



January 3, 2022

Cory Smith  
New Mexico Oil Conservation Division  
1000 Rio Brazos  
Aztec, New Mexico 87410

*Submitted via NMOCD Online Portal*

**RE: Q4 2021 Periodic Progress Report  
Trunk S Release (October-December 2021)  
3RP-1014; Incident #NCS1931842879  
Unit I, Section 7, T25N, R3W  
Rio Arriba County, New Mexico**

Dear Mr. Smith:

Animas Environmental Services, LLC (AES) has prepared this Q4 2021 Periodic Progress Report for a release which was discovered June 25, 2019, at the Harvest Four Corners (Harvest) Trunk S natural gas pipeline, located in Rio Arriba County, New Mexico. A topographic site location map is included as Figure 1, and an aerial site map is presented on Figure 2. This report covers site activities from October to December 2021.

### ***1.0 Soil Vapor Extraction (SVE) System***

Harvest Midstream purchased a Varisolar Soil Vapor Extraction (SVE) system in late 2019. The SVE system is constructed of 2-inch Schedule 40 PVC above-ground conveyance pipe and fittings. Rotometers are installed on each leg of the manifold to accompany dedicated vacuum gauges and sample ports. A combined vapor stream sample port is located between the influent vapor manifold and the moisture separator, upstream of the blower. Additionally, a sample port was installed on the exhaust stack, downstream of the two granular carbon vessels to facilitate monitoring of emissions concentrations. Full time system operation began on July 16, 2020.

624 E. Comanche St., Farmington, NM 87401  
PO Box 8, Farmington NM 87499  
505-564-2281  
[www.animasenvironmental.com](http://www.animasenvironmental.com)

Cory Smith NMOCD  
Harvest Trunk S Release (3RP-1014; Incident #1931842879)  
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## 2.0 SVE System Operations and Maintenance (O&M) – 4<sup>th</sup> Quarter 2021

### 2.1 SVE O&M

Monthly operations and maintenance (O&M) visits were conducted by AES on:

- October 20, 2021
- November 30, 2021
- December 14, 2021

During each visit, AES personnel collected system flow, vacuum, and vapor data and monitored granular activated carbon (GAC) efficiency. A sample of each vapor stream was collected in a Tedlar bag using a small vacuum pump. Influent and effluent vapor concentrations were measured using a calibrated Mini Rae 3000 organic vapor meter (OVM). Field measurements were recorded onto field SVE data sheets and are recorded in Table 1, along with telemetry data.

Additionally, samples of the influent vapor stream were collected on December 14, 2021, for laboratory analysis. Two 1-liter Tedlar bags were collected for analysis for volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (USEPA) Method 8260B (full list), gasoline-range organics (GRO) by EPA Method 8015, and oxygen and carbon dioxide by Gas Processors Association (GPA) Method 2261.

Other maintenance activities included the following:

- At the October 20 and November 30, 2021, site visits, AES took OVM measurements from all five SVE zones. OVM readings from Zones 4 and 5 were less than 100 parts per million (ppm), indicating that VOC concentrations have not yet rebounded in those two zones. Therefore, Zones 4 and 5 remained shut off to pulse remediation operations and to increase the vacuum in the remaining zones. Zones 1, 2, and 3 remained under an applied vacuum.
- On November 18, 2021, AES restored telemetry data collection from the VariSolar unit.
- At the December 14, 2021 site visit, cracks were observed in the PVC T-fittings for the pressure gauges for Zones 3 and 4. Air could be heard moving through the cracks. These damaged components likely contributed to the lower vacuum readings that were recorded in late November and early December. The cracks were temporarily patched and repairs are scheduled for the next site visit in January 2022.
- No GAC changeouts were required this quarter.

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## 2.2 Laboratory Analytical Results

Laboratory analytical results show that SVE influent in December 2021 included:

- 13,000 micrograms per liter (µg/L) of total petroleum hydrocarbons (TPH)-GRO;
- 22 µg/L benzene;
- 140 µg/L toluene;
- 10 µg/L ethylbenzene;
- 170 µg/L xylenes;
- 21.828% oxygen;
- 77.678% nitrogen; and
- 0.404% carbon dioxide.

GRO concentrations in SVE influent flow rebounded from September 2021 to December 2021. This concentration increase is likely due to closing off of Zones 4 and 5, which was intended to increase the draw from the more heavily impacted Zones 1, 2, and 3. Overall, GRO concentrations have decreased by 93.5% and combined benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations have decreased by 91% since the system began operations in July 2020. Additionally, carbon dioxide concentrations are also decreasing over time, indicating the movement of air into the subsurface area of contamination, which is typically characterized by low oxygen and elevated carbon dioxide. Laboratory analytical data are included in Table 1, and the laboratory analytical report is attached.

## 3.0 Operational Data and Petroleum Mass Removal – 4<sup>th</sup> Quarter 2021

An SVE operations summary through December 14, 2021, is presented below:

<i>Trunk S Solar SVE System Operations Summary</i>	
<i>Total SVE system operating hours since system startup (hrs)</i>	<i>6,312</i>
<i>Most recent event SVE system influent PID-OVM reading (ppm)</i>	<i>1,570</i>
<i>Most recent event Inlet Vacuum (inH<sub>2</sub>O)</i>	<i>-8</i>
<i>Most recent event Actual Flow Rate (acfm)</i>	<i>54</i>
<i>Total cumulative standard volume processed since system startup (ft<sup>3</sup>)</i>	<i>31,400,485</i>

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<i>Trunk S Solar SVE System Operations Summary</i>	
<i>Total estimated petroleum mass removal since system startup (lbs)</i>	<i>81,721</i>
<i>Estimated lbs removed/std ft<sup>3</sup> for current reporting period (lbs/std ft<sup>3</sup>)</i>	<i>0.0008</i>

System operating parameters and corrected mass removal estimates are detailed in Table 2, and Graph 1 shows remediation progress through December 14, 2021.

#### *4.0 Ongoing SVE System Monitoring and Sampling*

Harvest and AES will continue to maintain SVE runtime greater than or equal to 90 percent per quarter based on available sunlight hours. One soil gas sample per quarter will be collected and analyzed for:

- TPH-GRO per EPA Method 8015;
- Volatile organics per EPA Method 8260 (full list); and
- Carbon dioxide and oxygen per GPA 2261.

Harvest and AES will submit a quarterly progress report detailing remediation operations to NMOCD. The report will include at a minimum:

- Summary of remediation activity for the quarter;
- SVE run time, SVE operating parameters, and petroleum hydrocarbon mass removal;
- Gas sample analytical data; and
- Documentation of replacement of GAC canisters.

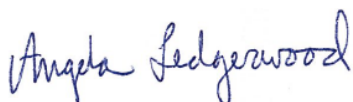
Cory Smith NMOCD  
Harvest Trunk S Release (3RP-1014; Incident #1931842879)  
January 3, 2022; Page 5 of 5

## 6.0 Schedule

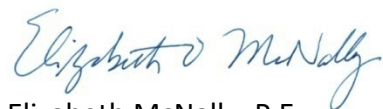
AES will continue to conduct monthly O&M visits, quarterly vapor field and laboratory analytical sampling, and monitoring and replacing GAC drums as needed. The cracked fittings that were discovered during the December 14, 2021, site visit will be replaced as part of the January 2022 site visit.

If you have any questions about site conditions, SVE operations, or this report, please do not hesitate to contact Angela Ledgerwood at (720) 537-6650 or Elizabeth McNally at (505) 564-2281.

Sincerely,



Angela Ledgerwood  
Senior Project Manager



Elizabeth McNally, P.E.  
Principal

## Attachments:

Table 1. SVE Vapor Laboratory Analytical Results  
Table 2. SVE Field Operating Parameters and Mass Removal  
Figure 1. Topographic Site Location Map  
Figure 2. Aerial Site Map with SVE Unit and SVE Well Layout  
Graph 1. Estimated Remedial Progress – Mass Removal over Time  
Laboratory Analytical Reports –  
December 14, 2021 Vapor Sampling (Hall No. 2112971)

Cc: Monica Smith  
Harvest Midstream Company  
Electronic Mail: [msmith@harvestmidstream.com](mailto:msmith@harvestmidstream.com)

Shared Documents/Trunk S Release/Reports and Workplans/2021.12.24 Trunk S Periodic Progress Report 4th Qtr 2021  
DR EM.doc

TABLE 1  
SVE VAPOR LABORATORY ANALYTICAL RESULTS  
Harvest Trunk S  
Release 3RP-1014, Incident #NCS1931842879

<i>Date</i>	<i>Benzene</i> <i>µg/L</i>	<i>Toluene</i> <i>µg/L</i>	<i>Ethyl- benzene</i> <i>µg/L</i>	<i>Totals</i> <i>Xylenes</i> <i>µg/L</i>	<i>GRO</i> <i>µg/L</i>	<i>O<sub>2</sub></i> <i>Mol %</i>	<i>CO<sub>2</sub></i> <i>Mol %</i>
16-Jul-20	1,700	1,570	29.4	517.9	NS	20.2	0.671
3-Sep-20	45	220	22	230	NS	NS	NS
30-Sep-20	49	480	86	770	NS	NS	NS
14-Oct-20	150	460	15	270	68,000	20.939	0.928
8-Jan-21	76	310	9.1	150	38,000	20.810	0.880
9-Apr-21	50	160	8.2	140	30,000	21.541	0.485
12-Jul-21	33	150	12	210	19,000	21.465	0.491
29-Sep-21	15	77	5.3	85	6,500	21.567	0.536
14-Dec-21	22	140	10	170	13,000	21.828	0.404

**Notes:**

Benzene, toluene, ethylbenzene, and total xylenes analyzed via USEPA Method 8260B.

GRO analyzed via USEPA Method 8015D.

O<sub>2</sub> and CO<sub>2</sub> analyzed via GPA Method 2261.

CO<sub>2</sub>            Carbon dioxide

GRO            Total petroleum hydrocarbons, gasoline-range organics (C6-C10)

µg/L           Micrograms per liter

Mol%           Mole percent

NS            Not Sampled

O<sub>2</sub>            Oxygen

TABLE 2  
SVE FIELD OPERATING PARAMETERS and MASS REMOVAL  
Harvest Trunk S  
Release 3RP-1014, Incident #NCS1931842879

Date	Operating Days	Telemetry Operating Hours Reading	Field PID-OVM (ppmv)	Telemetry Inlet Vacuum (in. H <sub>2</sub> O)	Calculated Inlet Vacuum (in. Hg)	Field Inlet Temp. (°F)	Field Outlet Temp. (°F)	Telemetry Actual Flow Rate (acfm) <sup>7</sup>	Telemetry Converted to Standard Flow Rate (scfm)	Total Standard Volume (ft <sup>3</sup> )	VOCs (GRO) (ug/L)	VOCs (GRO) Removed (lbs/ Δt)	lbs removed/ std ft <sup>3</sup>
16-Jul-20	0	322	4,268	-12	-0.883	NM	NM	120	88	--	200,000	--	--
3-Sep-20	49	963	1,100	-16	-1.177	NM	NM	119	86	3,346,020	54,357	13,247	0.0040
30-Sep-20	76	1,298	1,200	-16	-1.177	NM	153	120	87	1,738,650	59,000	6,135	0.0035
14-Oct-20	90	1,450	1,357	-20	-1.471	NM	NM	122	86	788,880	68,000	3,119	0.0040
23-Nov-20	130	1,847	2,033	-17	-1.250	54	62	124	92	2,119,980	NM	--	--
8-Jan-21	176	2,275	786	-28	-2.060	50	60	131	94	2,388,240	38,000	20,209	0.0045
5-Feb-21	204	2,543	763	-20	-1.471	36	44	129	96	1,527,600	NM	--	--
10-Mar-21	237	2,891	433	-20	-1.471	50	58	128	93	1,973,160	NM	--	--
9-Apr-21	267	3,246	898	-17	-1.250	62	78	124	92	1,970,250	30,000	16,691	0.0031
16-Apr-21	274	3,334	NM	-21	-1.545	NM	NM	123	90	480,480	NM	--	--
17-Jun-21	336	4,182	772	-19	-1.398	94	100	124	84	4,425,412	NM	--	--
12-Jul-21	361	4,535	859	-19	-1.398	86	94	124	85	1,790,116	19,000	14,174	0.0021
12-Aug-21	392	4,958	355	-19	-1.398	76	94	124	86	2,169,580	NM	--	--
9-Sep-21	420	5,314	351	-19	-1.398	85	102	124	85	1,826,229	NM	--	--
29-Sep-21	440	5,550	561	-19	-1.398	50	53	124	92	1,256,771	6,500	5,232	0.0010
20-Oct-21	461	5,783	563	-19	-1.398	55	55	124	91	1,278,072	NM	--	--
18-Nov-21	490	6,080	NM	-21	-1.545	NM	NM	106	80	1,522,687	NM	--	--
30-Nov-21	502	6,182	1,570	-13	-0.956	58	70	76	56	416,160	NM	--	--
14-Dec-21	516	6,312	NM	-8	-0.588	NM	NM	54	42	382,200	13,000	2,913	0.0008
Cumulative Flow										31,400,485	81,721 total lbs removed		

**Notes:**

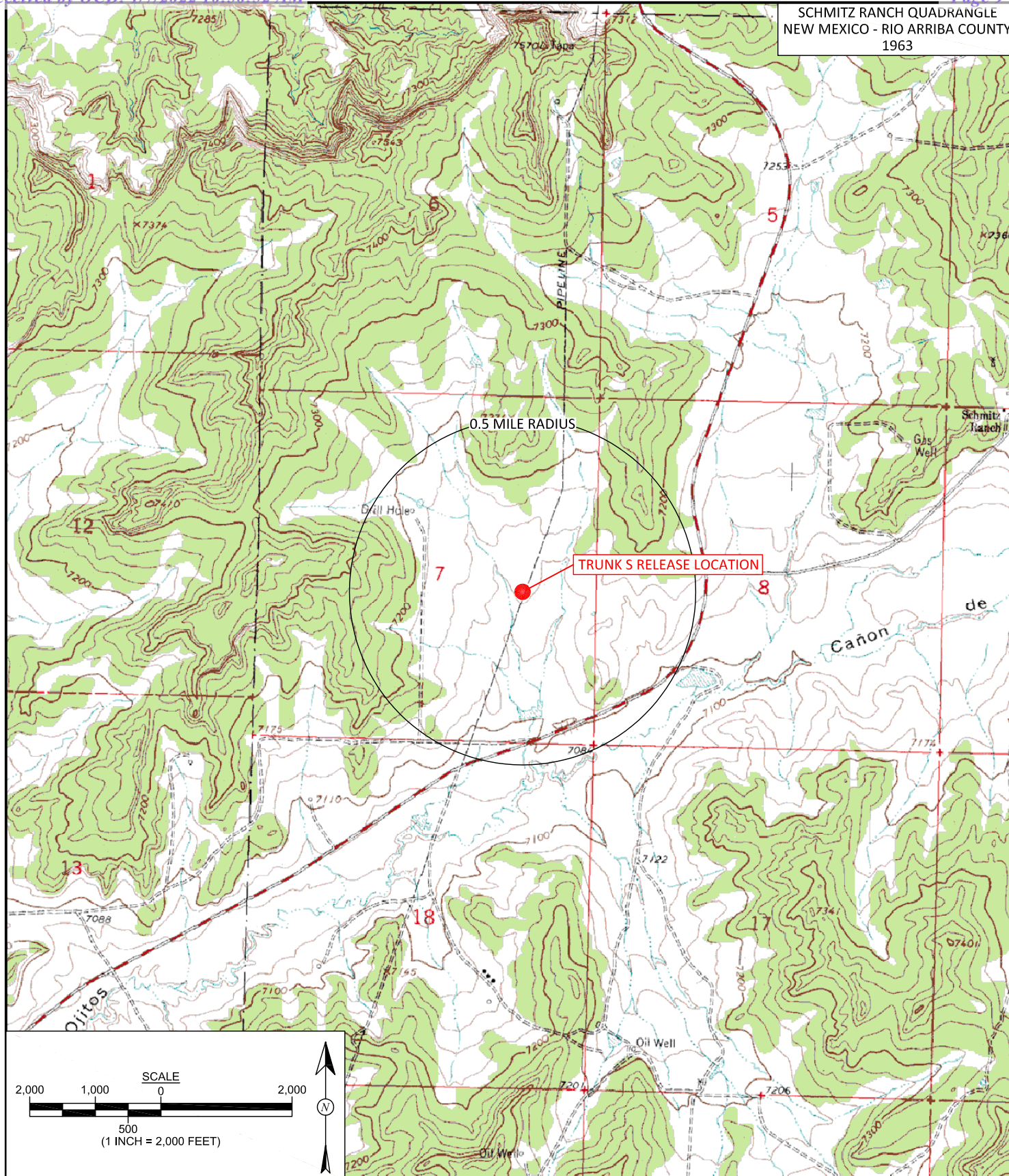
1. PID - photoionization detector; OVM - organic vapor meter
2. ppmv - parts per million by volume (v/v; equivalent to mL/L or mL/m<sup>3</sup>)
3. acfm - measured cubic feet per minute (volumetric flow, calculated based on flow velocity and pipe diameter)

TABLE 2  
SVE FIELD OPERATING PARAMETERS and MASS REMOVAL  
Harvest Trunk S  
Release 3RP-1014, Incident #NCS1931842879

<i>Date</i>	<i>Operating Days</i>	<i>Telemetry Operating Hours Reading</i>	<i>Field PID-OVM (ppmv)</i>	<i>Telemetry Inlet Vacuum (in. H<sub>2</sub>O)</i>	<i>Calculated Inlet Vacuum (in. Hg)</i>	<i>Field Inlet Temp. (°F)</i>	<i>Field Outlet Temp. (°F)</i>	<i>Telemetry Actual Flow Rate (acfm)<sup>7</sup></i>	<i>Telemetry Converted to Standard Flow Rate (scfm)</i>	<i>Total Standard Volume (ft<sup>3</sup>)</i>	<i>VOCs (GRO) (ug/L)</i>	<i>VOCs (GRO) Removed (lbs/ Δt)</i>	<i>lbs removed/ std ft<sup>3</sup></i>
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4. total flow - vapor flow between system readings (ΔT)
5. °F - degrees Fahrenheit
6. Site elevation - 7,140 ft amsl
7. Flow readings from telemetry data.
8. NM = not measured





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services

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**DRAWN BY:**  
C. Lameman

**DATE DRAWN:**  
July 22, 2019

**REVISIONS BY:**  
C. Lameman

**DATE REVISED:**  
July 22, 2019

**CHECKED BY:**  
E. McNally

**DATE CHECKED:**  
July 22, 2019

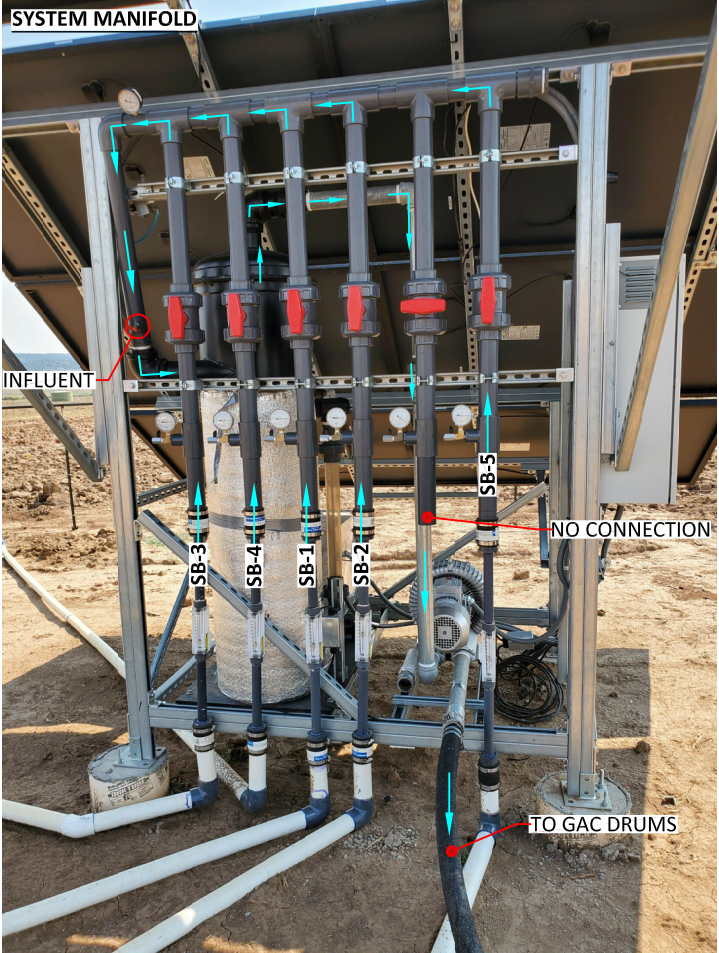
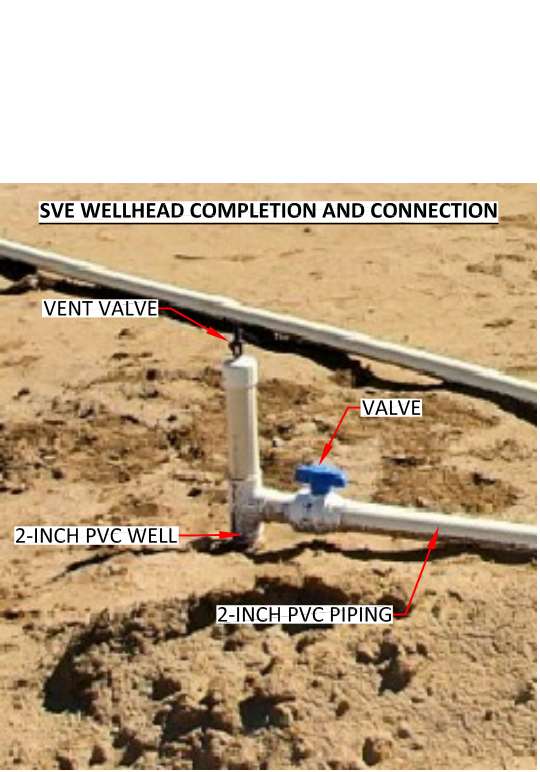
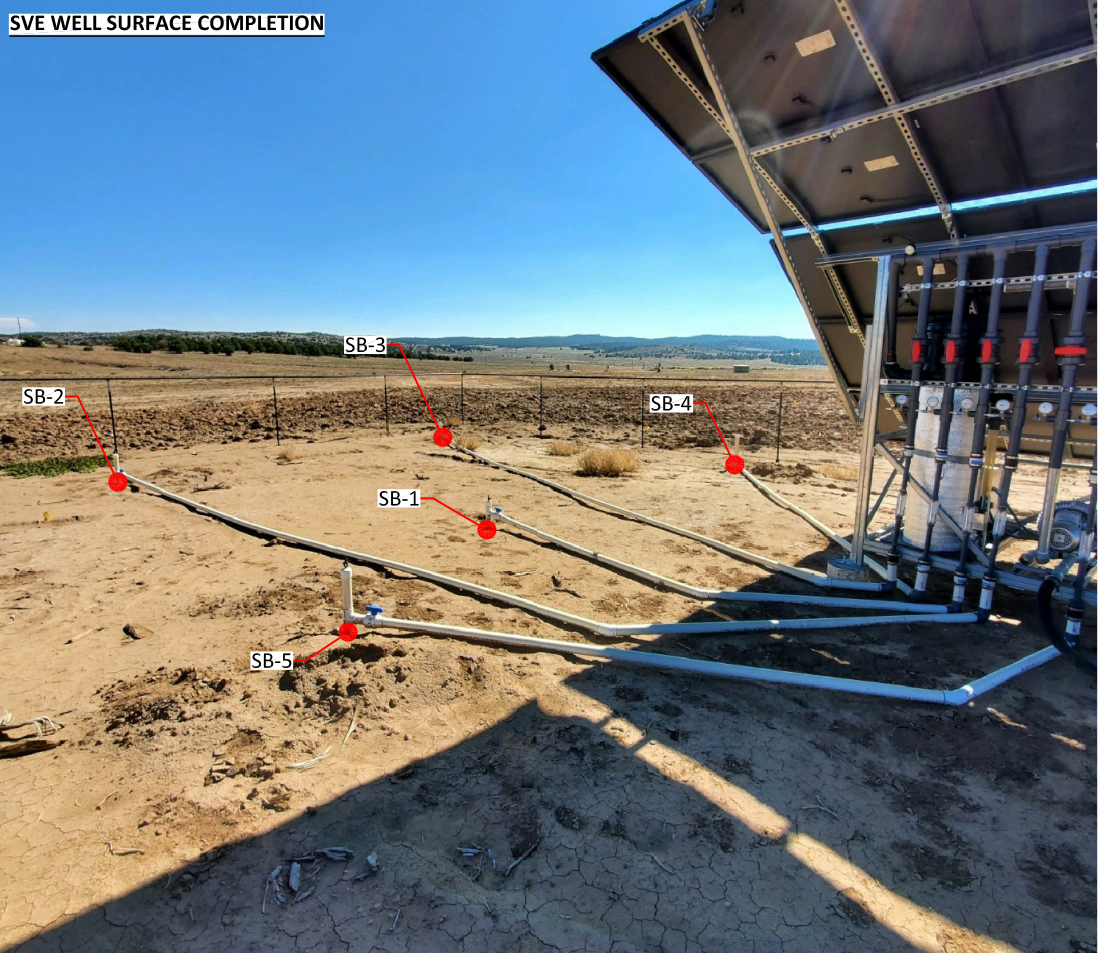
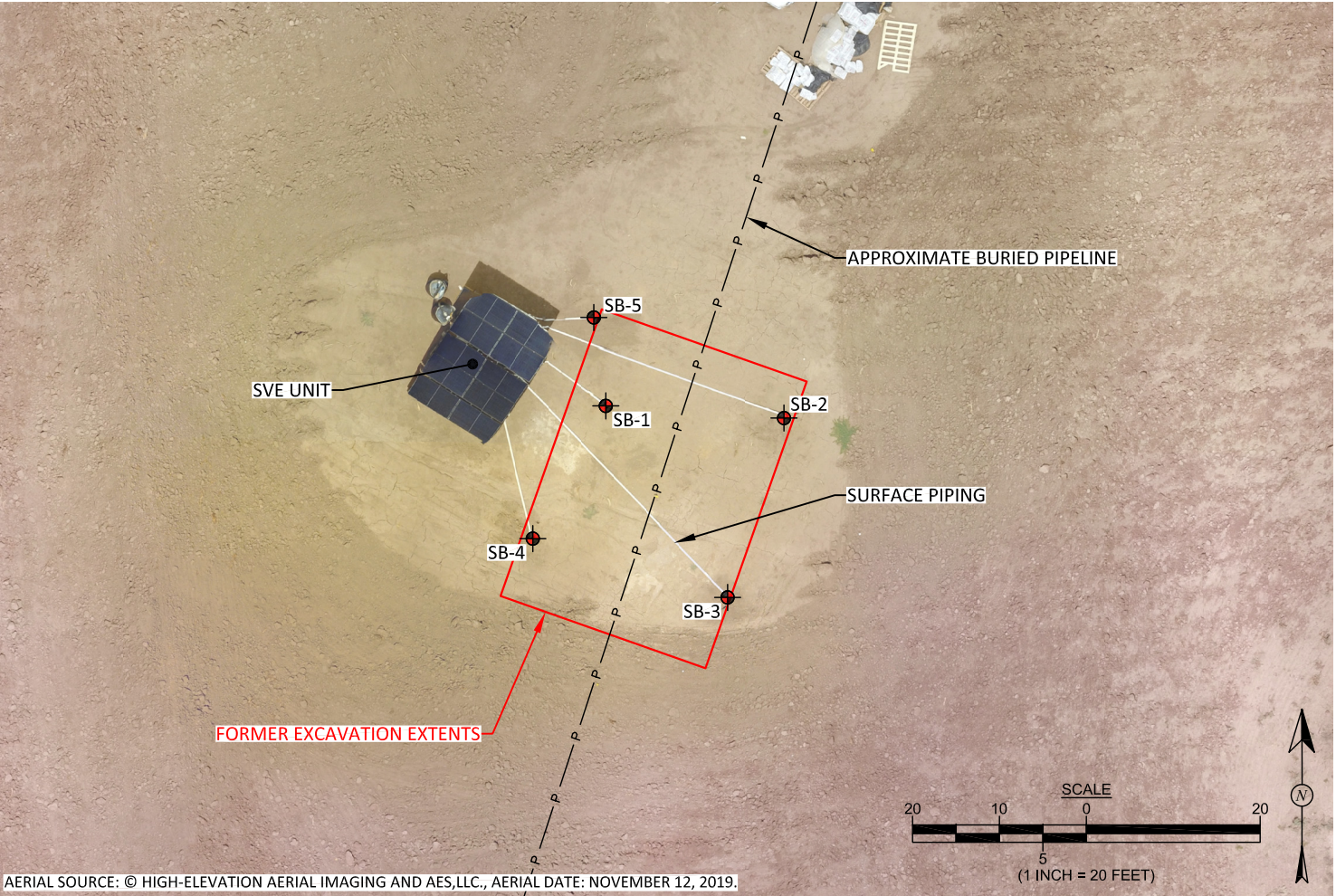
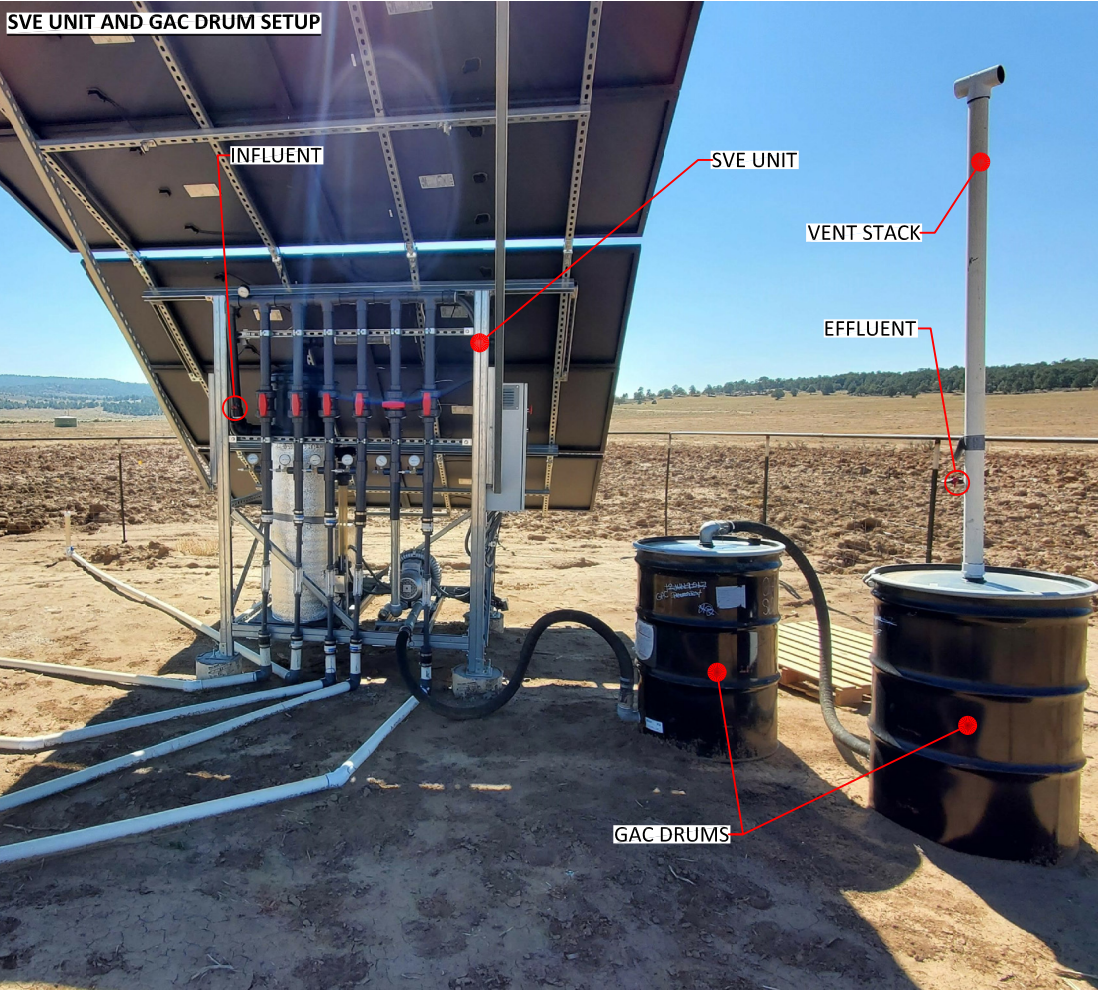
**APPROVED BY:**  
E. McNally

**DATE APPROVED:**  
July 22, 2019

## FIGURE 1

**TOPOGRAPHIC SITE LOCATION MAP**  
HARVEST MIDSTREAM  
TRUNK S RELEASE LOCATION  
NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SEC. 7, T25N, R3W  
RIO ARriba COUNTY, NEW MEXICO  
N36.41180, -107.18085





**FIGURE 2**

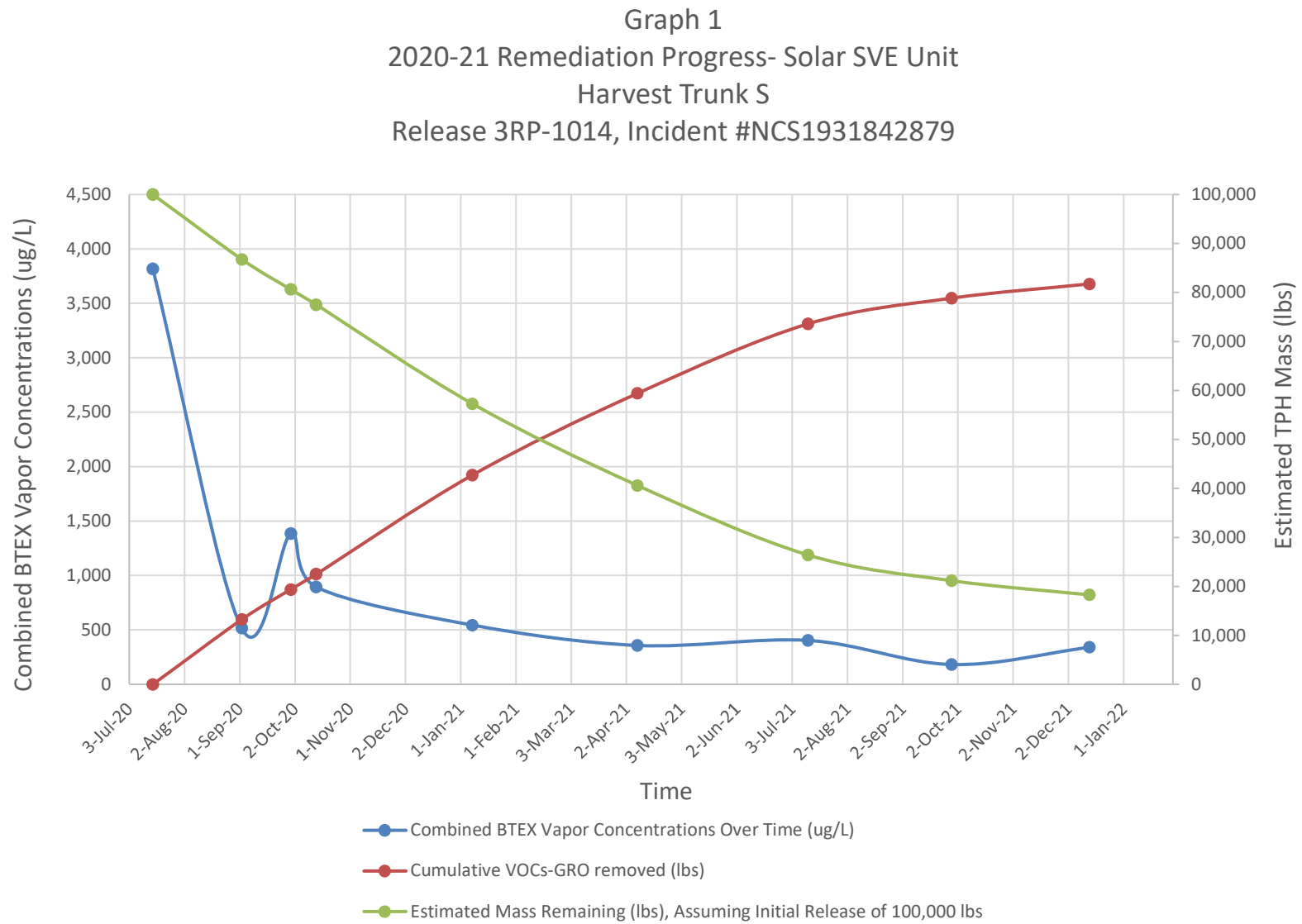
**SVE UNIT AND SVE WELL LAYOUT**  
HARVEST MIDSTREAM  
TRUNK S RELEASE LOCATION  
INCIDENT NUMBER: NCS1931842879  
RELEASE ID: 373888  
NE¼ SE¼, SEC. 7, T25N, R3W  
RIO ARriba COUNTY, NEW MEXICO  
N36.41180, W107.18085



<b>DRAWN BY:</b> C. Lameman	<b>DATE DRAWN:</b> August 3, 2020
<b>REVISIONS BY:</b> C. Lameman	<b>DATE REVISED:</b> October 22, 2020
<b>CHECKED BY:</b> E. McNally	<b>DATE CHECKED:</b> October 22, 2020
<b>APPROVED BY:</b> E. McNally	<b>DATE APPROVED:</b> October 22, 2020

**LEGEND**  
SOIL VAPOR EXTRACTION WELL







Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

December 28, 2021

Angela Ledgerwood  
Animas Environmental Services  
624 E. Comanche  
Farmington, NM 87401  
TEL: (505) 564-2281  
FAX: (505) 324-2022

RE: Harvest Trunk S Quarterly Air Sampling

OrderNo.: 2112971

Dear Angela Ledgerwood:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/15/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman".

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2112971

Date Reported: 12/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Animas Environmental Services

Client Sample ID: SVE Influent

Project: Harvest Trunk S Quarterly Air Sampling

Collection Date: 12/14/2021 10:47:00 AM

Lab ID: 2112971-001

Matrix: AIR

Received Date: 12/15/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	13000	100		µg/L	20	12/16/2021 9:20:30 AM	G84607
Surr: BFB	472	37.3-213	S	%Rec	20	12/16/2021 9:20:30 AM	G84607
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: <b>CCM</b>
Benzene	22	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Toluene	140	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Ethylbenzene	10	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Methyl tert-butyl ether (MTBE)	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2,4-Trimethylbenzene	4.0	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,3,5-Trimethylbenzene	5.9	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2-Dichloroethane (EDC)	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2-Dibromoethane (EDB)	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Naphthalene	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1-Methylnaphthalene	ND	8.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
2-Methylnaphthalene	ND	8.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Acetone	ND	20		µg/L	20	12/17/2021 3:12:00 PM	R84633
Bromobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Bromodichloromethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Bromoform	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Bromomethane	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
2-Butanone	ND	20		µg/L	20	12/17/2021 3:12:00 PM	R84633
Carbon disulfide	ND	20		µg/L	20	12/17/2021 3:12:00 PM	R84633
Carbon tetrachloride	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Chlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Chloroethane	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Chloroform	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Chloromethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
2-Chlorotoluene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
4-Chlorotoluene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
cis-1,2-DCE	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
cis-1,3-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2-Dibromo-3-chloropropane	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Dibromochloromethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Dibromomethane	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,3-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,4-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Dichlorodifluoromethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1-Dichloroethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1-Dichloroethene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

## Analytical Report

Lab Order 2112971

Date Reported: 12/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Animas Environmental Services

Client Sample ID: SVE Influent

Project: Harvest Trunk S Quarterly Air Sampling

Collection Date: 12/14/2021 10:47:00 AM

Lab ID: 2112971-001

Matrix: AIR

Received Date: 12/15/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: CCM
1,2-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,3-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
2,2-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Hexachlorobutadiene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
2-Hexanone	ND	20		µg/L	20	12/17/2021 3:12:00 PM	R84633
Isopropylbenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
4-Isopropyltoluene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
4-Methyl-2-pentanone	ND	20		µg/L	20	12/17/2021 3:12:00 PM	R84633
Methylene chloride	ND	6.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
n-Butylbenzene	ND	6.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
n-Propylbenzene	2.0	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
sec-Butylbenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Styrene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
tert-Butylbenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1,1,2-Tetrachloroethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Tetrachloroethene (PCE)	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
trans-1,2-DCE	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
trans-1,3-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2,3-Trichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2,4-Trichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1,1-Trichloroethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,1,2-Trichloroethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Trichloroethene (TCE)	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Trichlorofluoromethane	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
1,2,3-Trichloropropane	ND	4.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Vinyl chloride	ND	2.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Xylenes, Total	170	3.0		µg/L	20	12/17/2021 3:12:00 PM	R84633
Surr: Dibromofluoromethane	96.6	70-130		%Rec	20	12/17/2021 3:12:00 PM	R84633
Surr: 1,2-Dichloroethane-d4	85.2	70-130		%Rec	20	12/17/2021 3:12:00 PM	R84633
Surr: Toluene-d8	118	70-130		%Rec	20	12/17/2021 3:12:00 PM	R84633
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	20	12/17/2021 3:12:00 PM	R84633

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Page 2 of 2



## ANALYTICAL SUMMARY REPORT

December 18, 2021

Hall Environmental  
 4901 Hawkins St NE Ste D  
 Albuquerque, NM 87109-4372

Work Order: G21120300

Project Name: Not Indicated

Energy Laboratories Inc. Gillette WY received the following 1 sample for Hall Environmental on 12/16/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G21120300-001	2112971-001B; SVE Influent	12/14/21 10:47	12/16/21	Gas	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo-Critical Pressure Natural Gas Analysis - Psuedo-Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these tests results, please contact your Project Manager.

Report Approved By:



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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

## LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 2112971-001B; SVE Influent  
**Location:**  
**Lab ID:** G21120300-001

**Report Date:** 12/18/21  
**Collection Date:** 12/14/21 10:47  
**Date Received:** 12/16/21  
**Sampled By:** Not Provided

### Analyses

**Result Units Qualifier Method Analysis Date / By**

### NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT

Oxygen	21.828 Mol %	GPA 2261	12/17/21 14:41 / djb
Nitrogen	77.678 Mol %	GPA 2261	12/17/21 14:41 / djb
Carbon Dioxide	0.404 Mol %	GPA 2261	12/17/21 14:41 / djb
Hydrogen Sulfide	< 0.001 Mol %	GPA 2261	12/17/21 14:41 / djb
Methane	< 0.001 Mol %	GPA 2261	12/17/21 14:41 / djb
Ethane	0.001 Mol %	GPA 2261	12/17/21 14:41 / djb
Propane	< 0.001 Mol %	GPA 2261	12/17/21 14:41 / djb
Isobutane	0.001 Mol %	GPA 2261	12/17/21 14:41 / djb
n-Butane	0.002 Mol %	GPA 2261	12/17/21 14:41 / djb
Isopentane	0.003 Mol %	GPA 2261	12/17/21 14:41 / djb
n-Pentane	0.002 Mol %	GPA 2261	12/17/21 14:41 / djb
Hexanes plus	0.081 Mol %	GPA 2261	12/17/21 14:41 / djb

### GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS

GPM Ethane	< 0.0003 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Propane	< 0.0003 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Isobutane	< 0.0003 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM n-Butane	0.0010 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Isopentane	0.0010 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM n-Pentane	0.0010 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Hexanes plus	0.0350 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Pentanes plus	0.0370 gal/MCF	GPA 2261	12/17/21 14:41 / djb
GPM Total	0.0390 gal/MCF	GPA 2261	12/17/21 14:41 / djb

### CALCULATED PROPERTIES

Calculation Pressure Base	14.730 psia	GPA 2261	12/17/21 14:41 / djb
Calculation Temperature Base	60 °F	GPA 2261	12/17/21 14:41 / djb
Compressibility Factor, Z	1.0000 unitless	GPA 2261	12/17/21 14:41 / djb
Molecular Weight	29.00 unitless	GPA 2261	12/17/21 14:41 / djb
Pseudo-critical Pressure, psia	548 psia	GPA 2261	12/17/21 14:41 / djb
Pseudo-critical Temperature, deg R	241 deg R	GPA 2261	12/17/21 14:41 / djb
Specific Gravity (air=1.000)	1.004 unitless	GPA 2261	12/17/21 14:41 / djb
Gross BTU per cu ft @ std cond, dry	4.53 BTU/cu ft	GPA 2261	12/17/21 14:41 / djb
Gross BTU per cu ft @ std cond, wet	4.45 BTU/cu ft	GPA 2261	12/17/21 14:41 / djb

**Report** RL - Analyte Reporting Limit  
**Definitions:** QCL - Quality Control Limit

MCL - Maximum Contaminant Level  
ND - Not detected at the Reporting Limit (RL)





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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

## QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental

Work Order: G21120300

Report Date: 12/18/21

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: GPA 2261</b>							Analytical Run: R268601		
<b>Lab ID: ICV-2112170950</b>	Initial Calibration Verification Standard							12/17/21 09:51	
Oxygen	0.379	Mol %	0.001	94	75	110			
Nitrogen	5.088	Mol %	0.001	101	90	110			
Carbon Dioxide	4.899	Mol %	0.001	99	90	110			
Hydrogen Sulfide	0.125	Mol %	0.001	126	100	136			
Methane	73.254	Mol %	0.001	100	90	110			
Ethane	4.995	Mol %	0.001	101	90	110			
Propane	4.999	Mol %	0.001	100	90	110			
Isobutane	1.991	Mol %	0.001	99	90	110			
n-Butane	1.973	Mol %	0.001	98	90	110			
Isopentane	0.988	Mol %	0.001	99	90	110			
n-Pentane	1.001	Mol %	0.001	100	90	110			
Hexanes plus	0.308	Mol %	0.001	102	90	110			
<b>Lab ID: CCV-2112170957</b>	Continuing Calibration Verification Standard							12/17/21 09:58	
Oxygen	0.602	Mol %	0.001	100	90	110			
Nitrogen	1.283	Mol %	0.001	92	85	110			
Carbon Dioxide	0.956	Mol %	0.001	96	90	110			
Hydrogen Sulfide	0.023	Mol %	0.001	92	70	130			
Methane	93.575	Mol %	0.001	100	90	110			
Ethane	1.012	Mol %	0.001	101	90	110			
Propane	1.006	Mol %	0.001	101	90	110			
Isobutane	0.493	Mol %	0.001	98	90	110			
n-Butane	0.492	Mol %	0.001	98	90	110			
Isopentane	0.199	Mol %	0.001	99	90	110			
n-Pentane	0.200	Mol %	0.001	100	90	110			
Hexanes plus	0.159	Mol %	0.001	106	90	110			
<b>Lab ID: CCV-2112171552</b>	Continuing Calibration Verification Standard							12/17/21 15:52	
Oxygen	0.618	Mol %	0.001	103	90	110			
Nitrogen	1.326	Mol %	0.001	95	85	110			
Carbon Dioxide	0.954	Mol %	0.001	95	90	110			
Hydrogen Sulfide	0.022	Mol %	0.001	88	70	130			
Methane	93.525	Mol %	0.001	100	90	110			
Ethane	1.011	Mol %	0.001	101	90	110			
Propane	1.008	Mol %	0.001	101	90	110			
Isobutane	0.493	Mol %	0.001	98	90	110			
n-Butane	0.492	Mol %	0.001	98	90	110			
Isopentane	0.198	Mol %	0.001	99	90	110			
n-Pentane	0.199	Mol %	0.001	99	90	110			
Hexanes plus	0.154	Mol %	0.001	103	90	110			
<b>Method: GPA 2261</b>							Batch: R268601		
<b>Lab ID: G21120300-001ADUP</b>	Sample Duplicate							Run: Varian GC_211217A	
Oxygen	21.824	Mol %	0.001				0.0	10	12/17/21 14:47

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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## QA/QC Summary Report

Prepared by Gillette, WY Branch

**Client:** Hall Environmental

**Work Order:** G21120300

**Report Date:** 12/18/21

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: GPA 2261</b>							Batch: R268601		
<b>Lab ID: G21120300-001ADUP</b>	Sample Duplicate		Run: Varian GC_211217A				12/17/21 14:47		
Nitrogen	77.680	Mol %	0.001				0.0	10	
Carbon Dioxide	0.404	Mol %	0.001				0.0	10	
Hydrogen Sulfide	< 0.001	Mol %	0.001					10	
Methane	< 0.001	Mol %	0.001					10	
Ethane	0.001	Mol %	0.001				0.0	10	
Propane	< 0.001	Mol %	0.001					10	
Isobutane	0.001	Mol %	0.001				0.0	10	
n-Butane	0.002	Mol %	0.001				0.0	10	
Isopentane	0.003	Mol %	0.001				0.0	10	
n-Pentane	0.002	Mol %	0.001				0.0	10	
Hexanes plus	0.083	Mol %	0.001				2.4	10	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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# Work Order Receipt Checklist

Hall Environmental

G21120300

Login completed by: Chantel S. Johnson

Date Received: 12/16/2021

Reviewed by: Misty Stephens

Received by: csj

Reviewed Date: 12/17/2021

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>
Container/Temp Blank temperature:	°C		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

## Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

None



## CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Hall Environmental Analysis Laboratory  
 4901 Hawkins NE  
 Albuquerque, NM 87109  
 TEL: 505-345-3975  
 FAX: 505-345-4107  
 Website: clients.hallenvironmental.com

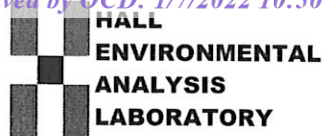
SUB CONTRACTOR		Energy Labs-Gillette		COMPANY:	Energy Laboratories		PHONE:	(866) 686-7175		FAX:
ADDRESS:		400 W Borelder Rd		ACCOUNT #:		EMAIL:				
CITY, STATE, ZIP		Gillette, WY 82718								

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2112971-001B	SVE Influent	TEDLAR	Air	12/14/2021 10:47:00 AM	1	Fixed Gases O2, CO2

## SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED:
aw	12/15/2021	1:33 PM	Received By:	12/16/2021	1:33 PM	HARD COPY (extra cost) FAX ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Temp of samples Attempt to Cool?
TAT:	Standard Y	RUSH	Next BD	2nd BD	3rd BD	Comments: 621120300



Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: clients.hallenvironmental.com

## Sample Log-In Check List

Client Name: Animas Environmental Services

Work Order Number: 2112971

RcptNo: 1

Received By: Isaiah Ortiz 12/15/2021 8:00:00 AM

Completed By: Cheyenne Cason 12/15/2021 1:32:29 PM

Reviewed By: IO

12/15/21

IO

Chad

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: *[Signature]* 12.15.21

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

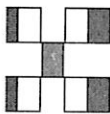
Client Instructions: \_\_\_\_\_

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.8	Good	Yes			





## HALL ENVIRONMENTAL ANALYSIS LABORATORY

[www.hallenvironmental.com](http://www.hallenvironmental.com)

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

## Analysis Request

[illegible]

Remarks:

Please direct-bill this project to BMG.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS  
  
Action 71022

CONDITIONS

Operator: Harvest Four Corners, LLC 1111 Travis Street Houston, TX 77002	OGRID: 373888
	Action Number: 71022
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 129947 for most updated status.	10/18/2022