

March 6, 2018

Mike Bratcher
Oil Conservation Division, District 2
811 S First St.
Artesia, NM 88210

Re: Work Plan
Asio Otus Federal #003H
API #: 30-015-42395
RP#: 2RP-4484
Unit Letter K Section 12, Township 26S, Range 26E
Eddy County, NM

Mr. Bratcher,

COG Operating, LLC (COG) is pleased to submit for your consideration the following remediation work plan for the Asio Otus Federal #003H. This plan is in response to a produced water release that occurred on November 8, 2017. Subsequent to the release a C-141 initial report was approved by the New Mexico Oil Conservation Division (NMOCD) on November 14, 2017. On November 13, 2017 the Bureau of Land Management (BLM) confirmed via email that they do not have jurisdiction over this release.

BACKGROUND

The Asio Otus Federal #003H release is located in Unit Letter K, Section 12, Township 26 South and Range 26 East in Eddy County, New Mexico. More specifically the latitude and longitude for this release are 32.05387 North and -104.24792 West.

On November 8, 2017, a semi-truck rolled over into the ditch adjacent to the lease road crushing COG's water transfer line. This incident occurred approximately 1.6 miles northwest of the Asio Otus Federal #003H location. Approximately one-hundred (100) barrels (bbls) of produced water and one-tenth (0.1) bbl of Oil was released into the pasture adjacent to the lease road. A vacuum truck was able to recover approximately sixty (60) bbls of produced water.

On December 14, 2017, a site assessment and soil sampling were conducted in order to 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 thirty-one (31) feet below ground surface (BGS) (Appendix II). No water well or surface water was observed within one-thousand (1,000) feet of the release site. Therefore the site ranking for this release is twenty (20) based on the following:

Depth to groundwater	<50-feet
Distance to surface water body	>1000-feet
Wellhead Protection Area	>1000-feet

Analytical Results

12/14/2017

Sample ID	Depth (feet)	Benzene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	Total TPH (mg/kg)
T-1	0	<0.002	<0.002	14700	<15.0
T-1	1	--	--	7610	--
T-1	2	--	--	3830	--
T-1	3	--	--	281	--
T-1	4	--	--	<50.0	--
T-2	0	<0.002	<0.002	1290	35.2
T-2	1	--	--	2223	--
T-2	2	--	--	282	--
T-2	3	--	--	<50.0	--
T-2	4	--	--	101	--
T-3	0	<0.002	0.035	52700	75.4
T-3	1	--	--	1960	--
T-3	2	--	--	118	--
T-3	3	--	--	<50.0	--
T-3	4	--	--	223	--
BG-1	0	--	--	137	--
BG-1	1	--	--	<50.0	--
BG-1	2	--	--	<50.0	--
BG-1	3	--	--	370	--
BG-1	4	--	--	<50.0	--
BG-1	5	--	--	<50.0	--
BG-1	6	--	--	<50.0	--
BG-1	8	--	--	<50.0	--
BG-1	10	--	--	<50.0	--

12/14/2017 Continued

Sample ID	Depth (feet)	Benzene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	Total TPH (mg/kg)
BG-2	0	--	--	<25.0	--
BG-2	1	--	--	<50.0	--
BG-2	2	--	--	1050	--
BG-2	3	--	--	557	--
BG-2	4	--	--	88.4	--
BG-2	5	--	--	<50.0	--
BG-2	6	--	--	<50.0	--
BG-2	8	--	--	<50.0	--
BG-2	10	--	--	<50.0	--
NORTH-1	0	--	--	<25.0	--
SOUTH-1	0	--	--	235	--
WEST	0	--	--	<25.0	--
NORTH-2	0	--	--	29.8	--
SOUTH-2	0	--	--	<25.0	--
EAST	0	--	--	<50.0	--

(--) Analysis not requested

PROPOSED REMEDIAL ACTIONS

- The impacted area in the vicinity of sample location T-1 will be excavated to a depth of three (3) feet BGS.
- The impacted area in the vicinity of sample location T-2 and T-3 will be excavated to a depth of two (2) feet BGS.
- The excavation will be backfilled with clean “like” material, contoured to match the surrounding terrain.

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

Sincerely,



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

Asio Otus Federal #003H



APPENDIX II



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02438		ED		4	2	3	12	26S	26E	571015	3546705*	141	30		
C 02218		CUB	ED	4	1	4	07	26S	27E	573039	3546725*	2124	35		
C 02439		ED		2	4	2	15	26S	26E	568614	3545697*	2555	30		
C 01887		C	ED	4	4	2	15	26S	26E	568614	3545497*	2648	53	31	22
C 02219		CUB	ED	4	4	4	05	26S	27E	575033	3547948*	4272	35		
C 01013		C	ED			4	25	25S	26E	571505	3551456*	4687	245		

Average Depth to Water: **31 feet**

Minimum Depth: **31 feet**

Maximum Depth: **31 feet**

Record Count: 6

Basin/County Search:

County: Eddy

UTMNAD83 Radius Search (in meters):

Easting (X): 570916

Northing (Y): 3546806

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

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

NM OIL CONSERVATION

ARTESIA DISTRICT

NOV 13 2017

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in
conformance with 19.15.29 NMAC.

RECEIVED

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC [229137]	Contact: Robert McNeil
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: ASIO OTUS FEDERAL #003H	Facility Type: Tank Battery

Surface Owner: Private	Mineral Owner: Federal	API No. 30-015-42395
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LOCATION OF RELEASE

Unit Letter K	Section 12	Township 26S	Range 26E	Feet from the	North/South Line	Feet from the	East/West Line	County Eddy
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Latitude 32.05387 Longitude - 104.24792 NAD83

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 100 bbls. PW; 0.1 bbls OIL	Volume Recovered: 60 bbls PW
Source of Release: Flowline	Date and Hour of Occurrence: November 8, 2017	Date and Hour of Discovery: November 9, 2017 10:30 am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher NMOCD	
By Whom? Dakota Neel	Date and Hour: November 9, 2017 4:08 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

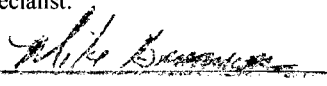
Describe Cause of Problem and Remedial Action Taken.*

This release occurred when a water hauler from another company wrecked and rolled his truck onto a COG water transfer line causing it to rupture. The damaged section of the transfer line was replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred in the pasture next to the lease road. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area evaluated for any possible impact from the release and will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 		OIL CONSERVATION DIVISION	
Printed Name: Dakota Neel		Approved by Environmental Specialist:	
Title: HSE Coordinator		Signed By: 	
E-mail Address: dneel2@concho.com		Approval Date: 11/14/17	Expiration Date: N/A
Date: November 13, 2017 Phone: 575-746-2010		Conditions of Approval: See Attached	Attached ☐ 2RP-4484

* Attach Additional Sheets If Necessary

APPENDIX IV



Certificate of Analysis Summary 571792

COG Operating LLC, Artesia, NM

Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571792-001	571792-002	571792-003	571792-004	571792-005	571792-006
	<i>Field Id:</i>	T-1 0'	T-1 1'	T-1 2'	T-1 3'	T-1 4'	T-2 0'
	<i>Depth:</i>		1- ft	2- ft	3- ft	4- ft	
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-14-17 10:00	Dec-14-17 10:02	Dec-14-17 10:04	Dec-14-17 10:06	Dec-14-17 10:08	Dec-14-17 12:00
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-21-17 13:00					Dec-21-17 13:00
	<i>Analyzed:</i>	Dec-21-17 16:53					Dec-21-17 17:12
	<i>Units/RL:</i>	mg/kg RL					mg/kg RL
Benzene		<0.00199 0.00199					<0.00200 0.00200
Toluene		<0.00199 0.00199					<0.00200 0.00200
Ethylbenzene		<0.00199 0.00199					<0.00200 0.00200
m,p-Xylenes		<0.00398 0.00398					<0.00399 0.00399
o-Xylene		<0.00199 0.00199					<0.00200 0.00200
Total Xylenes		<0.00199 0.00199					<0.00200 0.00200
Total BTEX		<0.00199 0.00199					<0.00200 0.00200
Chloride by EPA 300	<i>Extracted:</i>	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30
	<i>Analyzed:</i>	Dec-21-17 22:40	Dec-21-17 22:47	Dec-21-17 21:44	Dec-21-17 23:15	Dec-21-17 23:22	Dec-22-17 12:36
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		14700 250	7610 100	3830 50.0	281 50.0	<50.0 50.0	1290 50.0
TPH By SW8015 Mod	<i>Extracted:</i>	Dec-21-17 07:00					Dec-21-17 07:00
	<i>Analyzed:</i>	Dec-21-17 18:14					Dec-21-17 19:16
	<i>Units/RL:</i>	mg/kg RL					mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0					<15.0 15.0
Diesel Range Organics (DRO)		<15.0 15.0					35.2 15.0
Oil Range Hydrocarbons (ORO)		<15.0 15.0					<15.0 15.0
Total TPH		<15.0 15.0					35.2 15.0

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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Mike Kimmel
Client Services Manager



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COG Operating LLC, Artesia, NM

Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	571792-007	571792-008	571792-009	571792-010	571792-011	571792-012
	Field Id:	T-2 1'	T-2 2'	T-2 3'	T-2 4'	T-3 0'	T-3 1'
	Depth:	1- ft	2- ft	3- ft	4- ft		1- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Dec-14-17 12:05	Dec-14-17 12:10	Dec-14-17 12:15	Dec-14-17 12:20	Dec-14-17 13:30	Dec-14-17 13:35
BTEX by EPA 8021B		Extracted:				Dec-21-17 13:00	
		Analyzed:				Dec-21-17 20:21	
		Units/RL:				mg/kg RL	
Benzene						<0.00198 0.00198	
Toluene						0.00488 0.00198	
Ethylbenzene						0.00295 0.00198	
m,p-Xylenes						0.0209 0.00396	
o-Xylene						0.00586 0.00198	
Total Xylenes						0.0268 0.00198	
Total BTEX						0.0346 0.00198	
Chloride by EPA 300		Extracted:	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30	Dec-21-17 17:30
		Analyzed:	Dec-22-17 12:43	Dec-22-17 12:50	Dec-22-17 12:57	Dec-22-17 13:04	Dec-22-17 13:11
		Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride			223 50.0	282 50.0	<50.0 50.0	101 50.0	52700 250
TPH By SW8015 Mod		Extracted:				Dec-21-17 07:00	
		Analyzed:				Dec-21-17 19:37	
		Units/RL:				mg/kg RL	
Gasoline Range Hydrocarbons (GRO)						18.0 15.0	
Diesel Range Organics (DRO)						57.4 15.0	
Oil Range Hydrocarbons (ORO)						<15.0 15.0	
Total TPH						75.4 15.0	

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Mike Kimmel
Client Services Manager



Certificate of Analysis Summary 571792

COG Operating LLC, Artesia, NM

Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571792-013	571792-014	571792-015	571792-016	571792-017	571792-018
	<i>Field Id:</i>	T-3 2'	T-3 3'	T-3 4'	BG-1 0'	BG-1 1'	BG-1 2'
	<i>Depth:</i>	2- ft	3- ft	4- ft		1- ft	2- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-14-17 13:40	Dec-14-17 13:45	Dec-14-17 13:50	Dec-14-17 10:30	Dec-14-17 10:32	Dec-14-17 10:34
Chloride by EPA 300	<i>Extracted:</i>	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00
	<i>Analyzed:</i>	Dec-22-17 17:37	Dec-22-17 17:43	Dec-22-17 17:50	Dec-22-17 17:57	Dec-22-17 18:04	Dec-22-17 17:02
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		118 50.0	<50.0 50.0	223 50.0	137 50.0	<50.0 50.0	<50.0 50.0

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Mike Kimmel
Client Services Manager



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COG Operating LLC, Artesia, NM

Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571792-019	571792-020	571792-021	571792-022	571792-023	571792-024
	<i>Field Id:</i>	BG-1 3'	BG-1 4'	BG-1 5'	BG-1 6'	BG-1 8'	BG-1 10'
	<i>Depth:</i>	3- ft	4- ft	5- ft	6- ft	8- ft	10- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-14-17 10:36	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38
Chloride by EPA 300	<i>Extracted:</i>	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00
	<i>Analyzed:</i>	Dec-22-17 18:32	Dec-22-17 18:39	Dec-22-17 19:00	Dec-22-17 19:07	Dec-22-17 19:14	Dec-22-17 19:21
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		370 50.0	<50.0 50.0	<50.0 50.0	<50.0 50.0	<50.0 50.0	<50.0 50.0

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Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571792-025	571792-026	571792-027	571792-028	571792-029	571792-030
	<i>Field Id:</i>	BG-2 0'	BG-2 1'	BG-2 2'	BG-2 3'	BG-2 4'	BG-2 5'
	<i>Depth:</i>		1- ft	2- ft	3- ft	4- ft	5- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38	Dec-14-17 10:38
Chloride by EPA 300	<i>Extracted:</i>	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 14:00	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14
	<i>Analyzed:</i>	Dec-22-17 19:28	Dec-22-17 19:35	Dec-22-17 19:42	Dec-22-17 22:58	Dec-22-17 20:45	Dec-22-17 20:52
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<25.0 25.0	<50.0 50.0	1050 50.0	557 50.0	88.4 50.0	<50.0 50.0

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COG Operating LLC, Artesia, NM

Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571792-031	571792-032	571792-033	571792-034	571792-035	571792-036
	<i>Field Id:</i>	BG-2 6'	BG-2 8'	BG-2 10'	N.1	S.1	W
	<i>Depth:</i>	6- ft	8- ft	10- ft			
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-14-17 15:00	Dec-14-17 15:05	Dec-14-17 15:10	Dec-14-17 16:00	Dec-14-17 16:30	Dec-14-17 16:40
Chloride by EPA 300	<i>Extracted:</i>	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14
	<i>Analyzed:</i>	Dec-22-17 20:59	Dec-22-17 21:06	Dec-22-17 21:27	Dec-22-17 21:34	Dec-22-17 21:41	Dec-22-17 21:48
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<50.0 50.0	<50.0 50.0	<50.0 50.0	<25.0 25.0	235 50.0	<25.0 25.0

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Project Name: Asio Otus Federal #3H



Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy County NM

Date Received in Lab: Tue Dec-19-17 11:45 am

Report Date: 07-MAR-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	571792-037	571792-038	571792-039			
	Field Id:	N.2	S.2	E			
	Depth:						
	Matrix:	SOIL	SOIL	SOIL			
	Sampled:	Dec-14-17 16:50	Dec-14-17 17:00	Dec-14-17 17:15			
Chloride by EPA 300	Extracted:	Dec-22-17 16:14	Dec-22-17 16:14	Dec-22-17 16:14			
	Analyzed:	Dec-22-17 21:55	Dec-22-17 23:05	Dec-22-17 22:23			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Chloride		29.8 25.0	<25.0 25.0	<50.0 50.0			

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

Version: 1.9%

Mike Kimmel
Client Services Manager

Analytical Report 571792

for COG Operating LLC

Project Manager: Sheldon Hitchcock

Asio Otus Federal #3H

07-MAR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-16), 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 (T104704400-18-14)

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)

Xenco-Atlanta (LELAP Lab ID #04176)



07-MAR-18

Project Manager: **Sheldon Hitchcock**

COG Operating LLC

2407 Pecos Avenue

Artesia, NM 88210

Reference: XENCO Report No(s): **571792**

Asio Otus Federal #3H

Project Address: Eddy County NM

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) 571792. 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. 571792 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,

Mike Kimmel

Client Services Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

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COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 0'	S	12-14-17 10:00		571792-001
T-1 1'	S	12-14-17 10:02	1 ft	571792-002
T-1 2'	S	12-14-17 10:04	2 ft	571792-003
T-1 3'	S	12-14-17 10:06	3 ft	571792-004
T-1 4'	S	12-14-17 10:08	4 ft	571792-005
T-2 0'	S	12-14-17 12:00		571792-006
T-2 1'	S	12-14-17 12:05	1 ft	571792-007
T-2 2'	S	12-14-17 12:10	2 ft	571792-008
T-2 3'	S	12-14-17 12:15	3 ft	571792-009
T-2 4'	S	12-14-17 12:20	4 ft	571792-010
T-3 0'	S	12-14-17 13:30	ft	571792-011
T-3 1'	S	12-14-17 13:35	1 ft	571792-012
T-3 2'	S	12-14-17 13:40	2 ft	571792-013
T-3 3'	S	12-14-17 13:45	3 ft	571792-014
T-3 4'	S	12-14-17 13:50	4 ft	571792-015
BG-1 0'	S	12-14-17 10:30	ft	571792-016
BG-1 1'	S	12-14-17 10:32	1 ft	571792-017
BG-1 2'	S	12-14-17 10:34	2 ft	571792-018
BG-1 3'	S	12-14-17 10:36	3 ft	571792-019
BG-1 4'	S	12-14-17 10:38	4 ft	571792-020
BG-1 5'	S	12-14-17 10:38	5 ft	571792-021
BG-1 6'	S	12-14-17 10:38	6 ft	571792-022
BG-1 8'	S	12-14-17 10:38	8 ft	571792-023
BG-1 10'	S	12-14-17 10:38	10 ft	571792-024
BG-2 0'	S	12-14-17 10:38	ft	571792-025
BG-2 1'	S	12-14-17 10:38	1 ft	571792-026
BG-2 2'	S	12-14-17 10:38	2 ft	571792-027
BG-2 3'	S	12-14-17 10:38	3 ft	571792-028
BG-2 4'	S	12-14-17 10:38	4 ft	571792-029
BG-2 5'	S	12-14-17 10:38	5 ft	571792-030
BG-2 6'	S	12-14-17 15:00	6 ft	571792-031
BG-2 8'	S	12-14-17 15:05	8 ft	571792-032
BG-2 10'	S	12-14-17 15:10	10 ft	571792-033
N.1	S	12-14-17 16:00	ft	571792-034
S.1	S	12-14-17 16:30	ft	571792-035
W	S	12-14-17 16:40	ft	571792-036
N.2	S	12-14-17 16:50	ft	571792-037
S.2	S	12-14-17 17:00	ft	571792-038
E	S	12-14-17 17:15	ft	571792-039



CASE NARRATIVE

Client Name: COG Operating LLC

Project Name: Asio Otus Federal #3H

Project ID:

Work Order Number(s): 571792

Report Date: 07-MAR-18

Date Received: 12/19/2017

Sample receipt non conformances and comments:

03/07/18: Revised report to correct sample ID's for 571792-011 and 016.

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3036624 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-1 0'**
Lab Sample Id: 571792-001

Matrix: Soil
Date Collected: 12.14.17 10.00

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Prep Method: E300P

% Moisture:

Date Prep: 12.21.17 17.30

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14700	250	mg/kg	12.21.17 22.40		50

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3036672

Prep Method: TX1005P

% Moisture:

Date Prep: 12.21.17 07.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	12.21.17 18.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	12.21.17 18.14	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	12.21.17 18.14	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	12.21.17 18.14	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	12.21.17 18.14	
o-Terphenyl	84-15-1	99	%	70-135	12.21.17 18.14	



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-1 0'**
Lab Sample Id: 571792-001

Matrix: Soil
Date Collected: 12.14.17 10.00

Date Received: 12.19.17 11.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 12.21.17 13.00

Basis: Wet Weight

Seq Number: 3036624

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	12.21.17 16.53	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
Total BTEX		<0.00199	0.00199	mg/kg	12.21.17 16.53	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	90	%	80-120	12.21.17 16.53		
1,4-Difluorobenzene	540-36-3	94	%	80-120	12.21.17 16.53		



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-1 1'
Lab Sample Id: 571792-002

Matrix: Soil
Date Collected: 12.14.17 10.02

Date Received: 12.19.17 11.45
Sample Depth: 1 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: JUM

% Moisture:

Analyst: OJS

Date Prep: 12.21.17 17.30

Basis: Wet Weight

Seq Number: 3036680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7610	100	mg/kg	12.21.17 22.47		20



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-1 2'
Lab Sample Id: 571792-003

Matrix: Soil
Date Collected: 12.14.17 10.04

Date Received: 12.19.17 11.45
Sample Depth: 2 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3830	50.0	mg/kg	12.21.17 21.44		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-1 3'**
Lab Sample Id: 571792-004

Matrix: Soil
Date Collected: 12.14.17 10.06

Date Received: 12.19.17 11.45
Sample Depth: 3 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	281	50.0	mg/kg	12.21.17 23.15		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-1 4'**
Lab Sample Id: 571792-005

Matrix: Soil
Date Collected: 12.14.17 10.08

Date Received: 12.19.17 11.45
Sample Depth: 4 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.21.17 23.22	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-2 0'
Lab Sample Id: 571792-006

Matrix: Soil
Date Collected: 12.14.17 12.00

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Prep Method: E300P

% Moisture:

Date Prep: 12.21.17 17.30

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1290	50.0	mg/kg	12.22.17 12.36		10

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3036672

Prep Method: TX1005P

% Moisture:

Date Prep: 12.21.17 07.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	12.21.17 19.16	U	1
Diesel Range Organics (DRO)	C10C28DRO	35.2	15.0	mg/kg	12.21.17 19.16		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	12.21.17 19.16	U	1
Total TPH	PHC635	35.2	15.0	mg/kg	12.21.17 19.16		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	12.21.17 19.16	
o-Terphenyl	84-15-1	89	%	70-135	12.21.17 19.16	



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-2 0'**
Lab Sample Id: 571792-006

Matrix: Soil
Date Collected: 12.14.17 12.00

Date Received: 12.19.17 11.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 12.21.17 13.00

Basis: Wet Weight

Seq Number: 3036624

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	12.21.17 17.12	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.21.17 17.12	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	100	%	80-120	12.21.17 17.12		
1,4-Difluorobenzene	540-36-3	89	%	80-120	12.21.17 17.12		



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-2 1'
Lab Sample Id: 571792-007

Matrix: Soil
Date Collected: 12.14.17 12.05

Date Received: 12.19.17 11.45
Sample Depth: 1 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: JUM

% Moisture:

Analyst: OJS

Date Prep: 12.21.17 17.30

Basis: Wet Weight

Seq Number: 3036680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	223	50.0	mg/kg	12.22.17 12.43		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-2 2'
Lab Sample Id: 571792-008

Matrix: Soil
Date Collected: 12.14.17 12.10

Date Received: 12.19.17 11.45
Sample Depth: 2 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	282	50.0	mg/kg	12.22.17 12.50		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-2 3'
Lab Sample Id: 571792-009

Matrix: Soil
Date Collected: 12.14.17 12.15

Date Received: 12.19.17 11.45
Sample Depth: 3 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: JUM

% Moisture:

Analyst: OJS

Date Prep: 12.21.17 17.30

Basis: Wet Weight

Seq Number: 3036680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 12.57	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-2 4'**
Lab Sample Id: 571792-010

Matrix: Soil
Date Collected: 12.14.17 12.20

Date Received: 12.19.17 11.45
Sample Depth: 4 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	101	50.0	mg/kg	12.22.17 13.04		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-3 0'**
Lab Sample Id: 571792-011

Matrix: Soil
Date Collected: 12.14.17 13.30

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Date Prep: 12.21.17 17.30

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	52700	250	mg/kg	12.22.17 13.11		50

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3036672

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Date Prep: 12.21.17 07.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	18.0	15.0	mg/kg	12.21.17 19.37		1
Diesel Range Organics (DRO)	C10C28DRO	57.4	15.0	mg/kg	12.21.17 19.37		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	12.21.17 19.37	U	1
Total TPH	PHC635	75.4	15.0	mg/kg	12.21.17 19.37		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	85	%	70-135	12.21.17 19.37	
o-Terphenyl	84-15-1	90	%	70-135	12.21.17 19.37	



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-3 0'**
Lab Sample Id: 571792-011

Matrix: Soil
Date Collected: 12.14.17 13.30

Date Received: 12.19.17 11.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 12.21.17 13.00

Basis: Wet Weight

Seq Number: 3036624

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	12.21.17 20.21	U	1
Toluene	108-88-3	0.00488	0.00198	mg/kg	12.21.17 20.21		1
Ethylbenzene	100-41-4	0.00295	0.00198	mg/kg	12.21.17 20.21		1
m,p-Xylenes	179601-23-1	0.0209	0.00396	mg/kg	12.21.17 20.21		1
o-Xylene	95-47-6	0.00586	0.00198	mg/kg	12.21.17 20.21		1
Total Xylenes	1330-20-7	0.0268	0.00198	mg/kg	12.21.17 20.21		1
Total BTEX		0.0346	0.00198	mg/kg	12.21.17 20.21		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	95	%	80-120	12.21.17 20.21		
1,4-Difluorobenzene	540-36-3	85	%	80-120	12.21.17 20.21		



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-3 1'
Lab Sample Id: 571792-012

Matrix: Soil
Date Collected: 12.14.17 13.35

Date Received: 12.19.17 11.45
Sample Depth: 1 ft

Analytical Method: Chloride by EPA 300

Tech: JUM

Analyst: OJS

Seq Number: 3036680

Date Prep: 12.21.17 17.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1960	50.0	mg/kg	12.22.17 13.18		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-3 2'
Lab Sample Id: 571792-013

Matrix: Soil
Date Collected: 12.14.17 13.40

Date Received: 12.19.17 11.45
Sample Depth: 2 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	118	50.0	mg/kg	12.22.17 17.37		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: T-3 3'
Lab Sample Id: 571792-014

Matrix: Soil
Date Collected: 12.14.17 13.45

Date Received: 12.19.17 11.45
Sample Depth: 3 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 17.43	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **T-3 4'**
Lab Sample Id: 571792-015

Matrix: Soil
Date Collected: 12.14.17 13.50

Date Received: 12.19.17 11.45
Sample Depth: 4 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	223	50.0	mg/kg	12.22.17 17.50		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 0'**
Lab Sample Id: 571792-016

Matrix: Soil
Date Collected: 12.14.17 10.30

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	137	50.0	mg/kg	12.22.17 17.57		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 1'**
Lab Sample Id: 571792-017

Matrix: Soil
Date Collected: 12.14.17 10.32

Date Received: 12.19.17 11.45
Sample Depth: 1 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 18.04	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 2'**
Lab Sample Id: 571792-018

Matrix: Soil
Date Collected: 12.14.17 10.34

Date Received: 12.19.17 11.45
Sample Depth: 2 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 17.02	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 3'**
Lab Sample Id: 571792-019

Matrix: Soil
Date Collected: 12.14.17 10.36

Date Received: 12.19.17 11.45
Sample Depth: 3 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	370	50.0	mg/kg	12.22.17 18.32		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 4'**
Lab Sample Id: 571792-020

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 4 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 18.39	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 5'**
Lab Sample Id: 571792-021

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 5 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 19.00	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 6'**
Lab Sample Id: 571792-022

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 6 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 19.07	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 8'**
Lab Sample Id: 571792-023

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 8 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 19.14	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-1 10'**

Matrix: Soil

Date Received: 12.19.17 11.45

Lab Sample Id: 571792-024

Date Collected: 12.14.17 10.38

Sample Depth: 10 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 19.21	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 0'**
Lab Sample Id: 571792-025

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<25.0	25.0	mg/kg	12.22.17 19.28	U	5



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 1'**
Lab Sample Id: 571792-026

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 1 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036806

Date Prep: 12.22.17 14.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 19.35	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 2'**
Lab Sample Id: 571792-027

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 2 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 14.00

Basis: Wet Weight

Seq Number: 3036806

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1050	50.0	mg/kg	12.22.17 19.42		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 3'**
Lab Sample Id: 571792-028

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 3 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036815

Date Prep: 12.22.17 16.14

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	557	50.0	mg/kg	12.22.17 22.58		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 4'**
Lab Sample Id: 571792-029

Matrix: Soil
Date Collected: 12.14.17 10.38

Date Received: 12.19.17 11.45
Sample Depth: 4 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036815

Date Prep: 12.22.17 16.14

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	88.4	50.0	mg/kg	12.22.17 20.45		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 5'**

Matrix: Soil

Date Received: 12.19.17 11.45

Lab Sample Id: 571792-030

Date Collected: 12.14.17 10.38

Sample Depth: 5 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 20.52	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 6'**
Lab Sample Id: 571792-031

Matrix: Soil
Date Collected: 12.14.17 15.00

Date Received: 12.19.17 11.45
Sample Depth: 6 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 20.59	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 8'**
Lab Sample Id: 571792-032

Matrix: Soil
Date Collected: 12.14.17 15.05

Date Received: 12.19.17 11.45
Sample Depth: 8 ft

Analytical Method: Chloride by EPA 300

Tech: OJS

Analyst: OJS

Seq Number: 3036815

Date Prep: 12.22.17 16.14

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 21.06	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **BG-2 10'**

Matrix: Soil

Date Received: 12.19.17 11.45

Lab Sample Id: 571792-033

Date Collected: 12.14.17 15.10

Sample Depth: 10 ft

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 21.27	U	10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: N.1
Lab Sample Id: 571792-034

Matrix: Soil
Date Collected: 12.14.17 16.00

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<25.0	25.0	mg/kg	12.22.17 21.34	U	5



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: S.1
Lab Sample Id: 571792-035

Matrix: Soil
Date Collected: 12.14.17 16.30

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	235	50.0	mg/kg	12.22.17 21.41		10



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: **W** Matrix: Soil Date Received: 12.19.17 11.45
Lab Sample Id: 571792-036 Date Collected: 12.14.17 16.40
Analytical Method: Chloride by EPA 300 Prep Method: E300P
Tech: OJS % Moisture:
Analyst: OJS Date Prep: 12.22.17 16.14 Basis: Wet Weight
Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<25.0	25.0	mg/kg	12.22.17 21.48	U	5



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: N.2
Lab Sample Id: 571792-037

Matrix: Soil
Date Collected: 12.14.17 16.50

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	29.8	25.0	mg/kg	12.22.17 21.55		5



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: S.2
Lab Sample Id: 571792-038

Matrix: Soil
Date Collected: 12.14.17 17.00

Date Received: 12.19.17 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: OJS

Date Prep: 12.22.17 16.14

Basis: Wet Weight

Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<25.0	25.0	mg/kg	12.22.17 23.05	U	5



Certificate of Analytical Results 571792



COG Operating LLC, Artesia, NM

Asio Otus Federal #3H

Sample Id: E Matrix: Soil Date Received: 12.19.17 11.45
Lab Sample Id: 571792-039 Date Collected: 12.14.17 17.15
Analytical Method: Chloride by EPA 300 Prep Method: E300P
Tech: OJS % Moisture:
Analyst: OJS Date Prep: 12.22.17 16.14 Basis: Wet Weight
Seq Number: 3036815

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<50.0	50.0	mg/kg	12.22.17 22.23	U	10

- 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 **SQL** 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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COG Operating LLC

Asio Otus Federal #3H

Analytical Method: Chloride by EPA 300

Seq Number: 3036680

MB Sample Id: 7636474-1-BLK

Matrix: Solid

LCS Sample Id: 7636474-1-BKS

Prep Method: E300P

Date Prep: 12.21.17

LCSD Sample Id: 7636474-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	264	106	267	107	90-110	1	20	mg/kg	12.21.17 21:02	

Analytical Method: Chloride by EPA 300

Seq Number: 3036806

MB Sample Id: 7636563-1-BLK

Matrix: Solid

LCS Sample Id: 7636563-1-BKS

Prep Method: E300P

Date Prep: 12.22.17

LCSD Sample Id: 7636563-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	270	108	274	110	90-110	1	20	mg/kg	12.22.17 16:20	

Analytical Method: Chloride by EPA 300

Seq Number: 3036815

MB Sample Id: 7636572-1-BLK

Matrix: Solid

LCS Sample Id: 7636572-1-BKS

Prep Method: E300P

Date Prep: 12.22.17

LCSD Sample Id: 7636572-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	274	110	274	110	90-110	0	20	mg/kg	12.22.17 20:10	

Analytical Method: Chloride by EPA 300

Seq Number: 3036680

Parent Sample Id: 571699-006

Matrix: Soil

MS Sample Id: 571699-006 S

Prep Method: E300P

Date Prep: 12.21.17

MSD Sample Id: 571699-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	579	250	810	92	829	100	90-110	2	20	mg/kg	12.21.17 21:23	

Analytical Method: Chloride by EPA 300

Seq Number: 3036680

Parent Sample Id: 571706-002

Matrix: Soil

MS Sample Id: 571706-002 S

Prep Method: E300P

Date Prep: 12.21.17

MSD Sample Id: 571706-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	3040	1250	4320	102	4250	97	90-110	2	20	mg/kg	12.21.17 23:01	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery

$[D] = 100 * (C - A) / B$
 $RPD = 200 * | (C - E) / (C + E) |$
 $[D] = 100 * (C) / [B]$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



QC Summary 571792

COG Operating LLC

Asio Otus Federal #3H

Analytical Method: Chloride by EPA 300

Seq Number: 3036806

Parent Sample Id: 571446-003

Matrix: Soil

MS Sample Id: 571446-003 S

Prep Method: E300P

Date Prep: 12.22.17

MSD Sample Id: 571446-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1960	1250	3290	106	3120	93	90-110	5	20	mg/kg	12.22.17 18:18	

Analytical Method: Chloride by EPA 300

Seq Number: 3036806

Parent Sample Id: 571451-002

Matrix: Soil

MS Sample Id: 571451-002 S

Prep Method: E300P

Date Prep: 12.22.17

MSD Sample Id: 571451-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	573	250	794	88	790	87	90-110	1	20	mg/kg	12.22.17 16:41	X

Analytical Method: Chloride by EPA 300

Seq Number: 3036815

Parent Sample Id: 571793-003

Matrix: Soil

MS Sample Id: 571793-003 S

Prep Method: E300P

Date Prep: 12.22.17

MSD Sample Id: 571793-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	24.3	250	308	113	295	108	90-110	4	20	mg/kg	12.22.17 20:31	X

Analytical Method: Chloride by EPA 300

Seq Number: 3036815

Parent Sample Id: 571793-004

Matrix: Soil

MS Sample Id: 571793-004 S

Prep Method: E300P

Date Prep: 12.22.17

MSD Sample Id: 571793-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	74.5	250	344	108	348	109	90-110	1	20	mg/kg	12.22.17 22:09	

Analytical Method: TPH By SW8015 Mod

Seq Number: 3036672

MB Sample Id: 7636449-1-BLK

Matrix: Solid

LCS Sample Id: 7636449-1-BKS

Prep Method: TX1005P

Date Prep: 12.21.17

LCSD Sample Id: 7636449-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	881	88	882	88	70-135	0	35	mg/kg	12.21.17 17:33	
Diesel Range Organics (DRO)	<15.0	1000	914	91	919	92	70-135	1	35	mg/kg	12.21.17 17:33	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	83		84		84		70-135	%	12.21.17 17:33
o-Terphenyl	87		91		91		70-135	%	12.21.17 17:33

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



QC Summary 571792

COG Operating LLC

Asio Otus Federal #3H

Analytical Method: TPH By SW8015 Mod

Seq Number: 3036672

Parent Sample Id: 571792-001

Matrix: Soil

MS Sample Id: 571792-001 S

Prep Method: TX1005P

Date Prep: 12.21.17

MSD Sample Id: 571792-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	858	86	841	84	70-135	2	35	mg/kg	12.21.17 18:36	
Diesel Range Organics (DRO)	<15.0	998	869	87	857	86	70-135	1	35	mg/kg	12.21.17 18:36	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	83		80		70-135	%	12.21.17 18:36
o-Terphenyl	89		86		70-135	%	12.21.17 18:36

Analytical Method: BTEX by EPA 8021B

Seq Number: 3036624

MB Sample Id: 7636429-1-BLK

Matrix: Solid

LCS Sample Id: 7636429-1-BKS

Prep Method: SW5030B

Date Prep: 12.21.17

LCSD Sample Id: 7636429-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.0826	82	0.0851	85	70-130	3	35	mg/kg	12.21.17 13:48	
Toluene	<0.00202	0.101	0.0764	76	0.0786	79	70-130	3	35	mg/kg	12.21.17 13:48	
Ethylbenzene	<0.00202	0.101	0.0828	82	0.0850	85	71-129	3	35	mg/kg	12.21.17 13:48	
m,p-Xylenes	<0.00403	0.202	0.165	82	0.169	84	70-135	2	35	mg/kg	12.21.17 13:48	
o-Xylene	<0.00202	0.101	0.0770	76	0.0785	79	71-133	2	35	mg/kg	12.21.17 13:48	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	93		112		110		80-120	%	12.21.17 13:48
4-Bromofluorobenzene	83		110		119		80-120	%	12.21.17 13:48

Analytical Method: BTEX by EPA 8021B

Seq Number: 3036624

Parent Sample Id: 571522-005

Matrix: Soil

MS Sample Id: 571522-005 S

Prep Method: SW5030B

Date Prep: 12.21.17

MSD Sample Id: 571522-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00199	0.0994	0.0734	74	0.0880	88	70-130	18	35	mg/kg	12.21.17 23:31	
Toluene	<0.00199	0.0994	0.0689	69	0.0833	83	70-130	19	35	mg/kg	12.21.17 23:31	X
Ethylbenzene	<0.00199	0.0994	0.0721	73	0.0767	77	71-129	6	35	mg/kg	12.21.17 23:31	
m,p-Xylenes	<0.00398	0.199	0.142	71	0.138	69	70-135	3	35	mg/kg	12.21.17 23:31	X
o-Xylene	<0.00199	0.0994	0.0675	68	0.0685	69	71-133	1	35	mg/kg	12.21.17 23:31	X

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		89		80-120	%	12.21.17 23:31
4-Bromofluorobenzene	98		92		80-120	%	12.21.17 23:31

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Setting the Standard since 1990
Stafford, Texas (281-240-4200)
Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

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

Phoenix, Arizona (480-355-0900)

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www.xenco.com										Xenco Quote #	Xenco Job #	571792																			
Client / Reporting Information				Project Information				Analytical Information				Matrix Codes																			
Company Name / Branch: COG Operating, LLC Company Address: 2407 Pecos Ave. Artesia NM 88210				Project Name/Number: Aiso Otus Federal #3-H Project Location: Eddy County NM Invoice To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland TX, 79701																											
Email: sheldont@concho.com Phone No: 575-703-6475 dneel2@concho.com; cgray@concho.com; raskell@concho.com				Project Contact: Sheldon Hitchcock				PO Number:																							
Sampler's Name: Sheldon Hitchcock																															
No.		Field ID / Point of Collection		Collection		Number of preserved bottles		TPH EXTENDED		BTEX		CHLORIDES		Field Comments																	
				Sample Depth		Date		Time		Matrix		# of bottles		HCl		NaOH/Zn Acetate		HNO3		H2SO4		NaOH		NaHSO4		MEOH					
1		T-1 0'		0		12/14/17		10:00		S		1																			
2		T-1 1'		1				10:02		S		1																			
3		T-1 2'		2				10:04		S		1																			
4		T-1 3'		3				10:06		S		1																			
5		T-1 4'		4				10:08		S		1																			
6		T-2 0'		0				12:00		S		1																			
7		T-2 1'		1				12:05		S		1																			
8		T-2 2'		2				12:10		S		1																			
9		T-2 3'		3				12:15		S		1																			
10		T-2 4'		4				12:20		S		1																			
Turnaround Time (Business days)				Data Deliverable Information				Notes:																							
☐ Same Day TAT				☐ 5 Day TAT				☐ Level II Std QC				☐ Level IV (Full Data Pkg / raw data)																			
☐ Next Day EMERGENCY				☐ 7 Day TAT				☐ Level III Std QC+ Forms				☐ TRRP Level IV																			
☐ 2 Day EMERGENCY				☒ Contract TAT				☐ Level 3 (CLP Forms)				☐ UST / RG 411																			
☐ 3 Day EMERGENCY								☐ TRRP Checklist																							
TAT Starts Day received by Lab, if received by 5:00 pm																															
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																															
Relinquished by Sampler:		Date Time: 12/14/17		Received By: 104		Relinquished By: 12-19-17		Date Time: 12-19-17		Received By: 1145		Date Time: 12-19-17		Received By: 1145		Date Time: 12-19-17		Received By: 1145		Date Time: 12-19-17		Received By: 1145		Date Time: 12-19-17		Received By: 1145		Date Time: 12-19-17		Received By: 1145	
Relinquished by:		Date Time: 10:00a		Received By: 12-19-17		Relinquished By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17		Date Time: 12-19-17		Received By: 12-19-17	
Relinquished by:		Date Time: 3		Received By: 4		Relinquished By: 4		Date Time: 4		Received By: 4		Date Time: 4		Received By: 4		Date Time: 4		Received By: 4		Date Time: 4		Received By: 4		Date Time: 4		Received By: 4		Date Time: 4		Received By: 4	
Relinquished by:		Date Time: 5		Received By: 5		Relinquished By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5	
Relinquished by:		Date Time: 5		Received By: 5		Relinquished By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5	
Relinquished by:		Date Time: 5		Received By: 5		Relinquished By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5	
Relinquished by:		Date Time: 5		Received By: 5		Relinquished By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time: 5		Received By: 5		Date Time:							



Setting the Standard since 1990
Stafford, Texas (281-240-4200)
Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

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

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Phoenix, Arizona (480-355-0900)

Client / Reporting Information		Project Information		Analytical Information		Matrix Codes											
Company Name / Branch: COG Operating, LLC		Project Name/Number: Asio Oils Federal #314															
Company Address: 2407 Pecos Ave, Artesia NM 88210		Project Location: Eddy County NM															
Email: shitchcock@concho.com dnee12@concho.com ; cgray@concho.com ; rhaskell@concho.com		Invoice To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland Tx, 79701															
Project Contact: Sheldon Hitchcock		PO Number:															
Sampler's Name: Sheldon Hitchcock																	
No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCI	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MeOH	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-3 0'	0	12/14/17	1:30	S	1								X			
2	T-3 1'	1		1:35	S	1								X			
3	T-3 2'	2		1:40	S	1								X			
4	T-3 3'	3		1:45	S	1								X			
5	T-3 4'	4		1:50	S	1								X			
6	BG-1 0'	0		10:36	S	1								X			
7	BG-1 1'	1		10:32	S	1								X			
8	BG-1 2'	2		10:34	S	1								X			
9	BG-1 3'	3		10:36	S	1								X			
10	BG-1 4'	4		10:38	S	1								X			
Turnaround Time (Business days)																	
☐ Same Day TAT		☐ 5 Day TAT															
☐ Next Day EMERGENCY		☐ 7 Day TAT															
☐ 2 Day EMERGENCY		☒ Contract TAT															
☐ 3 Day EMERGENCY		☐ TRRP Checklist															
TAT Starts Day received by Lab, if received by 5:00 pm																	
Relinquished by Sampler:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:	
1. Sheldon Hitchcock		12/14/17		12/14/17		12/14/17		12/14/17		12/14/17		12/14/17		12/14/17		12/14/17	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:	
3				3		3		3		3		3		3		3	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:	
5				5		5		5		5		5		5		5	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:	
5				5		5		5		5		5		5		5	

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.



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

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

Phoenix, Arizona (480-355-0900)

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Xenco Quote #

Xenco Job #

571792

Client / Reporting Information

Company Name / Branch:

COG Operating, LLC

Company Address:

2407 Pecos Ave. Aresia NM 88210

Email: sheltonhitchcock@concho.com

Phone No: 575-703-6475

dneel2@concho.com, cgray@concho.com, raskell@concho.com

Project Contact: Sheldon Hitchcock

Project Name: Sheldon Hitchcock

Project Information

Project Name/Number: Asio Oius Federal #3H

Project Location:

Eddy County NM

Invoice To: COG Operating, LLC

Attn: Robert McNeill

600 W. Illinois Ave.

Midland TX, 79701

PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW = Ocean/Sea Water
WI = Wipe
O = Oil
WM = Waste Water
A = Air

No. Field ID / Point of Collection

No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MeOH	NONE	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	B6-15'	5	12/14/17	10:45	S	1												
2	B6-16'	6		10:50	S	1												
3	B6-18'	8		10:55	S	1												
4	B6-10'	10		10:59	S	1												
5	B6-20'	0		2:30	S	1												
6	B6-21'	1		2:35	S	1												
7	B6-22'	2		2:40	S	1												
8	B6-23'	3		2:45	S	1												
9	B6-24'	4		2:50	S	1												
10	B6-25'	5		2:55	S	1												

Data Deliverable Information

Notes:

Same Day TAT

6 Day TAT

Level II Std QC

Level IV (Full Data Pkg /raw data)

Next Day EMERGENCY

7 Day TAT

Level III Std QC+ Forms

TRRP Level IV

2 Day EMERGENCY

Contract TAT

Level 3 (CLP Forms)

UST / RG -411

3 Day EMERGENCY

TRRP Checklist

TAT Starts Day received by Lab, if received by 5:00 pm

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler:

Date Time: 12/14/17

Received By:

12-14-17 Relinquished By:

Date Time: 11:45

Received By:

Relinquished by:

Date Time: 10:00

Received By:

12-14-17 Relinquished By:

Date Time: 12-14-17

Received By:

Relinquished by:

Date Time:

Received By:

Custody Seal #

Preserved where applicable

On Ice

Cooler Temp.

Thermo. Corr. Factor

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating LLC

Date/ Time Received: 12/19/2017 11:45:00 AM

Work Order #: 571792

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	Yes
#5 Custody Seals intact on sample bottles?	Yes
#6 *Custody Seals Signed and dated?	Yes
#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)?	N/A
#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#:

Checklist completed by: Jessica Kramer
Jessica Kramer

Date: 12/20/2017

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks

Date: 12/26/2017