UIC - I - 5

EPA FALL-OFF TEST

2021

Sunco SWD #1

30-045-28653

Class I Disposal: UICI-5-0

2021 Reservoir Pressure Evaluation

Agua Moss, LLC

P.O Box 600

Farmington, NM 87499

ORGID 247130

Report Components:

1. Facility Operator Information
    a. Agua Moss, LLC
    b. PO Box 600 Farmington, NM 87499
    c. OGRID 247130
2. Well Information:
    a. UIC Permit # UICI-5-0
    b. Class I
    c. Sunco Disposal #1
    d. 30-045-28653
    e. UL E, Sec 2, T29N, R12W 1595 FNL & 1005 FWL San Juan County
3. Current Wellbore Diagram: **Attached** (page 4)
4. Copy of Electronic Log: **Previously submitted 1992** (page 5)
5. Copy of Porosity Log: **Previously submitted 1992** (page 6-7)
6. See attached Reservoir Pressure Evaluation analysis
    a. Reservoir Pressure Evaluation Procedure (Page 8)
    b. Analysis (Page 16
    c. Results (Page 17
    d. Summary (Page 16
7. Results Comparison attached (page 17)
8. The raw test data will be kept on file for a period of 3-years and will be made available to the NMOCD upon written request. (page 17)
9. Conclusions (page 18)
10. Any pressure or temperature anomaly: As seen in Figure 2 there is a slight drop in the surface pressure. The difference between the beginning and ending pressure is 12 psi. Since the drop is small it did not affect the test.
11. Plots attached
    a. Calculated BH Pressure vs Time (page 19)
    b. Injection Volumes and Surface Pressure (page 18)
12. NO PVT data necessary, wellbore fluid is fresh-to-slightly saline water. No significant hydrocarbons present that would alter the density, compressibility and/or viscosity of the fluid.
    a. See attached repot of the Second Quarter WQ Report (page 20-57)
13. The Agua Moss, LLC internal Daily Injection Reports were used to determine the appropriate injection history to use for the analysis. A summary of those reports (January 2021 through July 2021) are attached. (page 58-60)
14. The Sunco Disposal #1 has injected approximately 16,508,187 bbls into the point lookout formation from 1994 through June 2021. The offset well McGrath SWD #4 API 30-045-25923 was plugged 7/25/2013. Cumulative injection 1994-7/2013 27,746,479 bbls.
15. 2 Mile AOR:
    a. AOR 2 mile (page 61)
    b. AOR 2 mile well data (page 62)
    c. The McGrath #4 was the only offset well that was injecting into the Point Lookout formation within 1 mile. This well was plugged 7/25/2013.
16. Geological information was provided in the 2012 Permit renewal and approved in 2012.

17. Offset Wells: One offset well that was completed in the same injection interval was the McGrath #4. This well was plugged 7/2013 and therefore was not impacted.
18. Chronological listing of the daily, testing activities (Operations Log) attached (page 67)
    a. Date of Test: **July 12th, 2021 through July 16th, 2021**
    b. Type of injection fluid: **Produced water (no injection for test)**
    c. Total shut-in time: **98 hours**
    d. Final BH static pressure at the end of the RPE: **3188.7 psi**
19. Location of the shut-in valve: **A wing valve located on the well's Christmas Tree was closed to begin the RPE Test.**
20. Pressure Gauges: (68-77)
    a. HOBO UX120-006M data logger with a Foxboro IGP10S industrial pressure transducer
    b. Pressure range: **0-6000 psig**
    c. Last Calibration: **6/12/2017 (manufacturer calibration good for 5 years)**

Wellbore Schematic:

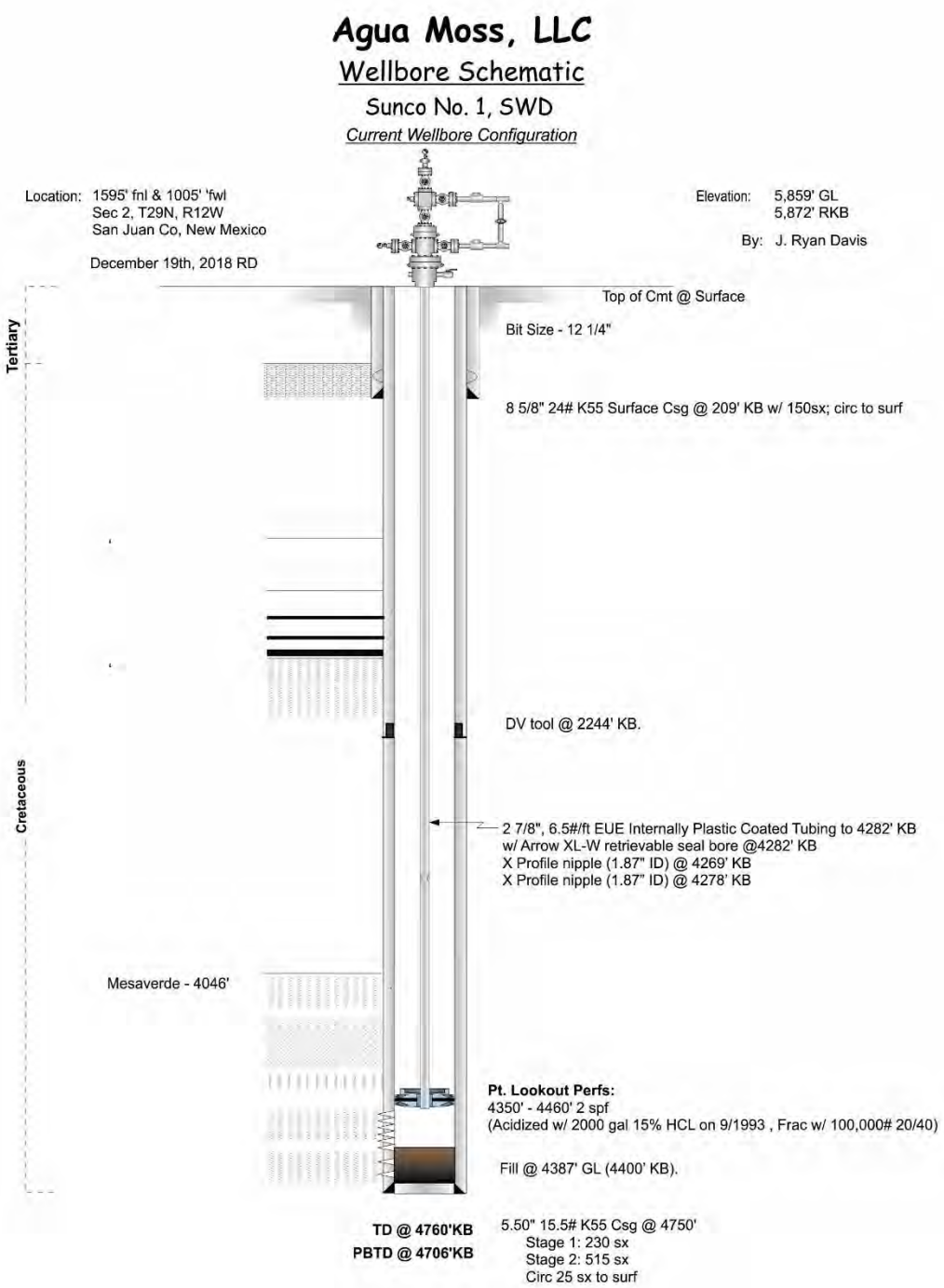
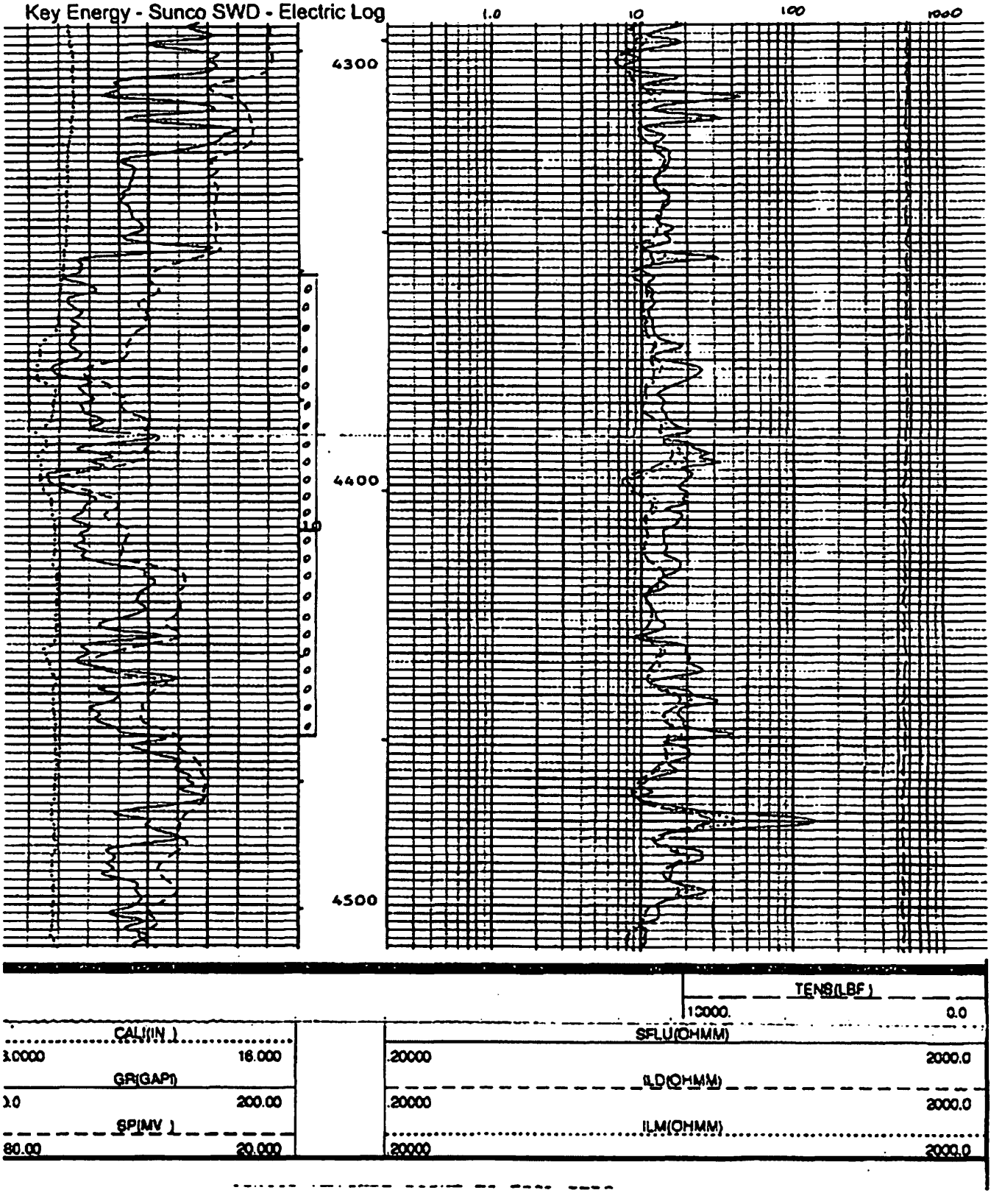
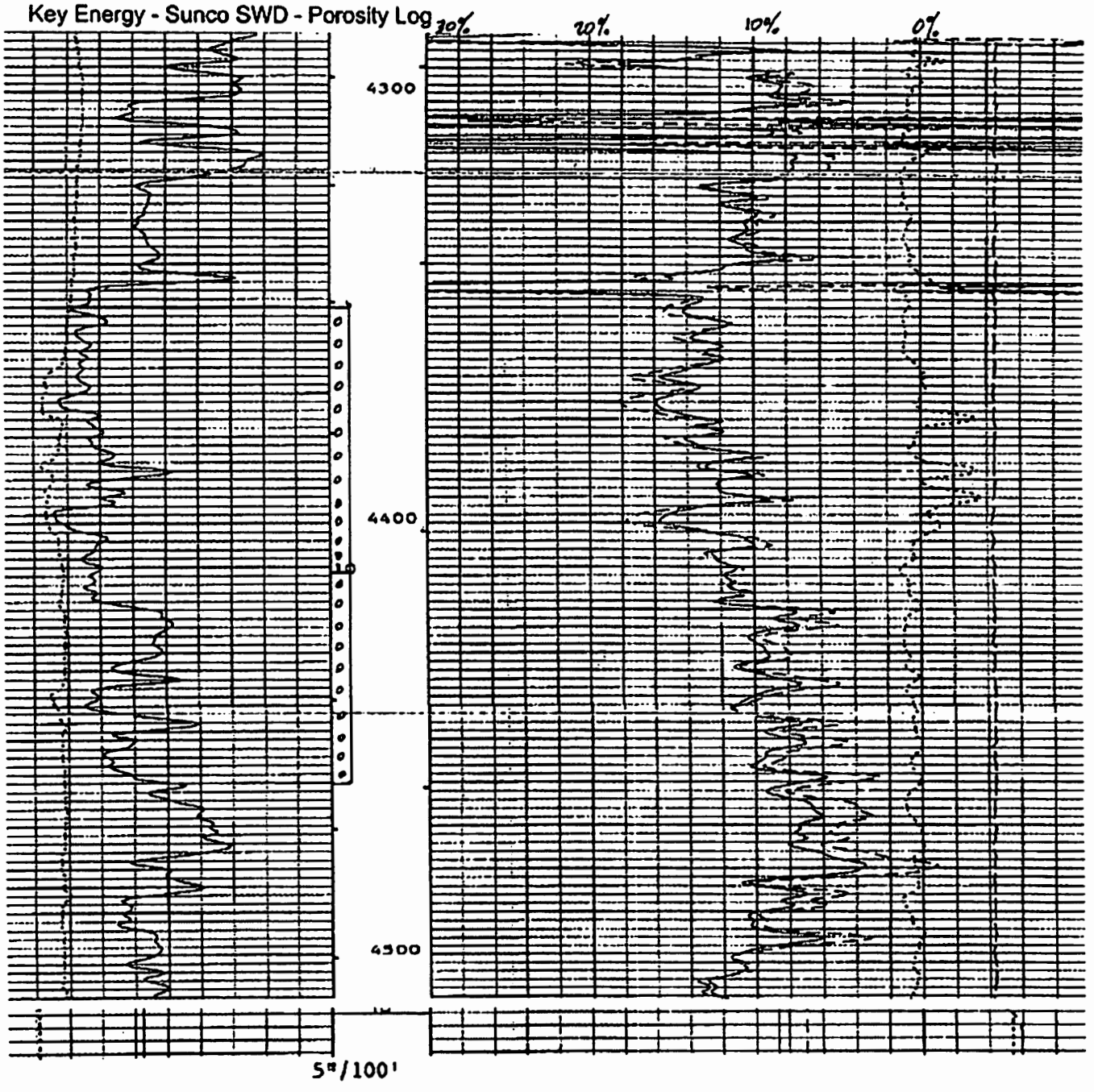
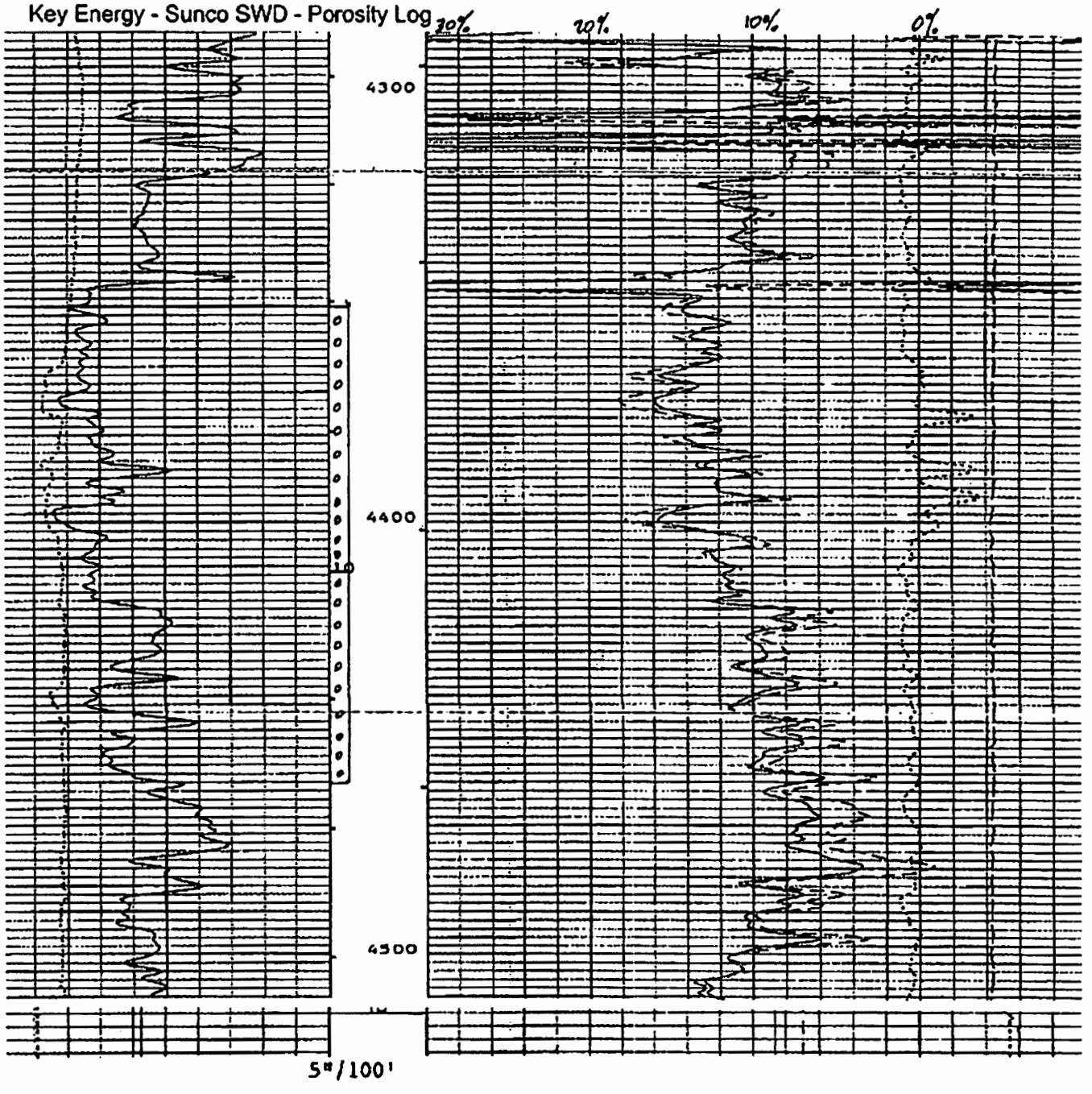


Figure 1: Wellbore Schematic


Key Energy - Sunco SWD - Electric Log
1.0
10
100
1000
4300
4400
4500
TENS(LBF)
10000.
0.0
CALI(IN)
16.000
GR(GAPI)
200.00
SP(MV)
20.000
SFLU(OHMM)
2000.0
ILD(OHMM)
2000.0
ILM(OHMM)
2000.0


Key Energy - Sunco SWD - Porosity Log
30%
20%
10%
0%
4300
4400
4500
5"/100'
CP 32.6
FILE 6
01-FEB-1992 20:21
(UP)
CRHO(G/C3)
-.2500
.25000
TENS(LBF)
10000.
0.0
CALI(IN.)
8.0000
16.000
RHOB(G/C3)
2.0000
3.0000
GR(GAPI)
0.0
200.00
DPHI(V/V)
.30000
-.1000


Key Energy - Sunco SWD - Porosity Log
30%
20%
10%
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4300
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CP 32.6
FILE 6
01-FEB-1992 20:21
(UP)
DRHO(G/C3)
-.2500
.25000
TENS(LBF)
10000.
0.0
CALI(IN)
8.0000
16.000
RHOB(G/C3)
2.0000
3.0000
GR(GAPI)
0.0
200.00
DPHI(V/V)
.30000
-.1000

Shacie Murray <shacie@merrion.bz>

Fwd: The Oil Conservation Division (OCD) has approved the application, Application ID: 31142

2 messages

Philana Thompson <pthompson@merrion.bz> Fri, Jun 11, 2021 at 3:38 PM
To: Ryan Davis <RDavis@merrion.bz>, Ryan Merrion <ryan@merrion.bz>, Shacie Murray <shacie@merrion.bz>

---------- Forwarded message ---------
From: <OCDOnline@state.nm.us>
Date: Fri, Jun 11, 2021 at 3:13 PM
Subject: The Oil Conservation Division (OCD) has approved the application, Application ID: 31142
To: <pthompson@merrion.bz>

To whom it may concern (c/o Philana Thompson for AGUA MOSS, LLC),

The OCD has approved the submitted *Discharge Permits* (DISCHARGE PERMIT), for facility ID (f#) fCJC2115960695, with the following conditions:

- **Conditions of Approval: 1) Alternate Approval of Procedure based on low volume of injected fluids and well economics; and 2) Annual Approvals by OCD subject to determination that a sufficient volume of fluids are injected to warrant a Fall-Off Test.**

The signed DISCHARGE PERMIT can be found in the OCD Online: Imaging under the facility ID (f#).

If you have any questions regarding this application, please contact me.

Thank you,
Carl Chavez
Environmental Engineer
505-660-7923
CarlJ.Chavez@state.nm.us

New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

--
Philana Thompson
HSE & Regulatory Compliance
Merrion Oil & Gas Corp
cell 505-486-1171

Shacie Murray <shacie@merrion.bz> Thu, Jul 1, 2021 at 5:03 PM
To: Ryan Merrion <ryan@merrion.bz>

Shacie Murray

Merrion Oil & Gas
Production Engineer
(505) 330-7605
shacie@merrion.bz
[Quoted text hidden]

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
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

Form C-103
Revised July 18, 2013

WELL API NO.
30-045-28653

5. Indicate Type of Lease
STATE ☐ FEE ☒

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
Sunco Disposal

1. Type of Well: Oil Well ☐ Gas Well ☐ Other SWD Class I

8. Well Number 1

2. Name of Operator
Agua Moss, LLC

9. OGRID Number 247130

3. Address of Operator
PO Box 600 Farmington, NM 87499

10. Pool name or Wildcat SWD-MV

4. Well Location
Unit Letter__E_____:___1595___feet from the __North___ line and __1005_____feet from the ___West___line
Section 2 Township 29N Range 12W NMPM County San Juan

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
5859'

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐						
OTHER:		Alternative FOT	☒	OTHER:		FOT	☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Agua Moss, LLC proposes to perform the following reservoir pressure evaluation test in place of the FOT. Please see the attached procedure.

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Philana Thompson TITLE Regulatory Compliance Spec DATE 6/11/2021

Type or print name Philana Thompson E-mail address: pthompson@merrion.bz PHONE: 505-486-1171

For State Use Only

APPROVED BY: TITLE DATE

Conditions of Approval (if any):

Agua Moss

June 4th, 2021

SUBJECT: REQUEST TO MODIFY THE SUNCO #1 2020 ANNUAL FALL OFF TEST

Dear Carl Chavez:

Agua Moss, LLC requests the OCD's approval to substitute a reservoir pressure evaluation test (RPE) to fulfill the Sunco #1's annual fall-off test requirement for the 2021 reporting period.

After evaluating the 2021 injection volumes and economic viability for the Sunco #1, Agua Moss, LLC feels that performing a fall of test this year would only affirm existing data. Over the past few years, the fall-off tests have yielded similar results and have not indicated reasons for concern. Please see the table below.

Fall Off Test Results	2020	2019	2018	2017	2016	2015	2010	2009	2008	2007
Rate (bbl/day)			3292	3150	3132	3340	4500			
P* (psi)	2968[1]	2939[1]	3479	3273	3114	3283	3231	3242	3176	3258
K (md)			10.8	10.4	11.5	15.8	13.6	10.2	20.7	
S			-6.0	-6.0	-5.93	-5.97	-7.18	-7.23	-6.79	
Radius of Inv (ft)			1690	1790	1430	1580	1450	1250	1750	1620
Frac ½ Length (ft)			598	517	594	467	893	926	596	688
Boundary			none	none	none	none	648, 1520	755	987	none

[1] Pressure collected from Reservoir Pressure Evaluation test, all other data from Fall-Off Test

From December 2020 to April 2021 all of Agua Moss's produced water was routed to Sunco due to issues with the Pretty Lady SWD. The resulting injection at Sunco went from an average of 651 bbls per month to 23,244 bbls per month. Once the Pretty Lady was repaired in April all the water went back to normal routes and in May the Sunco injected 0 bbls. Due to the irregular operating conditions, Sunco's injection volumes are inflated for the first four months of 2021. There is no indication that higher than normal injection rates will continue at Sunco and the rest of the year will return to the average 651 bbls per month.

A fall-off test requires ~6,500 bbls to be performed, which requires Sunco to outsource a significant volume of water. Currently, Farmington is at Stage 1 drought conditions and has released a water shortage advisory with a request to reduce consumption by 10%. We are concerned that drought conditions will persist and sourcing water will be an issue both logistically and economically.

Additionally, the well has not indicated any abnormal mechanical issues or pressures. The highest injection pressure recorded this year was 2204 psig, which is significantly below the facility's max allowable pressure of 2400 psig. Based on pressures during the irregular high-volume injection recently and normal operating conditions, there is no indication of additional stress to the injection zone that would warrant concern or require fall-off test analytics. We are also requesting to forgo the slickline work. Operating surface pressures have not indicated restrictions downhole and there will not be fluid injection during the RPE. If an indication does occur it will be addressed at that time.

Economics is another reason for not performing the fall-off test. When evaluating the viability of continuing operations, the cost to perform and analyze the fall-off test plays a significant role in economics. This cost especially impacts the economics when volumes are marginal. Agua Moss understands the importance of this well to the State, so the avoidance of any additional expenditure aids in the continuance of our operations.

Please let us know your decision as soon as possible. If we aren't able to perform the RPE, we would need to plan accordingly to make the September report submission deadline.

Thank you,

Shacie Murray
Production Engineer
505-330-7605

AGUA MOSS, LLC — PLAN FOR RESERVOIR PRESSURE TEST

Well Information			
Well:	**Sunco Disposal 1**	**Field:**	Mesaverde SWD
Location:	1595' fnl &1005' fwl S2, T29N, R12W San Juan Co. New Mexico	**Elevations:**	5859' GL 5872' RKB
		Depths:	4706' KB PBTD 4760' KB TD
		Engineer:	Shacie Murray(505.330.7605)
API:	30-045-28653	**Date:**	June 4, 2021
Surface Casing:	8- 5/8" @ 209' KB w/ 150sx; Circ to surface	**Production Casing:**	5-1/2" @ 4750' KB w/ 230 sx stage 1, 515 sx stage 2, circ 25 sx to surf, DV tool @ 2244' KB
Tubulars:	2- 7/8" 6.5# EUE (Epoxy Coated) @ 4282' KB	**Packer:**	Arrow XL-W retrievable seal bore @ 4282' KB.
Perforations (MV)	4350-4460' KB 2 spf (2000 gals 15% HCL, Frac w/ 100,000# 20/40)		
Additional Perforations			
Perforations (MV)	None		

Version 1: Static Reservoir Pressure Evaluation Procedure subject to change based on changing well conditions.

Proposed Test Schedule:

Date	Event	Remarks
Monday, July 12th, 2021	Check conditions, check pressures and perform MIT	Check conditions, check tubing pressure 9 am
Friday, July 16th, 2021	96 hrs	Conclude test at 9am

Test Considerations:

V.1 The pressure acquisition will be performed with pressure gauges at the surface.

V.2 There will be adequate storage capacity for waste water for the duration of the test.

V.3 There is one offset well completed in the Point Lookout disposal formation. The McGrath #4 is a class II disposal operated by ConocoPhillips approx 1.25 miles to the north west of the Sunco #1. The well has been P&A'd, so there will not be any injection activity from offset wells during the test.

V.4 A shut-in valve is located on the injection riser approx 3-feet from the wellhead. This valve can be shut to isolated the tubing at the wellhead.

V.5 Bottomhole pressure will not be collected directly but calculated from the surface pressure collected using the appropriate gradient. The use of surface pressure for the test is justified by the fact that the well will maintain a positive pressure at the surface during the entire test.

V.6 A test log will be kept during the test and submitted with the FOT results. The log will include key events with date and times.

- Well isolation
- Pressure recordings

V.7 Surface pressures will be recorded continuously using a data logger and transducer during the FOT. If any abnormal surface pressure change occurs the test validity will be questioned and the test will be aborted if deemed invalid.

V.8 The continuous data recording consists of a HOBO UX120-006M data logger with a Foxboro IGP10S industrial pressure transducer. The data logger features 4MB memory capable of keeping 1.9 million measurements, 1 year batter life (at 1 minute logging and 15 second sampling interval), and an accuracy of +/- 0.2%. Data will be recorded every 15 seconds. The pressure transducer has an accuracy of +/-0.05% and operating pressure range of 0-6,000 psi.

V.9 In addition, a chart recorder will monitor the tubing and casing pressure during the test as a backup for the data logger

Reservoir Pressure Test Procedure:

Prepare Well for Fall Off Test

1. Perform MIT
2. Setup pressure recording chart and digital gauge

Conduct Pressure Monitoring

1. Ensure surface gauges are configured properly
2. Record surface tubing pressure data for 96 hrs, Pressure readings will be taken every minute.
    a. Bottomhole pressures will be calculated and compiled for the test
3. Put well back into service for normal operation.

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

COMMENTS

Action 31627

COMMENTS

Operator: AGUA MOSS, LLC P.O. Box 600 Farmington, NM 87499	OGRID: 247130
	Action Number: 31627
	Action Type: [C-103] NOI General Sundry (C-103X)

COMMENTS

Created By	Comment	Comment Date
cchavez	SUNCO WDW-1: Alternate Fall-Off Test Procedure- Reservoir Pressure Evaluation Test due to low injection volume and well economics.	6/11/2021

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 31627

CONDITIONS

Operator: AGUA MOSS, LLC P.O. Box 600 Farmington, NM 87499	OGRID: 247130
	Action Number: 31627
	Action Type: [C-103] NOI General Sundry (C-103X)

CONDITIONS

Created By	Condition	Condition Date
cchavez	None	6/11/2021

A Reservoir Pressure Evaluation Test (RPE) was performed on the Sunco SWD #1 Class I injection well (UICI-5-0) on **07/12/2021**. The RPE was approved by Carl Chaves on 06/11/2021 to fulfill the permit required annual Falloff Test. Below is a summary of the findings from the RPE Test.

Procedure:

Two Foxboro IGP10S industrial pressure transducers were installed in parallel with a one-pin pressure recording chart meter. Injection pumps were shut down and the well was isolated at the wellhead. Pressures were recorded for 98 hours. Bottom hole pressure (BHP) was calculated based on the June 28, 2021, specific gravity measurement and the 2019 wireline fill depth of 4362' with reference to ground level. The initial calculated BHP was 3201 psi at a depth of 4362'. The pressure from the transducers was recorded every 10 seconds and the pressure was charted continually over 5 days. The final calculated bottom hole pressure was 3188.7 psi on 07/16/2021 at 12:56 pm.

Analysis:

The surface pressure data was compiled in excel and analyzed. The BHP was calculated using a 0.439 psi/ft. The data is nearly constant with only a slight, 12 psi, pressure drop between the beginning and ending volumes.

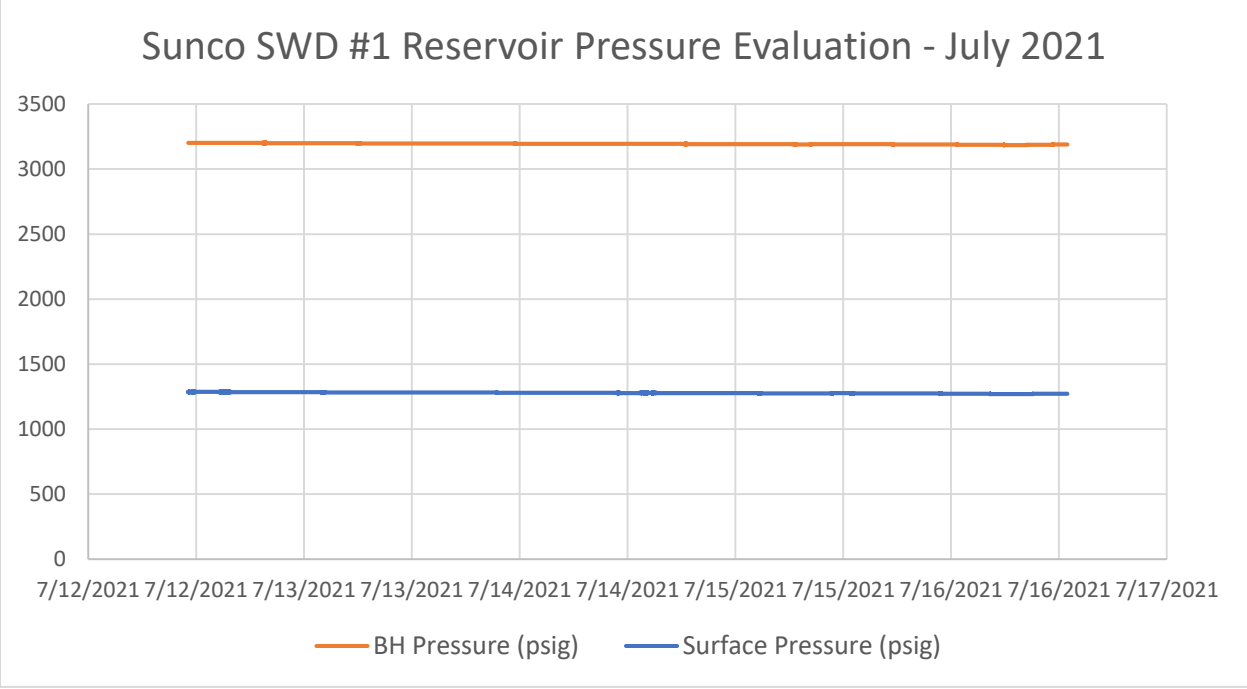

Figure 2 Calculated BH Pressure vs. Time

Results:

The well maintained a positive pressure during the entire RPE Test allowing a BHP to be calculated from the surface pressure readings collected. The average calculated BHP was 3193.8 psi. The steady reservoir pressure observed during the RPE indicates that the reservoir was in a near static state. This is due to the small amount of injection that has occurred this year and an ample shut-in period prior to the RPE Test. The RPE test was conducted with fill over a portion of the perforations

Comparison with past Falloff Tests:

The results from the 2021 RPE were compiled with previous RPE and FOT results from the facility and are shown below in Table 1.

Table 1: Results Comparison

	2021	2020	2019	2018	2017	2016	2015	2010	2009	2008	2007
Rate (bbl/day)				3292	3150	3132	3340	4500			
P* (psi)	3194*	2968*	2939*	3479	3273	3114	3283	3231	3242	3176	3258
K (md)				10.8	10.4	11.5	15.8	13.6	10.2	20.7	
S				-6.0	-6.0	-5.93	-5.97	-7.18	-7.23	-6.79	
Radius of Inv (ft)				1690	1790	1430	1580	1450	1250	1750	1620
Frac ½ Length (ft)				598	517	594	467	893	926	596	688
Boundary				None	none	none	none	648, 1520	755	987	none

Agua Moss did not conduct tests prior to 2015 and is relying on the 2010 report submitted by Key Energy, the past operator, for those results. The following observations were derived from a comparison of the results:

1. The surface pressures collected were relatively consistent indicating that the reservoir has equalized and the calculated BHP is representative of a static reservoir pressure.
2. The calculated BHP was within an expected range based on the extrapolated reservoir pressures from the previous FOTs.
3. The increase in BHP from the previous two RPE's is most likely due the greater than usual volume injected from 12/2020 to 04/2021.

The raw test data obtain during the 2021 RPE test will be kept on file for a period of three (3) years and will be available upon request.

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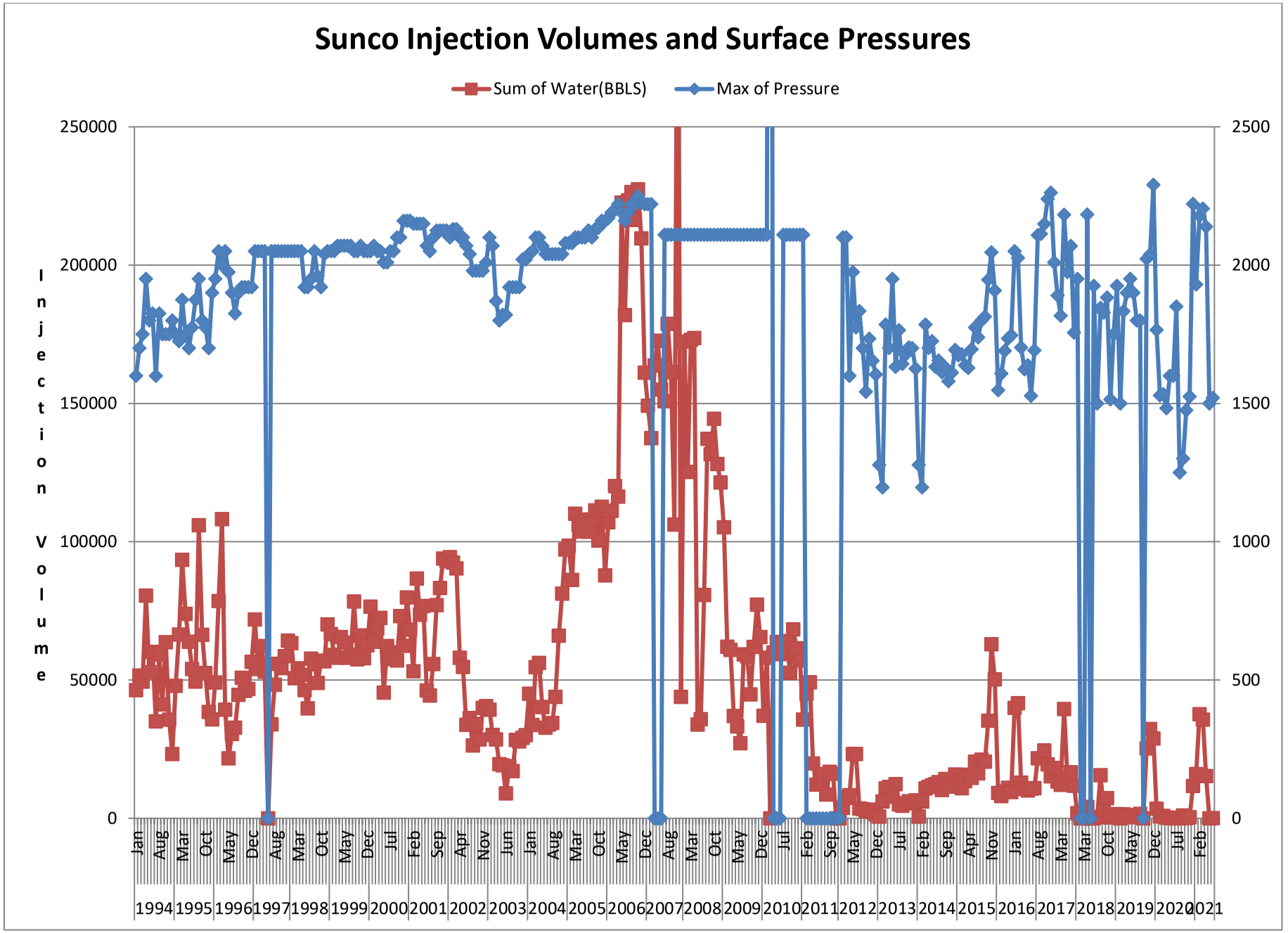
* The pressure shown for 2021 through 2019 is a bottom hole pressure calculated based on surface pressure and a fluid gradient. This pressure is being compared to the extrapolated reservoir pressures from previously completed Falloff Test. The comparison is being used to gauge the current condition of the injection interval to ensure the interval is suitable for continued injection operations.

Conclusions:

Based on the above analysis and results comparison, Agua Moss believes the Sunco SWD #1 2021 RPE was successfully completed. The results do not show indications of concern in continuing the current waste injection operations. The calculated BHP from the test was more than previous two RPE's but within the range of previous FOT extrapolated reservoir pressures. This higher pressure is due to the increased volume injected from 12/2020 to 04/2021. The injection rates during that time were similar to the rates in 2016 and 2017. The similar BHP in 2016, 2017, and 2021 indicates that the reservoir is still very suitable for continued injection.

Figure 2 Injection and Pressure Plot



HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

July 23, 2021

Heather Woods

Souder, Miller and Associates
401 W. Broadway
Farmington, NM 87401
TEL: (505) 325-5667
FAX (505) 327-1496

RE: Aqua Moss Sunco # 1 OrderNo.: 2106F12

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/29/2021 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 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: S-18 (6/28/21)
Project: Aqua Moss Sunco # 1
Collection Date: 6/28/2021 11:00:00 AM
Lab ID: 2106F12-001 **Matrix:** AQUEOUS **Received Date:** 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8081: PESTICIDES TCLP						Analyst:	**JME**
Chlordane	ND	0.030		mg/L	1	7/2/2021 9:43:16 AM	61046
Surr: Decachlorobiphenyl	104	41.7-129		%Rec	1	7/2/2021 9:43:16 AM	61046
Surr: Tetrachloro-m-xylene	93.1	31.8-88.5	S	%Rec	1	7/2/2021 9:43:16 AM	61046
EPA METHOD 8270C TCLP						Analyst:	**JME**
2-Methylphenol	ND	200		mg/L	1	7/9/2021 4:25:33 AM	61067
3+4-Methylphenol	ND	200		mg/L	1	7/9/2021 4:25:33 AM	61067
2,4-Dinitrotoluene	ND	0.13		mg/L	1	7/9/2021 4:25:33 AM	61067
Hexachlorobenzene	ND	0.13		mg/L	1	7/9/2021 4:25:33 AM	61067
Hexachlorobutadiene	ND	0.50		mg/L	1	7/9/2021 4:25:33 AM	61067
Hexachloroethane	ND	3.0		mg/L	1	7/9/2021 4:25:33 AM	61067
Nitrobenzene	ND	2.0		mg/L	1	7/9/2021 4:25:33 AM	61067
Pentachlorophenol	ND	100		mg/L	1	7/9/2021 4:25:33 AM	61067
Pyridine	ND	5.0		mg/L	1	7/9/2021 4:25:33 AM	61067
2,4,5-Trichlorophenol	ND	400		mg/L	1	7/9/2021 4:25:33 AM	61067
2,4,6-Trichlorophenol	ND	2.0		mg/L	1	7/9/2021 4:25:33 AM	61067
Cresols, Total	ND	200		mg/L	1	7/9/2021 4:25:33 AM	61067
Surr: 2-Fluorophenol	46.9	15-91.8		%Rec	1	7/9/2021 4:25:33 AM	61067
Surr: Phenol-d5	34.5	15-69.6		%Rec	1	7/9/2021 4:25:33 AM	61067
Surr: 2,4,6-Tribromophenol	67.2	15-115		%Rec	1	7/9/2021 4:25:33 AM	61067
Surr: Nitrobenzene-d5	54.7	15-109		%Rec	1	7/9/2021 4:25:33 AM	61067
Surr: 2-Fluorobiphenyl	52.8	15-96		%Rec	1	7/9/2021 4:25:33 AM	61067
Surr: 4-Terphenyl-d14	81.9	15-133		%Rec	1	7/9/2021 4:25:33 AM	61067
SPECIFIC GRAVITY						Analyst:	**JRR**
Specific Gravity	1.014	0			1	7/14/2021 11:06:00 AM	R79788
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Fluoride	ND	1.0		mg/L	10	6/29/2021 7:40:47 PM	R79465
Chloride	16000	500	*	mg/L	1E+	7/9/2021 5:25:39 PM	R79711
Bromide	23	1.0		mg/L	10	6/29/2021 7:40:47 PM	R79465
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	6/29/2021 7:40:47 PM	R79465
Sulfate	ND	5.0		mg/L	10	6/29/2021 7:40:47 PM	R79465
Nitrate+Nitrite as N	ND	10		mg/L	50	7/14/2021 2:59:54 AM	A79773
SM2510B: SPECIFIC CONDUCTANCE						Analyst:	**CAS**
Conductivity	51000	100		µmhos/c	10	7/2/2021 2:26:35 PM	R79556
SM2320B: ALKALINITY						Analyst:	**JRR**
Bicarbonate (As CaCO3)	886.3	50.00	H	mg/L Ca	2.5	7/15/2021 10:37:37 PM	R79813
Carbonate (As CaCO3)	ND	5.000	H	mg/L Ca	2.5	7/15/2021 10:37:37 PM	R79813
Total Alkalinity (as CaCO3)	886.3	50.00	H	mg/L Ca	2.5	7/15/2021 10:37:37 PM	R79813

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: S-18 (6/28/21)
Project: Aqua Moss Sunco # 1
Collection Date: 6/28/2021 11:00:00 AM
Lab ID: 2106F12-001 **Matrix:** AQUEOUS **Received Date:** 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst:	**JMT**
Total Dissolved Solids	29300	200	*D	mg/L	1	7/6/2021 11:27:00 AM	61072
SM4500-H+B / 9040C: PH						Analyst:	**CAS**
pH	5.83		H	pH units	1	6/30/2021 4:47:19 PM	R79516
EPA METHOD 7470: MERCURY						Analyst:	**ags**
Mercury	ND	0.020		mg/L	1	7/9/2021 11:04:54 AM	61188
EPA METHOD 6010B: DISSOLVED METALS						Analyst:	**ags**
Calcium	470	10		mg/L	10	6/30/2021 5:23:52 PM	A79508
Magnesium	80	10		mg/L	10	6/30/2021 5:23:52 PM	A79508
Potassium	39	10		mg/L	10	6/30/2021 5:23:52 PM	A79508
Sodium	8500	100		mg/L	100	6/30/2021 5:52:29 PM	A79508
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst:	**ags**
Arsenic	ND	5.0		mg/L	1	6/30/2021 4:58:00 PM	61023
Barium	110	100		mg/L	500	7/13/2021 1:12:40 PM	61023
Cadmium	ND	1.0		mg/L	1	6/30/2021 4:58:00 PM	61023
Chromium	ND	5.0		mg/L	1	6/30/2021 4:58:00 PM	61023
Lead	ND	5.0		mg/L	1	7/16/2021 3:32:09 PM	61023
Selenium	ND	1.0		mg/L	1	6/30/2021 4:58:00 PM	61023
Silver	ND	5.0		mg/L	1	6/30/2021 4:58:00 PM	61023
TCLP VOLATILES BY 8260B						Analyst:	**RAA**
Benzene	11	0.50		mg/L	200	7/1/2021 6:03:56 AM	T79505
1,2-Dichloroethane (EDC)	ND	0.50		mg/L	200	7/1/2021 6:03:56 AM	T79505
2-Butanone	ND	200		mg/L	200	7/1/2021 6:03:56 AM	T79505
Carbon Tetrachloride	ND	0.50		mg/L	200	7/1/2021 6:03:56 AM	T79505
Chloroform	ND	6.0		mg/L	200	7/1/2021 6:03:56 AM	T79505
1,4-Dichlorobenzene	ND	7.5		mg/L	200	7/1/2021 6:03:56 AM	T79505
1,1-Dichloroethene	ND	0.70		mg/L	200	7/1/2021 6:03:56 AM	T79505
Tetrachloroethene (PCE)	ND	0.70		mg/L	200	7/1/2021 6:03:56 AM	T79505
Trichloroethene (TCE)	ND	0.50		mg/L	200	7/1/2021 6:03:56 AM	T79505
Vinyl chloride	ND	0.20		mg/L	200	7/1/2021 6:03:56 AM	T79505
Chlorobenzene	ND	100		mg/L	200	7/1/2021 6:03:56 AM	T79505
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	200	7/1/2021 6:03:56 AM	T79505
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	200	7/1/2021 6:03:56 AM	T79505
Surr: Dibromofluoromethane	101	70-130		%Rec	200	7/1/2021 6:03:56 AM	T79505
Surr: Toluene-d8	94.3	70-130		%Rec	200	7/1/2021 6:03:56 AM	T79505

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: Trip Blank
Project: Aqua Moss Sunco # 1
Collection Date:
Lab ID: 2106F12-002
Matrix: TRIP BLANK
Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
TCLP VOLATILES BY 8260B						Analyst: **RAA**	
Benzene	ND	0.50		mg/L	1	7/1/2021 6:31:12 AM	T79505
1,2-Dichloroethane (EDC)	ND	0.50		mg/L	1	7/1/2021 6:31:12 AM	T79505
2-Butanone	ND	200		mg/L	1	7/1/2021 6:31:12 AM	T79505
Carbon Tetrachloride	ND	0.50		mg/L	1	7/1/2021 6:31:12 AM	T79505
Chloroform	ND	6.0		mg/L	1	7/1/2021 6:31:12 AM	T79505
1,4-Dichlorobenzene	ND	7.5		mg/L	1	7/1/2021 6:31:12 AM	T79505
1,1-Dichloroethene	ND	0.70		mg/L	1	7/1/2021 6:31:12 AM	T79505
Tetrachloroethene (PCE)	ND	0.70		mg/L	1	7/1/2021 6:31:12 AM	T79505
Trichloroethene (TCE)	ND	0.50		mg/L	1	7/1/2021 6:31:12 AM	T79505
Vinyl chloride	ND	0.20		mg/L	1	7/1/2021 6:31:12 AM	T79505
Chlorobenzene	ND	100		mg/L	1	7/1/2021 6:31:12 AM	T79505
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	7/1/2021 6:31:12 AM	T79505
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	7/1/2021 6:31:12 AM	T79505
Surr: Dibromofluoromethane	102	70-130		%Rec	1	7/1/2021 6:31:12 AM	T79505
Surr: Toluene-d8	98.9	70-130		%Rec	1	7/1/2021 6:31:12 AM	T79505

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

ANALYTICAL REPORT

July 23, 2021

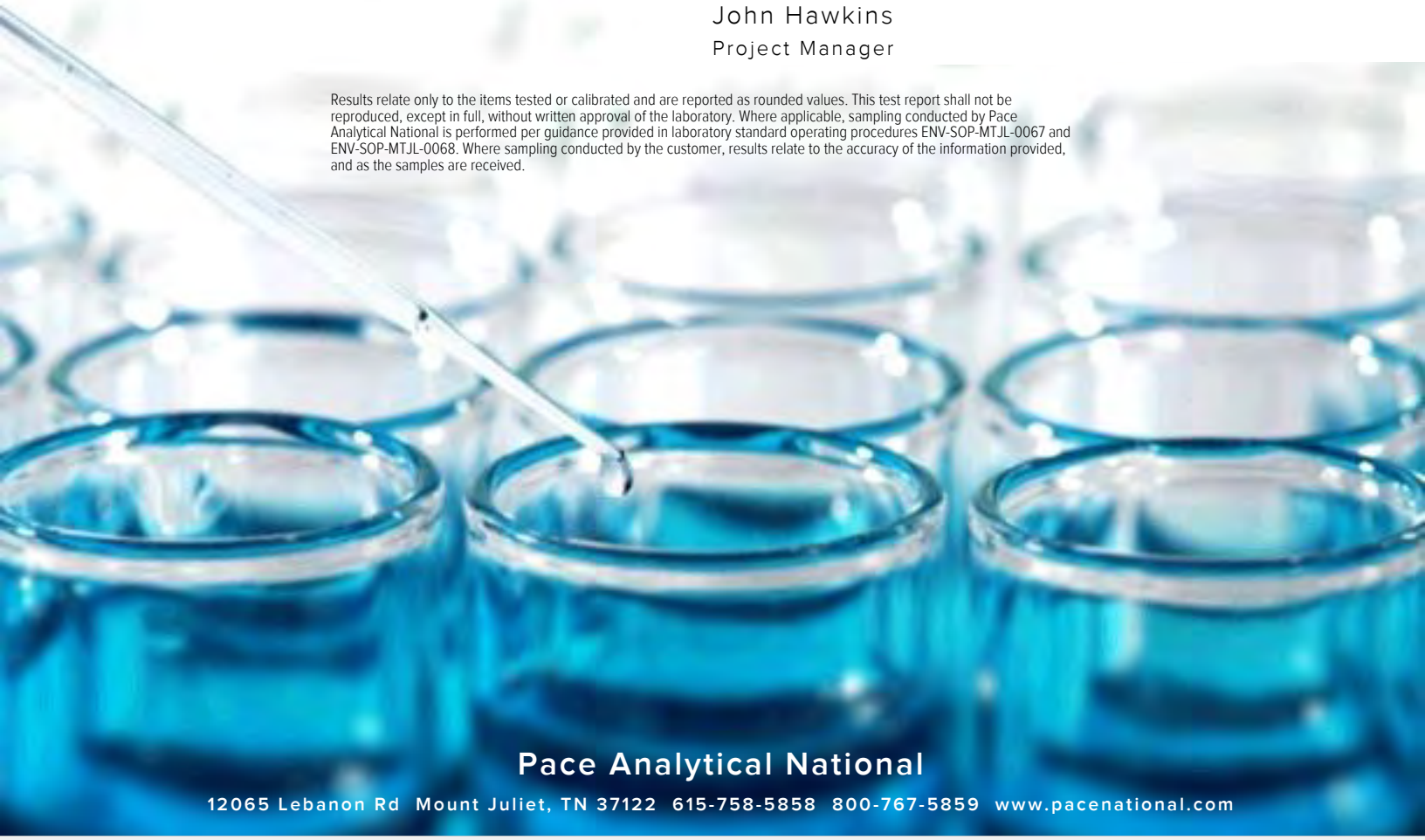
Hall Environmental Analysis Laboratory

Sample Delivery Group:	L1372907
Samples Received:	06/30/2021
Project Number:	
Description:	

Report To: Jackie Bolte
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By:

John Hawkins
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

2106F12-001F S-18 (6/28/21) L1372907-01 WW

Collected by	Collected date/time	Received date/time
	06/28/21 11:00	06/30/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500H+ B-2011	WG1700812	1	07/07/21 14:00	07/07/21 14:00	GJA	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG1703776	1	07/13/21 02:04	07/13/21 02:04	CAT	Mt. Juliet, TN

2106F12-001G S-18 (6/28/21) L1372907-02 WW

Collected by	Collected date/time	Received date/time
	06/28/21 11:00	06/30/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500 S2 D-2011	WG1700481	1	07/05/21 22:03	07/05/21 22:03	JIC	Mt. Juliet, TN

2106F12-001H S-18 (6/28/21) L1372907-03 WW

Collected by	Collected date/time	Received date/time
	06/28/21 11:00	06/30/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500 CN E-2011	WG1708500	1	07/20/21 20:52	07/21/21 12:44	KEG	Mt. Juliet, TN

2106F12-001I S-18 (6/28/21) L1372907-04 GW

Collected by	Collected date/time	Received date/time
	06/28/21 11:00	06/30/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG1700745	1	07/06/21 15:52	07/06/21 15:52	AMH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 4500 CN E-2011.
All Reactive Sulfide results reported in the attached report were determined as totals using method 4500 S2 D-2011.

Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
Corrosivity by pH	5.90	T8	1	07/07/2021 14:00	WG1700812

Sample Narrative:

L1372907-01 WG1700812: 5.9 at 21.3C

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	deg F			date / time	
Flashpoint	DNF at 170		1	07/13/2021 02:04	WG1703776

Wet Chemistry by Method 4500 S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Sulfide	0.330		0.0500	1	07/05/2021 22:03	WG1700481

Wet Chemistry by Method 4500 CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Cyanide	0.0162	J4	0.00500	1	07/21/2021 12:44	WG1708500

Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	mV			date / time	
ORP	42.5	T8	1	07/06/2021 15:52	WG1700745

L1372907-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1372907-04 07/06/21 15:52 • (DUP) R3676180-3 07/06/21 15:52

Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier	DUP Diff Limits mV
ORP	42.5	44.0	1	1.50		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3676180-1 07/06/21 15:52 • (LCSD) R3676180-2 07/06/21 15:52

Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	Diff mV	Diff Limits mV
ORP	106	106	106	100	100	86.0-105			0.000	20

Method Blank (MB)

(MB) R3682171-1 07/21/21 12:36

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Cyanide	U		0.00180	0.00500

L1373848-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1373848-03 07/21/21 12:46 • (DUP) R3682171-4 07/21/21 12:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

L1377992-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1377992-01 07/21/21 13:09 • (DUP) R3682171-7 07/21/21 13:10

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3682171-3 07/21/21 12:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	0.100	0.0820	82.0	87.1-120	J4

L1377792-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1377792-01 07/21/21 13:06 • (MS) R3682171-5 07/21/21 13:07 • (MSD) R3682171-6 07/21/21 13:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	ND	0.110	0.103	105	98.0	1	90.0-110			6.57	20

QUALITY CONTROL SUMMARY

L1372907-02

Method Blank (MB)

(MB) R3675772-1 07/05/21 21:20

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Sulfide	U		0.0250	0.0500

Laboratory Control Sample (LCS)

(LCS) R3675772-2 07/05/21 21:29

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Sulfide	0.500	0.536	107	85.0-115	

Laboratory Control Sample (LCS)

(LCS) R3676727-1 07/07/21 14:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
Corrosivity by pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.04 at 21.2C

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3678532-1 07/13/21 02:04 • (LCSD) R3678532-2 07/13/21 02:04

Analyte	Spike Amount deg F	LCS Result deg F	LCSD Result deg F	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Flashpoint	126	131	131	104	104	96.0-104			0.000	10

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J4	The associated batch QC was outside the established quality control range for accuracy.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

E183

SUB CONTRATOR: Pace TN	COMPANY: PACE TN	PHONE: (800) 767-5859	FAX: (615) 758-5859
ADDRESS: 12065 Lebanon Rd		ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: Mt. Juliet, TN 37122			

U372907

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2106F12-001F	S-18 (6/28/21)	500HDPE	Aqueous	6/28/2021 11:00:00 AM	1	RCI
2	2106F12-001G	S-18 (6/28/21)	500PLNAOH ZNAC	Aqueous	6/28/2021 11:00:00 AM	1	RCI
3	2106F12-001H	S-18 (6/28/21)	500PL-NaOH	Aqueous	6/28/2021 11:00:00 AM	1	RCI
4	2106F12-001I	S-18 (6/28/21)	125HDP	Aqueous	6/28/2021 11:00:00 AM	1	ORP

Sample Receipt Checklist

COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N

If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

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:
	6/29/2021	10:47 AM			
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	6/30/21	9:00

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples 4.6+2-4.8 A2OF Attempt to Cool ?
Comments:

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R79465**	RunNo: **79465**							
Prep Date:	Analysis Date: **6/29/2021**	SeqNo: **2793674**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R79465**	RunNo: **79465**							
Prep Date:	Analysis Date: **6/29/2021**	SeqNo: **2793675**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.53	0.10	0.5000	0	106	90	110			
Bromide	2.5	0.10	2.500	0	100	90	110			
Phosphorus, Orthophosphate (As P	4.7	0.50	5.000	0	93.3	90	110			
Sulfate	9.8	0.50	10.00	0	98.4	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R79711**	RunNo: **79711**							
Prep Date:	Analysis Date: **7/9/2021**	SeqNo: **2803588**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R79711**	RunNo: **79711**							
Prep Date:	Analysis Date: **7/9/2021**	SeqNo: **2803594**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.0	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **A79773**	RunNo: **79773**							
Prep Date:	Analysis Date: **7/13/2021**	SeqNo: **2806400**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**
23-Jul-21

Client: Souder, Miller and Associates
Project: Aqua Moss Sunco # 1

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A79773**	RunNo: **79773**
Prep Date:	Analysis Date: **7/14/2021**	SeqNo: **2806401** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.9	90	110			

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **MB-61046**	SampType: **MBLK**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **PBW**	Batch ID: **61046**	RunNo: **79529**
Prep Date: **6/30/2021**	Analysis Date: **7/1/2021**	SeqNo: **2796336** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0031		0.002500		124	41.7	129			
Surr: Tetrachloro-m-xylene	0.0015		0.002500		62.0	31.8	88.5			

Sample ID: **MB-61046**	SampType: **MBLK**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **PBW**	Batch ID: **61046**	RunNo: **79529**
Prep Date: **6/30/2021**	Analysis Date: **7/1/2021**	SeqNo: **2796337** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0033		0.002500		133	41.7	129			S
Surr: Tetrachloro-m-xylene	0.0017		0.002500		68.7	31.8	88.5			

Sample ID: **LCS-61046**	SampType: **LCS**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **LCSW**	Batch ID: **61046**	RunNo: **79529**
Prep Date: **6/30/2021**	Analysis Date: **7/1/2021**	SeqNo: **2796338** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0031		0.002500		124	41.7	129			
Surr: Tetrachloro-m-xylene	0.0018		0.002500		70.4	31.8	88.5			

Sample ID: **2106F12-001BMS**	SampType: **MS**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **S-18 (6/28/21)**	Batch ID: **61046**	RunNo: **79547**
Prep Date: **6/30/2021**	Analysis Date: **7/2/2021**	SeqNo: **2797400** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0041		0.002500		164	41.7	129			S
Surr: Tetrachloro-m-xylene	0.0031		0.002500		122	31.8	88.5			S

Sample ID: **2106F12-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **S-18 (6/28/21)**	Batch ID: **61046**	RunNo: **79547**
Prep Date: **6/30/2021**	Analysis Date: **7/2/2021**	SeqNo: **2797402** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0026		0.002500		102	41.7	129	0	0	
Surr: Tetrachloro-m-xylene	0.0024		0.002500		94.7	31.8	88.5	0	0	S

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **LCS-61046**	SampType: **LCS**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **LCSW**	Batch ID: **61046**	RunNo: **79529**
Prep Date: **6/30/2021**	Analysis Date: **7/1/2021**	SeqNo: **2797408** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0030		0.002500		119	41.7	129			
Surr: Tetrachloro-m-xylene	0.0018		0.002500		71.2	31.8	88.5			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **100ng lcs2**	SampType: **LCS**	TestCode: **TCLP Volatiles by 8260B**
Client ID: **LCSW**	Batch ID: **T79505**	RunNo: **79505**
Prep Date:	Analysis Date: **7/1/2021**	SeqNo: **2795327** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.022	0.00023	0.02000	0	110	70	130			
1,1-Dichloroethene	0.020	0.00013	0.02000	0	102	70	130			
Trichloroethene (TCE)	0.020	0.00020	0.02000	0	101	70	130			
Chlorobenzene	0.020	0.00014	0.02000	0	99.7	70	130			
Surr: 1,2-Dichloroethane-d4	0.011		0.01000		107	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		105	70	130			
Surr: Dibromofluoromethane	0.010		0.01000		102	70	130			
Surr: Toluene-d8	0.010		0.01000		102	70	130			

Sample ID: **mb2**	SampType: **MBLK**	TestCode: **TCLP Volatiles by 8260B**
Client ID: **PBW**	Batch ID: **T79505**	RunNo: **79505**
Prep Date:	Analysis Date: **7/1/2021**	SeqNo: **2795330** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
2-Butanone	ND	200								
Carbon Tetrachloride	ND	0.50								
Chloroform	ND	6.0								
1,4-Dichlorobenzene	ND	7.5								
1,1-Dichloroethene	ND	0.70								
Tetrachloroethene (PCE)	ND	0.70								
Trichloroethene (TCE)	ND	0.50								
Vinyl chloride	ND	0.20								
Chlorobenzene	ND	100								
Surr: 1,2-Dichloroethane-d4	0.010		0.01000		104	70	130			
Surr: 4-Bromofluorobenzene	0.011		0.01000		106	70	130			
Surr: Dibromofluoromethane	0.010		0.01000		101	70	130			
Surr: Toluene-d8	0.0098		0.01000		98.2	70	130			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**
23-Jul-21

Client: Souder, Miller and Associates
Project: Aqua Moss Sunco # 1

Sample ID: **MB-61067**	SampType: **MBLK**	TestCode: **EPA Method 8270C TCLP**
Client ID: **PBW**	Batch ID: **61067**	RunNo: **79674**
Prep Date: **7/1/2021**	Analysis Date: **7/8/2021**	SeqNo: **2802563** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	ND	200								
3+4-Methylphenol	ND	200								
2,4-Dinitrotoluene	ND	0.13								
Hexachlorobenzene	ND	0.13								
Hexachlorobutadiene	ND	0.50								
Hexachloroethane	ND	3.0								
Nitrobenzene	ND	2.0								
Pentachlorophenol	ND	100								
Pyridine	ND	5.0								
2,4,5-Trichlorophenol	ND	400								
2,4,6-Trichlorophenol	ND	2.0								
Cresols, Total	ND	200								
Surr: 2-Fluorophenol	0.074		0.2000		37.1	15	91.8			
Surr: Phenol-d5	0.061		0.2000		30.5	15	69.6			
Surr: 2,4,6-Tribromophenol	0.11		0.2000		54.5	15	115			
Surr: Nitrobenzene-d5	0.047		0.1000		46.6	15	109			
Surr: 2-Fluorobiphenyl	0.046		0.1000		46.0	15	96			
Surr: 4-Terphenyl-d14	0.071		0.1000		71.4	15	133			

Sample ID: **LCS-61067**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSW**	Batch ID: **61067**	RunNo: **79674**
Prep Date: **7/1/2021**	Analysis Date: **7/8/2021**	SeqNo: **2802564** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.053	0.00010	0.1000	0	53.2	33.8	121			
3+4-Methylphenol	0.11	0.00010	0.2000	0	55.3	33.6	109			
2,4-Dinitrotoluene	0.045	0.00010	0.1000	0	45.1	50.4	124			S
Hexachlorobenzene	0.060	0.00010	0.1000	0	60.5	50.1	120			
Hexachlorobutadiene	0.050	0.00010	0.1000	0	50.2	16.1	103			
Hexachloroethane	0.047	0.00010	0.1000	0	47.0	15	94.2			
Nitrobenzene	0.056	0.00010	0.1000	0	56.4	32.4	125			
Pentachlorophenol	0.055	0.00010	0.1000	0	54.8	44.6	114			
Pyridine	0.039	0.00010	0.1000	0	39.2	15	67			
2,4,5-Trichlorophenol	0.064	0.00010	0.1000	0	63.9	49.4	118			
2,4,6-Trichlorophenol	0.062	0.00010	0.1000	0	61.5	50.3	116			
Cresols, Total	0.16	0.00010	0.3000	0	54.6	33.8	109			
Surr: 2-Fluorophenol	0.093		0.2000		46.6	15	91.8			
Surr: Phenol-d5	0.075		0.2000		37.3	15	69.6			
Surr: 2,4,6-Tribromophenol	0.13		0.2000		66.6	15	115			

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **LCS-61067**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSW**	Batch ID: **61067**	RunNo: **79674**
Prep Date: **7/1/2021**	Analysis Date: **7/8/2021**	SeqNo: **2802564** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.056		0.1000		56.4	15	109			
Surr: 2-Fluorobiphenyl	0.060		0.1000		59.7	15	96			
Surr: 4-Terphenyl-d14	0.083		0.1000		82.6	15	133			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**
23-Jul-21

Client: Souder, Miller and Associates
Project: Aqua Moss Sunco # 1

Sample ID: **lcs-1 98.7uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R79556**	RunNo: **79556**
Prep Date:	Analysis Date: **7/2/2021**	SeqNo: **2798408** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	97	10	98.70	0	97.9	85	115			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **MB-61188**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**
Client ID: **PBW**	Batch ID: **61188**	RunNo: **79686**
Prep Date: **7/8/2021**	Analysis Date: **7/9/2021**	SeqNo: **2802512** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID: **LLLCS-61188**	SampType: **LCSLL**	TestCode: **EPA Method 7470: Mercury**
Client ID: **BatchQC**	Batch ID: **61188**	RunNo: **79686**
Prep Date: **7/8/2021**	Analysis Date: **7/9/2021**	SeqNo: **2802513** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020	0.0001500	0	79.5	50	150			

Sample ID: **LCS-61188**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**
Client ID: **LCSW**	Batch ID: **61188**	RunNo: **79686**
Prep Date: **7/8/2021**	Analysis Date: **7/9/2021**	SeqNo: **2802514** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.9	85	115			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A79508**	RunNo: **79508**
Prep Date:	Analysis Date: **6/30/2021**	SeqNo: **2795572** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A79508**	RunNo: **79508**
Prep Date:	Analysis Date: **6/30/2021**	SeqNo: **2795576** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	48	1.0	50.00	0	97.0	80	120			
Potassium	48	1.0	50.00	0	95.9	80	120			
Sodium	49	1.0	50.00	0	97.5	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **MB-61023**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **61023**	RunNo: **79508**
Prep Date: **6/29/2021**	Analysis Date: **6/30/2021**	SeqNo: **2795520** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.030								
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.020								
Selenium	ND	0.050								
Silver	ND	0.0050								

Sample ID: **LCS-61023**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **61023**	RunNo: **79508**
Prep Date: **6/29/2021**	Analysis Date: **6/30/2021**	SeqNo: **2795522** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.49	0.030	0.5000	0	97.5	80	120			
Barium	0.48	0.0020	0.5000	0	96.3	80	120			
Cadmium	0.49	0.0020	0.5000	0	97.3	80	120			
Chromium	0.48	0.0060	0.5000	0	96.5	80	120			
Lead	0.50	0.020	0.5000	0	99.3	80	120			
Selenium	0.50	0.050	0.5000	0	99.2	80	120			
Silver	0.098	0.0050	0.1000	0	98.4	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**

23-Jul-21

Client: Souder, Miller and Associates

Project: Aqua Moss Sunco # 1

Sample ID: **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809111**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809112**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.92	20.00	80.00	0	98.6	90	110			

Sample ID: **mb-2 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809134**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-2 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809135**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.88	20.00	80.00	0	98.6	90	110			

Sample ID: **mb-3 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809158**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-3 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R79813**	RunNo: **79813**							
Prep Date:	Analysis Date: **7/15/2021**	SeqNo: **2809159**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79.24	20.00	80.00	0	99.0	90	110			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**
23-Jul-21

Client: Souder, Miller and Associates
Project: Aqua Moss Sunco # 1

Sample ID: **2106F12-001C DUP**	SampType: **DUP**	TestCode: **Specific Gravity**							
Client ID: **S-18 (6/28/21)**	Batch ID: **R79788**	RunNo: **79788**							
Prep Date:	Analysis Date: **7/14/2021**	SeqNo: **2806734**	Units:						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.014	0						0.0592	20	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2106F12**
23-Jul-21

Client: Souder, Miller and Associates
Project: Aqua Moss Sunco # 1

Sample ID: **MB-61072**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **61072**	RunNo: **79588**
Prep Date: **7/1/2021**	Analysis Date: **7/6/2021**	SeqNo: **2798905** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-61072**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **61072**	RunNo: **79588**
Prep Date: **7/1/2021**	Analysis Date: **7/6/2021**	SeqNo: **2798906** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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: **Souder, Miller and Associates** Work Order Number: **2106F12** RcptNo: **1**

Received By: **Juan Rojas** **6/29/2021 8:00:00 AM** Juan Rojas

Completed By: **Sean Livingston** **6/29/2021 10:40:57 AM** Sean Livingston

Reviewed By: 6/29/21

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° 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 ☑ SCL 6/29/21	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: 3 3 (<2 or >12 unless noted)

Adjusted? yes

Checked by: SCL 6/29/21

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: added ~4.0mL HNO_3 to sample 001E, added ~0.4mL HNO_3 to sample 001D checked for preferred pH <2 poured off ~100mL for ORP analysis

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good				
2	1.5	Good				

SCL 6/29/21

Chain-of-Custody Record

Client: Souder, Miller & Associates

Mailing Address: 401 West Broadway
Farmington, NM 87401

Phone #: (505) 716-2787

email or Fax#: Heather.Woods@soudermiller.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Agua Moss Sunco #1

Project #:

Project Manager: Heather Woods

Sampler: Heather Woods

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp (including CF): 0.8-0.2=0.6 (°C) 1.7-0.2=1.5

HEAL No. 2106F12

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
6/28/21	1100	Aq	S-18 (6/28/21)	(1) ~~500~~ 250 mL Plastic	HNO_3	001
				(1) 500mL Plastic	NaOH	
				(1) 500mL Plastic	Zinc acetate NaOH	
				(2) 500mL Plastic	Non	
				(1) 125mL Plastic	H_2SO_4	
				(1) 125mL Plastic	HNO_3 Filtered	
				(5) 1L Amber	Non	
				(3) 40mL VOA	$HgCl_2$	

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	See Attached
										X

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
6/28/21	1643	Heather M. Woz	Chad Ward		4/28/21	1643
4/28/21	1759	Chad Ward		Courier	6/29/21	8:00

Remarks:
Direct Bill to Agua Moss
Rates per Andy

Characteristic of toxicity using the Toxicity Characteristic Leaching Procedure, EPA SW-846 Test Method 1311 (see Table 1, 40 CFR 261.24(b)).

QUARTERLY MONITORING LIST			
EPA HW No.	Contaminant	SW-846 Methods	Regulatory Level (mg/L)
D004	Arsenic	1311	5.0
D005	Barium	1311	100.0
D018	Benzene	8021B	0.5
D006	Cadmium	1311	1.0
D019	Carbon tetrachloride	8021B 8260B	0.5
D020	Chlordane	8081A	0.03
D021	Chlorobenzene	8021B 8260B	100.0
D022	Chloroform	8021B 8260B	6.0
D007	Chromium	1311	5.0
D023	o-Cresol	8270D	200.0
D024	m-Cresol	8270D	200.0
D025	p-Cresol	8270D	200.0
D026	Cresol	8270D	200.0
D027	1,4-Dichlorobenzene	8021B 8121 8260B 8270D	7.5
D028	1,2-Dichloroethane	8021B 8260B	0.5
D029	1,1-Dichloroethylene	8021B 8260B	0.7
D030	2,4-Dinitrotoluene	8091 8270D	0.13
D032	Hexachlorobenzene	8121	0.13
D033	Hexachlorobutadiene	8021B 8121 8260B	0.5
D034	Hexachloroethane	8121	3.0
D008	Lead	1311	5.0
D009	Mercury	7470A 7471B	0.2
D035	Methyl ethyl ketone	8015B 8260B	200.0

D036	Nitrobenzene	8091 8270D	2.0
D037	Pentrachlorophenol	8041	100.0
D038	Pyridine	8260B 8270D	5.0

D010	Selenium	1311	1.0
D011	Silver	1311	5.0
D039	Tetrachloroethylene	8260B	0.7
D040	Trichloroethylene	8021B 8260B	0.5
D041	2,4,5-Trichlorophenol	8270D	400.0
D042	2,4,6-Trichlorophenol	8041A 8270D	2.0
D043	Vinyl chloride	8021B 8260B	0.2

If o-, m-, and p-cresol concentrations cannot be differentiated, then the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.
If the quantitation limit is greater than the regulatory level, then the quantitation limit becomes the regulatory level.
If metals (dissolved), the EPA 1311 TCLP Laboratory Method is required with the exception of Mercury (total)

ADDITIONALLY:

RCI, specific conductance, specific gravity, ORP, and general water quality parameters (general chemistry/cations and anions, including: fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate, chloride, sulfate, total dissolved solids, cation/anion balance, pH, and bromide) using the methods specified at 40 CFR 136.3.

	WH	AP	
1/1/21		0	
1/2/21			
1/3/21			
1/4/21			
1/5/21			
1/6/21			
1/7/21			
1/8/21			
1/9/21			
1/10/21			
1/11/21			
1/12/21			
1/13/21			
1/14/21			
1/15/21	1250		
1/16/21			
1/17/21			
1/18/21	1250		
1/19/21	1400		
1/20/21	1550		
1/21/21	1600		
1/22/21	1700		
1/23/21	1750		
1/24/21	1700		
1/25/21	1400		
1/26/21	1700		
1/27/21	1750		
1/28/21	1800		
1/29/21	1850		
1/30/21	1800		
1/31/21	1800		
	1620	**0**	**AVG**
	1250	**0**	**MIN**
	1850	**0**	**MAX**

	WH	AP	
2/1/21	1750	0	
2/2/21	1800		
2/3/21	1850		
2/4/21	1850		
2/5/21	1900		
2/6/21	2350		
2/7/21	1850		
2/8/21	1850		
2/9/21	1800		
2/10/21	1900		
2/11/21	1900		
2/12/21	1900		
2/13/21	1900		
2/14/21	1850		
2/15/21	1800		
2/16/21	1850		
2/17/21	1800		
2/18/21	1800		
2/19/21	1800		
2/20/21	1900		
2/21/21	1750		
2/22/21	1750		
2/23/21	2075		
2/24/21	1900		
2/25/21	2100		
2/26/21	2100		
2/27/21	2100		
2/28/21	1925		
	1896.429	**0**	**AVG**
	1750	**0**	**MIN**
	2350	**0**	**MAX**

	WH	AP	
3/1/21	1900	0	
3/2/21	1900		
3/3/21	1900		
3/4/21	1900		
3/5/21	1900		
3/6/21	1950		
3/7/21	1850		
3/8/21	1900		
3/9/21	1900		
3/10/21	1925		
3/11/21	1925		
3/12/21	1950		
3/13/21	1950		
3/14/21	1900		
3/15/21	1850		
3/16/21	1900		
3/17/21	1950		
3/18/21	2150		
3/19/21	1950		
3/20/21	1950		
3/21/21	1850		
3/22/21	1850		
3/23/21	1950		
3/24/21	1850		
3/25/21	1850		
3/26/21	1950		
3/27/21	1950		
3/28/21	1850		
3/29/21	1950		
3/30/21	2000		
3/31/21	1900		
	1917.742	**0**	**AVG**
	1850	**0**	**MIN**
	2150	**0**	**MAX**

	WH	AP	
4/1/21	0	0	
4/2/21			
4/3/21			
4/4/21			
4/5/21			
4/6/21			
4/7/21			
4/8/21			
4/9/21			
4/10/21			
4/11/21			
4/12/21			
4/13/21			
4/14/21			
4/15/21			
4/16/21			
4/17/21			
4/18/21			
4/19/21			
4/20/21			
4/21/21			
4/22/21			
4/23/21			
4/24/21			
4/25/21			
4/26/21			
4/27/21			
4/28/21			
4/29/21			
4/30/21			
	0	**0**	**AVG**
	0	**0**	**MIN**
	0	**0**	**MAX**

	WH	AP	
5/1/21	1900	0	
5/2/21	1950		
5/3/21	1950		
5/4/21	1900		
5/5/21	1850		
5/6/21	1850		
5/7/21	1900		
5/8/21	1900		
5/9/21	1900		
5/10/21	2150		
5/11/21	1850		
5/12/21	1850		
5/13/21			
5/14/21			
5/15/21	1850		
5/16/21	1850		
5/17/21	1750		
5/18/21	1750		
5/19/21	1800		
5/20/21	1800		
5/21/21	1850		
5/22/21			
5/23/21			
5/24/21			
5/25/21			
5/26/21			
5/27/21			
5/28/21			
5/29/21			
5/30/21			
5/31/21			
	1873.684	**0**	**AVG**
	1750	**0**	**MIN**
	2150	**0**	**MAX**

	WH	AP	
6/1/21	1500	0	
6/2/21			
6/3/21			
6/4/21			
6/5/21			
6/6/21			
6/7/21			
6/8/21	1500		
6/9/21			
6/10/21			
6/11/21			
6/12/21			
6/13/21			
6/14/21			
6/15/21			
6/16/21	1500		
6/17/21	1500		
6/18/21			
6/19/21			
6/20/21			
6/21/21			
6/22/21			
6/23/21			
6/24/21			
6/25/21			
6/26/21			
6/27/21			
6/28/21			
6/29/21	1450		
6/30/21	1520		
	1495	**0**	**AVG**
	1450	**0**	**MIN**
	1520	**0**	**MAX**

	WH	AP	
7/1/21		0	
7/2/21			
7/3/21			
7/4/21			
7/5/21			
7/6/21			
7/7/21			
7/8/21			
7/9/21			
7/10/21			
7/11/21			
7/12/21			
7/13/21			
7/14/21			
7/15/21			
7/16/21			
7/17/21			
7/18/21			
7/19/21			
7/20/21			
7/21/21	1275		
7/22/21			
7/23/21	1275		
7/24/21			
7/25/21			
7/26/21			
7/27/21			
7/28/21	1720		
7/29/21			
7/30/21			
7/31/21			
	1423.333	**0**	**AVG**
	1275	**0**	**MIN**
	1720	**0**	**MAX**

Total Injected	Avg Vol	Avg Flow		Avg Vol	Avg Flow		Avg Vol	Avg Flow		Avg Vol	Avg Flow		Avg Vol	Avg Flow		Avg Vol	Avg Flow		Avg Vol	Avg Flow
1/1/21			2/1/21	1146	33.425	3/1/21	1074	31.325	4/1/2021	1465	42.72916667	5/1/2021			6/1/2021			7/1/2021		
1/2/21			2/2/21	2156	62.88333333	3/2/21	864	25.2	4/2/2021	1670	48.70833333	5/2/2021			6/2/2021			7/2/2021		
1/3/21			2/3/21	1402	40.89166667	3/3/21	2001	58.3625	4/3/2021	913	26.62916667	5/3/2021			6/3/2021			7/3/2021		
1/4/21			2/4/21	2235	65.1875	3/4/21	1640	47.83333333	4/4/2021			5/4/2021			6/4/2021			7/4/2021		
1/5/21			2/5/21	2011	58.65416667	3/5/21	1558	45.44166667	4/5/2021	699	20.3875	5/5/2021			6/5/2021			7/5/2021		
1/6/21			2/6/21	1178	34.35833333	3/6/21			4/6/2021	1144	33.36666667	5/6/2021			6/6/2021			7/6/2021		
1/7/21			2/7/21	931	27.15416667	3/7/21	885	25.8125	4/7/2021	1242	36.225	5/7/2021			6/7/2021			7/7/2021		
1/8/21			2/8/21	1494	43.575	3/8/21	1155	33.6875	4/8/2021	662	19.30833333	5/8/2021			6/8/2021			7/8/2021		
1/9/21			2/9/21	1316	38.38333333	3/9/21	903	26.3375	4/9/2021	587	17.12083333	5/9/2021			6/9/2021			7/9/2021		
1/10/21			2/10/21	1512	44.1	3/10/21	1980	57.75	4/10/2021	670	19.54166667	5/10/2021			6/10/2021			7/10/2021		
1/11/21			2/11/21	2104	61.36666667	3/11/21	1524	44.45	4/11/2021	1167	34.0375	5/11/2021			6/11/2021			7/11/2021		
1/12/21			2/12/21	2352	68.6	3/12/21	1801	52.52916667	4/12/2021	261	7.6125	5/12/2021			6/12/2021			7/12/2021		
1/13/21			2/13/21	559	16.30416667	3/13/21	1157	33.74583333	4/13/2021			5/13/2021			6/13/2021			7/13/2021		
1/14/21			2/14/21	260	7.583333333	3/14/21	357	10.4125	4/14/2021			5/14/2021			6/14/2021			7/14/2021		
1/15/21			2/15/21	1210	35.29166667	3/15/21	1557	45.4125	4/15/2021	1001	29.19583333	5/15/2021			6/15/2021			7/15/2021		
1/16/21			2/16/21	659	19.22083333	3/16/21	1297	37.82916667	4/16/2021	701	20.44583333	5/16/2021			6/16/2021			7/16/2021		
1/17/21			2/17/21	1605	46.8125	3/17/21	841	24.52916667	4/17/2021			5/17/2021			6/17/2021			7/17/2021		
1/18/21	407	11.87083333	2/18/21	1461	42.6125	3/18/21	2433	70.9625	4/18/2021	793	23.12916667	5/18/2021			6/18/2021			7/18/2021		
1/19/21	1163	33.92083333	2/19/21	1287	37.5375	3/19/21	1652	48.18333333	4/19/2021	1020	29.75	5/19/2021			6/19/2021			7/19/2021		
1/20/21	987	28.7875	2/20/21	490	14.29166667	3/20/21	374	10.90833333	4/20/2021	685	19.97916667	5/20/2021			6/20/2021			7/20/2021		
1/21/21	1648	48.06666667	2/21/21			3/21/21	303	8.8375	4/21/2021	595	17.35416667	5/21/2021			6/21/2021			7/21/2021		
1/22/21	2151	62.7375	2/22/21	1003	29.25416667	3/22/21	801	23.3625	4/22/2021			5/22/2021			6/22/2021			7/22/2021		
1/23/21	828	24.15	2/23/21	2264	66.03333333	3/23/21	1755	51.1875	4/23/2021			5/23/2021			6/23/2021			7/23/2021		
1/24/21	501	14.6125	2/24/21	653	19.04583333	3/24/21	918	26.775	4/24/2021			5/24/2021			6/24/2021			7/24/2021		
1/25/21	763	22.25416667	2/25/21	1497	43.6625	3/25/21	1524	44.45	4/25/2021			5/25/2021	0	0	6/25/2021			7/25/2021		
1/26/21	1223	35.67083333	2/26/21	1967	57.37083333	3/26/21	802	23.39166667	4/26/2021			5/26/2021			6/26/2021			7/26/2021		
1/27/21	1231	35.90416667	2/27/21	1857	54.1625	3/27/21	538	15.69166667	4/27/2021			5/27/2021			6/27/2021			7/27/2021		
1/28/21	2143	62.50416667	2/28/21	991	28.90416667	3/28/21	466	13.59166667	4/28/2021			5/28/2021			6/28/2021			7/28/2021	546	15.925
1/29/21	1244	36.28333333				3/29/21	928	27.06666667	4/29/2021			5/29/2021			6/29/2021			7/29/2021		
1/30/21	1184	34.53333333				3/30/21	1142	33.30833333	4/30/2021			5/30/2021			6/30/2021	16	0.466666667	7/30/2021		
1/31/21	536	15.63333333				3/31/21	1454	42.40833333				5/31/2021						7/31/2021		
AVG	1143.5	33.35208333		1392.592593	40.61728395		1189.466667	34.69277778		898.5294118	26.20710784		0	0		16	0.466666667		546	15.925
MAX	2151	62.7375		2352	68.6		2433	70.9625		1670	48.70833333		0	0		16	0.466666667		546	15.925
MIN	407	11.8708333		260	7.5833333		303	8.8375000		261	7.6125000		0	0.0000000		16	0.4666667		546	15.9250000
Total for mont	16009			37600			35684			15275			0			16			546	

UICI-5-0
Agua Moss, LLC
Sunco Disposal #1 30-045-28653

2021

Quarterly
Injection Report

	Average Pressure (psig)	Maximum Pressure (psig)	Minimum Pressure (psig)	Average Flow (gpm)	Maxium Flow (gpm)	Minimum Flow (gpm)	Average Annular Pressure (psig)	Maximum Annular Pressure (psig)	Minimum Annular Pressure (psig)	Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	Total Cumulative Volume (barrels)	
													Previous year	15182756	
Jan-2020	1620	1850	1250	33.35208333	62.7375	11.8708333	0	0	0	1143.5	2151	407	16009	15198765	
Feb-2020	1896.429	2350	1750	40.61728395	68.6	7.58333333	0	0	0	1392.592593	2352	260	37600	15236365	
Mar-2020	1917.742	2150	1850	34.69277778	70.9625	8.8375	0	0	0	1189.466667	2433	303	35684	15272049	
													Previous Quarter	15272049	
Apr-2020	0	0	0	26.20710784	48.70833333	7.6125	0	0	0	898.5294118	1670	261	15275	15287324	
May-2020	1873.684	2150	1750	0	0	0	0	0	0	0	0	0	0	15287324	
Jun-2020	1495	1520	1450	0.466666667	0.466666667	0.46666667	0	0	0	16	16	16	16	15287340	
													Previous Quarter	15287340	
Jul-20	1423.333	1720	1275	15.925	15.925	15.925	0	0	0	546	546	546	546	15287886	
Aug-20	0	0	0	0	0	0	0	0	0	0	0	0	0	15287886	
Sep-20	0	0	0	0	0	0	0	0	0	0	0	0	0	15287886	
													Previous Quarter	15287886	
Oct-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	15287886	
Nov-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	15287886	
Dec-2020	0	0	0	0	0	0	0	0	0	#DIV/0!	0	0	0	15287886	
												Total for year	**105130**	**15393016**	**Life Of well injected**

2020 AREA OF REVIEW
UNIT LETTERS ENCOMPASSED BY THE 2-MILE AOR

Sec	TWN	RNG	UL	
1	29N	12W	ALL	
2	29N	12W	ALL	
3	29N	12W	ALL	
4	29N	12W	ACFJKNP	
9	29N	12W	ABH	
10	29N	12W	ABCDIJN	
11	29N	12W	ACDGHILOP	
12	29N	12W	AEFKM	
25	30N	12W	EMN	
26	30N	12W	FGLNOP	
27	30N	12W	LMP	
28	30N	12W	O	
33	30N	12W	GHIJK	
34	30N	12W	ALL	
35	30N	12W	ALL	
36	30N	12W	AEIMN	

Radius expanded to 2 miles for permit renewal requirements.

													Surface Casing			*INT Casing*			*Production Casing*					
API	**Well Name**	**Well #**	**Current Operator**	**Type**	**Lease**	**Status**	**Sec**	**TWN**	**RNG**	**UL**	**Spud Date**	**TD**	**size**	**depth**	**Sacks TOC**	**size**	**depth**	**Sacks TOC**	**size**	**depth**	**Sacks TOC**	**Perfs**	**Packer**	**PLUGGED**
30-045-28653	SUNCO DISPOSAL	#001	Agua Moss	Salt Water Disposal	Private	Active	2	29N	12W	E	1/28/1992	4760	8.625	209	150 surf				5.5	4760	1010 surf	4350-4460	4282 10/15/07	4350-4460 TA'd
30-045-08851	ALLEN A	#001	BP America	Gas	Private	Plugged	1	29N	12W	D	3/12/1961	6785	8.265	264	200 surf				4.5	6785	300 surf	6518-6718		3/27/2018
30-045-26214	ALLEN A	#001E	SIMCOE LLC	Gas	Federal	Active	1	29N	12W	L	3/22/1985	5825	8.625	318	225 surf				5.5	6622	820 surf	6425-6602		
30-045-08661	Dudley Cornell A	#001	SIMCOE LLC	Gas	Federal	Active	1	29N	12W	O	11/15/1960	6730	9.625	263	200 surf				4.5	6707	300 surf	6434-6587		
30-045-24129	Dudley Cornell A	#001E	SIMCOE LLC	Gas	Federal	Active	1	29N	12W	G	4/28/1980	6722	9.625	348	250 surf				4.5	6710	180 surf	6496-6629		
30-045-34348	Allen Com	#100	Burlington	Gas	Federal	Plugged	1	29N	12W	B	10/22/2007	138												1/22/2009
30-045-08782	Cornell	5	Burlington	Gas	Federal	Plugged	1	29N	12W	G	9/30/1955	99999												4/28/1994
30-045-29167	Hike	1	Dugan Production	Gas	Federal	Active	1	29N	12W	G	7/10/1994	3840	8.625	260	175 surf				4.5	3820	595 surf	3710-3718	3710	
30-045-08656	Cornell	2	Energen Resources	Gas	Federal	Plugged	1	29N	12W	M	10/2/1955	1996												9/15/2005
30-045-29539	Cornell	3R	Epic Energy	Gas	Federal	Plugged	1	29N	12W	I	10/7/1955	0	7	131	45-53				3.5	2193	434-741	1991-2041		7/13/2018
30-045-29538	Cornell	5R	HilCorp	Gas	Federal	Active	1	29N	12W	A	4/14/1998	2225	7	131	45-53				3.5	2215	434-741	2029-2059		
30-045-08783	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Private	Plugged	1	29N	12W	F	7/9/2003	2090												12/31/1901
30-045-08641	PRE-ONGARD WELL	#003	Pre Ongard	Gas	Federal	Plugged	1	29N	12W	O	4/11/1998	2203												11/16/1981
30-045-08793	Pre-Ongard		Southern union	Gas	Private	Plugged	1	29N	12W	E	3/16/1948	2125												3/16/1948
30-045-32346	CORNELL	#002R	Southland Royalty	Gas	Federal	Active	1	29N	12W	M	7/22/2004	2152	7	137	90 surf				4.5	2151	310 surf	1702-1926		
30-045-31612	Cornell	2S	Southland Royalty	Gas	Federal	Active	1	29N	12W	O	7/27/1957	0	7	136	56 surf				4.5	2058	225 surf	1725-1921		
30-045-33573	CORNELL COM	#500S	Burlington	Gas	Private	Plugged	2	29N	12W	P	3/18/2006	2210	7	132	34 surf	6.25	2210		4.5	2198	279 surf	1754-1939 1743-1924		1/23/2013
30-045-08844	KATTLER	#001	Burlington	Gas	Private	Plugged	2	29N	12W	C	1/26/1945	2069	10	846	surf	5.5	1960		3.5	2050	205 surf	1961-2007		5/26/2012
30-045-08713	McGrath SRC	#001	Burlington	Gas	Private	Plugged	2	29n	12w	j	7/7/1973	2136												1998
30-045-30486	MCGRATH SRC	#001R	Burlington	Gas	Private	Plugged	2	29N	12W	J	3/23/2001	2235												6/25/2010
30-045-32241	BECK	#001R	HilCorp	Gas	Private	Active	2	29N	12W	G	12/1/2004	2225	7	135	34 surf				4.5	2221	262 surf	1774-2077		
30-045-33811	BECK	#001S	HilCorp	Gas	Private	Active	2	29N	12W	D	8/17/2006	2200	7	162	85 surf				4.5	2195	255 surf	1730-1951		
30-045-31580	CORNELL COM	#500	HilCorp	Gas	Federal	Active	2	29N	12W	N	7/14/2003	2136	7	139	44 surf	6.25	2126		4.5	2126	258 surf	1658-1878		
30-045-08714	CORNELL SRC	#007	HilCorp	Gas	Federal	Active	2	29N	12W	L	7/29/1944	2107	16	42	10 surf	5.5	1978		3.5	2106	250 surf	1976-2010		

30-045-08704	MCGRATH B	#001	HilCorp	Gas	Private	Active	2	29N	12W	J	11/19/1961	6720	8.625	318	225 surf				4.5	1865	1065 surf	6489-6596		
30-045-08839	YOUNG	#001	HilCorp	Gas	Private	Active	2	29N	12W	D	8/1/1961	6740	8.625	307	275 surf				4.5	6739	700 surf	6446-6644		
30-045-08797	Pre-Ongard		Southland	Gas	Private	Plugged	2	29n	12w	g	4/14/1948	2125												2/23/1984
30-045-27635	PRE-ONGARD WELL	#500		Gas	Federal	Plugged	2	29N	12W	M														12/31/1901
30-045-08709	MCGRATH	#003	Burlington	Gas	Private	Plugged	3	29N	12W	J	3/4/1945	2040												3/1/2013
30-045-60274	WALKER 2	#002	Burlington	Gas	Private	Plugged	3	29N	12W	D	1/8/1945	1974												7/24/1998
30-045-08823	Walker SRC	1	Burlington	Gas	Private	Plugged	3	29N	12W	G	2/25/1943	2050												10/12/2009
30-045-33580	MCGRATH	#003S	HilCorp	Gas	Private	Active	3	29N	12W	B	7/13/2007	2132	7	218	150 surf				4.5	2112	289 surf	1692-1904		
30-045-08712	MCGRATH A	#001	HilCorp	Gas	Private	Active	3	29N	12W	I	3/14/1964	6689	8.625	307	250 surf				4.5	6688	500 surf	6432-6524		
30-045-32931	WALKER	#100S	HilCorp	Gas	Private	Active	3	29N	12W	F	8/14/2005	2120	7	144	61 surf				4.5	2117	238 surf	1621-1885		
30-045-08801	WALKER 1	#001	HilCorp	Gas	Private	Active	3	29N	12W	E	4/12/1960	6620	8.625	232	150 surf				4.5	6620	300 surf	6546-6556		
30-045-30244	WALKER 100	#100	HilCorp	Gas	Private	TA'd	3	29N	12W	L	3/30/2001	1948	7	126	140-168				4.5	1940	219-399	1659-1872	1597 CIBP@1609	Tad
30-045-08711	Pre-Ongard		Union Texas	Gas	Private	Plugged	3	29N	12W	K	6/25/1955	1940												11/10/1964
30-045-29117	RIGGS	#001	Enduring Resources	Gas	Private	Active	4	29N	12W	A	6/24/1994	1900												
30-045-29118	RIGGS	#002	Enduring Resources	Gas	Private	Plugged	4	29N	12W	N	6/28/1994	1890												5/8/2017
30-045-32239	RIGGS	#003	Enduring Resources	Gas	Private	Active	4	29N	12W	C	2/21/2005	1906												
30-045-32312	RIGGS	#004	Enduring Resources	Gas	Private	Active	4	29N	12W	P	3/20/2005	2002												
30-045-08718	STANDARD	#001	HilCorp	Gas	Federal	Active	4	29N	12W	J	11/3/1960	6600	8.625	236	175 surf				4.5	6600	250 surf	6356-6510		
30-045-08720	DEVONIAN FEDERAL	#001	Holcomb Oil & Gas	Gas	Federal	Active	4	29N	12W	K	6/23/1959	6538												
30-045-24552	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Federal	Plugged	4	29N	12W	A	5/29/1981	0												12/7/1995
30-045-08804	FEDERAL	#001	Riggs Oil & Gas	Gas	Federal	Plugged	4	29N	12W	F	5/29/1959	1856												2/9/2017
30-045-08586	FLORANCE GAS COM B	#001	SIMCOE LLC	Gas	Federal	Active	9	29N	12W	H	1/20/1964	6470												
30-045-28824	ROPCO FEE FC 9	#002	HilCorp	Gas	Private	Active	9	29N	12W	A	11/25/1992	1975												
30-045-26855	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Private	Plugged	9	29N	12W	B	3/18/1988	0												3/9/1989
30-045-08601	CORNELL A	#001	SIMCOE LLC	Gas	Federal	Active	10	29N	12W	D	12/28/1960	6510												
30-045-24132	CORNELL A	#001E	BP America	Gas	Federal	Plugged	10	29N	12W	N	4/4/1980	6350												1/24/2018

30-045-08605	CORNELL	#007	Burlington	Gas	Federal	Plugged	10	29N	12W	C	4/20/1956	1807												7/18/1996
30-045-23889	BECK A	#001E	HilCorp	Gas	Federal	Active	10	29N	12W	B	1/5/1981	6514	8.625	240	150 surf				4.5	6514	765 surf	6277-6454		
30-045-08517	BECK A	#001	HilCorp	Gas	Private	Active	10	29N	12W	J	6/12/1962	6410												
30-045-30381	CORNELL	#100	HilCorp	Gas	Federal	Active	10	29N	12W	B	1/7/2003	1968	7	147	55 surf				4.5	1959	229 surf	1543-1704 1744-1800		
30-045-08523	PRE-ONGARD WELL	#001	Pre Ongard	Water	Private	Permanently	10	29N	12W	J	8/21/1946	1871												10/31/1977
30-045-23758	Pre-Ongard		Southland	Gas	Federal	Plugged	10	29N	12W	A	12/19/1980	1870												2/10/1984
30-045-34452	BECK 29 12 10	#108	Synergy	Gas	Federal	Active	10	29N	12W	N	2/21/2008	1865												
30-045-13092	CORNELL C	#001	SIMCOE LLC	Gas	Federal	Active	11	29N	12W	D	12/6/1961	6604	8.625	250	150 surf				4.5	6604	300 surf	6298-6483		
30-045-08615	CORNELL	#006	Epic Energy	Gas	Federal	Active	11	29N	12W	C	11/7/1955	1839	8.625	106	70 surf	5.5	1811		3.5	2022	181 surf	1811-1839		
30-045-31581	CORNELL	#101	HilCorp	Gas	Federal	Active	11	29N	12W	D	10/7/2003	2008	7	140	35 surf				4.5	2000	270 surf	1726-1764		
30-045-24447	FEDERAL PRI	#001E	HilCorp	Gas	Federal	Active	11	29N	12W	H	10/9/1980	6581												
30-045-29945	PAYNE	#001R	Mcelvain Energy	Gas	Federal	Active	11	29N	12W	H	10/27/1999	2050												
30-045-32667	PRI	#003	Mcelvain Energy	Gas	Federal	Active	11	29N	12W	I	2/27/2005	1960												
30-045-13218	PRE-ONGARD WELL	#010	Pre Ongard	Gas	Federal	Plugged	11	29N	12W	A		0												12/31/1901
30-045-08558	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Federal	Plugged	11	29N	12W	G	1/1/1940	0												4/16/1976
30-045-08515	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Private	Plugged	11	29N	12W	L	11/25/1932	0												12/13/1982
30-045-20067	PRE-ONGARD WELL	#001	Pre Ongard	Gas	Federal	Plugged	11	29N	12W	O	5/5/1967	0												4/18/1986
30-045-08475	CARROLL CORNELL	#012	Producing Royalties	Gas	Federal	Plugged	11	29N	12W	P	11/22/1953	1895												6/13/1979
30-045-22118	PAYNE	#001	Producing Royalties	Gas	Federal	Plugged	11	29N	12W	A	7/31/1976	2060												2/13/2002
30-045-24086	CORNELL D	#001E	SIMCOE LLC	Gas	Federal	Active	12	29N	12W	A	5/22/1980	6635												
30-045-24283	CORNELL E	#001E	SIMCOE LLC	Gas	Federal	Active	12	29N	12W	F	5/12/1980	6609												
30-045-08444	CORNELL E	#001	BP America	Gas	Federal	Plugged	12	29N	12W	M	9/28/1962	6562												6/27/2017
30-045-08528	CORNELL SRC	#004	Burlington	Gas	Federal	Plugged	12	29N	12W	K	5/25/1941	1970												3/29/2017
30-045-22119	PAYNE	#002	Mcelvain Energy	Gas	Federal	Plugged	12	29N	12W	F	7/22/1976	2062												10/30/2010
30-045-22962	PAYNE	#002J	RIM Operating	Gas	Federal	Active	12	29N	12W	E	6/12/1978	2026												
30-045-33015	PRI	#001S	RIM Operating	Gas	Federal	Active	12	29N	12W	A	9/20/2005	2057												

30-045-32665	PRI	#001	RIM Operating	Gas	Federal	Active	12	29N	12W	E	2/17/2005	2090													
30-045-32666	PRI	#002	RIM Operating	Gas	Federal	Active	12	29N	12W	M	2/8/2005	2010													
30-045-09117	PRE-ONGARD WELL	#001	ONGARD WELL OPERATOR	Gas	Private	Plugged	25	30N	12W	M	4/13/1953	0													5/26/1958
30-045-26121	ROWLAND GAS COM	#001E	HilCorp	Gas	Private	Active	25	30N	12W	M	3/19/1985	6560													
30-045-29707	RUBY CORSCOT A	#001	HilCorp	Gas	Private	Active	25	30N	12W	N	9/25/1999	2007													
30-045-31641	RUBY CORSCOT A	#002	HilCorp	Gas	Private	Active	25	30N	12W	E	6/2/2003	2076													
30-045-30456	KATY COM	#002	[14634] MERRION OIL & GAS CORP	Gas	Private	Plugged	26	30N	12W	P	4/27/2001	2028													8/10/2015
30-045-09177	PAUL PALMER	#001	[14634] MERRION OIL & GAS CORP	Gas	Private	Plugged	26	30N	12W	L	9/13/1961	3509													8/14/2015
30-045-29414	PRE-ONGARD WELL	#001	ONGARD WELL OPERATOR	Gas	Private	Plugged	26	30N	12W	G	6/21/1953	0													12/31/1901
30-045-09130	PRE-ONGARD WELL	#003	ONGARD WELL OPERATOR	Gas	Private	Plugged	26	30N	12W	O		0													3/12/1954
30-045-09165	PAUL PALMER D	#001	[5073] CONOCO INC	Gas	Private	Plugged	26	30N	12W	L	10/11/1961	99999													3/17/1995
30-045-30027	PADILLA	#001	HilCorp	Gas	Private	Active	26	30N	12W	F	1/15/2004	1953													
30-045-32243	PADILLA	#002	HilCorp	Gas	Private	Active	26	30N	12W	N	5/13/2004	2153													
30-045-09200	PRE-ONGARD WELL	#001	ONGARD WELL OPERATOR	Gas	Private	Plugged	27	30N	12W	L	3/30/1947	0													3/17/1959
30-045-13120	DUFF GAS COM B	#001	AMERICA PRODUCTION	Gas	Private	Plugged	27	30N	12W	P	2/28/1962	1950													5/30/1996
30-045-30544	DUFF GAS COM	#003	HilCorp	Gas	Private	Active	27	30N	12W	P	4/1/2001	5167													
30-045-09134	DUFF GAS COM C	#001	HilCorp	Gas	Private	Active	27	30N	12W	M	1/30/1964	6365													
30-045-26076	DUFF GAS COM C	#001E	HilCorp	Gas	Private	Active	27	30N	12W	P	9/20/1984	6500													
30-045-29664	DUFF GAS COM C	#002	HilCorp	Gas	Private	Active	27	30N	12W	M	10/16/1998	1856													
30-045-31284	DUFF GAS COM C	#004	HilCorp	Gas	Private	Active	27	30N	12W	P	1/27/2003	1996													
30-045-34235	GILBREATH	#002	Enduring Resources	Gas	Private	Active	28	30N	12W	O	4/30/2008	2170													
30-045-09037	HARGIS	#001	MCGEE OIL & GAS ONSHORE LP	Gas	Private	Plugged	33	30N	12W	G	9/15/1944	1808													2/23/1994
30-045-08999	PRE-ONGARD WELL	#002	ONGARD WELL OPERATOR	Gas	Private	Plugged	33	30N	12W	J	7/10/1946	0													6/4/1982
30-045-08998	JULANDER	#002	PRODUCTION CORP	Gas	Private	Plugged	33	30N	12W	I	4/1/1946	1936													4/12/1999
30-045-29023	REDFERN	#002	Enduring Resources	Gas	Private	Active	33	30N	12W	H	12/5/1993	1950													
30-045-32236	REDFERN	#003	Enduring Resources	Gas	Private	Active	33	30N	12W	I	3/8/2005	1993													

30-045-28912	SHIOTANI	#007	Enduring Resources	Gas	Private	Active	33	30N	12W	K	12/31/1992	1782												
30-045-09001	MADDOX	#001	HilCorp	Gas	Private	Active	33	30N	12W	J	9/21/1961	6400												
30-045-25923	MCGRATH	#004	BURLINGTON RESOURCES OIL &	Salt Water Disposal	Federal	Plugged	34	30N	12W	B	9/4/1984	4700												7/25/2013
30-045-09052	PRE-ONGARD WELL	#001	ONGARD WELL OPERATOR	Gas	Federal	Plugged	34	30N	12W	F	9/11/1945	0												1/22/1964
30-045-08939	PRE-ONGARD WELL	#001	ONGARD WELL OPERATOR	Gas	Private	Plugged	34	30N	12W	L	1/1/1945	0												6/4/1982
30-045-08950	HUDSON	2	Burlington	Gas	Federal	Plugged	34	30N	12W	P	7/17/1946	2137												9/26/2008
30-045-08945	MCGRATH C	#001	Burlington	Gas	Federal	Plugged	34	30n	12W	p	2/7/1963	6637												4/29/2009
30-045-26141	DUFF GAS COM	#001E	HilCorp	Gas	Federal	TA'd	34	30N	12W	G	11/20/1984	6608	8.625	316	295 surf				4.5	6608	1000 surf	6396-6576 04'RC to FC 1492-1870		TA'd 3/5/14
30-045-09071	DUFF GAS COM	#001	HilCorp	Gas	Private	Active	34	30N	12W	D	1/30/1962	6425												
30-045-31756	JULANDER	#100	HilCorp	Gas	Private	Shut In	34	30N	12W	D	7/13/2005	1895												
30-045-33411	JULANDER	#100S	HilCorp	Gas	Federal	Shut In	34	30N	12W	M	3/7/2006	2075												
30-045-31355	CARNAHAN COM	#001Y	HOLCOMB OIL & GAS INC	Gas	Private	Active	35	30N	12W	A	2/15/2003	2150												
30-045-11770	HUDSON J	#003	HilCorp	Gas	Federal	TA'd	35	30N	12W	E	7/22/1966	6750	8.625	306	250 surf				4.5	6750	750 surf	6460-6680 01' RC to FC 1784-1994		
30-045-08946	CARNAHAN COM	#001	Holcomb Oil & Gas	Gas	Private	Active	35	30N	12W	P	12/19/1960	6778	8.625	301	200 surf				4.5	6760	445 surf	6521-6708 94 RC to FC 1824-2037		
30-045-25844	CARNAHAN COM	#002	Merrion Oil & Gas	Gas	Private	Active	35	30N	12W	P	6/15/1984	6780	8.625	230	170 surf				4.5	6777	1425 surf	6529-6714		
30-045-20140	Pre-Ongard		Southland	Gas	Federal	Plugged	35	30N	12W	L	9/7/1967	DH												6/9/1982
30-045-28177	FC STATE COM	#024	Burlington	Gas	State	Plugged	36	30N	12W	M	10/9/1990	6608												3/26/2013
30-045-12188	NEW MEXICO COM N	#001	HilCorp	Gas	State	Active	36	30N	12W	E	1/2/1966	6562												
30-045-31074	NEW MEXICO COM N	#100	HilCorp	Gas	State	Shut In	36	30N	12W	A	8/29/2002	2135												
30-045-08986	STATE COM AH	#030	HilCorp	Gas	State	Active	36	30N	12W	I	6/14/1961	6645												
30-045-24037	STATE COM AH	#030E	HilCorp	Gas	State	Plugged	36	30N	12W	N	8/10/1980	6620												4/28/2016

Sunco RPE Daily Operations Log		
Date	**Time**	**Comments**
7/12/2021	8:15 AM	BH test, Jonathon Kelly onsite
7/12/2021	8:35 AM	Start MIT
7/12/2021	9:20 AM	Finish MIT, approved by Jonathon Kelly onsite
7/12/2021	11:07 AM	Install transducers and start aquiring data for RPE
7/16/2021	12:53 PM	Finish aquiring data, remove transducers. Total time 168 hours

HOBO® 4-Channel Analog Data Logger (UX120-006M) Manual

The HOBO 4-Channel Analog data logger has 16-bit resolution and can record up to 1.9 million measurements or events. The four external channels accept a variety of sensors, including temperature and split-core AC current sensors as well as 4-20 mA and voltage input cables (sold separately). Using HOBOware®, you can easily configure an alarm to trip when the sensor reading rises above or falls below a measurement that you specify. Or, you can set up burst logging in which the logger records data at a different interval during certain conditions. The logger can also calculate minimum, maximum, average, and standard deviation statistics. This easy-to-use data logger has a built-in LCD screen to check current readings and to monitor logging status, battery use, and memory consumption in between readouts.

HOBO 4-Channel Analog Data Logger

UX120-006M

Included Items:

- Command™ strip
- Double-sided tape
- Hook & loop strap
- Two AAA 1.5 V alkaline batteries

Required Items:

- HOBOware 3.6 or later
- USB cable (included with software)

Sensors and cables available at www.onsetcomp.com.

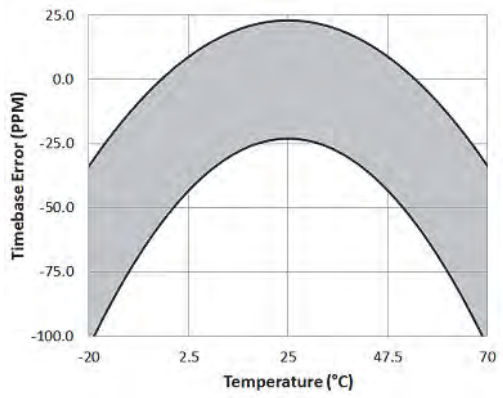
Specifications

Logger with Cable Type	CABLE-4-20mA	CABLE-2.5-STEREO	CABLE-ADAP5	CABLE-ADAP10	CABLE-ADAP24
Measurement Range	0 to 20.1 mA	0 to 2.5 V	0 to 5.0 V	0 to 10 V	0 to 24 V
Accuracy	±0.001 mA ±0.2% of reading	±0.1 mV ±0.1% of reading	±0.2 mV ±0.3% of reading	±0.4 mV ±0.3% of reading	±1.0 mV ±0.3% of reading
Resolution	0.3 µA	40 µV	80 µV	160 µV	384 µV

Logger	
Operating Range	Logging: -20° to 70°C (-4° to 158°F); 0 to 95% RH (non-condensing); Launch/Readout: 0° to 50°C (32° to 122°F) per USB specification
Logging Rate	1 second to 18 hours, 12 minutes, 15 seconds
Logging Modes	Fixed interval (normal), burst, or statistics
Memory Modes	Wrap when full or stop when full
Start Modes	Immediate, push button, date & time, or next interval
Stop Modes	When memory full, push button, or date & time
Restart Mode	Push button
Time Accuracy	±1 minute per month at 25°C (77°F), see Plot A
Power Source	Two AAA 1.5 V alkaline batteries, user replaceable, and USB cable
Battery Life	1 year, typical with logging rate of 1 minute and sampling interval of 15 seconds or greater
Memory	4 MB (1.9 million measurements, maximum)
Download Type	USB 2.0 interface
Full Memory Download Time	Approximately 1.5 minutes
LCD	LCD is visible from 0° to 50°C (32° to 122°F); the LCD may react slowly or go blank in temperatures outside this range
Size	10.8 x 5.41 x 2.54 cm (4.25 x 2.13 x 1 in.)
Weight	107.5 g (3.79 oz)
Environmental Rating	IP50
CE	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).

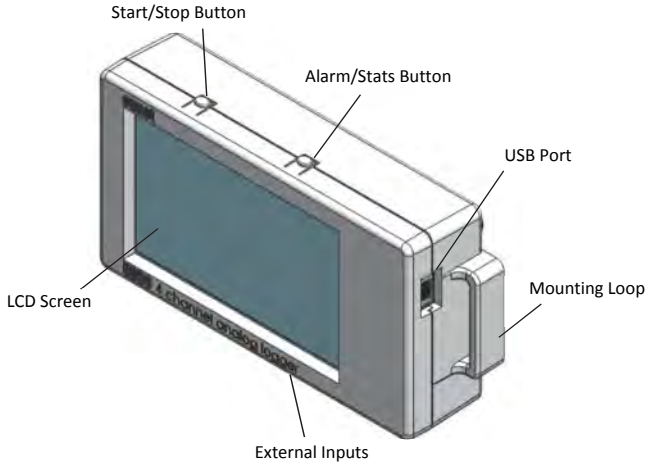
Note: The HOBO U-Shuttle (U-DT-1) is not compatible with this logger.

Specifications (continued)



Plot A: Time Accuracy

Logger Components and Operation



Start/Stop Button: Press this button for 3 seconds to start or stop logging data, or to resume logging on the next even logging interval. This requires configuring the logger in HOBOware with a push button start or stop, and with "Resume logging on next button push" selected (see *Setting up the Logger*). You can also press this button for 1 second to record an internal event (see *Recording Internal Logger Events*) or to turn the LCD screen on if the option to turn off the LCD has been enabled (see *Setting up the Logger*).

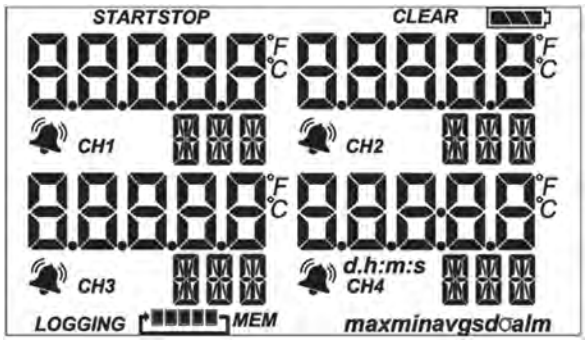
Alarm/Stats Button: Use this button to clear a tripped alarm (see *Setting up Alarms*) or to switch between statistics, alarm readings, and the current sensor reading.

Mounting Loops: Use the two mounting loops (only one visible in the diagram) to mount the logger with the hook-and-loop strap (see *Mounting the Logger*).

External Inputs: Use these 2.5 mm jacks (not visible in the diagram) to connect up to 4 sensors (see *Connecting External Sensors*).

USB Port: Use this port to connect the logger to the computer via USB cable (see *Setting up the Logger* and *Reading Out the Logger*).

LCD Screen: This logger is equipped with an LCD screen that displays details about the current status. This example shows all symbols illuminated on the LCD screen followed by definitions of each symbol in the table.



LCD Symbol	Description
START	The logger is waiting to be launched. Press and hold the Start/Stop button for 3 seconds to launch the logger.
STOP	The logger has been launched with push button stop enabled; press and hold the Start/Stop button for 3 seconds to stop the logger. **Note**: If you also launched the logger with a push button start, this symbol will not appear on the display for 30 seconds.
CLEAR	An alarm is ready to be cleared. This will only appear if "Cleared with button press" was selected in the HOBOware alarm settings. Press the Alarm/Stats button for 3 seconds to clear the alarm.
	The battery indicator shows the approximate battery power remaining.
86.2°F	This is an example of a temperature reading from a temperature sensor. Temperature units are determined by the settings in HOBOware. To switch between Celsius and Fahrenheit, change the Display Preferences in HOBOware before launching the logger.
	A sensor reading is above or below the high or low alarm that you configured. Press and release the Alarm/Stats button until the "alm" symbol (described later in this chart) is displayed on the screen. This symbol at left will clear depending on how alarms were configured in HOBOware. If the alarm was configured to clear when the logger is relaunched, this symbol will remain on the LCD. Otherwise, it will clear when the sensor reading is back within the alarm limits or by pressing the Alarm/Stats button for 3 seconds.
CH1	This is the channel number associated with the sensor reading (channel 1 for this example). Up to four channels are visible at one time.
AMP	This is an example of the units entered for the sensor, which appears to the right of the channel number. The unit type is determined by what was entered in the LCD Units field for that sensor in HOBOware. See *Setting up the Logger* for more details. Note that units for temperature sensors are displayed as °F or °C only.
05:38 m:s	The logger has been configured to start logging on a particular date/time. The display will count down in days, hours, minutes, and seconds until logging begins. In this example, 5 minutes and 38 seconds remain until logging will begin.

LCD Symbol	Description
LOGGING	The logger is currently logging.
MEM	The logger has been configured to stop logging when memory fills. The memory bar indicates the approximate space remaining in the logger to record data. When first launched, all five segments in the bar will be empty. In this example, the logger memory is almost full (only one segment in the memory bar is empty).
MEM	The logger has been configured to never stop logging (wrapping). The logger will continue recording data indefinitely, with newest data overwriting the oldest data. When first launched, all five segments in the memory bar will be empty. In this example, the memory is full (all five segments are filled in) and new data is now overwriting the oldest data. This will continue until the logger is stopped or the battery runs out.
max min avg sdσ	These symbols show the maximum, minimum, average, and standard deviation values most recently calculated by the logger (if the logging mode has been set to Statistics in HOBOware). Press the Alarm/Stats button for 1 second to cycle through each of the available statistics, any alarm readings, and back to the current sensor reading.
alm	This is the sensor reading that tripped the alarm. Press the Alarm/Stats button to view this reading. Press the Alarm/Stats button again to cycle through any statistics and return to the current readings.
LoAd	The launch settings are being loaded onto the logger from HOBOware. Do not disconnect the USB cable during this process.
Err	An error occurred while loading the launch configurations onto the logger from HOBOware. Make sure the USB cable is connected to both the logger and the computer and try launching again.
StoP	The logger has been stopped with HOBOware or because the memory is full.

Notes:

- You can disable the LCD screen when logging. Select "Turn LCD off" when setting up the logger as described in the next section. When this option is enabled, you can still temporarily view the LCD screen by pushing the Start/Stop button for 1 second. The LCD will then remain on for 10 minutes.
- The LCD screen refreshes every 15 seconds while logging regardless of the logging interval selected in HOBOware. If you choose a logging interval less than 15 seconds, the data will be recorded at the faster interval, but the sensor readings will only be updated on the screen every 15 seconds.
- If a sensor is disconnected during logging, erroneous values will display for that sensor on the LCD and return to normal readings once reconnected. See *Connecting External Sensors* for more details.
- When the logger has stopped logging, the LCD screen will remain on until the logger is offloaded to a computer or (unless launched with the "Turn LCD off" option). Once the logger has been offloaded and disconnected from the computer, the LCD will turn off automatically after 2 hours. The LCD will turn back on the next time the logger is connected to the computer.

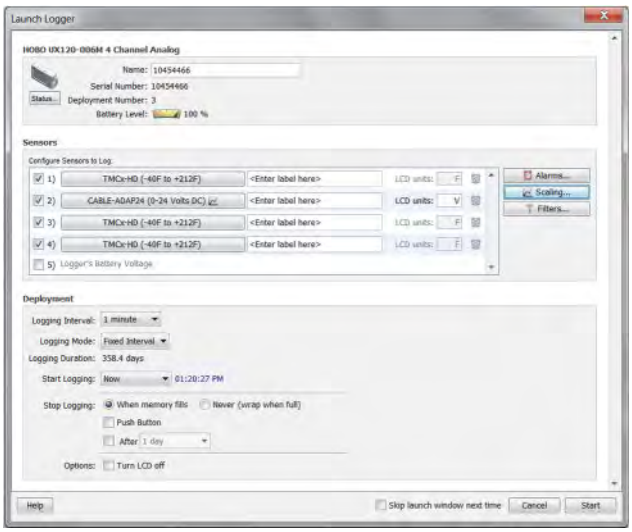
Setting up the Logger

Use HOBOware to set up the logger, including setting alarms, selecting the options to start and stop logging, and choosing a logging mode.

1. **Install the batteries.** See *Battery Information* for details.
2. **Connect the logger and open the Launch Logger window**. To connect the logger to a computer, use the USB cable provided. Click the Launch icon on the HOBOware toolbar or select Launch from the Device menu.

Important: USB 2.0 specifications do not guarantee operation outside the range of 0°C (32°F) to 50°C (122°F).

3. **Configure a sensor.** Under Configure Sensors to Log, click the checkbox for sensor 1. Select the type of sensor or cable that will be connected to channel 1 on the logger. Type a label for the sensor if desired. Be sure to connect the sensor before logging begins.
4. **Set up scaling (optional).** You can configure some sensors to scale logged data into different values and units than the default. If the sensor supports scaling, click the Scaling button and type in the appropriate values and units (consult the sensor user manual for recommended scaling factors). Click Save and return to the Launch Logger window.
5. **Set the LCD units (optional).** Each sensor has its own default units that will appear on the logger LCD. Type in up to 3 characters if you want a different unit name to appear on the LCD than the default. (Units for temperature sensors are F or C and cannot be changed.) Note that if you have configured Scaling for the sensor, then the scaled units name will appear in the Launch Logger window for the sensor instead of its default unit. You can still override this by entering a new name in the LCD units field.



6. **Set up alarms (optional).** Click the Alarms button if you want to configure an alarm to trip when the sensor reading is above or below a value you specify. See *Setting up Alarms* for details.
7. **Configure filters (optional).** Click the Filters button to create additional filtered data series. Any filtered series will be available automatically upon reading out the logger.

8. **Configure additional sensors.** Repeat steps 3 through 7 to configure up to three more sensors.
9. **Select the Logging Interval.** Select a logging interval from 1 second to a maximum of 18 hours, 12 minutes, and 15 seconds.
10. **Select the Logging Mode**:
    - **Fixed Interval.** In Fixed Interval mode, data will always be recorded at the regular logging interval set in the previous step. This is the default setting.
    - **Burst.** In Burst mode, logging will occur at a different interval when a specified condition is met. See *Burst Logging* for more information.
    - **Statistics.** In Statistics mode, maximum, minimum, average, and standard deviation statistics are calculated for the temperature during logging, sampling at an interval you specify. See *Statistics* for more information.
11. **Choose when to start logging:**
    - **Now.** Logging begins immediately.
    - **At Interval.** Logging will begin at the next even interval as determined by the selected logging interval.
    - **On Date/Time.** Logging will begin at a date and time you specify.
    - **Push Button.** Logging will begin once you press the Start/Stop logging button for 3 seconds.
12. **Choose when to stop logging:**
    - **When Memory Fills.** Logging will end once the logger memory is full.
    - **Never (Wrap When Full).** The logger will continue recording data indefinitely, with newest data overwriting the oldest.
    - **Push Button.** Logging will end once you press the Start/Stop logging button for 3 seconds. Note that if you also choose Push Button to start logging, then you will not be able to stop logging until 30 seconds after logging begins.

      If you select the Push Button setting, then you also have the option to select "Allow button restart." This allows you to stop and then restart logging during the deployment by pushing the Start/Stop button on the logger for 3 seconds.

      Important: When "Allow button restart" is selected and you use the Start/Stop button to stop and restart logging, logging will restart on the next even logging interval, not at the time the button was pushed. For example, a logger started logging at 7:00 AM with a logging interval set to 1 hour. If you press the Start/Stop button to stop the logger at 8:45 AM and then press the button again at 10:15 AM, logging will not begin immediately at 10:15. Instead, logging will begin again at 11:00 AM, which is the next even interval time based on your 1-hour logging interval. Therefore, depending on the logging interval, the gap between the time you press the button to resume logging and the time actual logging begins could be significant. The faster the logging interval, the less time will elapse before logging resumes.
    - **Specific Stop Time.** Logging will end at a date and time you specify. Note that if you also configure the logger for a Push Button stop and to "Allow button restart," then the logger will stop logging at the date you select regardless of how many times you stop and restart the logger with the Start/Stop button.
13. **Choose whether to keep the LCD on or off.** By default, the LCD will always remain on while logging. If you select the "Turn LCD off" checkbox, the LCD will not show the current readings, status, or other information while the logger is logging. You will, however, be able to temporarily turn the LCD screen on by pressing the Start/Stop button for 1 second if you select this option.
14. **Click the Start button to launch the logger.** Note that the Start button text changes based on the Start Logging selection. Disconnect the logger from the computer and deploy it using the mounting materials (see *Mounting the Logger*). After logging begins, you can read out the logger at any time (see *Reading Out the Logger* for details).

Connecting External Sensors

The logger can accept up to four external sensors (refer to onsetcomp.com for a current list of supported sensors). Plug each sensor into one of the four input jacks, making sure each sensor is firmly seated in the appropriate numbered jack based on how you configured that corresponding channel in the Launch Logger window. For example, if you selected "TMCx-HD" for sensor 1 in the Launch Logger window, then you must plug the TMCx-HD temperature sensor into the port labeled "1" on the logger otherwise the logger will not record the correct data. Connect each sensor before logging begins. Refer to the sensor or cable manual for more information on connecting the sensor and wiring, if applicable.

If you disconnect a sensor or if it is not fully inserted into the jack while the logger is logging, an erroneous sensor reading can appear on the LCD for that channel. In addition, erroneous readings will be logged and saved in the data file depending on the logging interval (e.g. if a sensor is disconnected for 5 minutes and the logging interval is set to 1 minute, then there will be 5 erroneous data points while the sensor was disconnected). If you reconnect the sensor, the correct values will display on the LCD again and will be logged and saved in the data file.

Some sensors, such as temperature sensors, can be connected directly to the external input jacks, but others require additional cables as described in the following sections.

4-20mA Input Cable

The 4-20mA input cable (CABLE-4-20mA) measures current from 0 to 20.1 mA. Do not expose to current above 20 mA or to

negative current. Do not cut off the end of the gray cable where it connects to the blue and yellow wires as it contains the precision resistor required for current measurement.

Voltage Input Cable

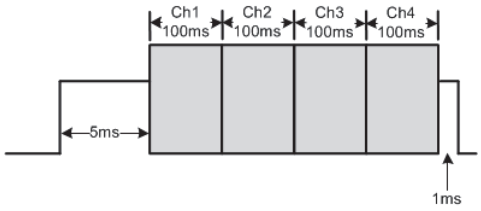
The logger's external inputs can accept the voltage input cable (CABLE-2.5-STEREO), which allows a voltage to be recorded. The input line must not be exposed to signals below 0 V or above 2.5 V. The voltage input cable connections are as follows:

Wire	Connection
Red	Switched 2.5 V output
White	Voltage input
Black	Ground

Switched 2.5 V Output

The external input channels have a switched 2.5 V output. This signal can be used to power a sensor directly or to trigger an external circuit. External sensors should draw no more than 4 mA total when powered.

The switched 2.5 V output turns on about 5 ms before the external channels are measured as shown in the following diagram. The shaded area shows the 100 ms period for each enabled channel during which the logger samples the input signals.



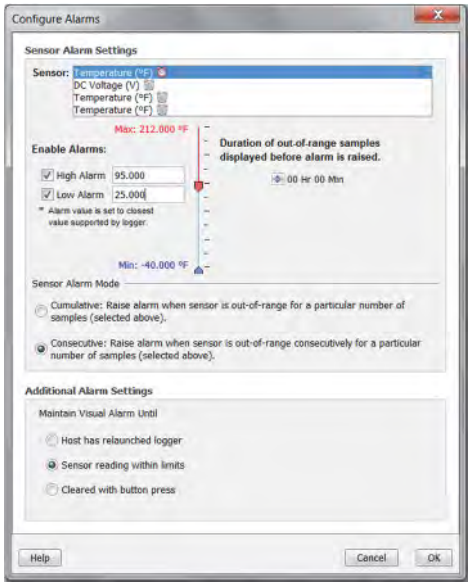
When using multiple voltage and/or current inputs, the (-) from the current source(s) and the 0 V line from the voltage source(s) are tied together at the logger. If these lines are at different voltage potentials, this may cause inaccurate readings or even damage your logger. Keep in mind that these lines may also be tied to earth ground through the USB cable when the logger is connected to the computer. Special precautions may be necessary if any of the voltage or current source common lines are not tied to earth ground. Input isolators may be needed in industrial environments to prevent errors caused by ground loops.

WARNING: Analog channel input cannot exceed 2.5 V DC. For sensor outputs up to 24 V DC, use the appropriate voltage adapter cable (CABLE-ADAPX).

Setting up Alarms

You can set an alarm to trip when a sensor reading rises above or falls below a specified value on any of the four sensor channels. To set an alarm:

1. Click the Alarms button from the Launch Logger window. If the Alarms button is disabled, make sure the Logging Mode is not set to Burst. (Alarms can only be configured if the logger is in Normal or Statistics mode.)
2. In the Configure Alarms window, select a sensor from the list. In the example in this section, a temperature sensor was selected.
3. Select the High Alarm checkbox if you want an alarm to trip when the sensor reading rises above the high alarm value. Type the reading next to the High Alarm checkbox or drag the red upper slider in the Configure Alarms window.
4. Select the Low Alarm checkbox if you want an alarm to trip when the sensor reading falls below the low alarm value. Type the reading next to the Low Alarm checkbox or drag the blue lower slider.
5. Set the duration before an alarm is tripped.
6. Select either Cumulative or Consecutive. If you select Cumulative, then the alarm will trip when the time the sensor is out of range over the course of the deployment is equal to the selected duration. If you select Consecutive, then the alarm will trip when the time the sensor is continuously out of range is equal to the selected duration. For example, the high alarm for temperature is set to 85°F and the duration is set to 30 minutes. If Cumulative is selected, then an alarm will trip once a sensor reading has been at or above 85°F for a total of 30 minutes since the logger was configured; specifically, this could be 15 minutes above 85°F in the morning and then 15 minutes above 85°F again in the afternoon. If Consecutive is selected, then an alarm will trip only if all sensor readings are 85°F or above for a continuous 30-minute period.



7. Repeat steps 2 through 6 for any additional sensors.
8. Choose how long the logger should maintain the sensor alarm once it has tripped. Select "Host has relaunched logger" if you want the alarm to remain visible on the LCD until the next time you relaunch the logger. Select "Sensor reading within limits" if you want the alarm to clear once the sensor reading returns to the normal range between the high and low alarm limits. Select "Cleared with button press" if you want the alarm to remain on until you press the Alarm/Stats button on the logger.
9. Click OK to save alarm settings.

Notes:

- Once the logger is launched, alarms will trip as determined by these settings. Logger alarms will display on the LCD screen. Note that the alarm limits are only

checked when the logger's LCD screen refreshes every 15 seconds.

- The actual values for the high and low alarm limits are set to the closest values supported by the logger based on the sensor type. This means the value that triggers the alarm may differ slightly than the value entered.
- When you read out the logger, high and low alarm levels will be displayed on the plot along with "Chan <#> Alarm Tripped" and "Chan <#> Alarm Cleared" events showing when the alarm tripped and cleared. The "Chan <#> Alarm Cleared" event contains the value that was furthest out of range for the sensor before the alarm cleared (see the Points table for the actual value).

Burst Logging

Burst logging is a logging mode that allows you to set up more frequent logging when a specified condition is met. For example, let's say the logger has a temperature sensor connected to channel 1 and is recording data at a 5-minute logging interval. Burst logging is configured on channel 1 to log every 10 seconds when the temperature goes above 85°F (the high limit) or falls below 32°F (the low limit). This means the logger will record data every 5 minutes as long as the temperature remains between 85°F and 32°F. Once the temperature reaches 90°F, for example, the logger will switch to the faster logging rate and record data every 10 seconds until the temperature falls back below the high limit (or 85°F in this case). At that time, logging then resumes every 5 minutes at the normal logging interval. Similarly, if the temperature falls to 30°F, for example, then the logger would switch to burst logging mode again and record data every 10 seconds. Once the temperature rises back to 32°F, the logger will then return to normal mode, logging every 5 minutes. To set up burst logging:

1. Select Burst for Logging Mode in the Launch Logger window. If Burst has already been configured for this logger, click the Edit button in the Launch Logger window.
2. In the Burst Logging window, select a sensor from the list. In the following example, a temperature sensor was selected.

3. Select the High Limit checkbox if you want to set up a condition in which burst logging will occur when the sensor reading rises above the high limit value. Type in the value or drag the red upper slider.
4. Select the Low Limit checkbox if you want to set up a condition in which burst logging will occur when the sensor reading falls below the low limit value. Type in the value or drag the blue lower slider.
5. Repeat steps 2 through 4 for any additional sensors.
6. Set the burst logging interval, which must be less than the logging interval. Select either a preset burst logging interval or select Custom and enter your own interval. Keep in mind that the more frequent the burst logging rate, the greater the impact on battery life and the shorter the logging duration.
7. Click OK when done. This will return you to the Launch Logger window. Click the Edit button next to Logging Mode in the Launch Logger window to make additional changes.

Notes:

- Once the logger is launched, the high and low burst logging limits are only checked when the logger's LCD screen refreshes once every 15 seconds. Therefore, if you set the logging interval to less than 15 seconds and the sensor reading falls outside the limits, the burst logging will not begin until the next 15-second refresh cycle.
- If high and/or low limits have been configured for more than one sensor, then burst logging will begin when any high or low condition goes out of range. Burst logging will not end until all conditions on all sensors are back within normal range.
- The actual values for burst logging limits are set to the closest values supported by the logger based on the sensor type.
- Once the high or low condition clears, the logging interval time will be calculated using the last recorded data point in burst logging mode, not the last data point recorded in "normal mode." For example, let's assume the logger has a 10-minute logging interval and logged a data point at 9:05. Then, the high limit was surpassed and burst logging began at 9:06. Burst logging then continued until 9:12 when the sensor reading fell back below the high limit. Now back in normal mode, the next logging interval will be 10 minutes from the last burst logging point, or 9:22 in this case. If burst logging had not occurred, the next data point would have been at 9:15.
- A New Interval event will appear on the plot (if you select events for plotting in the Plot Setup window) each time the logger enters or exits burst logging mode.

Statistics

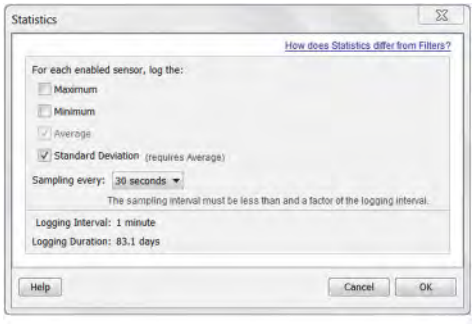
Statistics is a logging mode in which the logger calculates maximum, minimum, average, and standard deviation statistics during logging, recording the results at each logging interval based on samples taken at a rate you specify. This will result in up to four additional series per sensor that record the following information at each logging interval:

- The maximum, or highest, sampled value,
- The minimum, or lowest, sampled value,
- An average of all sampled values, and
- The standard deviation from the average for all sampled values.

For example, let's say the logging interval is set to 5 minutes and the sampling interval is set to 30 seconds (with maximum, minimum, average, and standard deviation all enabled). Once logging begins, the logger will measure and record the actual sensor values every 5 minutes. In addition, the logger will take a sample every 30 seconds and temporarily store it in memory. The logger will then calculate the maximum, minimum, average, and standard deviation using the samples gathered over the previous 5-minute period and log the resulting value(s). When reading out the logger, this would result in 5 data series for each channel: one sensor series (with data logged every 5 minutes) plus four maximum, minimum, average, and standard deviation series (with values calculated and logged every 5 minutes based on the 30-second sampling).

To set up statistics:

1. Select Statistics for Logging Mode in the Launch Logger window. If Statistics has already been configured for this logger, click the Edit button in the Launch Logger window.
2. Click the Maximum, Minimum, Average, and Standard Deviation checkboxes for each of the statistics you want to calculate during logging. Note that Average is automatically enabled when selecting Standard Deviation. In addition, the more statistics you record, the shorter the logger duration and the more memory is required.



3. Set the sampling interval, which must be less than and a factor of the logging interval. Choose either a preset sampling interval or select Custom and enter your own sampling interval. Keep in mind that the more frequent the sampling rate, the greater the impact on battery life.
4. Click OK when done. This will return you to the Launch Logger window. Click the Edit button next to Logging Mode in the Launch Logger window to make additional changes.

Once logging begins, click the Alarm/Stats button on the logger to cycle through the current maximum, minimum, average, and standard deviation data on the LCD screen. You can plot the statistics series once you read out the logger.

Reading Out the Logger

To read out the logger, connect it to the computer with a USB cable. In HOBOware, select Readout from the Device menu. You can then save the data, plot it, and export it for further analysis. Refer to the HOBOware Help for details.

Recording Internal Logger Events

The logger records the following internal events to track logger operation and status. You can plot these events in HOBOware after reading out the logger and opening the data file.

Internal Event Name	Definition
Host Connected	The logger was connected to the computer.
Started	The Start/Stop button was pressed to begin logging.
Stopped	The logger received a command to stop recording data (from HOBOware or by pushing the Start/Stop button).
Button Up/Button Down	The Start/Stop button was pressed for 1 second.
Chan <#> Alarm Tripped	An alarm has tripped on that channel.
Chan <#> Alarm Cleared	An alarm has cleared on that channel. This event also contains the value that was furthest out of range for the sensor before the alarm cleared.
New Interval	The logger has entered or exited burst logging mode.
Safe Shutdown	The battery level dropped below 1.85 V; the logger performs a safe shutdown.

Mounting the Logger

There are several ways to mount the logger using the materials included:

- Use the four built-in magnets on the back of the logger to mount it to a magnetic surface.
- Attach the Command strip to the back of the logger to mount it a wall or other flat surface.
- Use the double-sided tape to affix the logger to a surface.
- Insert the hook-and-loop strap through the mounting loops on both sides of the logger to mount it to a curved surface, such as a pipe or tubing.

Protecting the Logger

The logger is designed for indoor use and can be permanently damaged by corrosion if it gets wet. Protect it from condensation. If the message FAIL CLK appears on the LCD screen, there was a failure with the internal logger clock possibly due to condensation. Remove the batteries immediately and dry the circuit board.

Note: Static electricity may cause the logger to stop logging. The logger has been tested to 8 KV, but avoid electrostatic discharge by grounding yourself to protect the logger. For more information, search for "static discharge" at www.onsetcomp.com.

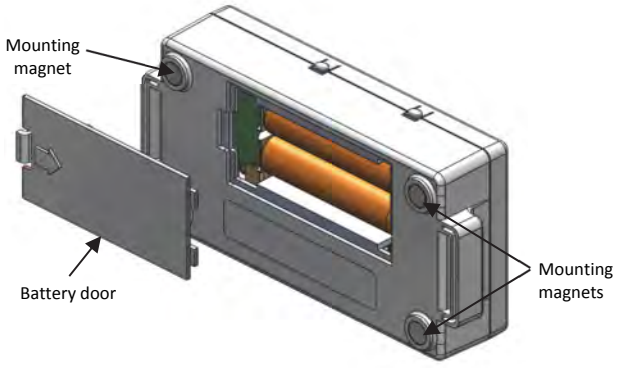
Battery Information

The logger requires two user-replaceable AAA 1.5 V alkaline or optional lithium batteries for operation at the extreme ends of the logger operating range. Expected battery life varies based on the ambient temperature where the logger is deployed, the logging or sampling interval, frequency of offloading to the computer, number of channels that are active, if burst or statistics logging modes are active, and battery performance. New batteries typically last 1 year with logging intervals greater than 1 minute. Deployments in extremely cold or hot temperatures, a logging interval faster than 1 minute, or a sampling interval faster than 15 seconds can impact battery life. Estimates are not guaranteed due to uncertainties in initial battery conditions and operating environment.

The logger can also be powered by the USB cable when the remaining battery voltage is too low for it to continue logging. Connect the logger to the computer, click the Readout button on the toolbar, and save the data as prompted. Replace the battery before launching the logger again.

To install or replace the batteries:

1. Open the battery door on the back of the logger.
2. Remove any old batteries.
3. Insert two new batteries observing polarity.
4. Reinsert the battery door and snap it back into place.



⚠ **WARNING:** If using optional lithium batteries, do not cut open, incinerate, heat above 85°C (185°F), or recharge the lithium batteries. The batteries may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the batteries case. Do not dispose of the logger or batteries in fire. Do not expose the contents of the batteries to water. Dispose of the batteries according to local regulations for lithium batteries.

HOBOware provides the option of recording the current battery voltage at each logging interval, which is disabled by default. Recording battery life at each logging interval takes up memory and therefore reduces logging duration. It is recommended you only record battery voltage for diagnostic purposes.

FOXBORO BY SCHNEIDER-ELECTRIC

FOXBORO, MASS., U. S. A.

C A L I B R A T I O N D A T A S H E E T

Customer	DWIGHT W PROUTY CO., INC.	Date 12 Jun 2017 Time 14:12:19	
Customer P.O.	207497-43759	Cal. by AM Dept. 1329	
Customer Tag	504038	1445257 / 0010	
Foxboro Order	1797672	Inst. type	IGP10S-F HART
Serial #	17230543		

Range 0.0000 to 6000.0000 Psi

Actual input in Psi	Actual output in Psi	Digital error in % of Rdg*
0.000	-0.020	-0.001
1498.763	1498.872	0.007
3003.237	3003.441	0.007
4500.872	4501.429	0.012
5999.908	6001.271	0.023

Max. Digital ERROR **0.023** % at 100 % of Span

S5G3

Gauge(s): 210577E Dmm: 09856-40 Tmp: 210331-8

* The error of the first test point is in % of 25% of the range.

All measurement standards are calibrated at scheduled intervals against certified standards which are traceable to the National Institute of Standards and Technology.

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FOXBORO BY SCHNEIDER-ELECTRIC

FOXBORO, MASS., U. S. A.

C A L I B R A T I O N D A T A S H E E T

Customer	DWIGHT W PROUTY CO., INC.	Date 2 Nov 2016 Time 10:23:29	
Customer P.O.	203802-42335	Cal. by AM Dept. 1329	
Customer Tag	504022	1394802 / 0010	
Foxboro Order	1711768	Inst. type	IGP10S-F
Serial #	16410398		HART

Range 0.0000 to 6000.0000 Psi

Actual input in Psi	Actual output in Psi	Digital error in % of Rdg*
0.000	0.002	0.000
1502.209	1502.470	0.017
3001.576	3001.550	-0.001
4500.371	4500.247	-0.003
6000.220	5999.934	-0.005

Max. Digital ERROR **0.017** % at 25 % of Span

S5G3

Gauge(s): 210577E Dmm: 209856-40 Tmp: 210331-8

* The error of the first test point is in % of 25% of the range.

All measurement standards are calibrated at scheduled intervals against certified standards which are traceable to the National Institute of Standards and Technology.

Form 2759A(1/93)