

**VIA ELECTRONIC MAIL**

January 25, 2020

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

**Subject: Quarterly Solar SVE System Update
Trunk L Tank Battery
Harvest Four Corners, LLC
Incident Number NVF1900731813
Remediation Permit Number 3RP-13665
Rio Arriba County, New Mexico**

Dear Mr. Smith:

WSP USA Inc. (WSP), formally LT Environmental, on behalf of Harvest Four Corners, LLC (Harvest), presents the following quarterly report summarizing the solar soil vapor extraction (SVE) system performance at the Trunk L Tank Battery (Site), located in Unit A of Section 28, Township 28 North, Range 05 West, in Rio Arriba County, New Mexico (Figure 1).

BACKGROUND

The solar SVE system was installed on September 18, 2019, to remediate subsurface soil impacts following a release on December 14, 2018. Excessive liquids were released onto the Site during a pigging event. Additionally, the volume of fluid in the slug catcher was elevated due to a stuck float valve, causing a release of approximately 22 barrels (bbls) into the lined secondary containment. Harvest reported the release to the New Mexico Oil Conservation Division (NMOCD) on a Release Notification and Corrective Action Form C-141 on December 28, 2018, and the event was assigned Incident Number NVF1900731813. A SVE system was installed to remediate impacts resulting from the release. Reports summarizing remediation system operation for the previous quarters of system operation have been submitted to the NMOCD by Harvest.

SOLAR SVE SYSTEM OPERATION AND MONITORING

The solar SVE system consists of 3 deep SVE wells, 3 shallow SVE wells, and a 2.75 horsepower, three-phase blower capable of producing 105 cubic feet per minute (cfm) at 50 inches of water column (IWC) vacuum, with a maximum vacuum capability of 84 IWC. Each SVE well was installed with its own adjustable valve and vacuum gauge on a manifold to control flow and vacuum. LTE utilized a solar-powered SVE system due to the remote location and the lack of electrical grid power at the Site. The blower is powered by 10 solar panels with a nominal maximum power output of 3,050 watts. The blower is connected to the solar panels via a motor controller that automatically starts the system as soon as sunlight is available and throttles the blower up as sun power increases throughout the day to maximize efficiency. Seasonally, there are approximately 10 hours in the winter and 12 hours in the summer of available solar power in Farmington, New Mexico. The complete solar SVE system is constructed as one unit designed for utilization at off-grid locations and operates autonomously. The layout of the solar SVE system is depicted on Figure 2.

Between startup of the SVE system on September 18, 2019, and the most recent site visit on January 4, 2021, there have been 475 days of operation, with an estimated 5,502 total hours of nominal daylight available for solar SVE system operation. Since installation, the system had an actual runtime of 5,610 hours, for an overall runtime

WSP USA
848 EAST 2ND AVENUE
DURANGO CO 81301

Tel.: 970-385-1096
wsp.com



efficiency of 102 percent (%). Below is a table showing SVE system runtime in comparison with nominal available daylight hours per month, according to the National Oceanic and Atmospheric Administration's National Weather Service.

Time Period	Start up on September 18, 2019 to September 15, 2020	September 16, 2020 to September 30, 2020	October 2020	November 2020	December 1, 2020 to January 4, 2021
Days	363	15	31	31	35
Avg. Nominal Daylight Hours	12	12	11	10	9
Available Runtime Hours	4,356	180	341	310	315
Total Available Daylight Runtime Hours					5,502
Actual Runtime Hours					5,610
Cumulative % Runtime					102.0%
Quarterly Available Daylight Runtime Hours					1,146
Quarterly Runtime Hours					1,163
Quarterly % Runtime					101.5%

AIR EMISSIONS MONITORING

An initial air sample was collected on September 18, 2019, from the influent side of the blower on the solar SVE system. Subsequent air samples were collected with the most recent sample collected December 2, 2020 (Table 1). Samples were collected in Tedlar® bags and submitted to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico, for analyses of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (EPA) Method 8021 and total volatile petroleum hydrocarbons (TVPH) using EPA Method 8015.

Estimated air emissions were calculated using air sample data collected to-date (Table 2). The impacted mass source removal via the solar SVE system to-date is an estimated 18,659 pounds (lbs) of TVPH. An estimated 3,009 gallons (72 bbls) of air equivalent condensate has been recovered to-date. An increase in TVPH analytical results was observed due to system optimization, through focusing system operation on the four SVE wells with the highest photoionization detector measurements.

PLAN FOR NEXT QUARTER OF OPERATION

During the upcoming first quarter 2021 operations, visits to the Site will continue on a monthly basis by WSP personnel to ensure 90% runtime efficiency continues and that any maintenance issues are addressed. An air sample will be collected in the first quarter and analyzed for BTEX by EPA Method 8021 and TVPH by EPA Method 8015. An updated quarterly report with sample results, runtime, and mass source removal will be submitted under separate cover.

Quarterly air sampling and reporting will continue until a decline in volatile organic compounds (VOCs) is observed and indicates that hydrocarbon impacts have been reduced. At that time, WSP will conduct additional soil sampling to investigate potential residual impacts and request closure if concentrations of BTEX and TPH are below the applicable standards as detailed in the approved Remediation Work Plan dated May 28, 2019.

If the final delineation samples indicate hydrocarbon impact has been reduced to below Table 1 Closure Criteria, WSP will present the confirmation laboratory analysis data in a report and request closure of the release. Should the results indicate that analytes in the soil exceed Table 1 Closure Criteria, WSP will continue to operate the system and make operational adjustments based on results of the investigation.



Kind regards,

A handwritten signature in blue ink that reads "Eric Carroll".

Eric Carroll
Associate Geologist

A handwritten signature in blue ink that reads "Robert T. Rebel".

Robert Rebel, P.E.
Technical Principal, Lead Consultant

cc: Kijun Hong, Harvest Four Corners

Encl.

Figure 1 - Site Location Map

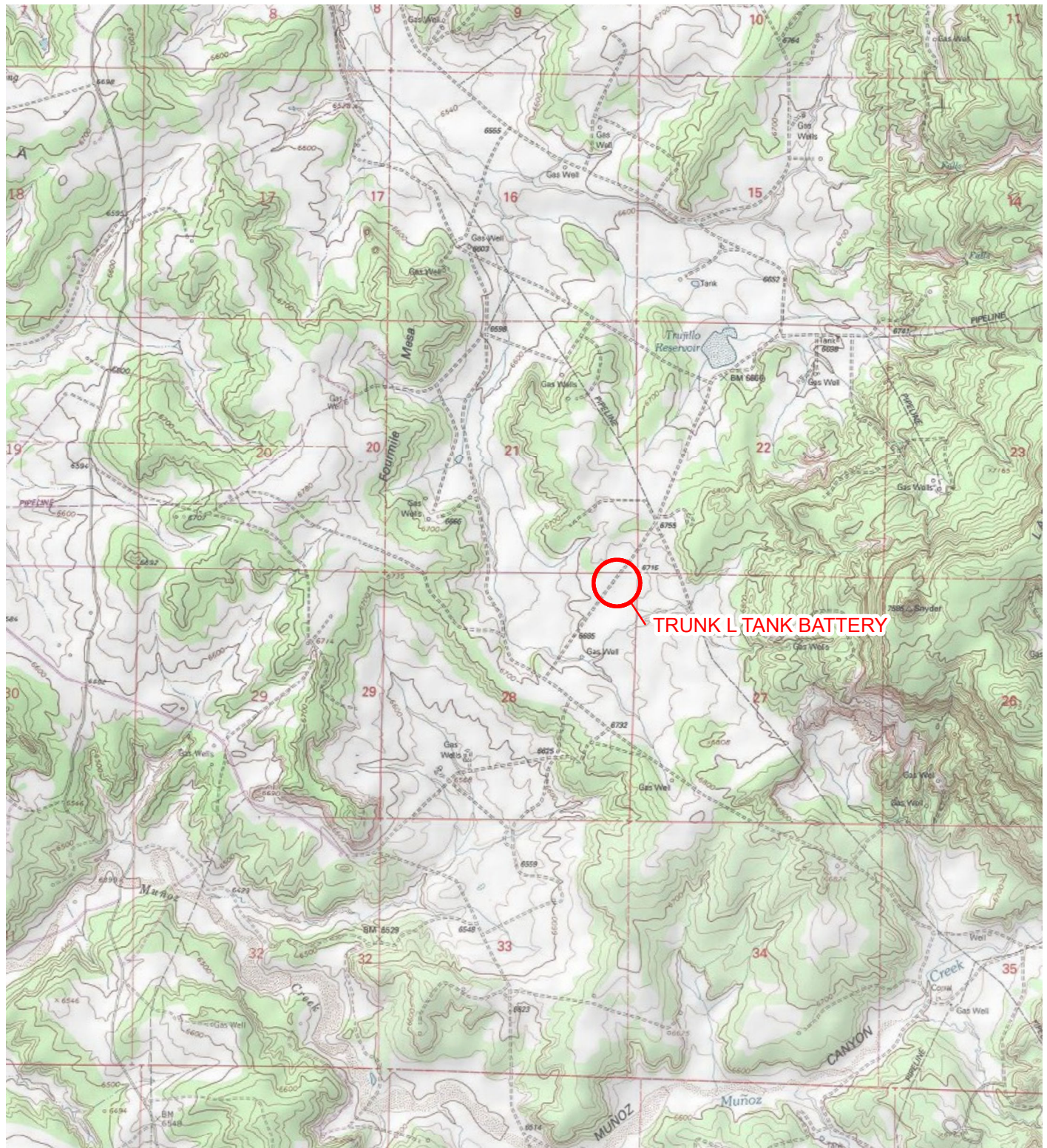

Figure 2 – SVE System Layout

Table 1 – Air Sample Analytical Results

Table 2 – Soil Vapor System Recovery & Emissions Summary

Enclosure A – Laboratory Analytical Report

FIGURES

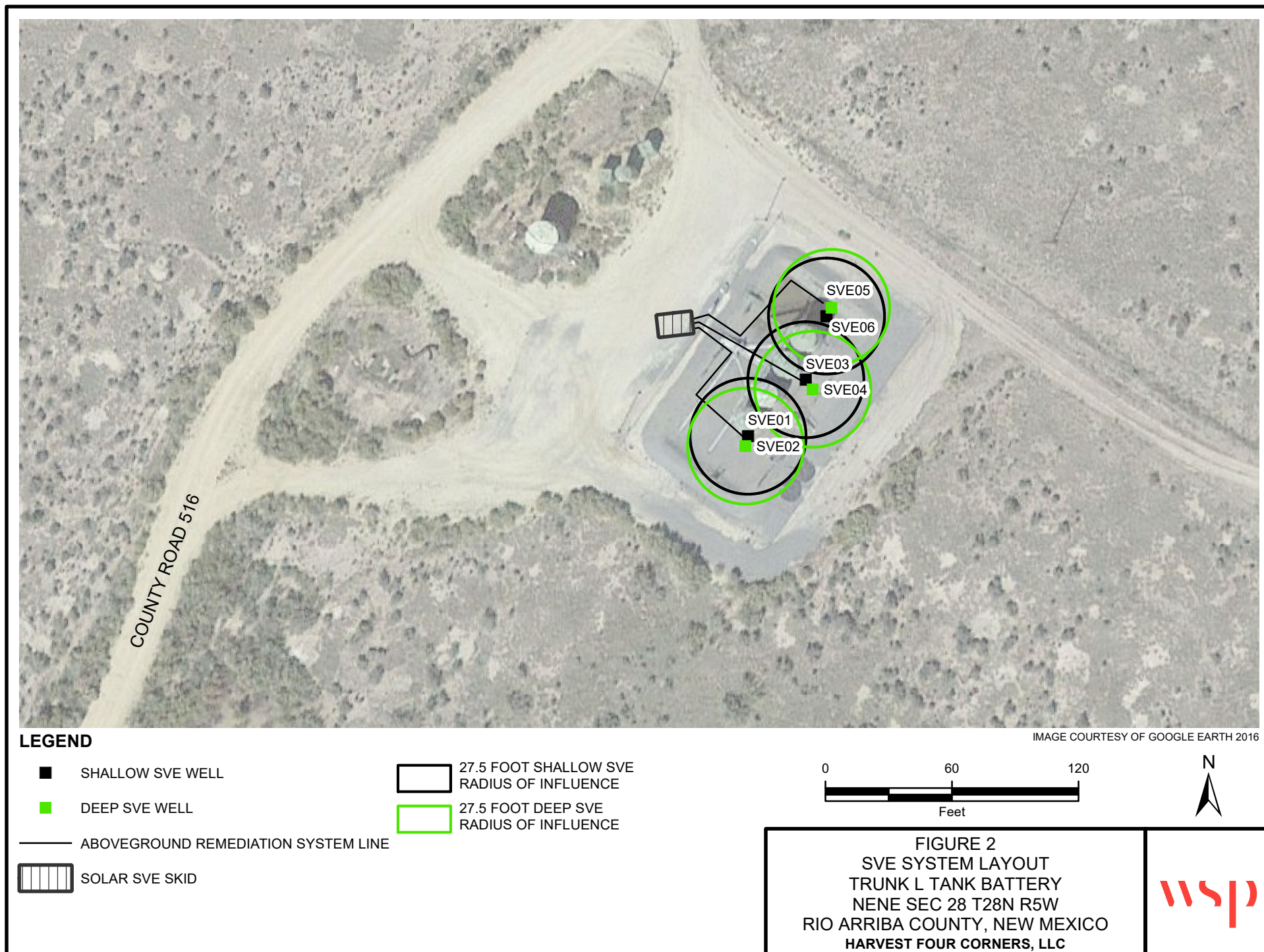
**LEGEND** SITE LOCATION

0 3,000 6,000
Feet



FIGURE 1
SITE LOCATION MAP
TRUNK L TANK BATTERY
NENE SEC 28 T28N R5W
RIO ARRIBA COUNTY, NEW MEXICO
HARVEST FOUR CORNERS, LLC





P:\Harvest Four Corners\GIS\MXD\090319022_TRUNK L\090319022_FIG02_SVE_SYSTEM LAYOUT_2020.mxd

TABLES

TABLE 1

**AIR SAMPLE ANALYTICAL RESULTS
TRUNK L TANK BATTERY
RIO ARRIBA COUNTY, NEW MEXICO**

Sample ID	Sample Date	Vapor PID (ppm)	Benzene (µg/L)	Toluene (µ/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
Influent 9/18	9/18/2019	946	1,000	1,500	50	550	NA
Influent 10/18	10/18/2019	931	250	410	6.5	74	NA
Influent 11/14	11/14/2019	578	1.8	4.3	0.19	1.7	250
Influent 3/3/20	3/3/2020	868	3.9	22	1.3	13	760
Influent 5/1/20	5/1/2020	913	610	1,500	58	570	95,000
Influent 6/10/20	6/10/2020	1,527	640	1,600	56	530	95,000
Influent 9/15	9/15/2020	1,077	180	840	24	230	35,000
Influent 12/2/20	12/2/2020	1,320	380	1,100	23	270	86,000

Notes:

µg/L - micrograms per liter

NA - not analyzed

PID - photoionization detector

PPM - parts per million

TVPH- total volume petroleum hydrocarbons

TABLE 2

**SOIL VAPOR EXTRACTION SYSTEM RECOVERY & EMISSIONS SUMMARY
TRUNK L TANK BATTERY
RIO ARriba COUNTY, NEW MEXICO**

Sample Information and Lab Analysis								
Date	Total Flow (cf)	Delta Flow (cf)	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
9/18/2019*	3,033	3,033	1,435	1,000	1,500	50	550	3,013
10/18/2019*	723,303	720,270	931	250	410	6.5	74	744
11/14/2019	1,334,343	611,040	578	1.8	4.3	0.19	1.7	250
3/3/2020	2,898,866	1,564,523	868	3.9	22	1.3	13	760
4/1/2020**	3,795,613	896,747	838	3.7	21	1.2	12	733
5/1/2020	3,882,637	87,024	913	610	1,500	58	570	95,000
6/10/2020	4,869,885	987,248	1,527	640	1,600	56	530	95,000
9/15/2020	7,089,263	3,293,650	1,077	180	840	24	230	35,000
12/2/2020	8,447,393	4,564,756	1,320	380	1,100	23	270	86,000
Average			1,054	341	777	24	250	35,167

Vapor Extraction Calculations						
Date	Flow Rate (cfm)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
9/18/2019	33.70	0.1262	0.1892	0.0063	0.0694	0.380
10/18/2019	37.75	0.0353	0.0579	0.0009	0.0105	0.105
11/14/2019	38.00	0.0003	0.0006	0.0000	0.0002	0.036
3/3/2020	21.26	0.0003	0.0018	0.0001	0.0010	0.060
4/1/2020	21.26	0.0003	0.0017	0.0001	0.0010	0.058
5/1/2020	39.20	0.0895	0.2201	0.0085	0.0836	13.940
6/10/2020	29.33	0.0703	0.1757	0.0061	0.0582	10.430
9/15/2020	27.77	0.0187	0.0873	0.0025	0.0239	3.638
12/2/2020	26.63	0.0379	0.1097	0.0023	0.0269	8.573
Average	30.54	0.04	0.09	0.00	0.03	4.14

Pounds Extracted Over Total Operating Time								
Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethylbenzene (lbs)	Total Xylenes (lbs)	Total BTEX (lbs)	TVPH (lbs)
9/18/2019	1.5	1.5	0.2	0.3	0.0	0.1	0.6	0.6
10/18/2019	319.5	318.0	11.2	18.4	0.3	3.3	33.3	33.4
11/14/2019	587.5	268.0	0.1	0.2	0.0	0.1	0.3	9.5
3/3/2020	1,814	1,226.5	0.4	2.1	0.1	1.3	3.9	74.2
4/1/2020	2,517	703.0	0.2	1.2	0.1	0.7	2.1	41.0
5/1/2020	2,554	37.0	3.3	8.1	0.3	3.1	14.9	515.8
6/10/2020	3,115	561.0	39.4	98.6	3.4	32.6	174.1	5,851
9/15/2020	4,447	1,332.0	24.9	116.3	3.3	31.8	176.4	4,846
12/2/2020	5,297	850.0	32.2	93.2	1.9	22.9	150.2	7,287
Total Extracted to Date			111.9	338.4	9.5	95.9	555.8	18,659

NOTES:

* - TVPH data extrapolated from PID values

** - Analytical data extrapolated from PID values

BTEX - benzene, toluene, ethylbenzene, total xylenes

cf - cubic feet

cfm - cubic feet per minute

lbs - pounds

lb/hr - pounds per hour

µg/L - microgram per liter

PID - photoionization detector

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

ENCLOSURE A – LABORATORY ANALYTICAL REPORT



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

December 21, 2020

Kijun Hong

Harvest

1755 Arroyo Dr.

Bloomfield, NM 87413

TEL: (505) 632-4475

FAX:

RE: Trunk L

OrderNo.: 2012732

Dear Kijun Hong:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/12/2020 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 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", is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2012732

Date Reported: 12/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Harvest

Client Sample ID: Influent 12-2-20

Project: Trunk L

Collection Date: 12/2/2020 3:45:00 PM

Lab ID: 2012732-001

Matrix: AIR

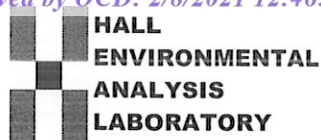
Received Date: 12/12/2020 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	86000	500	E	µg/L	100	12/16/2020 11:56:41 AM	G74066
Surr: BFB	94.9	70-130		%Rec	100	12/16/2020 11:56:41 AM	G74066
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	380	10		µg/L	100	12/16/2020 11:56:41 AM	SL74066
Toluene	1100	10	E	µg/L	100	12/16/2020 11:56:41 AM	SL74066
Ethylbenzene	23	10		µg/L	100	12/16/2020 11:56:41 AM	SL74066
Xylenes, Total	270	15		µg/L	100	12/16/2020 11:56:41 AM	SL74066
Surr: 1,2-Dichloroethane-d4	53.9	70-130	S	%Rec	100	12/16/2020 11:56:41 AM	SL74066
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	100	12/16/2020 11:56:41 AM	SL74066
Surr: Dibromofluoromethane	70.3	70-130		%Rec	100	12/16/2020 11:56:41 AM	SL74066
Surr: Toluene-d8	105	70-130		%Rec	100	12/16/2020 11:56:41 AM	SL74066

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		

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

Sample Log-In Check List

Client Name: Harvest

Work Order Number: 2012732

RcptNo: 1

Received By: Isaiah Ortiz

12/12/2020 9:45:00 AM

I-Ox

Completed By: Emily Mocho

12/15/2020 12:40:48 PM

Reviewed By: JGL 12/15/20

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°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: ENM 12/15/20

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

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 17389

CONDITIONS

Operator: Harvest Four Corners, LLC 1111 Travis Street Houston, TX 77002	OGRID: 373888
	Action Number: 17389
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 129946 for most updated status.	9/21/2022