.570	20	WG706636
Styrene	mg/l	0.0272	0.0267	109.	80.4-126	1.86	20	WG706636
tert-Butylbenzene	mg/l	0.0276	0.0283	110.	75.3-126	2.30	20	WG706636
Tetrachloroethene	mg/l	0.0272	0.0275	109.	72.6-126	1.08	20	WG706636
Toluene	mg/l	0.0243	0.0240	97.0	79.7-116	1.08	20	WG706636
trans-1,2-Dichloroethene	mg/l	0.0251	0.0251	100.	72.6-121	0.0700	20	WG706636
trans-1,3-Dichloropropene	mg/l	0.0255	0.0250	102.	74.3-123	2.12	20	WG706636
Trichloroethene	mg/l	0.0258	0.0257	103.	77.7-118	0.230	20	WG706636
Trichlorofluoromethane	mg/l	0.0223	0.0229	89.0	63.5-135	2.64	20	WG706636
Vinyl chloride	mg/l	0.0229	0.0231	92.0	65.9-128	0.830	20	WG706636
Xylenes, Total	mg/l	0.0780	0.0786	104.	78.7-121	0.720	20	WG706636
4-Bromofluorobenzene				102.0	71-126			WG706636
Dibromofluoromethane				96.90	78.3-121			WG706636
Toluene-d8				103.0	88.5-111			WG706636

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
1,1,1,2-Tetrachloroethane	mg/l	0.0251	0.0	.025	100.	64-128	L683266-01	WG706636
1,1,1-Trichloroethane	mg/l	0.0244	0.0	.025	98.0	58.7-134	L683266-01	WG706636
1,1,2,2-Tetrachloroethane	mg/l	0.0225	0.000489	.025	88.0	56-132	L683266-01	WG706636
1,1,2-Trichloroethane	mg/l	0.0244	0.0	.025	98.0	66.3-125	L683266-01	WG706636
1,1,2-Trichlorotrifluoroethane	mg/l	0.0268	0.0	.025	110.	54.8-154	L683266-01	WG706636
1,1-Dichloroethane	mg/l	0.0257	0.0	.025	100.	58.5-132	L683266-01	WG706636
1,1-Dichloroethene	mg/l	0.0224	0.0	.025	90.0	51.1-140	L683266-01	WG706636
1,1-Dichloropropene	mg/l	0.0258	0.0	.025	100.	57.3-136	L683266-01	WG706636
1,2,3-Trichlorobenzene	mg/l	0.0277	0.0	.025	110.	59.1-138	L683266-01	WG706636
1,2,3-Trichloropropane	mg/l	0.0242	0.0	.025	97.0	61.4-128	L683266-01	WG706636
1,2,3-Trimethylbenzene	mg/l	0.0205	0.0	.025	82.0	61.3-122	L683266-01	WG706636
1,2,4-Trichlorobenzene	mg/l	0.0292	0.0	.025	120.	63.6-143	L683266-01	WG706636
1,2,4-Trimethylbenzene	mg/l	0.0243	0.0	.025	97.0	57.4-137	L683266-01	WG706636
1,2-Dibromo-3-Chloropropane	mg/l	0.0258	0.0	.025	100.	57.3-136	L683266-01	WG706636

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Barb Lary
621 SW Morrison St., Suite 600

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Quality Assurance Report
Level II

L683488

February 18, 2014

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
1,2-Dibromoethane	mg/l	0.0250	0.0	.025	100.	67.1-125	L683266-01	WG706636
1,2-Dichlorobenzene	mg/l	0.0257	0.0	.025	100.	68.2-123	L683266-01	WG706636
1,2-Dichloroethane	mg/l	0.0240	0.0	.025	96.0	60-126	L683266-01	WG706636
1,2-Dichloropropane	mg/l	0.0253	0.00136	.025	96.0	64.2-123	L683266-01	WG706636
1,3,5-Trimethylbenzene	mg/l	0.0251	0.0	.025	100.	63.6-132	L683266-01	WG706636
1,3-Dichlorobenzene	mg/l	0.0259	0.0	.025	100.	63.1-131	L683266-01	WG706636
1,3-Dichloropropane	mg/l	0.0249	0.0	.025	100.	67.9-121	L683266-01	WG706636
1,4-Dichlorobenzene	mg/l	0.0248	0.0	.025	99.0	68.6-123	L683266-01	WG706636
2,2-Dichloropropane	mg/l	0.0242	0.0	.025	97.0	50.5-144	L683266-01	WG706636
2-Butanone (MEK)	mg/l	0.107	0.0	.125	86.0	22.4-138	L683266-01	WG706636
2-Chloroethyl vinyl ether	mg/l	0.0568	0.0	.125	45.0	10-155	L683266-01	WG706636
2-Chlorotoluene	mg/l	0.0252	0.0	.025	100.	63.6-128	L683266-01	WG706636
4-Chlorotoluene	mg/l	0.0244	0.0	.025	98.0	65.7-127	L683266-01	WG706636
4-Methyl-2-pentanone (MIBK)	mg/l	0.131	0.0	.125	100.	60.8-140	L683266-01	WG706636
Acetone	mg/l	0.0712	0.00132	.125	56.0	10-130	L683266-01	WG706636
Acrolein	mg/l	0.250	0.00798	.125	190.	10-200	L683266-01	WG706636
Acrylonitrile	mg/l	0.131	0.0	.125	100.	49.4-133	L683266-01	WG706636
Benzene	mg/l	0.0253	0.0	.025	100.	54.3-133	L683266-01	WG706636
Bromobenzene	mg/l	0.0234	0.0	.025	94.0	63.9-124	L683266-01	WG706636
Bromodichloromethane	mg/l	0.0222	0.0	.025	89.0	63.9-121	L683266-01	WG706636
Bromoform	mg/l	0.0249	0.0	.025	100.	59.5-134	L683266-01	WG706636
Bromomethane	mg/l	0.0209	0.0	.025	84.0	41.7-155	L683266-01	WG706636
Carbon tetrachloride	mg/l	0.0253	0.0	.025	100.	55.7-134	L683266-01	WG706636
Chlorobenzene	mg/l	0.0256	0.0	.025	100.	67-125	L683266-01	WG706636
Chlorodibromomethane	mg/l	0.0242	0.0	.025	97.0	64.3-125	L683266-01	WG706636
Chloroethane	mg/l	0.0188	0.0	.025	75.0	51.5-136	L683266-01	WG706636
Chloroform	mg/l	0.0239	0.0	.025	96.0	63-129	L683266-01	WG706636
Chloromethane	mg/l	0.0260	0.0	.025	100.	42.4-135	L683266-01	WG706636
cis-1,2-Dichloroethene	mg/l	0.0241	0.0	.025	96.0	59.2-129	L683266-01	WG706636
cis-1,3-Dichloropropene	mg/l	0.0260	0.0	.025	100.	66.4-125	L683266-01	WG706636
Di-isopropyl ether	mg/l	0.0250	0.0	.025	100.	56.9-136	L683266-01	WG706636
Dibromomethane	mg/l	0.0248	0.0	.025	99.0	68.2-124	L683266-01	WG706636
Dichlorodifluoromethane	mg/l	0.0290	0.0	.025	120.	40.6-144	L683266-01	WG706636
Ethylbenzene	mg/l	0.0258	0.0	.025	100.	61.4-133	L683266-01	WG706636
Hexachloro-1,3-butadiene	mg/l	0.0264	0.0	.025	110.	55.1-136	L683266-01	WG706636
Isopropylbenzene	mg/l	0.0274	0.0	.025	110.	66.8-141	L683266-01	WG706636
Methyl tert-butyl ether	mg/l	0.0243	0.0	.025	97.0	57.7-134	L683266-01	WG706636
Methylene Chloride	mg/l	0.0242	0.0	.025	97.0	58.1-122	L683266-01	WG706636
n-Butylbenzene	mg/l	0.0257	0.0	.025	100.	62.7-140	L683266-01	WG706636
n-Propylbenzene	mg/l	0.0254	0.0	.025	100.	65.9-131	L683266-01	WG706636
Naphthalene	mg/l	0.0252	0.0	.025	100.	58-135	L683266-01	WG706636
p-Isopropyltoluene	mg/l	0.0265	0.0	.025	110.	63.2-139	L683266-01	WG706636
sec-Butylbenzene	mg/l	0.0253	0.0	.025	100.	62.2-136	L683266-01	WG706636
Styrene	mg/l	0.0260	0.0	.025	100.	66.8-133	L683266-01	WG706636
tert-Butylbenzene	mg/l	0.0264	0.0	.025	110.	63.3-134	L683266-01	WG706636
Tetrachloroethene	mg/l	0.0269	0.0	.025	110.	53-139	L683266-01	WG706636
Toluene	mg/l	0.0244	0.0	.025	98.0	61.4-130	L683266-01	WG706636
trans-1,2-Dichloroethene	mg/l	0.0250	0.0	.025	100.	56.5-129	L683266-01	WG706636
trans-1,3-Dichloropropene	mg/l	0.0258	0.0	.025	100.	64.1-128	L683266-01	WG706636
Trichloroethene	mg/l	0.0259	0.0	.025	100.	44.1-149	L683266-01	WG706636
Trichlorofluoromethane	mg/l	0.0229	0.0	.025	92.0	49.6-145	L683266-01	WG706636
Vinyl chloride	mg/l	0.0232	0.0	.025	93.0	47.8-137	L683266-01	WG706636
Xylenes, Total	mg/l	0.0750	0.0	.075	100.	63.3-131	L683266-01	WG706636
4-Bromofluorobenzene					99.80	71-126		WG706636
Dibromofluoromethane					101.0	78.3-121		WG706636
Toluene-d8					104.0	88.5-111		WG706636

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Quality Assurance Report
Level II

L683488

February 18, 2014

Analyte	Units	Matrix Spike MSD	Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
1,1,1,2-Tetrachloroethane	mg/l	0.0264	0.0251	106.	64-128	5.04	20	L683266-01	WG706636
1,1,1-Trichloroethane	mg/l	0.0249	0.0244	99.8	58.7-134	2.15	20	L683266-01	WG706636
1,1,2,2-Tetrachloroethane	mg/l	0.0241	0.0225	94.5	56-132	7.05	22.2	L683266-01	WG706636
1,1,2-Trichloroethane	mg/l	0.0258	0.0244	103.	66.3-125	5.60	20	L683266-01	WG706636
1,1,2-Trichlorotrifluoroethane	mg/l	0.0273	0.0268	109.	54.8-154	1.68	22.5	L683266-01	WG706636
1,1-Dichloroethane	mg/l	0.0263	0.0257	105.	58.5-132	2.34	20	L683266-01	WG706636
1,1-Dichloroethene	mg/l	0.0232	0.0224	92.8	51.1-140	3.57	20.2	L683266-01	WG706636
1,1-Dichloropropene	mg/l	0.0266	0.0258	106.	57.3-136	3.06	20	L683266-01	WG706636
1,2,3-Trichlorobenzene	mg/l	0.0290	0.0277	116.	59.1-138	4.41	23.7	L683266-01	WG706636
1,2,3-Trichloropropane	mg/l	0.0254	0.0242	102.	61.4-128	4.80	22.4	L683266-01	WG706636
1,2,3-Trimethylbenzene	mg/l	0.0216	0.0205	86.4	61.3-122	4.98	20	L683266-01	WG706636
1,2,4-Trichlorobenzene	mg/l	0.0297	0.0292	119.	63.6-143	1.60	21.9	L683266-01	WG706636
1,2,4-Trimethylbenzene	mg/l	0.0256	0.0243	102.	57.4-137	5.12	20	L683266-01	WG706636
1,2-Dibromo-3-Chloropropane	mg/l	0.0272	0.0258	109.	57.3-136	5.27	27	L683266-01	WG706636
1,2-Dibromoethane	mg/l	0.0267	0.0250	107.	67.1-125	6.66	20	L683266-01	WG706636
1,2-Dichlorobenzene	mg/l	0.0267	0.0257	107.	68.2-123	4.13	20	L683266-01	WG706636
1,2-Dichloroethane	mg/l	0.0246	0.0240	98.4	60-126	2.57	20	L683266-01	WG706636
1,2-Dichloropropane	mg/l	0.0268	0.0253	102.	64.2-123	5.83	20	L683266-01	WG706636
1,3,5-Trimethylbenzene	mg/l	0.0266	0.0251	106.	63.6-132	5.60	20.5	L683266-01	WG706636
1,3-Dichlorobenzene	mg/l	0.0275	0.0259	110.	63.1-131	6.24	20	L683266-01	WG706636
1,3-Dichloropropane	mg/l	0.0268	0.0249	107.	67.9-121	7.07	20	L683266-01	WG706636
1,4-Dichlorobenzene	mg/l	0.0256	0.0248	102.	68.6-123	3.08	20	L683266-01	WG706636
2,2-Dichloropropane	mg/l	0.0239	0.0242	95.4	50.5-144	1.52	21.9	L683266-01	WG706636
2-Butanone (MEK)	mg/l	0.110	0.107	88.1	22.4-138	2.62	27	L683266-01	WG706636
2-Chloroethyl vinyl ether	mg/l	0.0219	0.0568	17.5	10-155	88.8*	20	L683266-01	WG706636
2-Chlorotoluene	mg/l	0.0260	0.0252	104.	63.6-128	3.33	20	L683266-01	WG706636
4-Chlorotoluene	mg/l	0.0254	0.0244	102.	65.7-127	3.98	20	L683266-01	WG706636
4-Methyl-2-pentanone (MIBK)	mg/l	0.139	0.131	112.	60.8-140	6.56	25.1	L683266-01	WG706636
Acetone	mg/l	0.0719	0.0712	56.4	10-130	0.920	27.9	L683266-01	WG706636
Acrolein	mg/l	0.279	0.250	216.*	10-200	11.0	27.7	L683266-01	WG706636
Acrylonitrile	mg/l	0.133	0.131	106.	49.4-133	1.31	25.3	L683266-01	WG706636
Benzene	mg/l	0.0259	0.0253	104.	54.3-133	2.33	20	L683266-01	WG706636
Bromobenzene	mg/l	0.0241	0.0234	96.4	63.9-124	3.02	20	L683266-01	WG706636
Bromodichloromethane	mg/l	0.0227	0.0222	90.8	63.9-121	2.05	20	L683266-01	WG706636
Bromoform	mg/l	0.0264	0.0249	106.	59.5-134	5.79	20.5	L683266-01	WG706636
Bromomethane	mg/l	0.0211	0.0209	84.3	41.7-155	0.710	21.9	L683266-01	WG706636
Carbon tetrachloride	mg/l	0.0259	0.0253	103.	55.7-134	2.22	20	L683266-01	WG706636
Chlorobenzene	mg/l	0.0265	0.0256	106.	67-125	3.35	20	L683266-01	WG706636
Chlorodibromomethane	mg/l	0.0260	0.0242	104.	64.3-125	6.85	20.8	L683266-01	WG706636
Chloroethane	mg/l	0.0184	0.0188	73.8	51.5-136	1.67	40	L683266-01	WG706636
Chloroform	mg/l	0.0244	0.0239	97.7	63-129	2.23	20	L683266-01	WG706636
Chloromethane	mg/l	0.0266	0.0260	106.	42.4-135	2.19	20	L683266-01	WG706636
cis-1,2-Dichloroethene	mg/l	0.0251	0.0241	100.	59.2-129	4.17	20	L683266-01	WG706636
cis-1,3-Dichloropropene	mg/l	0.0271	0.0260	108.	66.4-125	4.13	20	L683266-01	WG706636
Di-isopropyl ether	mg/l	0.0257	0.0250	103.	56.9-136	2.76	20	L683266-01	WG706636
Dibromomethane	mg/l	0.0259	0.0248	104.	68.2-124	4.50	20	L683266-01	WG706636
Dichlorodifluoromethane	mg/l	0.0290	0.0290	116.	40.6-144	0.220	20.2	L683266-01	WG706636
Ethylbenzene	mg/l	0.0265	0.0258	106.	61.4-133	2.85	20	L683266-01	WG706636
Hexachloro-1,3-butadiene	mg/l	0.0268	0.0264	107.	55.1-136	1.63	23.6	L683266-01	WG706636
Isopropylbenzene	mg/l	0.0284	0.0274	114.	66.8-141	3.70	20	L683266-01	WG706636
Methyl tert-butyl ether	mg/l	0.0248	0.0243	99.2	57.7-134	2.10	20	L683266-01	WG706636
Methylene Chloride	mg/l	0.0248	0.0242	99.2	58.1-122	2.54	20	L683266-01	WG706636
n-Butylbenzene	mg/l	0.0258	0.0257	103.	62.7-140	0.600	20.3	L683266-01	WG706636
n-Propylbenzene	mg/l	0.0262	0.0254	105.	65.9-131	3.11	20	L683266-01	WG706636
Naphthalene	mg/l	0.0266	0.0252	106.	58-135	5.48	25.5	L683266-01	WG706636
p-Isopropyltoluene	mg/l	0.0273	0.0265	109.	63.2-139	3.06	20.4	L683266-01	WG706636
sec-Butylbenzene	mg/l	0.0266	0.0253	106.	62.2-136	5.24	20.3	L683266-01	WG706636
Styrene	mg/l	0.0274	0.0260	110.	66.8-133	4.98	20	L683266-01	WG706636
tert-Butylbenzene	mg/l	0.0276	0.0264	110.	63.3-134	4.35	21	L683266-01	WG706636
Tetrachloroethene	mg/l	0.0278	0.0269	111.	53-139	3.37	20	L683266-01	WG706636

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

ESC LAB SCIENCES
YOUR LAB OF CHOICE

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

GeoSyntec - Portland, OR
Barb Lary
621 SW Morrison St., Suite 600

Portland, OR 97205

Quality Assurance Report
Level II

L683488

February 18, 2014

Analyte	Units	Matrix Spike MSD	Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Toluene	mg/l	0.0256	0.0244	102.	61.4-130	4.70	20	L683266-01	WG706636
trans-1,2-Dichloroethene	mg/l	0.0258	0.0250	103.	56.5-129	3.22	20	L683266-01	WG706636
trans-1,3-Dichloropropene	mg/l	0.0273	0.0258	109.	64.1-128	5.78	20	L683266-01	WG706636
Trichloroethene	mg/l	0.0265	0.0259	106.	44.1-149	2.18	20	L683266-01	WG706636
Trichlorofluoromethane	mg/l	0.0232	0.0229	92.6	49.6-145	0.910	21.2	L683266-01	WG706636
Vinyl chloride	mg/l	0.0233	0.0232	93.4	47.8-137	0.530	20	L683266-01	WG706636
Xylenes, Total	mg/l	0.0782	0.0750	104.	63.3-131	4.08	20	L683266-01	WG706636
4-Bromofluorobenzene				101.0	71-126				WG706636
Dibromofluoromethane				99.60	78.3-121				WG706636
Toluene-d8				104.0	88.5-111				WG706636

Batch number /Run number / Sample number cross reference

WG706636: R2885766: L683488-01 02 03 04

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Geosyntec Consultants
621 SW Morrison St.
Suite 600
Portland, OR. 97205

Billing Information:
Geosyntec Consultants
621 SW Morrison St. Suite 600
Portland, OR. 97205

Report to: Barb Lary / Cindy Bartlett

Email to: cbartlett@geosyntec.com

Project Description: Cascade Corp - TGA Remedy

City/State Collected: GRESHAM, OR

Phone: (503) 956-2983
FAX:

Client Project #: PNG0564G14

ESC Key:

Collected by: BARB LARY

Site/Facility ID#:

P.O.#:

Collected by (signature): Barb Lary

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day. 200%
___ Next Day. 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed:

Email? __No __Yes

FAX? __No __Yes

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1

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12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

C159

CoCode GEOSYNPO (lab use only)

Template/Prelogin

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	V8260	Trip Blanks	Remarks/Contaminant	Sample # (lab only)
TRIP BLANK	—	GW	—	2/17/14	—	1		X		L603488-01
UL2-021714	GRAB				1130	3	X			02
UL2-021714-DUP					1135	3	X			03
UL1-021714					1305	3	X			04

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

pH _____ Temp _____

Remarks: 5781 0505 4613

Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Barb Lary	2/17/14	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____

Temp: 32 | Bottles Received: 10 | Date: 2/18/14 | Time: 0930

Condition: (lab use only) OK

CoC Seals Intact: ___ Y ___ N ___ NA

pH Checked: | NCF: