BACKGROUND INFORMATION FOR REVIEW OF RADIOACTIVE TRACER SURVEYS FOR CEMENT INTEGRITY

Facility Name: Romulus Facility			Operator: Environmental Geo Technologies		
Well Name: Well #2-12			USEPA Permit Number: MI-163-1W-C011	Witness	
State: Michigan	Test Date		Logging Company		

Well and Operational Information

Long String Csg Mater: Steel and Hastelloy	Long String Casing OD: 7	Casing weight, #/ft: 26	Casing ID, ins: [illegible]	Long String Casing Length, ft: 3983	
Tubing Material: Fiberglass	Tubing OD, ins: 4.5		Tubing ID, ins: #N/A	Tubing Length, ft: 3965	
Tail Pipe Material: [illegible]	Tail Pipe OD, ins: [illegible]	Tail Pipe weight#/ft: [illegible]	Tail Pipe ID, ins: [illegible]	Tail Pipe Length, ft: [illegible]	Tail Pipe Depth: 3969
	Open hole diameter, in: 8.75	TD, ft: 4350	PBTD, ft: 4180	Top of Open Interval, ft: 3983	
Packer Model:	Packer Type: GPS	Top of Packer, ft: 3965	Bottom of Packer, ft: 3969		

Geological Information

Lowermost USDW Name: Dundee Limestone		Fms in Arrestment Interval: Utica Shale and Trenton Limestone	Fms in Injection Interval: Franconia, Eau Claire, Mt. Simon
Base of USDW, ft: 387		Depth to top of Arrestment interval, ft: 2397	Injection Interval Top, ft: 3937

TOOL INFORMATION

Ejector, ft above BDET: 10'	TDET, ft above BDET: 6'	MDET, ft above BDET			

CALIBRATION INFORMATION

Depth BDET, ft	Depth TDET, ft	BDET CPSPI	Shaly zone	Maximum Reading, LD	Minimum Reading, LD
Depth BDET, ft	Depth TDET, ft	BDET CPSPI	Clean zone	Maximum Reading, LD	Minimum Reading, LD

BACKGROUND LOG (BDET) BEFORE TESTS

Appearance of Log, lithology discernible, extremely suppressed, noisy, etc. Is calibration the same as for statistical checks?

FIRST SLUG TRACKING SEQUENCE

Flow Rate, gpm	Velocity in tubing, fps	Depth of deflection on	Deflection on 1st pass	Deflection/Background	Passes Through Slug
Slug Split? yes or no	Depth of Split, ft	Moved up, yes or no	Minimum Slug Depth,	Distance above shoe,	Maximum Slug Depth, ft

FIRST STATIONARY TEST

Depth of BDET, ft	Depth of TDET, ft	BDET to open interval	Time at station, mins	Injection Rate, gpm	Log Divisions per Minute
Depth at Injection, ft		BDET above end of tubing or casing, ft	Reached BDET up, LD	Reach UDET up, LD	Velocity Up, ft/min
2nd Setting Depth, ft	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	
3rd Setting Depth	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	
4th setting depth, ft	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	Upper Limit of Movement, ft

BACKGROUND INFORMATION FOR REVIEW OF TEMPERATURE LOGS

Facility Name: Romulus Facility		Operator: Environmental Geotechnologies	
Well Name: Well #2-12		USEPA Permit Number: MI-163-2-A0011	
County: Wayne	State: Michigan	Test Date: 7-25-1[illegible]	

Well and Operational Information

Top of Open Interval, ft: 3983	Tubing Depth, ft: 3965	Date of Last Injection: 7-22-1[illegible]	Is This a Multi-Zone Facility?
Depth to Base of USDW, ft: 387	Name of lowermost USDW: Dundee Limestone	Hour of Last Injection	Other Zones Used at Facility
Depth to Top of Permitted Int, ft: 3369	Name of Injection Interval: Trempealeau, Franconia	Volume Injected in Past Year, gal	Name of Shallower Injection Zone
Plugged Back Depth, ft: [illegible]	Total Depth, ft: 4550	Injectate Temperature Variance, °F	Depth to Shallower Injection Zone, ft

Calibration Information		Logging Information	
Low Gauge Temperature, °F: 33.03	High Gauge Temperature, °F: 96.7	Time of Start of Logging: 7-25-1[illegible]	
Low Thermometer Temperature, °F: 33.6	High Thermometer Temperature, °F: 96.9	Days Since Last Injection: 3	Maximum Log Depth, ft: 4186
Were Log Readings Adjusted? NO	Gauge Calibration Date	Multiple Log Runs? YES	Maximum Logging Speed, ft/min: 30

REMEMBER

1. Well should have been shut in for at least 36 hours.
2. If well cannot be shut in for 36 hours, shut in as long as possible and run two logs at least six (6) hours apart
3. Record log data at one measurement per foot.
4. Record natural gamma ray activity log with temperature.
5. Log top to bottom. Keep logging speed below 30 feet per minute.
6. Log quality in air-filled holes can be improved by logging at a slower speed. Please reduce logging speed to less than 20 feet per minute in the top 1000 feet of air-filled holes.
7. Please compare data in your records to that in the gray cells above. If there is a difference, be sure the correct information is noted. Please fill in the other cells.
8. Submit digital logging data on a CD in .las or .asc format
9. Please submit an up-to-date well schematic

BACKGROUND INFORMATION FOR ANALYSIS OF PRESSURE FALL-OFF TEST

FACILITY NAME		OPERATOR	
Romulus Facility		Environmental Geo-Technologies	
WELL NAME		USEPA PERMIT NUMBER	STATE PERMIT NUMBER
Well #2-12		MI-163-1W-0001	MI-33
TEST DATE			

GEOLOGICAL DATA

POROSITY, decimal	NET PERMEABLE THICKNESS, ft.	VISCOSITY, cp.	COMPRESSIBILITY, per psi
0.11	133	1.22	6.70E-06

WELL AND OPERATION DATA

WELL RADIUS, ins.	PRETEST FLOW RATE, gpm	INJECTATE TEMPERATURE, deg.F	KB ELEVATION, ft.
4.375			6[illegible]
GAUGE DEPTH, ft	PRETEST FLOW TIME, hrs.	INJECTATE SPECIFIC GRAVITY	TEST DEPTH FOR COMPARISON, ft
CUMULATIVE VOLUME INJECTED SINCE LAST PRESSURE EQUALIZATION, gallons			

TEST DATA

GAUGE CALIBRATION DATE			
FLOW RATE, gpm	INITIAL PRESSURE, psi	FINAL PRESSURE, psi	TO SUPPORT FULL COLUMN, psi
TEST LENGTH, hrs.	INITIAL GRADIENT, psi/ft.	FINAL GRADIENT, psi/ft.	FINAL FLUID LEVEL, ft.

REMEMBER

1. Injection of normal injectate at normal rate is preferred.
2. Please compare data in your records to that in the gray cells above. If there is a difference, be sure the correct information is noted. Please fill in the information in the other cells.
3. Please submit an up-to-date well schematic
4. Data should be collected at the maximum rate for at least the first five minutes; between five and thirty minutes at no less than one reading every 30 seconds. After thirty minutes, the operator can reduce frequency as required.

ANNULUS PRESSURE TEST PROCEDURES
FOR
EGT WELL #1-12 AND EGT WELL #2-12

- Record last date of injection
- Install digital test gauge at test port that has been certified within the last 12 months (certificates to be at hand)
- Pressure up annulus to approximately 900 psi for one (1) hour prior to test to allow for annulus to equilibrate
- Record current annulus pressure
- Record current injection pressure
- Record current annulus fluid in storage tank
- Pressure up annulus to 900 +25/-0 psi and allow annulus to equilibrate
- Record fluid needed to establish pressure
- Record data at 10-minute intervals for a one (1) hour period. (Pressure change limited to 3% of applied pressure for a one (1) hour period)
- Provide system back-up to confirm gauge reading
- Return annulus to normal stand-by pressure
- Record fluid level in tank
- Put WAMS system back on line
- Return well to operator control

PROCEDURES FOR RUNNING STATIC TEMPERATURE LOG ON EGT WELL #2-12

- Rig-up wireline unit on hole
- Verify temperature sonde has been calibrated and has certification
- Conduct "bucket test" on hot and cold samples
- Verify sonde temperature in ice water
- Verify sonde temperature in warm water
- Run tool well and record temperature from surface to K.D. (4550')or top of fill
- Tool to be run at a consistent speed and not to exceed 30 feet per minute
- Once tool reaches bottom, stabilized temperature readings (3 minutes) should be made at 500' intervals while coming out of well
- After completion of temperature survey, wireline rig should be made ready to perform radioactive tracer survey (RTS)

PROCEDURES FOR RUNNING RADIOACTIVE TRACER SURVEY ON EGT WELL #2-12

- Radioactive tracer material to be iodine 131
- Rig-up surface read out wireline unit on hole
- Run into hole with casing collar locator and radioactive tracer tool
- Run bottom up base run survey from 4300' (or deepest attainable) to approximately 3080' (sensitivity at 40 counts per second per inch (CPSPI)
- Run first 5-minute stat with bottom detector at 3855'
- Run second 5-minute stat with bottom detector at 3800'
- Start injection at a stable rate of 30-35 gpm
- Release first slug at 3750'
- Run 30-minute time drive with bottom detector at 3977' (Time starts when slug passes bottom detector)
- Release second slug at 3100'
- Chase slug with a minimum of two (2) chases in tubing (as many as practical)
- Run final base bottom-up from 4300' (or deepest attainable) to approximately 3080'
- Rig down wireline
- Turn over to operator

PROCEDURES FOR RUNNING

AMBIENT PRESSURE MONITORING

ON

EGT WELL #2-12

Run in well with dual quartz memory gauges on slick line, pressure and temperature readings recording at 5 second intervals

- Inject into well at a steady rate of 30 to 35 GPM for at least 12 hours prior to start of falloff portion of test

- Well No. 1-12 will be shut down at least 4 hours prior to and during the fall off portion of test. Shut in of Well No. 1-12 is optimal during entire test of Well No. 2-12

- Bottom gauges to be in well to a depth of ±3950' KB (top of injection interval) and record pressures and temperatures for a minimum of 2 hours prior to shutting down injection

- Shut down injection as rapidly as possible at determined time starting fall off portion

- Record pressures and temperatures for a minimum of 8 hours

- Pull bottom hole pressure gauge out of well

- Rig down wireline

- Turn over to operator

GENERAL DESCRIPTION OF EGT WELL #2-12

Location: Wayne County / Romulus, Michigan
Section: 12 / Township: 35 / Range: 9B

Ground Level Elevation: 626'
K.B.: 13' / Drilling measured from K.B Elev. 639"

Conductor: 16"- 65# Surface to 178'
Protection Casing: 13-3/8"- 48# Surface to 598'
Intermediate Casing: 9- 5/8"- 36# Surface to 1444'
Long String Casing: 7"- 26# Surface to 3983'
Injection String: 4-1/2" Fiberglass Surface to 3953'

Packer:	3960'
Bottom of Tailpipe:	3971'
T.D.:	4550'

APPENDIX B

CHRONOLOGY OF FIELD ATIVITIES

ENVIRONMENTAL-GEO TECHNOLOGIES, LLC

MONDAY JULY 25, 2016

- Rig-up and perform annulus pressure test on Well #1-12
  Witnessed by Jack Lanigan of MDEQ
- Set-up and run hot and cold bucket test for Well #1-12
- Rig-up and perform annulus pressure test on Well #2-12
  Witnessed by Jack Lanigan of MDEQ
- Rig-up Michigan Wireline on Well #1-12 to perform temperature survey
- Set up and run hot and cold bucket test for Well #2-12
- Rig-up Michigan Wireline on Well #2-12 to perform temperature survey

MONDAY AUGUST 8, 2016

- Rig-up Michigan Wireline on Well #1-12 to perform radioactive tracer survey
- Rig-up Michigan Wireline on Well #2-12 to perform radioactive tracer survey

TUESDAY AUGUST 9, 2016

- Rig-up J.O. Well Service on Well #1-12 to start ambient pressure test

APPENDIX B (CONTINUED)

WEDNESDAY AUGUST 10, 2016

- Rig-down J.O. Well Service from Well #1-12 to end ambient pressure test

- Rig-up J.O. Well Service from Well #2-12 to start ambient pressure test

THURSDAY AUGUST 11, 2016

- Rig-down J.O. Well Service from Well #2-12 to end ambient pressure test

Pressure Test Report

COMPANY INFORMATION

Company Name	Environmental Geo-Technologies
Representative	Rich Schildhouse with Subsurface
Phone	(219) 287-2282
Fax	(219) 233-0026
Address	Subsurface Group 31728 SR 933 South Bend, IN 46637
E-Mail Address	
Service Company	J.O. Well Service & Testing, Inc.

WELL INFORMATION

Well Name	EGT Well #2-12
Well Location	Romulus, Michigan
Field and Pool	
Status (Oil, Gas, Water, Injection)	
Perforated Intervals	
Mid-point of Perforated Intervals (MPP)	
Drilling Rig Number	
Elevations	
Kelly Bushing (KB)	13 feet above ground level
Casing Flange (CF)	
KB-CF	
Ground Level	
Plug Back Total Depth	4550 feet
Total Depth	
Production Casing	
Production Tubing	E.O.T. at 3958 feet

TEST INFORMATION

Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016
Dead-weight Gauge Tubing Pressure	
Dead-weight Gauge Casing Pressure	
Shut-in Date (Duration)	
Date / Time on Bottom	
Date / Time off Bottom	
Probe Serial Number	9847
Probe Offset from End of Tool String	
Run Depth at Probe Pressure Port	

PRESSURE TEST RESULTS

Maximum Recorded Probe Pressure	2111.9 psig
Maximum Recorded Probe Temperature	82.8 deg F
Final Buildup Pressure	
Gradient Survey Information	
Extrapolated Pressure to MPP	
Final Gradient at Depth	
Job Number	

Company Name	Environmental Geo-Technologies
Well Name	EGT Well #2-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016

PROBE INFORMATION

Probe Serial Number	9847
Model	PR625
Pressure	
Calibrated Pressure Range	0.0 - 6,000.0 psig
Accuracy	1.4400 psig (0.024% FS)
Resolution	0.0900 psig (0.0015% FS)
Temperature	
Calibrated Temperature Range	0.00 - 125.00 deg C
Accuracy	0.288 deg C (0.23% FS)
Resolution	0.003 deg C (0.002% FS)
Calibration File Used for Reports	June 25, 2016

PROGRAMMING DETAILS

Step	Sample Mode	Period	Duration	Comment

Program Start Time
Program End Time
Total Samples Taken
Usage for this Test
Generic Data File Name

Company Name	Environmental Geo-Technologies
Well Name	EGT Well #2-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016

COMMENTS

Reported By Tim Auker

Zeroed bottom gauge in reference to Kelly Bushing Measurements.

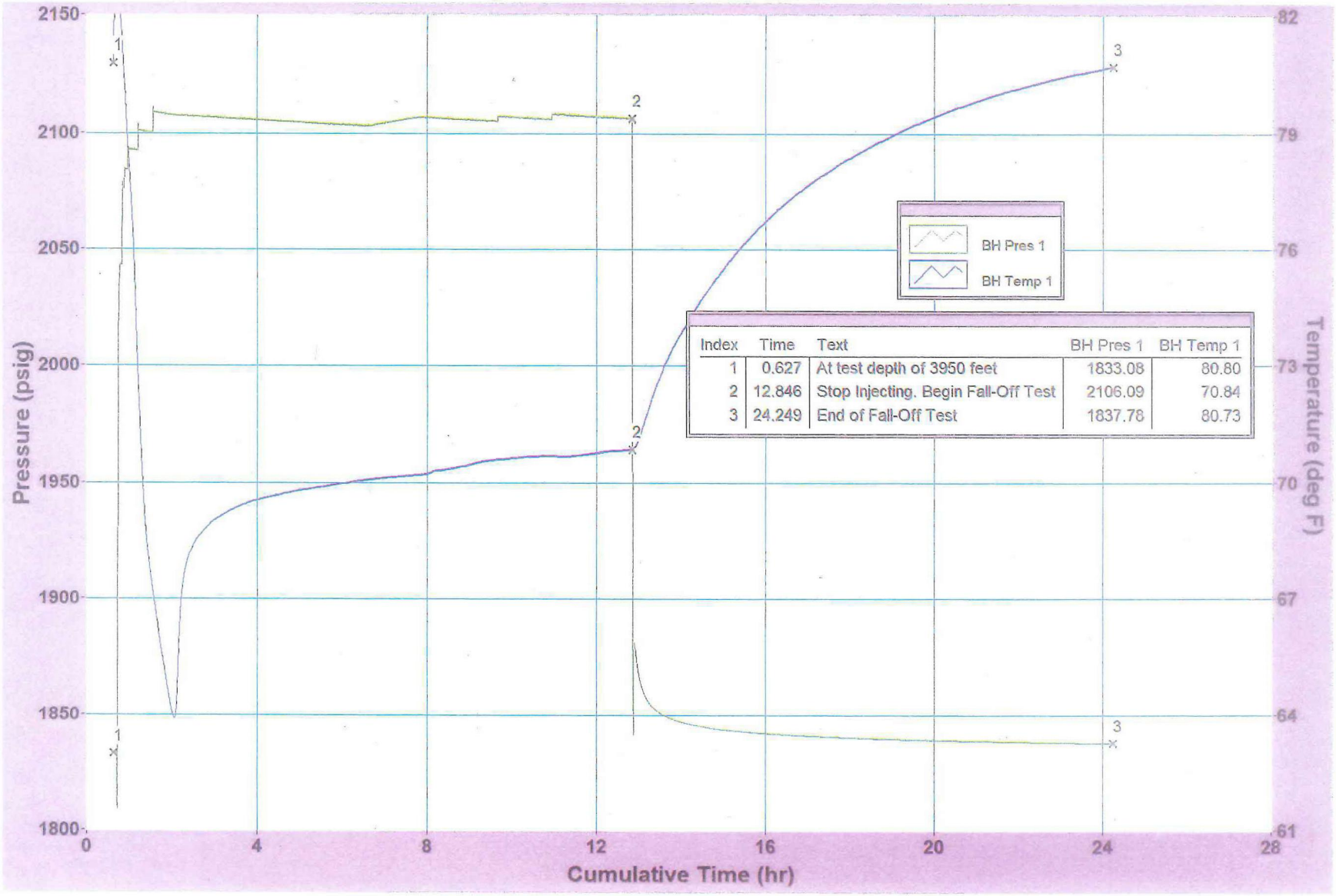
Top Gauge: 40010 two feet above bottom gauge
Bottom Gauge: 9847

The bottom gauge (9847) was used for this report.

R.I.H. with gauges. Hang bottom gauge at 3950 feet for Build-Up/Fall-Off Test. P.O.O.H. with gauges.

Company Name	Environmental Geo-Technologies
Well Name	EGT Well #2-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016

Injection/Fall-Off Test



Index	Time	Text	BH Pres 1	BH Temp 1
1	0.627	At test depth of 3950 feet	1833.08	80.80
2	12.846	Stop Injecting. Begin Fall-Off Test	2106.09	70.84
3	24.249	End of Fall-Off Test	1837.78	80.73

Company Name: Environmental Geo-Technologies
Well Name: EGT Well #2-12
Type of Test: Injection/Fall-Off
Date(s) of Test: August 10, 2016 thru August 11, 2016

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
Gauges on surface				
2016/08/11	06:59:06	0.0000	-0.573	71.942
2016/08/11	07:04:05	0.0831	-0.474	72.518
2016/08/11	07:09:05	0.1664	-0.529	72.842
2016/08/11	07:14:05	0.2497	-0.658	72.536
2016/08/11	07:19:05	0.3331	-0.821	72.230
Begin equalizing lubricator				
2016/08/11	07:20:35	0.3581	-0.658	72.248
2016/08/11	07:24:05	0.4164	121.855	74.498
R.I.H. with gauges				
2016/08/11	07:25:00	0.4317	122.331	74.534
2016/08/11	07:29:05	0.4997	567.414	56.354
2016/08/11	07:34:05	0.5831	1426.755	67.802
At test depth of 3950 feet				
2016/08/11	07:36:45	0.6275	1833.083	80.798
2016/08/11	07:39:05	0.6664	1833.326	82.292
2016/08/11	07:44:05	0.7497	2020.051	82.760
2016/08/11	07:49:05	0.8331	2059.468	81.356
2016/08/11	07:54:05	0.9164	2084.646	79.826
2016/08/11	07:59:05	0.9997	2093.076	78.188
2016/08/11	08:04:05	1.0831	2092.950	76.658
2016/08/11	08:09:05	1.1664	2092.709	73.904
2016/08/11	08:14:05	1.2497	2101.197	71.510
2016/08/11	08:19:05	1.3331	2101.128	69.656
2016/08/11	08:24:05	1.4164	2100.724	68.396
2016/08/11	08:29:05	1.4997	2100.329	67.640
2016/08/11	08:34:05	1.5831	2109.092	66.974
2016/08/11	08:39:05	1.6664	2108.862	66.326
2016/08/11	08:44:05	1.7497	2108.888	65.678
2016/08/11	08:49:05	1.8331	2108.820	65.156
2016/08/11	08:54:05	1.9164	2108.184	64.580
2016/08/11	08:59:05	1.9997	2107.991	64.094
2016/08/11	09:04:05	2.0831	2107.675	63.986
2016/08/11	09:09:05	2.1664	2107.622	65.984
2016/08/11	09:14:05	2.2497	2107.464	67.370
2016/08/11	09:19:05	2.3331	2107.568	67.910
2016/08/11	09:24:05	2.4164	2107.352	68.198
2016/08/11	09:29:05	2.4997	2107.649	68.396
2016/08/11	09:34:05	2.5831	2107.355	68.558
2016/08/11	09:39:05	2.6664	2107.117	68.684
2016/08/11	09:44:05	2.7497	2107.263	68.774
2016/08/11	09:49:05	2.8331	2106.918	68.882
2016/08/11	09:54:05	2.9164	2106.759	68.972
2016/08/11	09:59:05	2.9997	2106.943	69.044
2016/08/11	10:04:05	3.0831	2106.841	69.116
2016/08/11	10:09:05	3.1664	2106.795	69.152
2016/08/11	10:14:05	3.2497	2106.570	69.224
2016/08/11	10:19:05	3.3331	2106.634	69.278
2016/08/11	10:24:05	3.4164	2106.444	69.314
2016/08/11	10:29:05	3.4997	2106.290	69.368
2016/08/11	10:34:05	3.5831	2106.284	69.386
2016/08/11	10:39:05	3.6664	2106.569	69.440
2016/08/11	10:44:05	3.7497	2106.126	69.458
2016/08/11	10:49:05	3.8331	2106.144	69.494
2016/08/11	10:54:05	3.9164	2106.042	69.548
2016/08/11	10:59:05	3.9997	2105.894	69.566
2016/08/11	11:04:05	4.0831	2105.452	69.584
2016/08/11	11:09:05	4.1664	2105.604	69.602
2016/08/11	11:14:05	4.2497	2105.630	69.620
2016/08/11	11:19:05	4.3331	2105.681	69.656
2016/08/11	11:24:05	4.4164	2105.333	69.656
2016/08/11	11:29:05	4.4997	2105.047	69.692
2016/08/11	11:34:05	4.5831	2105.321	69.728
2016/08/11	11:39:05	4.6664	2104.963	69.746
2016/08/11	11:44:05	4.7497	2105.110	69.746
2016/08/11	11:49:05	4.8331	2105.005	69.764
2016/08/11	11:54:05	4.9164	2104.896	69.782
2016/08/11	11:59:05	4.9997	2105.133	69.818
2016/08/11	12:04:05	5.0831	2104.761	69.818
2016/08/11	12:09:05	5.1664	2104.689	69.836
2016/08/11	12:14:05	5.2497	2104.590	69.836
2016/08/11	12:19:05	5.3331	2104.387	69.872
2016/08/11	12:24:05	5.4164	2104.582	69.890
2016/08/11	12:29:05	5.4997	2104.195	69.890
2016/08/11	12:34:05	5.5831	2104.090	69.908
2016/08/11	12:39:05	5.6664	2103.991	69.926
2016/08/11	12:44:05	5.7497	2104.248	69.926
2016/08/11	12:49:05	5.8331	2103.669	69.944
2016/08/11	12:54:05	5.9164	2103.748	69.962
2016/08/11	12:59:05	5.9997	2103.954	69.980
2016/08/11	13:04:05	6.0831	2103.376	69.998
2016/08/11	13:09:05	6.1664	2103.508	70.016
2016/08/11	13:14:05	6.2497	2103.258	70.016
2016/08/11	13:19:05	6.3331	2103.556	70.052
2016/08/11	13:24:05	6.4164	2103.356	70.070
2016/08/11	13:29:05	6.4997	2103.304	70.088
2016/08/11	13:34:05	6.5831	2103.082	70.088
2016/08/11	13:39:05	6.6664	2103.342	70.106
2016/08/11	13:44:05	6.7497	2103.958	70.106
2016/08/11	13:49:05	6.8331	2103.884	70.124
2016/08/11	13:54:05	6.9164	2104.321	70.124
2016/08/11	13:59:05	6.9997	2104.425	70.142
2016/08/11	14:04:05	7.0831	2104.899	70.142
2016/08/11	14:09:05	7.1664	2105.406	70.160
2016/08/11	14:14:05	7.2497	2105.461	70.160
2016/08/11	14:19:05	7.3331	2105.622	70.160
2016/08/11	14:24:05	7.4164	2105.758	70.178
2016/08/11	14:29:05	7.4997	2106.012	70.178
2016/08/11	14:34:05	7.5831	2106.435	70.196
2016/08/11	14:39:05	7.6664	2106.441	70.196

Company Name	Environmental Geo-Technologies
Well Name	EGT Well #2-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2016/08/11	14:44:05	7.7497	2106.908	70.196
2016/08/11	14:49:05	7.8331	2107.118	70.196
2016/08/11	14:54:05	7.9164	2107.039	70.214
2016/08/11	14:59:05	7.9997	2106.715	70.214
2016/08/11	15:04:07	8.0836	2106.844	70.268
2016/08/11	15:09:07	8.1669	2106.621	70.304
2016/08/11	15:14:07	8.2503	2106.702	70.304
2016/08/11	15:19:07	8.3336	2106.417	70.322
2016/08/11	15:24:07	8.4169	2106.577	70.340
2016/08/11	15:29:07	8.5003	2106.294	70.358
2016/08/11	15:34:07	8.5836	2106.242	70.358
2016/08/11	15:39:07	8.6669	2106.209	70.394
2016/08/11	15:44:07	8.7503	2106.402	70.412
2016/08/11	15:49:07	8.8336	2105.996	70.412
2016/08/11	15:54:07	8.9169	2105.957	70.448
2016/08/11	15:59:07	9.0003	2105.858	70.466
2016/08/11	16:04:07	9.0836	2105.832	70.484
2016/08/11	16:09:07	9.1669	2105.917	70.520
2016/08/11	16:14:07	9.2503	2105.680	70.538
2016/08/11	16:19:07	9.3336	2105.542	70.556
2016/08/11	16:24:07	9.4169	2105.595	70.574
2016/08/11	16:29:07	9.5003	2105.385	70.592
2016/08/11	16:34:07	9.5836	2105.189	70.592
2016/08/11	16:39:07	9.6669	2107.496	70.592
2016/08/11	16:44:07	9.7503	2107.364	70.592
2016/08/11	16:49:07	9.8336	2107.322	70.610
2016/08/11	16:54:07	9.9169	2107.252	70.628
2016/08/11	16:59:07	10.0003	2107.044	70.628
2016/08/11	17:04:07	10.0836	2106.986	70.646
2016/08/11	17:09:07	10.1669	2107.056	70.646
2016/08/11	17:14:07	10.2503	2106.719	70.664
2016/08/11	17:19:07	10.3336	2106.737	70.664
2016/08/11	17:24:07	10.4169	2106.334	70.664
2016/08/11	17:29:07	10.5003	2106.631	70.682
2016/08/11	17:34:07	10.5836	2106.545	70.682
2016/08/11	17:39:07	10.6669	2106.440	70.682
2016/08/11	17:44:07	10.7503	2106.183	70.682
2016/08/11	17:49:07	10.8336	2106.313	70.682
2016/08/11	17:54:07	10.9169	2105.884	70.682
2016/08/11	17:59:07	11.0003	2108.431	70.682
2016/08/11	18:04:07	11.0836	2108.193	70.682
2016/08/11	18:09:07	11.1669	2108.240	70.664
2016/08/11	18:14:07	11.2503	2108.097	70.682
2016/08/11	18:19:07	11.3336	2107.907	70.664
2016/08/11	18:24:07	11.4169	2107.652	70.682
2016/08/11	18:29:07	11.5003	2107.935	70.700
2016/08/11	18:34:07	11.5836	2107.925	70.700
2016/08/11	18:39:07	11.6669	2107.581	70.718
2016/08/11	18:44:07	11.7503	2107.514	70.718
2016/08/11	18:49:07	11.8336	2107.681	70.736

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2016/08/11	18:54:07	11.9169	2107.230	70.736
2016/08/11	18:59:07	12.0003	2107.105	70.754
2016/08/11	19:04:07	12.0836	2107.375	70.772
2016/08/11	19:09:07	12.1669	2106.923	70.790
2016/08/11	19:14:07	12.2503	2107.101	70.808
2016/08/11	19:19:07	12.3336	2106.824	70.808
2016/08/11	19:24:07	12.4169	2106.775	70.808
2016/08/11	19:29:07	12.5003	2106.659	70.808
2016/08/11	19:34:07	12.5836	2106.612	70.826
2016/08/11	19:39:07	12.6669	2106.711	70.826
2016/08/11	19:44:07	12.7503	2106.614	70.826
2016/08/11	19:49:07	12.8336	2106.403	70.844
Stop Injecting. Begin Fall-Off Test				
2016/08/11	19:49:52	12.8461	2106.094	70.844
2016/08/11	19:54:07	12.9169	1878.959	70.952
2016/08/11	19:59:07	13.0003	1867.602	71.132
2016/08/11	20:04:07	13.0836	1861.516	71.402
2016/08/11	20:09:07	13.1669	1857.906	71.690
2016/08/11	20:14:07	13.2503	1855.418	71.942
2016/08/11	20:19:07	13.3336	1853.581	72.212
2016/08/11	20:24:07	13.4169	1852.210	72.482
2016/08/11	20:29:07	13.5003	1851.078	72.698
2016/08/11	20:34:07	13.5836	1850.130	72.932
2016/08/11	20:39:07	13.6669	1849.350	73.130
2016/08/11	20:44:07	13.7503	1848.708	73.328
2016/08/11	20:49:07	13.8336	1848.114	73.508
2016/08/11	20:54:07	13.9169	1847.617	73.688
2016/08/11	20:59:07	14.0003	1847.138	73.832
2016/08/11	21:04:07	14.0836	1846.736	73.994
2016/08/11	21:09:07	14.1669	1846.342	74.156
2016/08/11	21:14:07	14.2503	1846.001	74.300
2016/08/11	21:19:07	14.3336	1845.707	74.462
2016/08/11	21:24:07	14.4169	1845.360	74.588
2016/08/11	21:29:07	14.5003	1845.106	74.732
2016/08/11	21:34:07	14.5836	1844.866	74.858
2016/08/11	21:39:07	14.6669	1844.615	75.002
2016/08/11	21:44:07	14.7503	1844.333	75.128
2016/08/11	21:49:07	14.8336	1844.167	75.272
2016/08/11	21:54:07	14.9169	1843.960	75.380
2016/08/11	21:59:07	15.0003	1843.799	75.506
2016/08/11	22:04:07	15.0836	1843.639	75.614
2016/08/11	22:09:07	15.1669	1843.441	75.722
2016/08/11	22:14:07	15.2503	1843.324	75.848
2016/08/11	22:19:07	15.3336	1843.176	75.938
2016/08/11	22:24:07	15.4169	1843.035	76.046
2016/08/11	22:29:07	15.5003	1842.893	76.136
2016/08/11	22:34:07	15.5836	1842.736	76.244
2016/08/11	22:39:07	15.6669	1842.649	76.352
2016/08/11	22:44:07	15.7503	1842.522	76.442
2016/08/11	22:49:07	15.8336	1842.391	76.532

Company Name: Environmental Geo-Technologies
Well Name: EGT Well #2-12
Type of Test: Injection/Fall-Off
Date(s) of Test: August 10, 2016 thru August 11, 2016

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2016/08/11	22:54:07	15.9169	1842.237	76.604
2016/08/11	22:59:07	16.0003	1842.148	76.712
2016/08/11	23:04:09	16.0842	1842.072	76.802
2016/08/11	23:09:09	16.1675	1841.975	76.874
2016/08/11	23:14:09	16.2508	1841.856	76.964
2016/08/11	23:19:09	16.3342	1841.805	77.054
2016/08/11	23:24:09	16.4175	1841.634	77.126
2016/08/11	23:29:09	16.5008	1841.551	77.198
2016/08/11	23:34:09	16.5842	1841.488	77.270
2016/08/11	23:39:09	16.6675	1841.404	77.342
2016/08/11	23:44:09	16.7508	1841.321	77.414
2016/08/11	23:49:09	16.8342	1841.258	77.504
2016/08/11	23:54:09	16.9175	1841.184	77.558
2016/08/11	23:59:09	17.0008	1841.112	77.630
2016/08/12	00:04:09	17.0842	1841.026	77.702
2016/08/12	00:09:09	17.1675	1840.939	77.774
2016/08/12	00:14:09	17.2508	1840.878	77.828
2016/08/12	00:19:09	17.3342	1840.826	77.900
2016/08/12	00:24:09	17.4175	1840.783	77.954
2016/08/12	00:29:09	17.5008	1840.658	78.008
2016/08/12	00:34:09	17.5842	1840.599	78.080
2016/08/12	00:39:09	17.6675	1840.557	78.134
2016/08/12	00:44:09	17.7508	1840.514	78.206
2016/08/12	00:49:09	17.8342	1840.433	78.260
2016/08/12	00:54:09	17.9175	1840.377	78.314
2016/08/12	00:59:09	18.0008	1840.262	78.368
2016/08/12	01:04:09	18.0842	1840.240	78.422
2016/08/12	01:09:09	18.1675	1840.200	78.476
2016/08/12	01:14:09	18.2508	1840.146	78.512
2016/08/12	01:19:09	18.3342	1840.153	78.584
2016/08/12	01:24:09	18.4175	1839.972	78.620
2016/08/12	01:29:09	18.5008	1839.947	78.674
2016/08/12	01:34:09	18.5842	1839.905	78.728
2016/08/12	01:39:09	18.6675	1839.843	78.764
2016/08/12	01:44:09	18.7508	1839.812	78.818
2016/08/12	01:49:09	18.8342	1839.783	78.872
2016/08/12	01:54:09	18.9175	1839.723	78.908
2016/08/12	01:59:09	19.0008	1839.648	78.944
2016/08/12	02:04:09	19.0842	1839.685	78.998
2016/08/12	02:09:09	19.1675	1839.599	79.034
2016/08/12	02:14:09	19.2508	1839.573	79.070
2016/08/12	02:19:09	19.3342	1839.502	79.124
2016/08/12	02:24:09	19.4175	1839.443	79.160
2016/08/12	02:29:09	19.5008	1839.473	79.196
2016/08/12	02:34:09	19.5842	1839.399	79.232
2016/08/12	02:39:09	19.6675	1839.367	79.268
2016/08/12	02:44:09	19.7508	1839.356	79.322
2016/08/12	02:49:09	19.8342	1839.273	79.358
2016/08/12	02:54:09	19.9175	1839.274	79.394
2016/08/12	02:59:09	20.0008	1839.209	79.430

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2016/08/12	03:04:09	20.0842	1839.183	79.466
2016/08/12	03:09:09	20.1675	1839.125	79.502
2016/08/12	03:14:09	20.2508	1839.077	79.538
2016/08/12	03:19:09	20.3342	1839.028	79.556
2016/08/12	03:24:09	20.4175	1839.028	79.610
2016/08/12	03:29:09	20.5008	1838.973	79.646
2016/08/12	03:34:09	20.5842	1838.944	79.664
2016/08/12	03:39:09	20.6675	1838.933	79.700
2016/08/12	03:44:09	20.7508	1838.906	79.736
2016/08/12	03:49:09	20.8342	1838.870	79.754
2016/08/12	03:54:09	20.9175	1838.802	79.790
2016/08/12	03:59:09	21.0008	1838.796	79.826
2016/08/12	04:04:09	21.0842	1838.759	79.862
2016/08/12	04:09:09	21.1675	1838.746	79.898
2016/08/12	04:14:09	21.2508	1838.684	79.916
2016/08/12	04:19:09	21.3342	1838.649	79.934
2016/08/12	04:24:09	21.4175	1838.649	79.988
2016/08/12	04:29:09	21.5008	1838.630	80.006
2016/08/12	04:34:09	21.5842	1838.559	80.024
2016/08/12	04:39:09	21.6675	1838.542	80.060
2016/08/12	04:44:09	21.7508	1838.501	80.078
2016/08/12	04:49:09	21.8342	1838.468	80.114
2016/08/12	04:54:09	21.9175	1838.445	80.132
2016/08/12	04:59:09	22.0008	1838.427	80.168
2016/08/12	05:04:09	22.0842	1838.420	80.186
2016/08/12	05:09:09	22.1675	1838.390	80.222
2016/08/12	05:14:09	22.2508	1838.365	80.240
2016/08/12	05:19:09	22.3342	1838.343	80.276
2016/08/12	05:24:09	22.4175	1838.300	80.276
2016/08/12	05:29:09	22.5008	1838.247	80.294
2016/08/12	05:34:09	22.5842	1838.239	80.330
2016/08/12	05:39:09	22.6675	1838.201	80.348
2016/08/12	05:44:09	22.7508	1838.187	80.366
2016/08/12	05:49:09	22.8342	1838.184	80.402
2016/08/12	05:54:09	22.9175	1838.143	80.420
2016/08/12	05:59:09	23.0008	1838.098	80.438
2016/08/12	06:04:09	23.0842	1838.094	80.456
2016/08/12	06:09:09	23.1675	1838.043	80.474
2016/08/12	06:14:09	23.2508	1838.047	80.510
2016/08/12	06:19:09	23.3342	1838.033	80.528
2016/08/12	06:24:09	23.4175	1837.997	80.546
2016/08/12	06:29:09	23.5008	1837.965	80.564
2016/08/12	06:34:09	23.5842	1837.940	80.582
2016/08/12	06:39:09	23.6675	1837.918	80.600
2016/08/12	06:44:09	23.7508	1837.907	80.636
2016/08/12	06:49:09	23.8342	1837.876	80.654
2016/08/12	06:54:09	23.9175	1837.841	80.654
2016/08/12	06:59:09	24.0008	1837.846	80.672
2016/08/12	07:04:11	24.0847	1837.791	80.690
2016/08/12	07:09:11	24.1681	1837.831	80.726

Company Name	Environmental Geo-Technologies
Well Name	EGT Well #2-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 10, 2016 thru August 11, 2016

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
End of Fall-Off Test				
2016/08/12	07:14:01	24.2486	1837.779	80.726
2016/08/12	07:14:11	24.2514	1834.147	80.726
2016/08/12	07:19:11	24.3347	1835.637	80.330
2016/08/12	07:24:11	24.4181	1837.090	80.294
P.O.O.H. with gauges				
2016/08/12	07:27:01	24.4653	1837.373	80.294
2016/08/12	07:29:11	24.5014	1580.160	79.124
2016/08/12	07:34:11	24.5847	878.647	63.086
2016/08/12	07:39:11	24.6681	156.822	58.316
2016/08/12	07:44:11	24.7514	128.266	71.132
Bleed-Off lubricator				
2016/08/12	07:44:21	24.7542	128.168	71.240
2016/08/12	07:49:11	24.8347	-0.951	73.238
2016/08/12	07:54:11	24.9181	-0.973	75.038

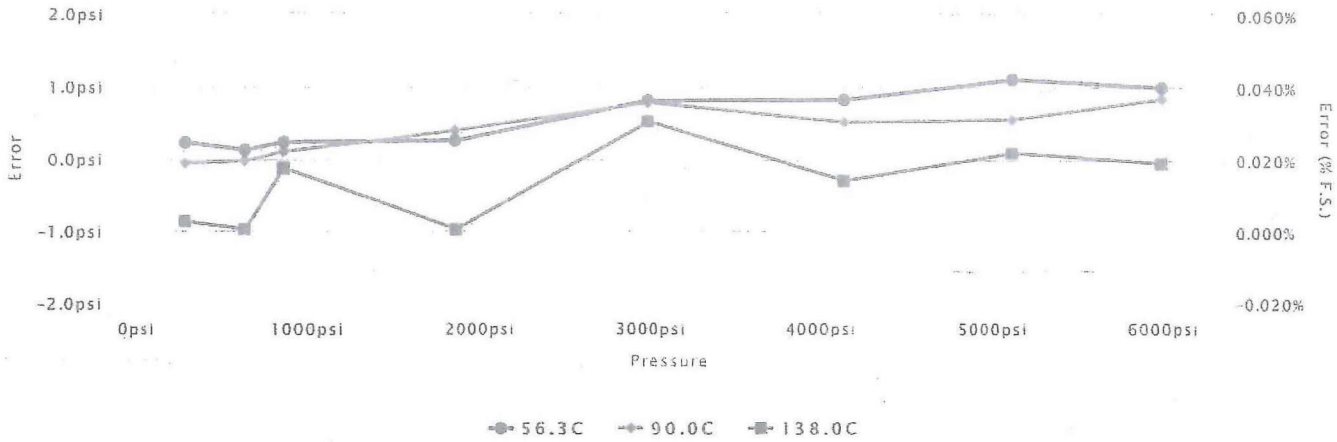
Kuster
a Probe company

2900 E. 29th St.
Long Beach, CA 90806 USA
Tel: +1 (562) 595-0661
Fax (562) 426-7897
www.kusterco.com

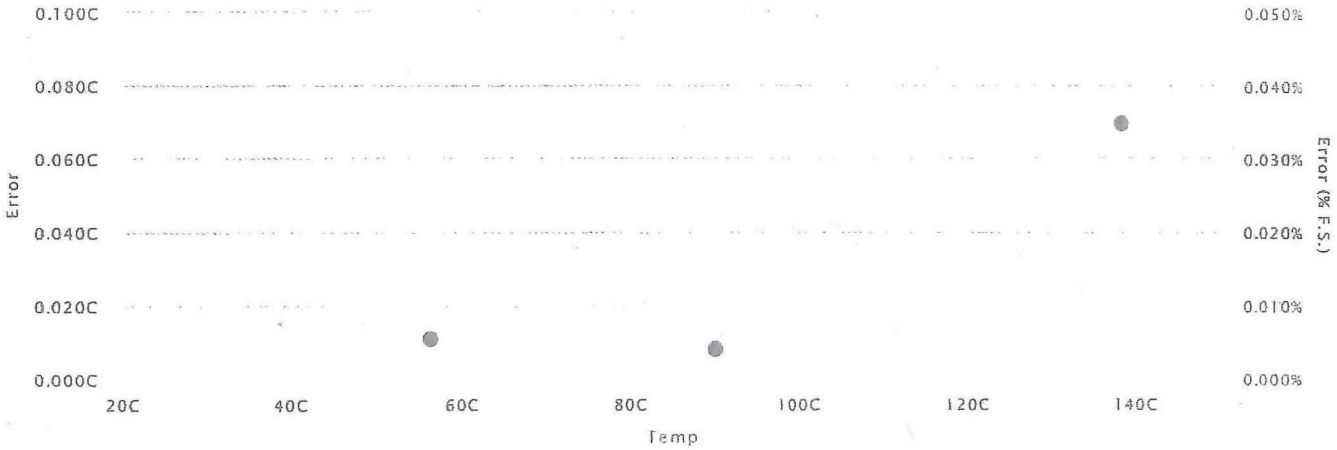
Calibration Certificate of Conformance

Serial	Model	Calibration Date
9847	AKS PR625	Jun-25-2016

Pressure Range (psi)	Temp. Range (°C) - Min	Temp. Range (°C) - Max	Pressure Spec.	Temp. Spec.
6000	20	150	±1.44 psi (0.024% F.S.)	±0.225°C (0.15% F.S.)



Max Error: 1.107psi (0.018% F.S.)



Max Error: 0.07°C (0.046% F.S.)

CALIBRATION STANDARDS

Pressure:	Fluke Piston Gauge (Uncertainty: [± 40Pa + (25 ppm + 0.04 ppm/MPa)])
Temperature:	Fluke PRT Temperature Reference (Accuracy: ±0.018 °C) Fluke Metrology Well (Accuracy: ±0.016 °C)

TRACEABILITY

All working standards are traceable to the National Institute of Standards and Technology (NIST), United States

Calibrated By: _____ Date: Jun-25-2016

Approved By: _____ Date: Jun-25-2016

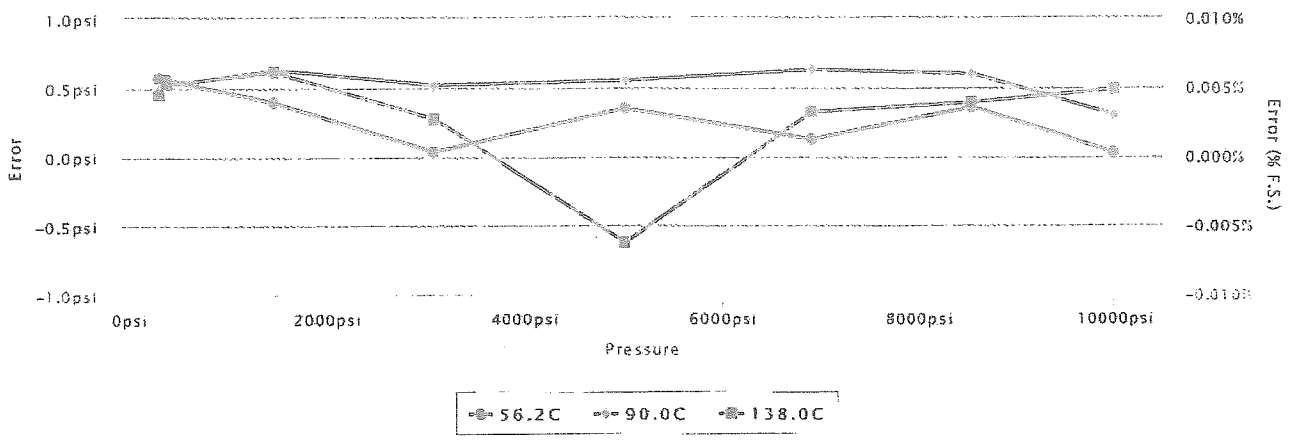
Kuster
a Probe company

2900 E 29th St.
Long Beach, CA 90806 USA
Tel: +1 (562) 595-0361
Fax: (562) 426-7897
www.kusterco.com

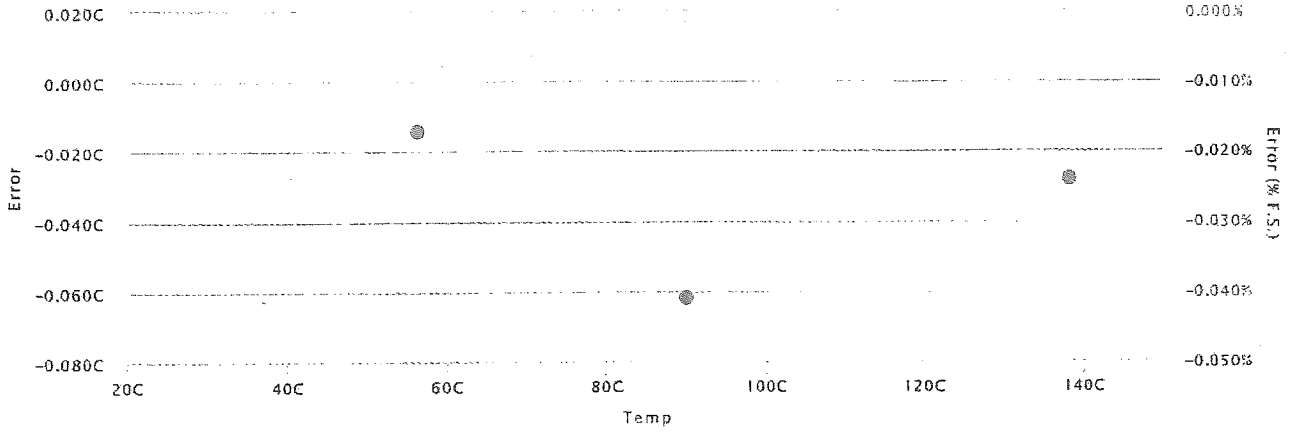
Calibration Certificate of Conformance

Serial	Model	Calibration Date
40010	AKS PR625	Jun-09-2016

Pressure Range (psi)	Temp. Range (°C) - Min	Temp. Range (°C) - Max	Pressure Spec.	Temp. Spec.
10000	20	150	±2.4 psi (0.024% F.S.)	±0.225°C (0.15% F.S.)



Max Error: 0.629psi (0.006% F.S.)



Max Error: -0.062°C (-0.041% F.S.)

CALIBRATION STANDARDS

Pressure: Fluke Piston Gauge (Uncertainty: [± 40Pa + (25 ppm + 0.04 ppm/MPa)])

Temperature: Fluke PRT Temperature Reference (Accuracy: ±0.018 °C)
Fluke Metrology Well (Accuracy: ±0.016 °C)

TRACEABILITY

All working standards are traceable to the National Institute of Standards and Technology (NIST), United States

Calibrated By: _____ Date: Jun-09-2016

Approved By: _____ Date: Jun-09-2016

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF OIL, GAS, AND MINERALS

ANNULAR PRESSURE TEST

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit Number: M453-MI-163-1W-C0008

Well name & No.: EDS 2-12

Surface location: SW 1/4 of NW 1/4 of SE 1/4, Section 12 T 3S R 9E

Name and address of permittee

Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, Michigan 48174

Township: Romulus

County: Wayne

Well type

Part 615 ☐ Secondary recovery ☐ Brine disposal

Part 625 ☒ Waste disposal ☐ Solution mining

Date of test: 25 July 2016

Casing: 7 inch at 3983 ft

Tubing: 4 1/2 inch fiberglas

Type of gauge: PG-3000 # U0951

inch face 2 psi range 3000

Packer type/model: GPS Model 12

Packer depth: 3960 ft

New gauge ☐ Yes ☒ No

if no, enter date of test calibration

Type of non-corrosive Diesel fuel and brine liquid in the annulus

Average rate during injection: NA

Maximum allowed injection pressure: 765 psi

TEST DATA

Pressure readings (psig)

Time	Annulus	tubing	Time	Annulus	tubing
8:50	983				
9:00	982				
9:10	980				
9:20	978				
9:30	978				
9:40	976				
9:50	973				

Comments

Well demonstrated mechanical integrity.
Fluid level in reserve tank at 24.24 inches during test, rose to 27.02 inches when pressure released; pressure returned to 384 psi after test.

Certification if witnessed by DEQ representative:
Jack Lanigan
Signature of DEQ employee

Date 7/25/16

Certification if not witnessed by DEQ representative: "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Signature [signature]

Date 7/25/16

MAIL TO: OFFICE OF OIL, GAS, AND MINERALS
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PO BOX 30256
LANSING MI 48909-7756

Automation Products Group, Inc.
1025 West 1700 North
Logan, UT 84321

Tel: 435-753-7300
Fax: 435-753-7490
www.apgsensors.com

NIST CALIBRATION DATA

Certificate Number: 423007	RANGE 3000 PSI S	RATED ACCURACY +/- 0.25 % FS BFSL	OUTPUT N / A
MODEL NUMBER: PG-3000-3000-PSIS-L7-EX-P1-N1-M1		ACTUAL LINEARITY 0.10 % FS	ACTUAL HYST. 0.10 % FS
PART NUMBER 548010-1271	SERIAL NUMBER U0951		

WORK PERFORMED:

- ☐ NEW ITEM, CALIBRATE TO MFG. SPEC IN ACCORDANCE WITH 9003101
- ☑ REPAIR, CALIBRATE TO MFG. SPEC IN ACCORDANCE WITH 9001749
- ☑ CALIBRATE IN COMPLIANCE WITH ANSI / NCSL Z540.1

REMARKS: Before test, zero was adjusted -11 counts

CALIBRATION RESULTS

	READING	PRESSURE	OUTPUT
Increasing	0	0	N / A
	596	600	N / A
	1196	1200	N / A
	1795	1800	N / A
	2397	2400	N / A
	3001	3000	N / A
Decreasing	2399	2400	N / A
	1798	1800	N / A
	1197	1200	N / A
	598	600	N / A
	0	0	N / A

P.O. NUMBER	SALES ORDER NUMBER	CUSTOMER I.D.	DATE OF TEST	DUE DATE
	213760		3/3/2016	

The calibration 'Due Date' has purposely been left blank, as APG will not dictate to our customers when they should re-calibrate their instruments.

STANDARD USED

MFG.	MODEL	INSTRUMENT	SERIAL #	ACCURACY	CAL.DATE	RECAL DATE	CERT NUMBER	SOURCE
AMETEK	T-150-1/C	Dead Weight	98097	+/-0.025%	2/22/2016	2/22/2017	1000709587	Quality Calibi
CONTROL CO	Traceable	HUMIDITY/TEMP	140202027	+/- 1%	8/25/2015	8/25/2016	4088-7008525	Control Co.

ENVIRONMENT	TEMP. 72 DEG.F	HUMIDITY 20 %

PERFORMED BY: Karl Gibbons

Technician Name and Stamp

CALIBRATION REPORT - STATEMENT OF TRACEABILITY

This instrument has been checked for accuracy, recalibrated to manufacturer's specifications using Best Fit Straight Line (BFSL), and found to be within the specified tolerance (unless otherwise noted).
The instruments used in this calibration are traceable to the National Institute of Standards and Technology (NIST) through certification documents on file at APG.
APG is in compliance with ANSI/NCSL Z540.1

This report shall not be reproduced except in full, without the written approval of APG.

Company	Environmental Geo-Technologies
Location	Romulus, MI
Well	Well #2-12
Test Date	August 10 - 11, 2016
Test Type	Buildup/Falloff
Gauge Type/Serial Number	PR625/#9847
Gauge Depth	3950 feet RKB
Analyst	LKM
WSP | Parsons Brinckerhoff	50909A

Reservoir Description

Fluid type : Water
Well orientation : Vertical
Number of wells : 1
Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	133.0000 ft
Average formation porosity	0.1100
Water saturation	1.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	6.2000e-6 psi-1
Layer pressure	1848.833436 psia
Temperature	81.790000 deg F

Well Parameters Data

	Well #2-12
Well radius	0.3646 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	1.2216e-3 bbl/psi
Storage Amplitude	0.000000 psi
Storage Time Constant	0.000000 hr
Second Wellbore Storage	0.000000 bbl/psi
Time Change for Second Storage	0.000000 hr
Well offset - x direction	0.0000 ft
Well offset - y direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	1828.860000 psia
Check Temperature	81.790000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3

Fluid Parameters Data (cont)

	Layer 1
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.798 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

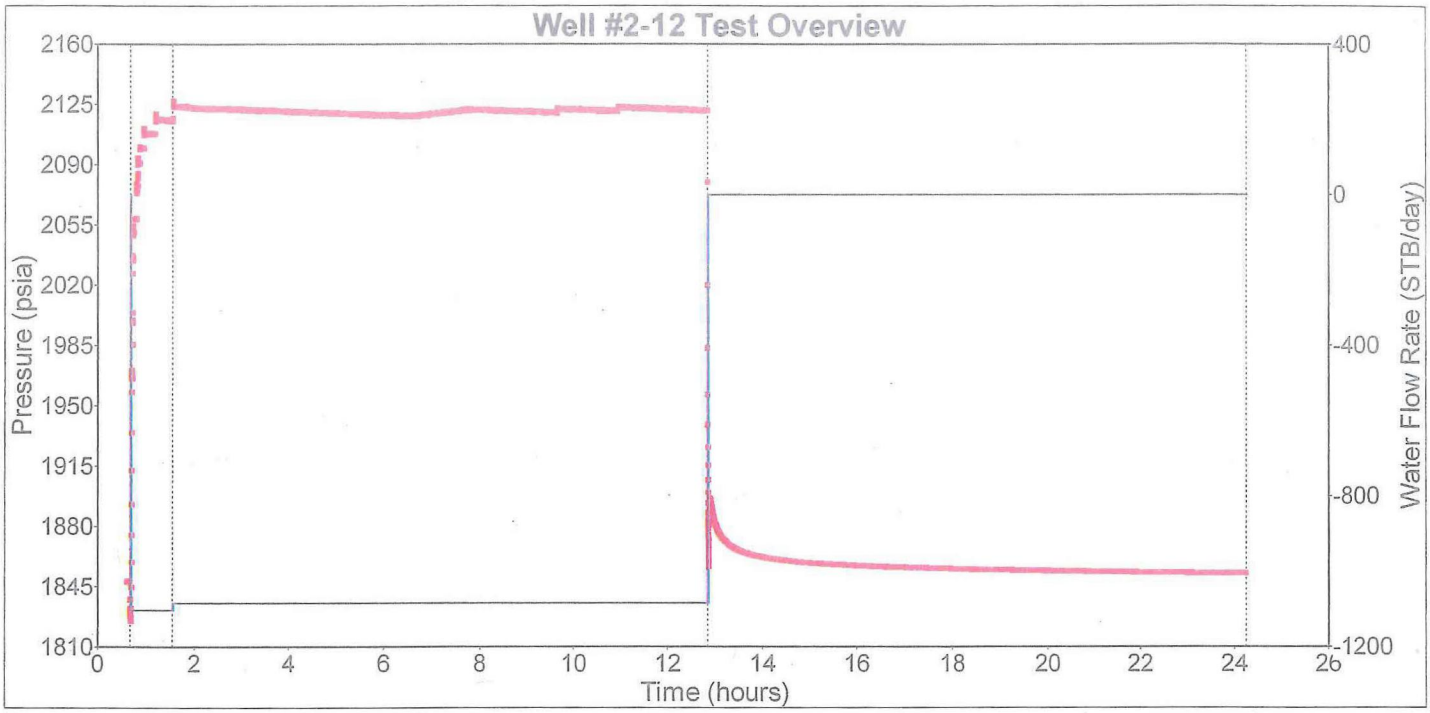
Layer 1 Correlations
Not Used

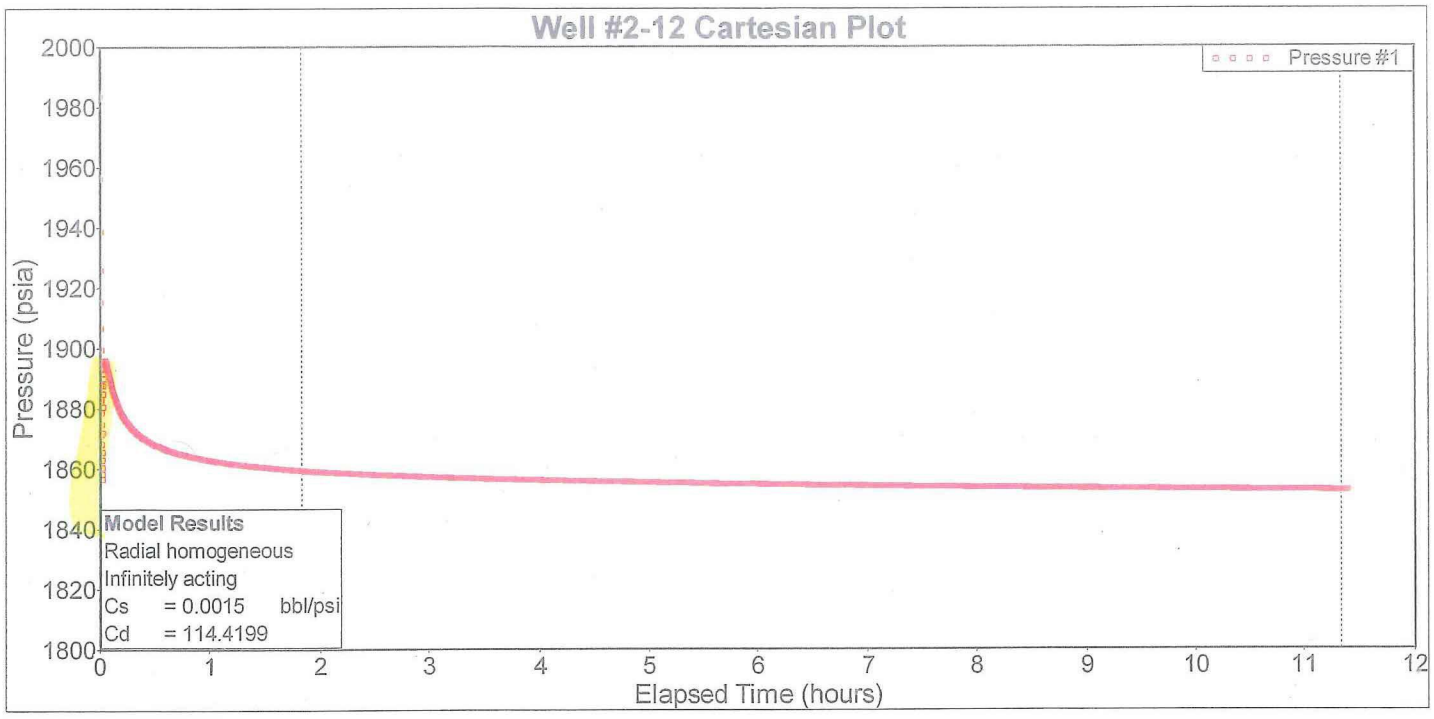
Layer 1 Model Data
Layer 1 Model Type : Radial homogeneous

	Layer 1
Permeability	89.916891 md
Skin factor (Well 1)	18.624063

Rate Change Data

Time Hours	Pressure psia	Rate STB/day
0.698330	1848.220000	0.000000
1.558060	2115.200000	-1103.210000
12.846542	2120.871000	-1084.300000
24.248610	1852.510000	0.000000


Well #2-12 Test Overview
Pressure (psia)
2160
2125
2090
2055
2020
1985
1950
1915
1880
1845
1810
Water Flow Rate (STB/day)
400
0
-400
-800
-1200
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Time (hours)



Well #2-12 Cartesian Plot Model Results

Radial homogeneous - Infinitely acting

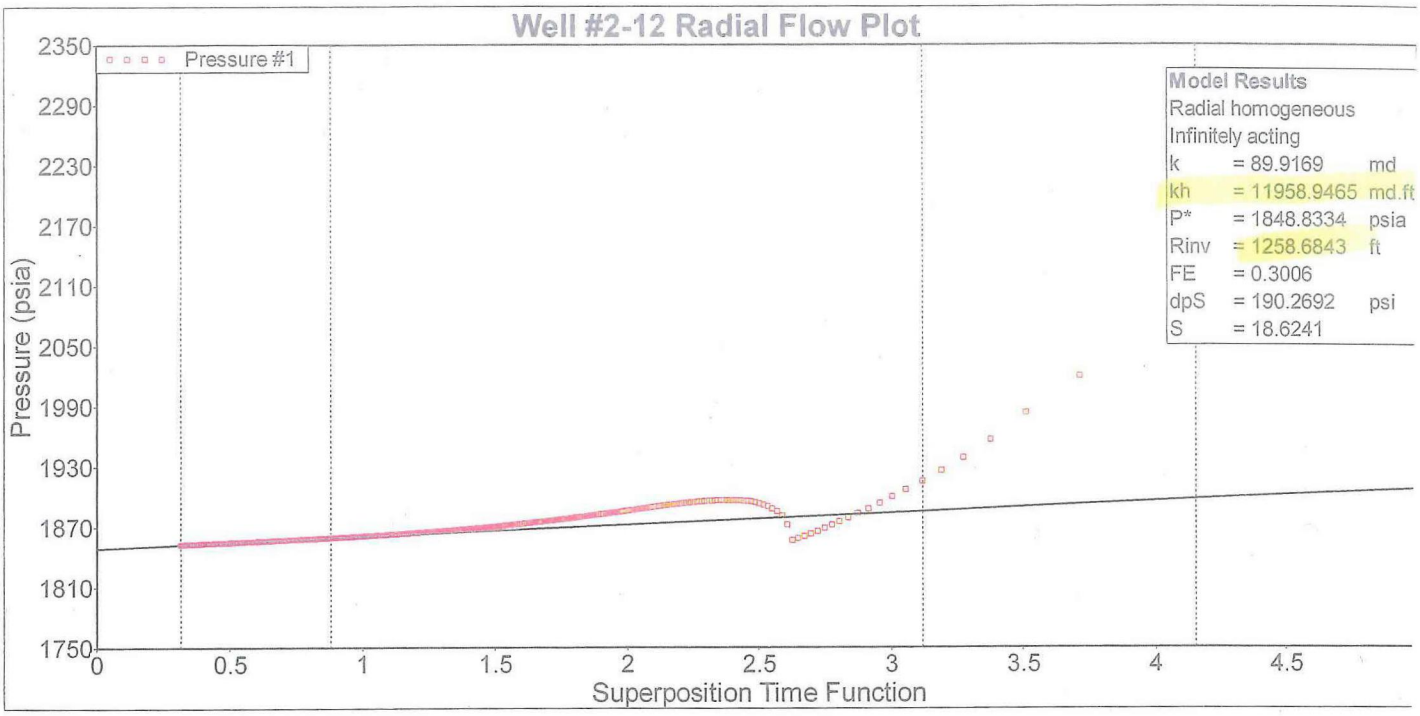
Classic Wellbore Storage

	Value
Wellbore storage coefficient	1.5432e-3 bbl/psi
Dimensionless wellbore storage	114.419879

Well #2-12 Cartesian Plot Line Details

Line type : Wellbore storage
Slope : -29275.5
Intercept : 2098.93
Coefficient of Determination : 0.967936

Number of Intersections = 0



Well #2-12 Radial Flow Plot Model Results
Radial homogeneous - Infinitely acting

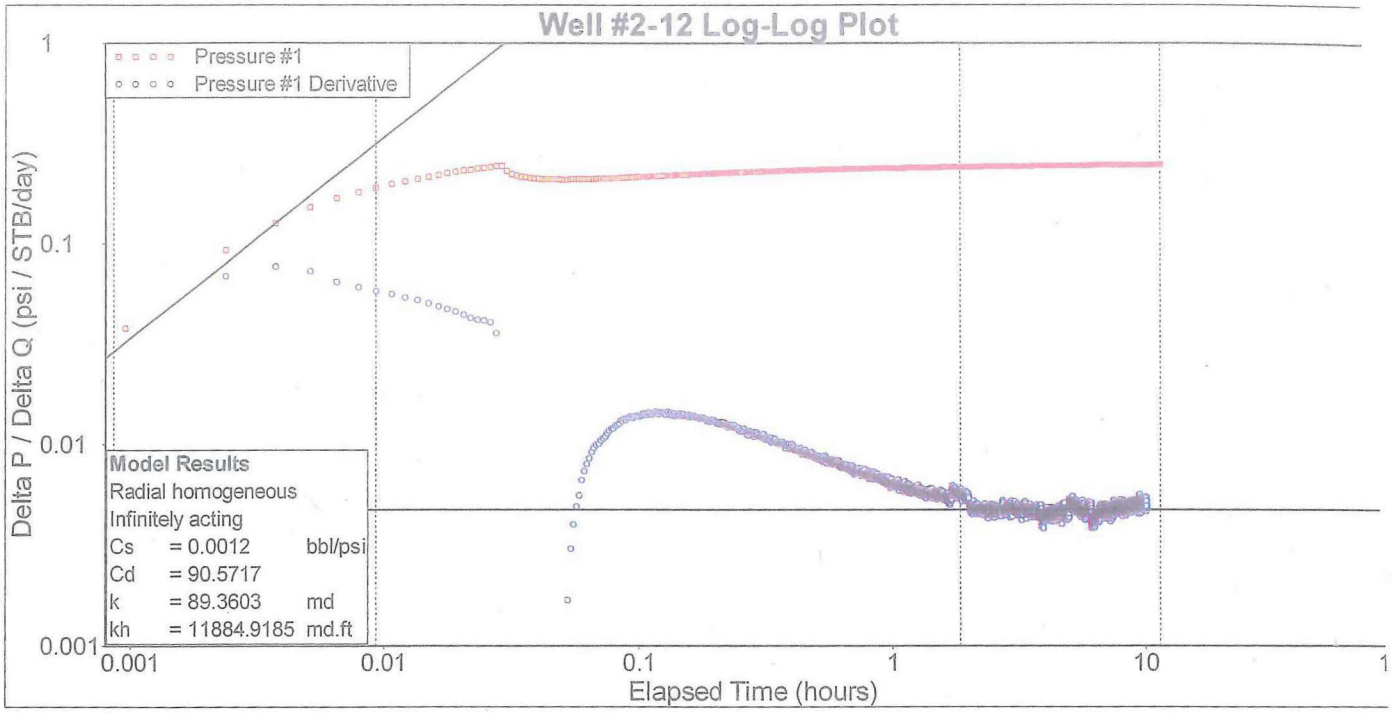
Classic Wellbore Storage

	Value
Permeability	89.916891 md
Permeability-thickness	1.1959e4 md.ft
Extrapolated pressure	1848.833436 psia
Radius of investigation	1258.684312 ft
Flow efficiency	0.300577
dP skin (constant rate)	190.269229 psi
Skin factor	18.624063

Well #2-12 Radial Flow Plot Line Details
Line type : Radial flow
Slope : 11.762
Intercept : 1848.83
Coefficient of Determination : 0.999749

	Radial flow
Extrapolated pressure	1848.833436 psia
Pressure at dt = 1 hour	1861.999547 psia

Number of Intersections = 0



Well #2-12 Log-Log Plot Model Results
Radial homogeneous - Infinitely acting

Classic Wellbore Storage

	Value
Wellbore storage coefficient	1.2216e-3 bbl/psi
Dimensionless wellbore storage	90.571660
Permeability	89.36029 md
Permeability-thickness	1.1885e4 md.ft

Well #2-12 Log-Log Plot Line Details
Line type : Radial flow
Slope : 0
Intercept : 0.00474036
Coefficient of Determination : Not Used

Line type : Wellbore storage
Slope : 1
Intercept : 34.1087
Coefficient of Determination : Not Used

Number of Intersections = 0