

December 21, 2017

Olivia Yu Oil Conservation Division, District 1 1625 N. French Dr. Hobbs, NM 88240

Shelly Tucker Bureau of Land Management, CFO 620 E. Green Street Carlsbad, NM 88220 APPROVED

By Olivia Yu at 2:24 pm, Jan 02, 2018

NMOCD approves of the delineation completed for 1RP-4811 and the proposed remediation with these clarifications: laboratory analyses (TPH extended and chlorides) of confirmation edge and bottom samples for the area represented by T-2.

Re: Work Plan BC Federal #032 API #: 30-025-38829 RP#: 1RP-4811 Unit Letter G Section 20, Township 17S, Range 32E Lea County, NM

Ms. Yu/Ms. Tucker,

COG Operating, LLC (COG) is pleased to submit for your consideration the following remediation work plan for the BC Federal #032. This plan is in response to an oil and produced water release that occurred on September 10, 2017. Subsequent to the release a C-141 initial report was submitted to the New Mexico Oil Conservation Division (NMOCD) on September 15, 2017.

BACKGROUND

The BC Federal #032 release is located in Unit Letter G, Section 20, Township 17 South, and Range 32 East in Lea County, New Mexico. More specifically the latitude and longitude for this release are 32.8208771 North and -103.7854462 West.

On September 10, 2017, a ¹/₄-inch nipple on a gauge failed due to corrosion resulting in the release of approximately three (3) barrels (bbls) of oil and four (4) bbls of produced water. A vacuum truck was utilized to recover free standing fluids. Approximately two (2) bbls of oil and three (3) bbls of produced water were recovered.

On October 16, 2017, a site assessment and soil sampling were conducted in order to vertically and horizontally define the impacted area. A site diagram is included in Appendix I. The analytical results from the soil sampling activities are summarized in the table below.

GROUNDWATER AND SITE RANKING

According to the New Mexico Office of the State Engineer (NMOSE) groundwater in the project vicinity is approximately eighty-one (81) feet below ground surface (BGS) (Appendix II). No water well or surface water was observed within 1,000-feet of the release site. Therefore the site ranking for this release is zero (10) based on the following:

Depth to ground water	50-100-feet
Distance to surface water body	>1000-feet
Wellhead Protection Area	>1000-feet

Analytical Results

Sample ID	Depth (feet)	Benzene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	Total TPH (mg/kg)
T-1	0	< 0.003	< 0.003	301	600
T-1	1	< 0.002	< 0.002	230	<25.0
T-1	2	< 0.002	< 0.002	480	<25.0
T-1	3	< 0.002	< 0.002	82.9	<25.0
T-1	4	0.003	< 0.002	40.7	<25.0
T-1	9			82.2	
T-2	0	0.103	2.63	1,060	2920
T-2	1	< 0.002	< 0.002	128	26.1
T-2	2	< 0.002	< 0.002	15.3	<25.0
T-2	3	< 0.002	< 0.002	15.9	<25.0
T-2	4	< 0.002	< 0.002	<4.95	<25.0
T-2	9			<4.94	
T-3	0	< 0.002	< 0.002	158	<25.0
T-3	1	< 0.002	< 0.002	252	<25.0
T-3	2	< 0.002	< 0.002	19.2	<25.0
T-3	3	< 0.002	< 0.002	<4.90	<25.0
T-3	8			65.1	
NORTH	0	< 0.002	< 0.002	<4.90	<25.0
NORTH	1	< 0.002	< 0.002	5.80	<25.0
SOUTH	0	< 0.002	< 0.002	19.9	<25.0
SOUTH	1	< 0.002	< 0.002	56.8	<25.0
EAST	0	< 0.002	< 0.002	<4.98	140
EAST	1	< 0.002	< 0.002	35.5	<25.0
WEST	0	< 0.002	< 0.002	< 5.00	<25.0
WEST	1	< 0.002	< 0.002	< 5.00	<25.0

PROPOSED REMEDIAL ACTIONS

- The impacted area in the vicinity of sample location T-2 will be excavated to a depth of one (1) foot BGS.
- The impacted area in the vicinity of sample locations T-1 and T-3 will be scraped to a depth of one-half (0.5) foot BGS to remove surface staining.
- All of the excavated material will be hauled to an NMOCD approved solid waste disposal facility.
- The excavation will be backfilled with caliche and contoured to match the surrounding location.

Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

Sheldon gittom

Sheldon L. Hitchcock HSE Coordinator slhitchcock@concho.com

Enclosed:

Appendix I: Site Diagram Appendix II: Groundwater Data Appendix III: Initial C-141 (Copy) Appendix IV: Analytical Reports and Chain-of-Custody Forms

APPENDIX I



APPENDIX II



New Mexico Office of the State Engineer Water Column/Average Depth to Water

(R=POD has (A CLW##### in the been replaced, POD suffix indicates the POD has been replaced O=orphaned, & no longer serves a C=the file is (quarters are 1=NW 2=NE 3=SW 4=SE) water right file.) closed) (quarters are smallest to largest) (NAD83 UTM in meters) (In feet) POD Sub-QQQ **Depth Depth Water POD Number** Well Water Column Code basin County 64 16 4 Sec Tws Rng X Υ Distance 614891 RA 12042 POD1 LE 2 2 1 28 17S 32E 3631181 1359 400 LE 28 17S 32E 614814 3631005* 158 RA 10175 2 1 1452 RA 12020 POD1 LE 2 2 1 28 17S 32E 614828 3630954 1501 120 81 39 RA 08855 LE 4 1 1 10 17S 32E 616061 3635742* 4097 158 LE 2 2 1 10 17S 32E RA 09505 616462 3635944 🚺 4481 147 LE 2 2 1 10 17S 32E L 13050 POD1 L 616463 3635945* 4481 156 132 24 LE 2 2 1 10 17S 32E RA 09505 S 616463 3635945* 4481 144 LE 2 2 1 10 17S 32E 616556 3635929 4520 165 RA 11734 POD1 L 04021 POD3 L LE 3 4 03 17S 32E 616761 3636252* 4902 247 Average Depth to Water: 106 feet Minimum Depth: 81 feet Maximum Depth: 132 feet Record Count: 9 **Basin/County Search:** County: Lea

UTMNAD83 Radius Search (in meters):

Easting (X): 613995

Northing (Y): 3632204

Radius: 5000

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

APPENDIX III

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

			Rele	ase Notific	ation	and Co	rrective A	ction	
						OPERAT	OR	🖾 Ini	itial Report 🛛 Final Report
				OGRID # 229		Contact:		Robert Mc	
Address:			enue, Mid	lland TX 79701		Telephone N		432-683-74	443
Facility Nan	ne: BC Fe	leral #032]	Facility Type	e: Wellhea	d	
Surface Own	ner: Fe	leral		Mineral O	wner: I	Federal		API 1	No. 30-025-38829
				LOCA	TION	N OF REL	LEASE		
Unit Letter G	Section 20	Township 17S	Range 32E	Feet from the 2,360		South Line North	Feet from the 1,650	East/West Lin East	e County Lea
			,	· · · · · · · · · · · · · · · · · · ·		Longitude	-103.7854462		
						OF RELI			
Type of Relea	ase:			INAL	URE	Volume of		Volum	e Recovered:
		Oil and Produ	ced Water				Oil & 4 bbl. PW	r l	2 bbl. Oil & 3 bbl. PW
Source of Rel	lease:	Wellhe	ad				our of Occurrenc er 10, 2017 3:00		nd Hour of Discovery: September 10, 2017 3:00 pm
Was Immedia	ate Notice C		au			If YES, To		քու լ	september 10, 2017 5.00 pm
			Yes 🖄	No 🖾 Not Re	quired				
		By Who	om?			Date and H			
Was a Water	course Read		Yes 🛛	l No		If YES, Vo	lume Impacting t	he Watercourse.	
If a Watercou	irse was Im	pacted, Descri	be Fully."				CEIVED		
						By C	Olivia Yu a	at 10:20 al	m, Sep 18, 2017
Describe Cau	se of Probl	em and Reme	lial Action	n Taken.*					
The release w	vas due to c	orrosion on a	one-fourth	inch nipple on th	e gauge	. The nipple v	vas removed and	the gauge was in	stalled directly into the valve.
		and Cleanup A			00			00	
The release o	coursed rec	ninad on loca	tion A us	anne terak mac d	icnataba	d to remove r	ll franctanding f	luide Conche ui	Il have the spill area evaluated for
									ny significant remediation
activities.	-			•		-	-		
I hereby certi	fy that the i	nformation gi	ven above	is true and compl where file contain re-	ete to th	ne best of my	knowledge and u	inderstand that p	ursuant to NMOCD rules and releases which may endanger
									relieve the operator of liability
should their o	operations h	ave failed to a	dequately	investigate and re	emediate	e contaminatio	on that pose a thr	eat to ground wa	ter, surface water, human health
		ddition, NMC ws and/or regu		tance of a C-141 i	report de	oes not relieve	e the operator of	responsibility fo	r compliance with any other
	11	ala	7				OIL CON	SERVATIO	N DIVISION
Signature: 1	Veu	a Hast	un						art
Printed Name	e:	Rebecca	Haskell			Approved by	Environmental S	pecialist:	
Title:		Senior HS	SE Coordi	nator		Approval Dat	e: 9/18/201	7 Expiratio	on Date:
The second states		ale a l'alla).			Conditions of	Approval		/
E-mail Addre	-55.	masken(a	concho.c	<u>viii</u>			ched direct	ivo	Attached 🚺
Date: Septerr			432-683	3-7443					
Attach Addi	tional She	ets If Necess	ary						
						1RP-481	1 nOY1	726137462	pOY1726137714

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _9/15/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4811_ has been assigned. Please refer to this case number in all future correspondence.

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

The responsible person shall complete <u>division-approved corrective action</u> for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC. [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before _10/18/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

• Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

• Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

• Nominal detection limits for field and laboratory analyses must be provided.

• Composite sampling is not generally allowed.

• Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

•Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

• If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

• Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold OCD Environmental Bureau Chief 1220 South St. Francis Drive Santa Fe, New Mexico 87505 505-476-3465 jim.griswold@state.nm.us

APPENDIX IV

Analytical Report 566213

for COG Operating, LLC

Project Manager: Sheldon Hitchcock

BC Federal #32

30-OCT-17

Collected By: Client





1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122): Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054) Oklahoma (2017-142)

> Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12) Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16) Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13) Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3) Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757) Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



30-OCT-17



Project Manager: **Sheldon Hitchcock COG Operating, LLC** 600 W Illinois Midland, TX 79701

Reference: XENCO Report No(s): 566213 BC Federal #32 Project Address:

Sheldon Hitchcock:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 566213. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 566213 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Huns hoah

Kelsey Brooks Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994. Certified and approved by numerous States and Agencies. A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 566213



COG Operating, LLC, Midland, TX

BC Federal #32

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 Surface	S	10-16-17 09:00	0	566213-001
T-1 1'	S	10-16-17 09:00	1	566213-002
T-1 2'	S	10-16-17 09:00	2	566213-003
T-1 3'	S	10-16-17 09:00	3	566213-004
T-1 4'	S	10-16-17 09:00	4	566213-005
T-1 9'	S	10-16-17 09:00	9	566213-006
T-2 Surface	S	10-16-17 10:00	0	566213-007
T-2 1'	S	10-16-17 10:00	1	566213-008
T-2 2'	S	10-16-17 10:00	2	566213-009
T-2 3'	S	10-16-17 10:00	3	566213-010
T-2 4'	S	10-16-17 10:00	4	566213-011
T-2 9'	S	10-16-17 10:00	9	566213-012
T-3 Surface	S	10-16-17 10:30	0	566213-013
T-3 1'	S	10-16-17 10:30	1	566213-014
T-3 2'	S	10-16-17 10:30	2	566213-015
T-3 3'	S	10-16-17 10:30	3	566213-016
T-3 8'	S	10-16-17 10:30	8	566213-017



Client Name: COG Operating, LLC Project Name: BC Federal #32

Project ID: Work Order Number(s): 566213
 Report Date:
 30-OCT-17

 Date Received:
 10/19/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments: Batch: LBA-3031638 BTEX by EPA 8021B Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031655 BTEX by EPA 8021B Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031729 BTEX by EPA 8021B Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



 Project Id:
 Sheldon Hitchcock

Project Location:

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX Project Name: BC Federal #32



Date Received in Lab:Thu Oct-19-17 11:45 amReport Date:30-OCT-17Project Manager:Kelsey Brooks

	Lab Id:	566213-0	001	566213-0	02	566213-(003	566213-	004	566213-	005	566213-0)06
	Field Id:	T-1 Surf	ace	T-1 1'		T-1 2'		T-1 3	,	T-1 4	.	T-1 9'	
Analysis Requested	Depth:	0-		1-		2-		3-		4-		9-	
	Matrix:	SOIL		SOIL		SOIL		SOIL	,	SOIL		SOIL	
	Sampled:	Oct-16-17	09:00	Oct-16-17 (09:00	Oct-16-17	09:00	Oct-16-17	09:00	Oct-16-17	09:00	Oct-16-17 (09:00
BTEX by EPA 8021B	Extracted:	Oct-26-17	10:30	Oct-25-17 1	4:00	Oct-25-17	14:00	Oct-25-17	14:00	Oct-25-17	14:00		
	Analyzed:	Oct-26-17	14:35	Oct-25-17 2	23:46	Oct-26-17 (00:48	Oct-26-17	01:08	Oct-26-17	01:26		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	< 0.00200	0.00200		
Toluene		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	0.00277	0.00200		
Ethylbenzene		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	< 0.00200	0.00200		
m,p-Xylenes		< 0.00676	0.00676	< 0.00399	0.00399	< 0.00404	0.00404	< 0.00402	0.00402	< 0.00399	0.00399		
o-Xylene		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	< 0.00200	0.00200		
Total Xylenes		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	< 0.00200	0.00200		
Total BTEX		< 0.00338	0.00338	< 0.00200	0.00200	< 0.00202	0.00202	< 0.00201	0.00201	0.00277	0.00200		
Chloride by EPA 300	Extracted:	Oct-25-17	09:00	Oct-25-17 (09:00	Oct-25-17 (09:00	Oct-25-17	09:00	Oct-25-17	09:00	Oct-25-17 ()9:00
	Analyzed:	Oct-25-17	19:47	Oct-25-17 1	9:53	Oct-25-17 2	20:00	Oct-25-17	20:07	Oct-25-17	20:14	Oct-25-17 2	20:20
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		301	4.99	230	4.95	480	4.91	82.9	4.90	40.7	4.90	82.2	4.94
TPH by Texas1005	Extracted:	Oct-26-17	08:00	Oct-26-17 (08:00	Oct-26-17 (08:00	Oct-26-17	08:00	Oct-26-17	08:00		
	Analyzed:	Oct-26-17	14:02	Oct-26-17 1	4:21	Oct-26-17	15:20	Oct-26-17	15:40	Oct-26-17	16:02		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C12-C28 Range Hydrocarbons		545	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C28-C35 Range Hydrocarbons		54.5	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
Total TPH		600	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Huns Boah

Kelsey Brooks Project Manager



 Project Id:
 Sheldon Hitchcock

Project Location:

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX Project Name: BC Federal #32



Date Received in Lab:Thu Oct-19-17 11:45 amReport Date:30-OCT-17Project Manager:Kelsey Brooks

	Lab Id:	566213-0	007	566213-(008	566213-0)09	566213-	010	566213-	011	566213-0	012
	Field Id:	T-2 Surf	ace	T-2 1'		T-2 2'		Т-2 3	,	Т-2 4	.	T-2 9'	
Analysis Requested	Depth:	0-		1-		2-		3-		4-		9-	
	Matrix:	SOIL	,	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17	10:00	Oct-16-17	10:00	Oct-16-17	10:00	Oct-16-17	10:00	Oct-16-17	10:00	Oct-16-17 1	10:00
BTEX by EPA 8021B	Extracted:	Oct-26-17	10:30	Oct-25-17	4:00	Oct-25-17	14:00	Oct-25-17	14:00	Oct-26-17	11:00		
	Analyzed:	Oct-26-17	18:25	Oct-26-17 (01:45	Oct-26-17 (02:04	Oct-26-17	02:22	Oct-26-17	21:55		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		< 0.0201	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	< 0.00202	0.00202		
Toluene		0.103	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	0.00240	0.00202		
Ethylbenzene		0.595	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	< 0.00202	0.00202		
m,p-Xylenes		1.23	0.0402	< 0.00398	0.00398	< 0.00401	0.00401	< 0.00398	0.00398	< 0.00404	0.00404		
o-Xylene		0.703	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	< 0.00202	0.00202		
Total Xylenes		1.93	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	< 0.00202	0.00202		
Total BTEX		2.63	0.0201	< 0.00199	0.00199	< 0.00200	0.00200	< 0.00199	0.00199	0.00240	0.00202		
Chloride by EPA 300	Extracted:	Oct-25-17	09:00	Oct-25-17 ()9:00	Oct-25-17 (09:00	Oct-25-17	09:00	Oct-25-17	09:00	Oct-25-17 (09:00
	Analyzed:	Oct-25-17	20:27	Oct-25-17 2	20:34	Oct-25-17 2	20:41	Oct-25-17	21:15	Oct-25-17	21:22	Oct-25-17 2	21:28
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1060	24.6	128	4.93	15.3	4.94	15.9	4.98	<4.95	4.95	<4.94	4.94
TPH by Texas1005	Extracted:	Oct-26-17	08:00	Oct-26-17 (08:00	Oct-26-17 (08:00	Oct-26-17	08:00	Oct-26-17	08:00		
	Analyzed:	Oct-26-17	16:22	Oct-26-17	6:42	Oct-26-17	17:02	Oct-26-17	17:22	Oct-26-17	17:42		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		488	125	<24.9	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
C12-C28 Range Hydrocarbons		2220	125	26.1	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
C28-C35 Range Hydrocarbons		212	125	<24.9	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
Total TPH		2920	125	26.1	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Huns Boah

Kelsey Brooks Project Manager



 Project Id:
 Sheldon Hitchcock

Project Location:

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX Project Name: BC Federal #32



Date Received in Lab:Thu Oct-19-17 11:45 amReport Date:30-OCT-17Project Manager:Kelsey Brooks

	Lab Id:	566213-0)13	566213-0	14	566213-0	015	566213-	016	566213-0	17	
An alugia Do au osto d	Field Id:	T-3 Surfa	ace	T-3 1'		T-3 2	,	Т-3 3	,	T-3 8'		
Analysis Requested	Depth:	0-		1-		2-		3-		8-		
	Matrix:	SOIL		SOIL		SOIL	,	SOIL	,	SOIL		
	Sampled:	Oct-16-17	10:30	Oct-16-17	0:30	Oct-16-17	10:30	Oct-16-17	10:30	Oct-16-17 1	0:30	
BTEX by EPA 8021B	Extracted:	Oct-25-17	14:00	Oct-25-17 1	4:00	Oct-26-17	11:00	Oct-26-17	11:00			
	Analyzed:	Oct-26-17 (03:02	Oct-26-17 (3:22	Oct-26-17	21:37	Oct-26-17	22:14			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL			
Benzene		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
Toluene		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
Ethylbenzene		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
m,p-Xylenes		< 0.00403	0.00403	< 0.00401	0.00401	< 0.00402	0.00402	< 0.00398	0.00398			
o-Xylene		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
Total Xylenes		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
Total BTEX		< 0.00202	0.00202	< 0.00200	0.00200	< 0.00201	0.00201	< 0.00199	0.00199			
Chloride by EPA 300	Extracted:	Oct-25-17 (09:00	Oct-25-17 (9:00	Oct-25-17	09:00	Oct-25-17	09:00	Oct-25-17 0	9:00	
	Analyzed:	Oct-25-17	21:35	Oct-25-17 2	21:42	Oct-25-17	21:49	Oct-25-17	21:55	Oct-25-17 2	2:02	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	
Chloride		158	4.90	252	4.95	19.2	4.99	<4.90	4.90	65.1	4.94	
TPH by Texas1005	Extracted:	Oct-26-17 (08:00	Oct-26-17 (08:00	Oct-26-17	08:00	Oct-26-17	08:00			
	Analyzed:	Oct-26-17	18:45	Oct-26-17 1	9:05	Oct-26-17	19:26	Oct-26-17	19:47			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL			
C6-C12 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0			
C12-C28 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0			
C28-C35 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0			
Total TPH		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Kelsey Brooks Project Manager



Flagging Criteria



- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- **F** RPD exceeded lab control limits.
- J The target analyte was positively identified below the quantitation limit and above the detection limit.
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- **H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- **K** Sample analyzed outside of recommended hold time.
- JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.
- ** Surrogate recovered outside laboratory control limit.
- **BRL** Below Reporting Limit.
- RL Reporting Limit

MDL Method Detection Limit	SDL Sample Detection Limit	LOD Limit of Detection
PQL Practical Quantitation Limit	MQL Method Quantitation Limit	LOQ Limit of Quantitation

- **DL** Method Detection Limit
- NC Non-Calculable
- + NELAC certification not offered for this compound.
- * (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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9701 Harry Hines Blvd, Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr Suite 102, Tempe AZ 85282	(602) 437-0330	



Project Name: BC Federal #32

	r ders : 5 66213 #: 3031729	3, Sample: 566213-002 / SMP	Batch	Project ID : 1 Matrix			
Units:	mg/kg	Date Analyzed: 10/25/17 23:46	SU	RROGATE R	RECOVERY	STUDY	
		X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0288	0.0300	96	80-120	
4-Bromoflu			0.0338	0.0300	113	80-120	
Lab Batch	#: 3031729	Sample: 566213-003 / SMP	Batch	: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 00:48	SU	RROGATE R	RECOVERY	STUDY	
		X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
140.0		Analytes	0.0000	0.0000		00.100	
1,4-Difluor			0.0299	0.0300	100	80-120	
	lorobenzene	G 1 5/(212.004/SMD	0.0336	0.0300	112	80-120	
	#: 3031729	Sample: 566213-004 / SMP	Batch				
Units:	mg/kg	Date Analyzed: 10/26/17 01:08	SUI	RROGATE R	RECOVERY	STUDY	
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0295	0.0300	98	80-120	
4-Bromoflu	orobenzene		0.0341	0.0300	114	80-120	
Lab Batch	#: 3031729	Sample: 566213-005 / SMP	Batch	: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 01:26	SUI	RROGATE R	RECOVERY	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor			0.0275	0.0300	92	80-120	
4-Bromoflu	orobenzene		0.0321	0.0300	107	80-120	
	#: 3031729	Sample: 566213-008 / SMP	Batch				
Units:	mg/kg	Date Analyzed: 10/26/17 01:45		RROGATE R		STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flage
1,4-Difluor			0.0355	0.0300	118	80-120	
,			0.0000	0.0000	110	00120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	#: 3031729	Sample: 566213-009 / SMP	Batcl				
J nits:	mg/kg	Date Analyzed: 10/26/17 02:04	SU	RROGATE F	RECOVERY	STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0305	0.0300	102	80-120	
4-Bromoflu	orobenzene		0.0352	0.0300	117	80-120	
Lab Batch	#: 3031729	Sample: 566213-010 / SMP	Batcl	n: 1 Matrix	c: Soil		
U nits:	mg/kg	Date Analyzed: 10/26/17 02:22	SU	RROGATE F	RECOVERY	STUDY	
	BTEX	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor	obenzene	Anaryus	0.0298	0.0300	99	80-120	
4-Bromoflu			0.0298	0.0300	115	80-120	
	#: 3031729	Sample: 566213-013 / SMP	Batcl			00 120	
Units:	mg/kg	Date Analyzed: 10/26/17 03:02		RROGATE F		STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes		[0]	[D]	/01	
1,4-Difluor	obenzene		0.0305	0.0300	102	80-120	
4-Bromoflu	orobenzene		0.0356	0.0300	119	80-120	
Lab Batch	#: 3031729	Sample: 566213-014 / SMP	Batcl	n: 1 Matrix	c: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 03:22	SU	RROGATE F	RECOVERY	STUDY	
	ВТЕХ	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor	obenzene		0.0299	0.0300	100	80-120	
4-Bromoflu	orobenzene		0.0347	0.0300	116	80-120	
Lab Batch	#: 3031677	Sample: 566213-001 / SMP	Batcl	n: 1 Matrix	: Soil	1	1
Units:	mg/kg	Date Analyzed: 10/26/17 14:02	SU	RROGATE F	RECOVERYS	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny	1		50.4	50.0	101	70-130	
1-Chlorooc			110	100	110	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Lab Batch	#: 3031677	Sample: 566213-002 / SMP	Batc	h: 1 Matrix	: 5011					
Units:	mg/kg	Date Analyzed: 10/26/17 14:21	SURROGATE RECOVERY STUDY							
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags			
		Analytes			[D]					
o-Terpheny	1		51.4	49.9	103	70-130				
1-Chlorooct	tane		107	99.8	107	70-130				
Lab Batch	#: 3031638	Sample: 566213-001 / SMP	Batc	h: 1 Matrix	: Soil					
Units:	mg/kg	Date Analyzed: 10/26/17 14:35	SU	RROGATE R	ECOVERY S	STUDY				
		A polytos	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags			
1,4-Difluor		Analytes	0.0200	0.0200		00.120				
4-Bromoflu			0.0309	0.0300	103	80-120				
	#: 3031677	Sample: 566213-003 / SMP	0.0354 Batc	0.0300 h: 1 Matrix	118 • Soil	80-120				
Lab Batch Units:		Date Analyzed: 10/26/17 15:20								
Units:	mg/kg	Date Analyzed: 10/20/17 13.20	su	RROGATE R	ECOVERYS	STUDY				
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags			
		Analytes			[D]					
o-Terpheny	1		50.0	49.8	100	70-130				
1-Chlorooct	tane		107	99.6	107	70-130				
Lab Batch	#: 3031677	Sample: 566213-004 / SMP	Batc	h: 1 Matrix	: Soil					
Units:	mg/kg	Date Analyzed: 10/26/17 15:40	SU	RROGATE R	ECOVERY S	STUDY				
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags			
- Tombond		Analytes	50.7	40.0		70.100				
o-Terpheny			50.7	49.9	102	70-130				
	#: 3031677	Sample: 566213-005 / SMP	105 Bate	99.8 h: 1 Matrix	105	70-130				
Units:	mg/kg	Date Analyzed: 10/26/17 16:02		RROGATE R		TUDV				
C III (3)		2 att muij2da. 10/20/17 10:02	50	1		51001				
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage			
		Analytes			[D]					
o-Terpheny			49.5	49.9	99	70-130				
1-Chlorooct	tane		101	99.8	101	70-130				

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Units:	malka	Sample: 566213-007 / SMP	~		DOOL		
Units:	mg/kg	Date Analyzed: 10/26/17 16:22	SU	RROGATE R	ECOVERY S	STUDY	
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terpheny	l		50.2	50.0	100	70-130	
1-Chlorooct	ane		103	99.9	103	70-130	
Lab Batch	#: 3031677	Sample: 566213-008 / SMP	Batcl	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 16:42	SU	RROGATE R	ECOVERY	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
- T 1		Analytes		40.0		50.100	
o-Terpheny			51.7	49.9	104	70-130	
1-Chlorooct	ane #: 3031677	Sample: 566212.000 / SMD	109 Batcl	99.7	109 	70-130	
		Sample: 566213-009 / SMP					
Units:	mg/kg	Date Analyzed: 10/26/17 17:02	SU	RROGATE R	ECOVERY S	STUDY	
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny	l		49.0	49.9	98	70-130	
1-Chlorooct	ane		105	99.7	105	70-130	
Lab Batch	#: 3031677	Sample: 566213-010 / SMP	Batcl	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 17:22	SU	RROGATE R	ECOVERY S	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny			49.4	50.0	99	70-130	
1-Chlorooct			106	99.9	106	70-130	
	#: 3031677	Sample: 566213-011 / SMP	Batcl				
Units:	mg/kg	Date Analyzed: 10/26/17 17:42	SU	RROGATE R	ECOVERY	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes	r1	[[20]	[D]		
o-Terpheny			50.9	49.8	102	70-130	
1-Chlorooct			106	99.6	106	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	#: 3031638	Sample: 566213-007 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 18:25	SU	RROGATE R	RECOVERY	STUDY	
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
1,4-Difluor	obenzene		0.0306	0.0300	102	80-120	
4-Bromoflu	orobenzene		0.0337	0.0300	112	80-120	
Lab Batch	#: 3031677	Sample: 566213-013 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 18:45	SU	RROGATE R	RECOVERY	STUDY	
	TPH	by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terpheny	1	Analytes	40.2	40.0	99	70-130	
1-Chlorooc			49.3	49.9	106	70-130	
	#: 3031677	Sample: 566213-014 / SMP	Batc			/0-130	
Lab Batch Units:		1					
Units:	mg/kg	Date Analyzed: 10/26/17 19:05	su	RROGATE R	RECOVERY	STUDY	
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny	1		48.7	49.8	98	70-130	
1-Chlorooc	tane		104	99.6	104	70-130	
Lab Batch	#: 3031677	Sample: 566213-015 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 19:26	SU	RROGATE R	RECOVERY	STUDY	
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flage
T 1	1	Analytes				50.100	
o-Terpheny			46.7	50.0	93	70-130	
1-Chlorooc		Semula: 5((2)2.01(/ SMD	94.2	99.9	94 94	70-130	
	#: 3031677	Sample: 566213-016 / SMP	Batch				
Units:	mg/kg	Date Analyzed: 10/26/17 19:47	SU	RROGATE R	RECOVERY	STUDY	
	TPH	by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
				1			
o-Terpheny	1	Analytes	50.1	50.0	100	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	Sample: 566213, ab Batch #: 3031655 Sample: 566213-015 / SM Inits: mg/kg Date Analyzed: 10/26/17 21:37	Batch:	Project ID 1 Matrix				
Units:	mg/kg	Date Analyzed: 10/26/17 21:37	SUR	ROGATE R	RECOVERY	STUDY	
		K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor			0.0266	0.0300	89	80-120	
	orobenzene		0.0275	0.0300	92	80-120	
Lab Batch	#: 3031655	Sample: 566213-011 / SMP	Batch:	1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 21:55	SUR	ROGATE R	RECOVERY	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4-Difluor		Analytes	0.0254	0.0200		00.120	
,	orobenzene			0.0300	85	80-120	
	#: 3031655	Sample: 566213-016 / SMP	0.0254 Batch:	0.0300 1 Matrix	85 85	80-120	
Lab batch Units:	mg/kg	Date Analyzed: 10/26/17 22:14					
omts.	mg/kg	Date Analyzeu. 10/20/17/22.14	SUR	ROGATE R	RECOVERY	STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0285	0.0300	95	80-120	
4-Bromoflu	orobenzene		0.0265	0.0300	88	80-120	
Lab Batch	#: 3031729	Sample: 7633243-1-BLK / B	LK Batch:	1 Matrix	: Solid		
Units:	mg/kg	Date Analyzed: 10/25/17 20:47	SUR	ROGATE R	RECOVERY	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor			0.0292	0.0300	97	80-120	
	orobenzene		0.0348	0.0300	116	80-120	
	#: 3031638	Sample: 7633352-1-BLK / B			: Solid	00 120	
Units:	mg/kg	Date Analyzed: 10/26/17 11:18			RECOVERY	STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0311	0.0300	104	80-120	
4-Bromoflu	orobenzene		0.0346	0.0300	115	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	#: 3031677	Sample: 7633286-1-BLK / 1					
Units:	mg/kg	Date Analyzed: 10/26/17 13:01	SU	RROGATE R	ECOVERY S	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terphenyl			53.3	50.0	107	70-130	
1-Chloroocta			107	100	107	70-130	
Lab Batch #	#: 3031655	Sample: 7633345-1-BLK /]	BLK Bate	h: 1 Matrix	: Solid		
U nits:	mg/kg	Date Analyzed: 10/26/17 15:27	SU	RROGATE R	ECOVERY S	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluoro			0.0288	0.0300	96	80-120	
4-Bromofluc			0.0264	0.0300	88	80-120	
	#: 3031729	Sample: 7633243-1-BKS / 1				00 120	
Units:	mg/kg	Date Analyzed: 10/25/17 18:53		RROGATE R	-	STUDY	
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluoro	benzene		0.0320	0.0300	107	80-120	
4-Bromofluc	orobenzene		0.0333	0.0300	111	80-120	
ab Batch	#: 3031638	Sample: 7633352-1-BKS / 1	BKS Bate	h: 1 Matrix	: Solid		
U nits:	mg/kg	Date Analyzed: 10/26/17 09:43	SU	RROGATE R	ECOVERY S	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluoro			0.0295	0.0300	98	80-120	
4-Bromofluc	orobenzene		0.0351	0.0300	117	80-120	
Lab Batch ;	#: 3031655	Sample: 7633345-1-BKS /]					
U nits:	mg/kg	Date Analyzed: 10/26/17 13:17	SU	RROGATE R	ECOVERY S	STUDY	
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analyta					
1,4-Difluoro		Analytes	0.0279	0.0300	[D] 93	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Lab Batch	#: 3031677	Sample: 7633286-1-BKS / F	BKS Bate	h: 1 Matrix	: Solid				
Units:	mg/kg	Date Analyzed: 10/26/17 13:22	SU	RROGATE R	ECOVERY S	STUDY			
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags		
		Analytes			[D]				
o-Terphenyl			51.9	50.0	104	70-130			
1-Chlorooct	ane		102	100	102	70-130			
Lab Batch	#: 3031729	Sample: 7633243-1-BSD / H	BSD Bate	h: 1 Matrix	: Solid				
Units:	mg/kg	Date Analyzed: 10/25/17 19:15	SU	RROGATE R	ECOVERY S	STUDY			
		A by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags		
1,4-Difluoro			0.0293	0.0300	98	80-120			
4-Bromoflue	orobenzene		0.0348	0.0300	116	80-120			
	#: 3031638	Sample: 7633352-1-BSD / E		h: 1 Matrix	: Solid				
Units:	mg/kg	Date Analyzed: 10/26/17 10:01	SURROGATE RECOVERY STUDY						
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage		
		Analytes			[D]				
1,4-Difluoro	benzene		0.0302	0.0300	101	80-120			
4-Bromoflue	orobenzene		0.0354	0.0300	118	80-120			
Lab Batch	#: 3031655	Sample: 7633345-1-BSD / E	BSD Bate	h: 1 Matrix	: Solid				
Units:	mg/kg	Date Analyzed: 10/26/17 13:36	SU	RROGATE R	ECOVERY S	STUDY			
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags		
1,4-Difluoro			0.0288	0.0300	96	80-120			
4-Bromoflue			0.0294	0.0300	98	80-120			
	#: 3031677	Sample: 7633286-1-BSD / F				00 120			
Units:	mg/kg	Date Analyzed: 10/26/17 13:42		RROGATE R		STUDY			
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage		
		Analytes			[D]				
o-Terphenyl			50.1	50.0	100	70-130			
1-Chlorooct	ane		108	100	108	70-130			

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	:ders : 5 66213 #: 3031729	3, Sample: 566215-001 S / MS	Batch:	Project ID 1 Matrix			
Units:	mg/kg	Date Analyzed: 10/25/17 19:33	SUR	ROGATE R	RECOVERY	STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluoro	obenzene		0.0319	0.0300	106	80-120	
4-Bromoflu	orobenzene		0.0350	0.0300	117	80-120	
Lab Batch	#: 3031638	Sample: 566321-001 S / MS	Batch:	1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/26/17 10:19	SUR	ROGATE R	RECOVERY	STUDY	
	BTEX	A polytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4 D'flere	- 1	Analytes	0.0252	0.0200		00.100	
1,4-Difluoro 4-Bromoflu			0.0352	0.0300	117	80-120	
		G 1 577221 002 5 / M5	0.0352	0.0300	117	80-120	
	#: 3031655	Sample: 566321-002 S / MS	Batch:				
Units:	mg/kg	Date Analyzed: 10/26/17 13:55	SUR	ROGATE R	RECOVERY	STUDY	
	BTEX	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluoro	obenzene		0.0283	0.0300	94	80-120	
4-Bromoflu	orobenzene		0.0318	0.0300	106	80-120	
Lab Batch	#: 3031677	Sample: 566213-002 S / MS	Batch:	1 Matrix	c: Soil	1	
Units:	mg/kg	Date Analyzed: 10/26/17 14:41	SUR	ROGATE R	RECOVERY	STUDY	
		by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl			49.3	50.0	99	70-130	
1-Chlorooct			95.1	99.9	95	70-130	
	#: 3031729	Sample: 566215-001 SD / MS					
Units:	mg/kg	Date Analyzed: 10/25/17 19:52	SUR	ROGATE R	RECOVERY	STUDY	
		X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flage
1,4-Difluoro			0.0284	0.0300	95	80-120	
4-Bromoflue			0.0351	0.0300	117	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	rders : 56621 #: 3031638	3, Sample: 566321-001 SD / M	MSD Bate	Project ID h: 1 Matrix			
Units:	mg/kg	Date Analyzed: 10/26/17 10:37	SU	JRROGATE R	ECOVERY	STUDY	
	BTE	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor	obenzene		0.0336	0.0300	112	80-120	
4-Bromoflu	orobenzene		0.0356	0.0300	119	80-120	
Lab Batch	#: 3031655	Sample: 566321-002 SD / M	MSD Bate	h: 1 Matrix	: Soil	1	
Units:	mg/kg	Date Analyzed: 10/26/17 14:13	SU	JRROGATE R	ECOVERY	STUDY	
	BTEX	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor	obenzene	•	0.0337	0.0300	112	80-120	
4-Bromoflu	orobenzene		0.0355	0.0300	118	80-120	
Lab Batch	#: 3031677	Sample: 566213-002 SD / M	MSD Bate	h: 1 Matrix	: Soil	1	
Units:	mg/kg	Date Analyzed: 10/26/17 15:01	SU	JRROGATE R	ECOVERY	STUDY	
	TPH	I by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terpheny	1		49.0	50.0	98	70-130	
1-Chlorooc	tane		107	99.9	107	70-130	

* Surrogate outside of Laboratory QC limits

- ** Surrogates outside limits; data and surrogates confirmed by reanalysis
- *** Poor recoveries due to dilution
- Surrogate Recovery [D] = 100 * A / B



BS / BSD Recoveries



Project Name: BC Federal #32

Work Order #: 566213	213 Project ID: Date Prepared: 10/25/2017 Date Analyzed: 10/25/201										
Analyst: ALJ	D	ate Prepar	red: 10/25/202	17			Date A	nalyzed:	10/25/2017		
Lab Batch ID: 3031729 Sample: 7633243-1-	BKS	Bate	h #: 1					Matrix:	Solid		
Units: mg/kg		BLAN	K /BLANK	SPIKE / 1	BLANK	SPIKE DUP	LICATE	RECOV	ERY STUI	ЭY	
BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.101	0.0851	84	0.100	0.0900	90	6	70-130	35	
Toluene	<0.00201	0.101	0.0939	93	0.100	0.0954	95	2	70-130	35	
Ethylbenzene	< 0.00201	0.101	0.0952	94	0.100	0.0971	97	2	71-129	35	
m,p-Xylenes	< 0.00402	0.201	0.187	93	0.200	0.190	95	2	70-135	35	
o-Xylene	< 0.00201	0.101	0.0926	92	0.100	0.0946	95	2	71-133	35	
Analyst: ALJ	D	ate Prepar	red: 10/26/202	17			Date A	nalyzed:	10/26/2017		
Lab Batch ID: 3031655 Sample: 7633345-1-	BKS	Batc	h #: 1					Matrix:	Solid		
Units: mg/kg	<0.00201 0.101 0.0926 92 0.100 0.0946 95 2 71-133 35 Date Prepared: 10/26/2017 Date Analyzed: 10/26/2017										
BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0958	96	0.0998	0.0867	87	10	70-130	35	
Toluene	< 0.00200	0.100	0.101	101	0.0998	0.0908	91	11	70-130	35	
Ethylbenzene	< 0.00200	0.100	0.110	110	0.0998	0.0997	100	10	71-129	35	
m,p-Xylenes	< 0.00401	0.200	0.216	108	0.200	0.196	98	10	70-135	35	
o-Xylene	< 0.00200	0.100	0.108	108	0.0998	0.0977	98	10	71-133	35	

Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100^{*}(C)/[B]$ Blank Spike Duplicate Recovery [G] = $100^{*}(F)/[E]$ All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: BC Federal #32

Work Order #: 566213							Pro	ject ID:			
Analyst: ALJ	Ι	Date Prepa	red: 10/26/20	17			Date A	nalyzed:	10/26/2017		
Lab Batch ID: 3031638	Sample: 7633352-1-BKS	Batc	h #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K /BLANK	SPIKE / I	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	ЭY	
BTEX by EPA 802	21B Blank Sample Result [A]	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Duplicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes		[B]	[C]	[D]	[E]	Result [F]	[G]				
Benzene	<0.00202	0.101	0.0831	82	0.100	0.0804	80	3	70-130	35	
Toluene	<0.00202	0.101	0.0941	93	0.100	0.0894	89	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0997	99	0.100	0.0943	94	6	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.196	97	0.200	0.185	93	6	70-135	35	
o-Xylene	<0.00202	0.101	0.0958	95	0.100	0.0907	91	5	71-133	35	
Analyst: MNV	Ι	Date Prepa	red: 10/25/20	17	•		Date A	nalyzed:	10/25/2017	+	
Lab Batch ID: 3031397	Sample: 7633169-1-BKS	Batc	h #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K /BLANK	SPIKE / 1	BLANK	SPIKE DUP	LICATE	RECOV	ERY STUI	ЭY	
Chloride by EPA Analytes	300 Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	244	98	250	243	97	0	90-110	20	

Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100^{*}(C)/[B]$ Blank Spike Duplicate Recovery [G] = $100^{*}(F)/[E]$ All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: BC Federal #32

Work Order	#: 566213	Project ID:											
Analyst:	ARM	Da	ate Prepar	red: 10/26/201	7	Date Analyzed: 10/26/2017							
Lab Batch ID:	: 3031677 Sample: 7633286-1	-BKS							Matrix: S	Solid			
Units:	mg/kg	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY Blank Spike Blank Blank											
	TPH by Texas1005		Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Duplicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag	
Analy	tes		[B]	[C]	[D]	[E]	Result [F]	[G]					
C6-C12 R	ange Hydrocarbons	<25.0	1000	956	96	1000	974	97	2	75-125	25		
C12-C28 I	Range Hydrocarbons	<25.0	1000	1010	101	1000	1020	102	1	75-125	25		

Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100^{*}(C)/[B]$ Blank Spike Duplicate Recovery [G] = $100^{*}(F)/[E]$ All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



Work Order # : 566213	Project ID:										
Lab Batch ID: 3031638	QC- Sample ID:	566321	-001 S	Ba	tch #:	1 Matrix	k: Soil				
Date Analyzed: 10/26/2017	Date Prepared:	10/26/2	017	Ar	alyst: A	ALJ					
Reporting Units: mg/kg		Μ	IATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
BTEX by EPA 8021B	Parent Sample Result	Spike Added	Spiked Sample Result [C]	Spiked Sample %R	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[A]	[B]		[D]	[E]		[G]				
Benzene	< 0.00199	0.0996	0.118	118	0.0992	0.117	118	1	70-130	35	
Toluene	0.00315	0.0996	0.112	109	0.0992	0.103	101	8	70-130	35	
Ethylbenzene	< 0.00199	0.0996	0.0959	96	0.0992	0.0847	85	12	71-129	35	
m,p-Xylenes	< 0.00398	0.199	0.190	95	0.198	0.167	84	13	70-135	35	
o-Xylene	< 0.00199	0.0996	0.0904	91	0.0992	0.0786	79	14	71-133	35	
Lab Batch ID: 3031655	QC- Sample ID:	566321	-002 S	Ba	tch #:	1 Matrix	k: Soil				
Date Analyzed: 10/26/2017	Date Prepared:	10/26/2	017	Ar	alyst: A	ALJ					
Reporting Units: mg/kg		Μ	IATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	0.00211	0.100	0.111	109	0.101	0.113	110	2	70-130	35	
Toluene	0.00542	0.100	0.0991	94	0.101	0.0928	87	7	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0881	88	0.101	0.0768	76	14	71-129	35	
m,p-Xylenes	< 0.00402	0.201	0.176	88	0.202	0.152	75	15	70-135	35	
o-Xylene	< 0.00201	0.100	0.0847	85	0.101	0.0753	75	12	71-133	35	

Matrix Spike Percent Recovery $[D] = 100^{*}(C-A)/B$ Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



Work Order # : 566213						Project II) :				
Lab Batch ID: 3031729	QC- Sample ID:	566215	-001 S	Ba	tch #:	1 Matrix	x: Soil				
Date Analyzed: 10/25/2017	Date Prepared:	10/25/2	017	An	alyst: A	ALJ					
Reporting Units: mg/kg		N	IATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
BTEX by EPA 8021B	Parent Sample Result	Spike Added	Spiked Sample Result [C]	Spiked Sample %R	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[A]	[B]		[D]	[E]		[G]				
Benzene	<0.00202	0.101	0.112	111	0.100	0.113	113	1	70-130	35	
Toluene	<0.00202	0.101	0.109	108	0.100	0.111	111	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.102	101	0.100	0.102	102	0	71-129	35	
m,p-Xylenes	< 0.00404	0.202	0.202	100	0.201	0.203	101	0	70-135	35	
o-Xylene	< 0.00202	0.101	0.0950	94	0.100	0.0959	96	1	71-133	35	
Lab Batch ID: 3031397	QC- Sample ID:	565635	-008 S	Ba	tch #:	1 Matrix	x: Soil				
Date Analyzed: 10/25/2017	Date Prepared:	10/25/2	017	An	alyst: N	MNV					
Reporting Units: mg/kg		Ν	IATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
Chloride by EPA 300	Parent Sample Result	Spike Added	Spiked Sample Result	Sample	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[A]	Added [B]	[C]	%R [D]	E]	Kesuit [F]	%K [G]	70	%0K	%KPD	
Chloride	5650	245	5680	12	245	5660	4	0	90-110	20	X
Lab Batch ID: 3031397	QC- Sample ID:	566213	-009 S	Ba	tch #:	1 Matrix	x: Soil	-	·	-	
Date Analyzed: 10/25/2017	Date Prepared:	10/25/2	017	An	alyst: N	MNV					
Reporting Units: mg/kg		N	IATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
			Spiked Sample	Spiked		Duplicate	Spiked		Control	Control	_
Chloride by EPA 300	Parent Sample Result	Spike	Result	Sample %R	Spike	Spiked Sample		RPD %	Limits %R	Limits % RPD	Flag
Chloride by EPA 300 Analytes		Spike Added [B]		Sample %R [D]	Spike Added [E]	Spiked Sample Result [F]	Dup. %R [G]	RPD %	Limits %R	Limits %RPD	Flag

Matrix Spike Percent Recovery [D] = 100*(C-A)/BRelative Percent Difference RPD = 200*|(C-F)/(C+F)| Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



	Work Order # :	566213 Project ID:											
	Lab Batch ID:	3031677 Q	C- Sample ID:	566213-	-002 S	Ba	tch #:	1 Matri	x: Soil				
	Date Analyzed:	10/26/2017	Date Prepared:		10/26/2017		alyst: A	ARM					
	Reporting Units:	mg/kg	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY										
		TPH by Texas1005	Parent Sample	Spike	Spiked Sample Result	Sample	Spike	Duplicate Spiked Sample	-	RPD	Control Limits	Control Limits	Flag
		Analytes	Result [A]	Added [B]	[C]	%R [D]	Added [E]	Result [F]	%R [G]	%	%R	%RPD	
	C6-C12 Range Hydrocarbons		<25.0	999	917	92	999	970	97	6	75-125	25	
	C12-C28 Range	Hydrocarbons	<25.0	999	998	100	999	1040	104	4	75-125	25	

Matrix Spike Percent Recovery $[D] = 100^{*}(C-A)/B$ Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.
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Biblioteck@controls.com Previous for \$7334473 Invite of Collection Invite of Collection Number of preserved bottes Description	Company Address: 2407 Pecos Ave. Artesia NM 88210		Project Loc	cation:			-		-	k										
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San Antonio, Texas (210-509-3334)

Phoenix, Arizona (480-355-0900)

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Client / Reporting Information			Project In	Project Information						-	An	Analytical Information	rmation				Matrix Codes
Company Name / Branch: COG Operating, LLC		Project Name/Number:	ber: R	1		432				-	_	_					W = Water
Company Address: 2407 Pecos Ave. Artesia NM 88210		Project Location:	VI	- DI CAN	1	100				-							S = Soil/Sed/Solid GW =Ground Water DW = Drinking Water
Email: <u>shitchcock@concho.com</u> Phone No: 575-703 dneel2@concho.com; alieb@concho.com; rhaskell@concho.com	-6475	Invoice To: CO	COG Operating, LLC Attn: Robert McNeill	ig, LLC								_	_				P = Product SW = Surface water SL = Sludge
Project Contact: Sheldon Hitchcock	-	1	Midland Tx, 79701	701						U		_	-				OW =Ocean/Sea Water WI = Wipe
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ALL NO



XENCO Laboratories Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating, LLC Acceptable Temperature Range: 0 - 6 degC Air and Metal samples Acceptable Range: Ambient Date/ Time Received: 10/19/2017 11:45:00 AM Temperature Measuring device used : R8 Work Order #: 566213 Comments Sample Receipt Checklist 13.2 #1 *Temperature of cooler(s)? #2 *Shipping container in good condition? Yes #3 *Samples received on ice? Yes #4 *Custody Seals intact on shipping container/ cooler? N/A #5 Custody Seals intact on sample bottles? N/A #6*Custody Seals Signed and dated? N/A #7 *Chain of Custody present? Yes #8 Any missing/extra samples? No #9 Chain of Custody signed when relinquished/ received? Yes #10 Chain of Custody agrees with sample labels/matrix? Yes #11 Container label(s) legible and intact? Yes #12 Samples in proper container/ bottle? Yes #13 Samples properly preserved? Yes #14 Sample container(s) intact? Yes #15 Sufficient sample amount for indicated test(s)? Yes #16 All samples received within hold time? Yes #17 Subcontract of sample(s)? No #18 Water VOC samples have zero headspace? N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Date: 10/23/2017

Checklist completed by: Connie Hernandez Checklist reviewed by: Kelsey Brooks

Date: 10/23/2017

Analytical Report 566215

for COG Operating, LLC

Project Manager: Sheldon Hitchcock

BC Federal #32

30-OCT-17

Collected By: Client





1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122): Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054) Oklahoma (2017-142)

> Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12) Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16) Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13) Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3) Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757) Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



30-OCT-17



Project Manager: **Sheldon Hitchcock COG Operating, LLC** 600 W Illinois Midland, TX 79701

Reference: XENCO Report No(s): 566215 BC Federal #32 Project Address:

Sheldon Hitchcock:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 566215. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 566215 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Huns hoah

Kelsey Brooks Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994. Certified and approved by numerous States and Agencies. A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 566215



COG Operating, LLC, Midland, TX

BC Federal #32

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
N. Surface	S	10-16-17 11:00	0	566215-001
N. 1'	S	10-16-17 11:00	1	566215-002
S. Surface	S	10-16-17 11:00	0	566215-003
S. 1'	S	10-16-17 11:00	1	566215-004
E. Surface	S	10-16-17 11:00	0	566215-005
E. 1'	S	10-16-17 11:00	1	566215-006
W. Surface	S	10-16-17 11:00	0	566215-007
W. 1'	S	10-16-17 11:00	1	566215-008



Client Name: COG Operating, LLC Project Name: BC Federal #32

Project ID: Work Order Number(s): 566215 Report Date: *30-OCT-17* Date Received: *10/19/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments: Batch: LBA-3031729 BTEX by EPA 8021B Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



 Project Id:
 Sheldon Hitchcock

Project Location:

Certificate of Analysis Summary 566215

COG Operating, LLC, Midland, TX Project Name: BC Federal #32



Date Received in Lab:Thu Oct-19-17 11:45 amReport Date:30-OCT-17Project Manager:Kelsey Brooks

	Lab Id:	566215-0	001	566215-0	002	566215-0	003	566215-	004	566215-	005	566215-	006
Analysis Requested	Field Id:	N. Surfa	ice	N. 1'		S. Surfa	ce	S. 1'		E. Surfa	ace	E. 1'	
Απαιγείε Κεγμεείεα	Depth:	0-		1-		0-		1-		0-		1-	
	Matrix:	SOIL		SOIL		SOIL		SOIL	,	SOIL		SOIL	
	Sampled:	Oct-16-17	11:00	Oct-16-17	11:00	Oct-16-17	11:00	Oct-16-17	11:00	Oct-16-17	11:00	Oct-16-17	11:00
BTEX by EPA 8021B	Extracted:	Oct-25-17	14:00	Oct-25-17	14:00	Oct-25-17	14:00	Oct-25-17	14:00	Oct-25-17	14:00	Oct-25-17	14:00
	Analyzed:	Oct-25-17	21:07	Oct-25-17	21:25	Oct-25-17	21:44	Oct-25-17	22:09	Oct-25-17	22:29	Oct-25-17	22:50
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
Toluene		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
Ethylbenzene		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
m,p-Xylenes		< 0.00398	0.00398	< 0.00401	0.00401	<0.00399	0.00399	< 0.00397	0.00397	< 0.00402	0.00402	< 0.00404	0.00404
o-Xylene		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
Total Xylenes		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
Total BTEX		< 0.00199	0.00199	< 0.00200	0.00200	< 0.00200	0.00200	< 0.00198	0.00198	< 0.00201	0.00201	< 0.00202	0.00202
Chloride by EPA 300	Extracted:	Oct-25-17 (09:00	Oct-25-17	11:00								
	Analyzed:	Oct-25-17	22:09	Oct-25-17	22:50	Oct-25-17	23:10	Oct-26-17	00:45	Oct-26-17	00:52	Oct-26-17	01:12
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.90	4.90	5.80	4.96	19.9	4.96	56.8	4.97	<4.98	4.98	35.5	4.92
TPH by Texas1005	Extracted:	Oct-24-17	16:00	Oct-24-17	16:00	Oct-24-17	16:00	Oct-24-17	16:00	Oct-24-17	16:00	Oct-24-17	16:00
	Analyzed:	Oct-25-17 (02:17	Oct-25-17	02:39	Oct-25-17	03:39	Oct-25-17	03:59	Oct-25-17	04:19	Oct-25-17	04:39
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0
C12-C28 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	103	24.9	<25.0	25.0
C28-C35 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	37.3	24.9	<25.0	25.0
Total TPH		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	140	24.9	<25.0	25.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Huns Boah

Kelsey Brooks Project Manager



 Project Id:
 Sheldon Hitchcock

Project Location:

Certificate of Analysis Summary 566215

COG Operating, LLC, Midland, TX Project Name: BC Federal #32



Date Received in Lab:Thu Oct-19-17 11:45 amReport Date:30-OCT-17Project Manager:Kelsey Brooks

	Lab Id:	566215-007	566215-008		
Analysis Requested	Field Id:	W. Surface	W. 1'		
<i>11</i>	Depth:	0-	1-		
	Matrix:	SOIL	SOIL		
	Sampled:	Oct-16-17 11:00	Oct-16-17 11:00		
BTEX by EPA 8021B	Extracted:	Oct-25-17 14:00	Oct-25-17 14:00		
	Analyzed:	Oct-25-17 23:09	Oct-25-17 23:28		
	Units/RL:	mg/kg RL	mg/kg RL		
Benzene		<0.00202 0.00202	<0.00199 0.00199		
Toluene		<0.00202 0.00202	<0.00199 0.00199		
Ethylbenzene		<0.00202 0.00202	<0.00199 0.00199		
m,p-Xylenes		<0.00403 0.00403	<0.00398 0.00398		
o-Xylene		<0.00202 0.00202	<0.00199 0.00199		
Total Xylenes		<0.00202 0.00202	<0.00199 0.00199		
Total BTEX		<0.00202 0.00202	<0.00199 0.00199		
Chloride by EPA 300	Extracted:	Oct-25-17 11:00	Oct-25-17 11:00		
	Analyzed:	Oct-26-17 01:19	Oct-26-17 01:26		
	Units/RL:	mg/kg RL	mg/kg RL		
Chloride		<4.98 4.98	<5.00 5.00		
TPH by Texas1005	Extracted:	Oct-26-17 08:00	Oct-26-17 08:00		
	Analyzed:	Oct-26-17 20:08	Oct-26-17 20:28		
	Units/RL:	mg/kg RL	mg/kg RL		
C6-C12 Range Hydrocarbons		<25.0 25.0	<24.9 24.9		
C12-C28 Range Hydrocarbons		<25.0 25.0	<24.9 24.9		
C28-C35 Range Hydrocarbons		<25.0 25.0	<24.9 24.9		
Total TPH		<25.0 25.0	<24.9 24.9		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Huns Boah

Kelsey Brooks Project Manager



Flagging Criteria



- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- **F** RPD exceeded lab control limits.
- J The target analyte was positively identified below the quantitation limit and above the detection limit.
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- **H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- **K** Sample analyzed outside of recommended hold time.
- JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.
- ** Surrogate recovered outside laboratory control limit.
- **BRL** Below Reporting Limit.
- RL Reporting Limit

MDL Method Detection Limit	SDL Sample Detection Limit	LOD Limit of Detection
PQL Practical Quantitation Limit	MQL Method Quantitation Limit	LOQ Limit of Quantitation

- **DL** Method Detection Limit
- NC Non-Calculable
- + NELAC certification not offered for this compound.
- * (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr Suite 102, Tempe AZ 85282	(602) 437-0330	



Project Name: BC Federal #32

	ders : 5 6621: #: 3031320	5, Sample: 566215-001 / SMP	Batcl	Project II h: 1 Matr	D: ix: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 02:17	SU	RROGATE	RECOVERYS	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny			50.5	49.9	101	70-130	
1-Chlorooct	ane		109	99.8	109	70-130	
Lab Batch	#: 3031320	Sample: 566215-002 / SMP	Batcl	h: 1 Matr	ix: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 02:39	SU	RROGATE	RECOVERYS	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
		Analytes					1
o-Terpheny			45.0	49.9	90	70-130	
1-Chlorooct			101	99.8	101	70-130	
	#: 3031320	Sample: 566215-003 / SMP	Batc		ix: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 03:39	SU	RROGATE	RECOVERY	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny			47.4	50.0	95	70-130	
1-Chlorooct	ane		97.8	100	98	70-130	
Lab Batch	#: 3031320	Sample: 566215-004 / SMP	Batcl	h: 1 Matr	ix: Soil		I
Units:	mg/kg	Date Analyzed: 10/25/17 03:59	SU	RROGATE	RECOVERY	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny			50.8	50.0	102	70-130	
1-Chlorooct	ane		109	99.9	109	70-130	
Lab Batch	#: 3031320	Sample: 566215-005 / SMP	Batcl	h: 1 Matri	ix: Soil	1	1
Units:	mg/kg	Date Analyzed: 10/25/17 04:19	SU	RROGATE	RECOVERYS	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny			48.0	49.9	96	70-130	
1-Chlorooct	ane		103	99.7	103	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	#: 3031320	Sample: 566215-006 / SMP	Batc	h: 1 Matrix	. 501		
Units:	mg/kg	Date Analyzed: 10/25/17 04:39	SU	RROGATE R	ECOVERY S	STUDY	
	ТРН	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terpheny	1		44.7	49.9	90	70-130	
1-Chlorooc	tane		95.1	99.8	95	70-130	
Lab Batch	#: 3031729	Sample: 566215-001 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 21:07	SU	RROGATE R	ECOVERY S	STUDY	
		A polytos	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor		Analytes	0.0321	0.0200		80.120	
4-Bromoflu			0.0321	0.0300	107	80-120	
	#: 3031729	Sample: 566215-002 / SMP	Bate		_	80-120	
Lab Batch Units:	mg/kg	Date Analyzed: 10/25/17 21:25					
Units:	iiig/Kg	Date Analyzeu: 10/23/17/21.23	SU	RROGATE R	ECOVERY	STUDY	
	BTEX	5 by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor	obenzene		0.0329	0.0300	110	80-120	
4-Bromoflu	orobenzene		0.0359	0.0300	120	80-120	
Lab Batch	#: 3031729	Sample: 566215-003 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 21:44	SU	RROGATE R	ECOVERY S	STUDY	
		A by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor			0.0296	0.0300	99	80-120	
4-Bromoflu			0.0356	0.0300	119	80-120	
	#: 3031729	Sample: 566215-004 / SMP	Batc				
Units:	mg/kg	Date Analyzed: 10/25/17 22:09		RROGATE R		STUDY	
	BTEX	C by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
1,4-Difluor	obenzene		0.0290	0.0300	97	80-120	
4-Bromoflu	orobenzene		0.0354	0.0300	118	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Units:	mg/kg	Date Analyzed: 10/25/17 22:29	SI	RROGATE R	ECOVERV	STUDY	
		L by EPA 8021B	Amount Found	True Amount	Recovery %R	Control Limits %R	Flags
		Analytes	[A]	[B]	[D]	70K	
1,4-Difluor	obenzene		0.0284	0.0300	95	80-120	
4-Bromoflu	orobenzene		0.0355	0.0300	118	80-120	
Lab Batch	#: 3031729	Sample: 566215-006 / SMP	Batc	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 22:50	SU	RROGATE R	ECOVERY	STUDY	
		A by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor		Anarytes	0.0291	0.0300	97	80-120	
4-Bromoflu			0.0291	0.0300	112	80-120	
	#: 3031729	Sample: 566215-007 / SMP	Batc			80-120	
Units:	mg/kg	Date Analyzed: 10/25/17 23:09		RROGATE R		TUDV	
c must	8		50	KNOGATE N			
		L by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor			0.0316	0.0300	105	80-120	
	orobenzene		0.0348	0.0300	116	80-120	
	#: 3031729	Sample: 566215-008 / SMP	Batc				
Units:	mg/kg	Date Analyzed: 10/25/17 23:28	SU	RROGATE R	ECOVERY S	STUDY	
		L by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4-Difluor		Anaryus	0.0274	0.0300	91	80-120	
4-Bromoflu			0.0274	0.0300	111	80-120	
	#: 3031677	Sample: 566215-007 / SMP	Bate			00 120	
Units:	mg/kg	Date Analyzed: 10/26/17 20:08		RROGATE R		STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terpheny			50.1	50.0	100	70-130	
1-Chlorooc	ane		102	100	102	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Lab Batch #:		Sample: 566215-008 / SMP	Batcl				
Units:	mg/kg	Date Analyzed: 10/26/17 20:28	SU	RROGATE R	ECOVERY S	STUDY	
	TPH	by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flag
		Analytes			[D]		
o-Terphenyl			45.6	49.9	91	70-130	
1-Chlorooctane	e		93.6	99.7	94	70-130	
Lab Batch #:	3031320	Sample: 7633149-1-BLK / E	BLK Bate	h: 1 Matrix	: Solid		
Units:	mg/kg	Date Analyzed: 10/24/17 21:50	SU	RROGATE R	ECOVERY S	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o Tombonyi		Analytes	55.6	50.0		70.120	
o-Terphenyl 1-Chlorooctane			55.6	50.0	111	70-130	
Lab Batch #:		Sample: 7633243-1-BLK / E	119 BLK Batcl	100 h: 1 Matrix	119	70-130	
		-					
Units:	mg/kg	Date Analyzed: 10/25/17 20:47	SU	RROGATE R	ECOVERY S	STUDY	
	BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes	[]		[D]	,	
1,4-Difluorobe	nzene		0.0292	0.0300	97	80-120	
4-Bromofluoro	benzene		0.0348	0.0300	116	80-120	
Lab Batch #:	3031677	Sample: 7633286-1-BLK / E	BLK Bate	h: 1 Matrix	: Solid		1
Units:	mg/kg	Date Analyzed: 10/26/17 13:01	SU	RROGATE R	ECOVERY S	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
r		Analytes			[D]		
o-Terphenyl			53.3	50.0	107	70-130	
1-Chlorooctane		~	107	100	107	70-130	
Lab Batch #:		Sample: 7633149-1-BKS / E					
Units:	mg/kg	Date Analyzed: 10/24/17 22:11	SU	RROGATE R	ECOVERY S	STUDY	
		by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terphenyl			48.9	50.0	98	70-130	
1-Chlorooctane	_		103	100	103	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	rders : 56621 #: 3031729	5, Sample: 7633243-1-BK	S / BKS Batcl	Project ID			
Units:	mg/kg	Date Analyzed: 10/25/17 18:53	SU	RROGATE R	RECOVERY	STUDY	
	BTE	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flag
		Analytes			[D]		
1,4-Difluor	obenzene		0.0320	0.0300	107	80-120	
4-Bromoflu	orobenzene		0.0333	0.0300	111	80-120	
Lab Batch	#: 3031677	Sample: 7633286-1-BK	S / BKS Batcl	h: 1 Matrix	: Solid		
Units:	mg/kg	Date Analyzed: 10/26/17 13:22	SU	RROGATE R	RECOVERY	STUDY	
	TPE	I by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flage
	,	Analytes					
o-Terpheny			51.9	50.0	104	70-130	
1-Chlorooc			102	100	102	70-130	
	#: 3031320	Sample: 7633149-1-BS			: Solid		
Units:	mg/kg	Date Analyzed: 10/24/17 22:31	SU	RROGATE R	RECOVERY	STUDY	
	TPE	I by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terpheny	/1		46.2	50.0	92	70-130	
1-Chlorooc	tane		101	100	101	70-130	
Lab Batch	#: 3031729	Sample: 7633243-1-BS	D / BSD Batcl	h: 1 Matrix	: Solid	<u> </u>	
Units:	mg/kg	Date Analyzed: 10/25/17 19:15	SU	RROGATE R	RECOVERY	STUDY	
	BTE	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor	obenzene		0.0293	0.0300	98	80-120	
·	orobenzene		0.0293	0.0300	98	80-120	
	#: 3031677	Sample: 7633286-1-BS			: Solid	00-120	
Units:	mg/kg	Date Analyzed: 10/26/17 13:42		RROGATE R		STUDY	
	TPH	I by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flage
		Analytes			[D]		
o-Terpheny	rl		50.1	50.0	100	70-130	
1-Chlorooc	tane		108	100	108	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

	rders : 56621: #: 3031320	5, Sample: 566212-001 S / MS	6 Batcl	Project ID h: 1 Matrix			
Units:	mg/kg	Date Analyzed: 10/24/17 23:15	SU	RROGATE R	ECOVERY S	STUDY	
		l by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny	1		48.0	50.0	96	70-130	
1-Chlorooct	tane		102	99.9	102	70-130	
Lab Batch	#: 3031729	Sample: 566215-001 S / MS	B Batcl	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/25/17 19:33	SU	RROGATE R	ECOVERY	STUDY	
		K by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluor		Analytes	0.0319	0.0300	106	80-120	
4-Bromoflu			0.0319	0.0300	117	80-120	
	#: 3031677	Sample: 566213-002 S / MS				80-120	
Units:	mg/kg	Date Analyzed: 10/26/17 14:41		RROGATE R		TUDV	
		2	50				
	ТРН	l by Texas1005	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
o-Terpheny	1		49.3	50.0	99	70-130	
1-Chlorooct	tane		95.1	99.9	95	70-130	
Lab Batch	#: 3031320	Sample: 566212-001 SD / N	ISD Batcl	h: 1 Matrix	: Soil		
Units:	mg/kg	Date Analyzed: 10/24/17 23:35	SU	RROGATE R	ECOVERY	STUDY	
		l by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terpheny		Anarytes	47.4	40.0		70.120	
1-Chlorooct			99.5	49.9 99.8	95	70-130 70-130	
	#: 3031729	Sample: 566215-001 SD / N				70-130	
Units:	mg/kg	Date Analyzed: 10/25/17 19:52		RROGATE R		STUDY	
		X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
		Analytes			[D]		
1,4-Difluor			0.0284	0.0300	95	80-120	
4-Bromoflu	orobenzene		0.0351	0.0300	117	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



Project Name: BC Federal #32

Lab Batch	rders : 56621 #: 3031677	Sample: 566213-002 SD / N	MSD Batcl	Project ID: n: 1 Matrix:			
Units:	mg/kg	Date Analyzed: 10/26/17 15:01	SU	RROGATE RI	ECOVERY	STUDY	
	TPH	l by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terpheny	n	•	49.0	50.0	98	70-130	
1-Chlorooc	tane		107	99.9	107	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B



BS / BSD Recoveries



Project Name: BC Federal #32

Work Order #: 566215							Proj	ject ID:			
Analyst: ALJ	D	ate Prepar	red: 10/25/20	17			Date A	nalyzed:	10/25/2017		
Lab Batch ID: 3031729 Sample: 7633243-1-	BKS	Batcl	h #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K /BLANK	SPIKE /]	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	DY	
BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes		[D]			[E]	Kesuit [F]	[6]				
Benzene	< 0.00201	0.101	0.0851	84	0.100	0.0900	90	6	70-130	35	
Toluene	< 0.00201	0.101	0.0939	93	0.100	0.0954	95	2	70-130	35	
Ethylbenzene	< 0.00201	0.101	0.0952	94	0.100	0.0971	97	2	71-129	35	
m,p-Xylenes	< 0.00402	0.201	0.187	93	0.200	0.190	95	2	70-135	35	
o-Xylene	< 0.00201	0.101	0.0926	92	0.100	0.0946	95	2	71-133	35	
Analyst: MNV	D	ate Prepar	red: 10/25/20	17			Date A	nalyzed:	10/25/2017	•	
Lab Batch ID: 3031397 Sample: 7633169-1-	BKS	Batcl	h #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K/BLANK	SPIKE /]	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	DY	
Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	244	98	250	243	97	0	90-110	20	

Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100^{*}(C)/[B]$ Blank Spike Duplicate Recovery [G] = $100^{*}(F)/[E]$ All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: BC Federal #32

Work Order #: 566215							Proj	ect ID:			
Analyst: MNV	D	ate Prepar	ed: 10/25/201	7			Date A	nalyzed:	10/25/2017		
Lab Batch ID: 3031539 Sample: 7633172-1	-BKS	Batch	n #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K/BLANK S	SPIKE /]	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	DY	
Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	246	98	1	90-110	20	
Analyst: ARM	D	ate Prepar	ed: 10/24/201	.7	ł	1	Date A	nalyzed:	10/24/2017	ł	ļ
Lab Batch ID: 3031320 Sample: 7633149-1	-BKS	Batch	n#: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K/BLANK	SPIKE / 1	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	DY	
TPH by Texas1005	Blank Sample Result [A]	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Duplicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes		[B]	[C]	[D]	[E]	Result [F]	[G]				
C6-C12 Range Hydrocarbons	<25.0	1000	939	94	1000	925	93	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1060	106	5	75-125	25	
Analyst: ARM	D	ate Prepar	ed: 10/26/201	7			Date A	nalyzed:	10/26/2017		
Lab Batch ID: 3031677 Sample: 7633286-1	-BKS	Batch	n #: 1					Matrix: S	Solid		
Units: mg/kg		BLAN	K/BLANK S	SPIKE /]	BLANK S	SPIKE DUP	LICATE	RECOV	ERY STUI	DY	
TPH by Texas1005 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Range Hydrocarbons	<25.0	1000	956	96	1000	974	97	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1020	102	1	75-125	25	

Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100^{*}(C)/[B]$ Blank Spike Duplicate Recovery [G] = $100^{*}(F)/[E]$ All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



Work Order # : 566215						Project II) :				
Lab Batch ID: 3031729	QC- Sample ID:	566215	-001 S	Ba	tch #:	1 Matri	x: Soil				
Date Analyzed: 10/25/2017	Date Prepared:	10/25/2	017	An	alyst: A	ALJ					
Reporting Units: mg/kg		N	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
BTEX by EPA 8021B	Parent Sample Result	Spike Added	Spiked Sample Result [C]	Sample %R	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[A]	[B]		[D]	[E]		[G]				
Benzene	<0.00202	0.101	0.112	111	0.100	0.113	113	1	70-130	35	
Toluene	<0.00202	0.101	0.109	108	0.100	0.111	111	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.102	101	0.100	0.102	102	0	71-129	35	
m,p-Xylenes	< 0.00404	0.202	0.202	100	0.201	0.203	101	0	70-135	35	
o-Xylene	< 0.00202	0.101	0.0950	94	0.100	0.0959	96	1	71-133	35	
Lab Batch ID: 3031397	QC- Sample ID:	565635	-008 S	Ba	tch #:	1 Matrix	x: Soil				
Date Analyzed: 10/25/2017	Date Prepared:	10/25/2	017	An	alyst: N	MNV					
Reporting Units: mg/kg		N	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
Chloride by EPA 300	Parent Sample Result	Spike Added	Spiked Sample Result [C]	Spiked Sample %R	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[A]	[B]	[C]	[D]	[E]	Kesun [F]	[G]	/0	70K	70KI D	
Chloride	5650	245	5680	12	245	5660	4	0	90-110	20	X
Lab Batch ID: 3031397	QC- Sample ID:	566213	-009 S	Ba	tch #:	1 Matri	x: Soil	·	·		
	QC- Sample ID.			2.0							
Date Analyzed: 10/25/2017	Date Prepared:				alyst: N	MNV					
Date Analyzed:10/25/2017Reporting Units:mg/kg		10/25/2	017	An	alyst: N	MNV KE DUPLICA	TE REC	OVERY	STUDY		
		10/25/2 N Spike	017 ATRIX SPIK Spiked Sample Result	An E / MAT Spiked Sample	nalyst: M RIX SPI Spike	KE DUPLICA Duplicate Spiked Sample	Spiked Dup.	RPD	Control Limits	Control Limits %RPD	Flag
Reporting Units: mg/kg	Date Prepared: Parent Sample	10/25/2 N	017 ATRIX SPIK Spiked Sample	An E / MAT Spiked	alyst: M RIX SPI	KE DUPLICA Duplicate	Spiked		Control		Flag

Matrix Spike Percent Recovery $[D] = 100^{\circ}(C-A)/B$ Relative Percent Difference RPD = $200^{\circ}|(C-F)/(C+F)|$ Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



Work Order # :	566215						Project II) :				
Lab Batch ID:	3031539	QC- Sample ID:	566212	-008 S	Ba	tch #:	1 Matrix	: Soil				
Date Analyzed:	10/26/2017	Date Prepared:	10/25/2	017	An	alyst: N	MNV					
Reporting Units:	mg/kg		Ν	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
	Chloride by EPA 300	Parent Sample Result	Spike Added	Spiked Sample Result [C]	Spiked Sample %R	Spike Added	Duplicate Spiked Sample Result [F]	Spiked Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
	Analytes	[A]	[B]	[C]	⁷ 6K [D]	E]	Kesult [F]	[G]	70	70K	70KFD	
Chloride		47.3	249	310	106	249	310	106	0	90-110	20	
Lab Batch ID:	3031539	QC- Sample ID:	566215	-002 S	Ba	tch #:	1 Matrix	:: Soil				
Date Analyzed:	10/25/2017	Date Prepared:	10/25/2	017	An	alyst: N	MNV					
Reporting Units:	mg/kg		Ν	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
	Chloride by EPA 300	Parent Sample Result	Spike	Spiked Sample Result	Spiked Sample %R	Spike	Duplicate Spiked Sample	Spiked Dup. %R	RPD	Control Limits %R	Control Limits	Flag
	Analytes	[A]	Added [B]	[C]	%R [D]	Added [E]	Result [F]	%K [G]	%	%K	%RPD	
Chloride		5.80	248	266	105	248	269	106	1	90-110	20	
Lab Batch ID:	3031320	QC- Sample ID:	566212	-001 S	Ba	tch #:	1 Matrix	: Soil				
Date Analyzed:	10/24/2017	Date Prepared:	10/24/2	017	An	alyst: A	ARM					
Reporting Units:	mg/kg		N	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
	TPH by Texas1005	Parent Sample	Spike	Spiked Sample Result	Sample	Spike	Duplicate Spiked Sample		RPD	Control Limits	Control Limits	Flag
	Analytes	Result [A]	Added [B]	[C]	%R [D]	Added [E]	Result [F]	%R [G]	%	%R	%RPD	
C6-C12 Range	Hydrocarbons	<25.0	999	1040	104	998	1020	102	2	75-125	25	
C12-C28 Range	e Hydrocarbons	<25.0	999	1050	105	998	1020	102	3	75-125	25	

Matrix Spike Percent Recovery $[D] = 100^{*}(C-A)/B$ Relative Percent Difference RPD = $200^{*}|(C-F)/(C+F)|$ Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: BC Federal #32



Work Order # :	566215						Project II):				
Lab Batch ID:	3031677 Q	C- Sample ID:	566213-	002 S	Ba	tch #:	1 Matrix	x: Soil				
Date Analyzed:	10/26/2017	Date Prepared:	10/26/2	017	An	alyst: A	ARM					
Reporting Units:	mg/kg		Μ	ATRIX SPIK	E / MAT	RIX SPI	KE DUPLICA	TE REC	OVERY	STUDY		
	TPH by Texas1005	Parent Sample	Spike	Spiked Sample Result	Sample	Spike	Duplicate Spiked Sample	Spiked Dup.	RPD	Control Limits	Control Limits	Flag
	Analytes	Result [A]	Added [B]	[C]	%R [D]	Added [E]	Result [F]	%R [G]	%	%R	%RPD	
C6-C12 Range H	lydrocarbons	<25.0	999	917	92	999	970	97	6	75-125	25	
C12-C28 Range	Hydrocarbons	<25.0	999	998	100	999	1040	104	4	75-125	25	

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

6	1
6	5
AB	<'
DRA	2
	5
mC)

Setting the Standard since 1990 Stafford,Texas (281-240-4200)

Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

Midland, Texas (432-704-5251) San Antonio, Texas (210-509-3334)

Phoenix, Arizona (480-355-0900)

		www.xenco.com		Ven	G[C99G	
Client / Reporting Information		Project Information		Analytical Information		Matrix Codes
Company Name / Branch: COG Operating, LLC		Project Name/Number: R / C-d - Val	#27			W = Water
Company Address: 2407 Pecos Ave. Artesia NM 88210		Project Location:				S = Soil/Sed/Solid GW =Ground Water
Email: <u>shitchcock@concho.com</u> Phone No: 575-70: dneel2@concho.com; dieb@concho.com; rhaskell@concho.com	Phone No: 575-703-6475 Il@concho.com	Invoice To: COG Operating, LLC Altn: Robert McNeill				DW = Drinking Water P = Product SW = Surface water
Project Contact: Sheldon Hitchcock		600 W. Illnois Ave. Midland Tx, 79701				SL = Sludge OW =Ocean/Sea Water
Samplers's Name: Sheldon Hitchcock		PO Number:		DED		WI = Wipe
		Collection	Number of preserved bottles			WW= Waste Water
No. Field ID / Point of Collection	Sample	¥о[DH/Zn tate	H EXT		A - All
1 V. Scincaire	3 Debin	Time Matrix bo	Aci HN H2: Nat Nat	BT	-	Field Comments
2 N. I'		-		XXX		
3 S. Sharpare	2-	+		XXX		
5 1	-0			XXX		
	-	00 I		-		
5 C. Sar Pace	0	s -		XXX		
	-	S 1				
7 WishFace	0	S 1				
8 V. ľ	-	s 1		-		
G		S 1		1		
10		S 1				
Turnaround Time (Business days)		Data Deliverable Information	formation	Mataor		
Same Day TAT 51	5 Day TAT	Level II Std QC	Level IV (Full Data Pkg /raw data)		3	
Next Day EMERGENCY	7 Day TAT	Level III Std QC+ Forms	TRRP Level IV		Temp: J 人 IR ID:R-8	:R-8
2 Day EMERGENCY	Contract TAT	Level 3 (CLP Forms)	UST/RG 411		(6-23: +0 2°C)	
3 Day EMERGENCY		TRRP Checklist		Corre	Corrected Temp:	
TAT Starts Day received by Lab, if received by 5:00 pm	ved by 5:00 pm			EED.EV /IIDC. T.	Sidn temp. 2	
	MPLE CUSTODY MUST BE D	SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER	GE POSSESSION, INCLUDING COURIER	DELIVERY	acking #	
Relinquished by:	Date Time:	Way 1 List Saller 16-19 Received By: 101	16-14-17 Relinquished By: 10A 2 July Bettler Relinquished By:	Date Time: 1145	Received By:	hurd
Relinquished by: 5	Date Time:	Relinquished by: Date Time: Received By: 4 4 5 Date Time: Received By: Custody Seal # Preserved where applicable On Ice Cooler Temp. Thermo. Corr. Factor	4 Custody Seal #	Preserved where applicable	On Ice Cooler Temp.	Thermo. Corr. Factor



XENCO Laboratories Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating, LLC Acceptable Temperature Range: 0 - 6 degC Air and Metal samples Acceptable Range: Ambient Date/ Time Received: 10/19/2017 11:45:00 AM Temperature Measuring device used : R8 Work Order #: 566215 Comments Sample Receipt Checklist 13.2 #1 *Temperature of cooler(s)? #2 *Shipping container in good condition? Yes #3 *Samples received on ice? Yes #4 *Custody Seals intact on shipping container/ cooler? N/A #5 Custody Seals intact on sample bottles? N/A #6*Custody Seals Signed and dated? N/A #7 *Chain of Custody present? Yes #8 Any missing/extra samples? No #9 Chain of Custody signed when relinquished/ received? Yes #10 Chain of Custody agrees with sample labels/matrix? Yes #11 Container label(s) legible and intact? Yes #12 Samples in proper container/ bottle? Yes #13 Samples properly preserved? Yes #14 Sample container(s) intact? Yes #15 Sufficient sample amount for indicated test(s)? Yes #16 All samples received within hold time? Yes #17 Subcontract of sample(s)? No #18 Water VOC samples have zero headspace? N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Date: 10/23/2017

Checklist completed by: Connie Hernandez Checklist reviewed by: Kelsey Brooks

Date: 10/23/2017