

UIC - I - _____ 8-3 _____

**EPA FALL-OFF
TEST**

DATE:

2016

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, July 27, 2017 11:38 AM
To: 'Dade, Lewis (Randy)'; Denton, Scott; Combs, Robert; Holder, Mike; Romine, William (Bill); Newton, Kevin; Acosta, Jesus
Cc: Sanchez, Daniel J., EMNRD; Griswold, Jim, EMNRD; Podany, Raymond, EMNRD
Subject: RE: Fall Off Testing and Shutting in all Wells

Randy, et al.:

The New Mexico Oil Conservation Division (OCD) is in receipt of HollyFrontier Navajo Refining, LLC's (Navajo) request to stop shutting-in and monitoring its entire inventory of disposal wells seated in the same formation during each individual well Fall-Off Test (FOT) and to focus on each well FOT individually or independently from the others from now on.

Navajo had monitored the other wells to determine interconnection between its wells and the injection zone(s) in order to pursue a reduced and staggered well FOT schedule with OCD. However, EPA recently communicated with OCD on the Federal requirements that each Underground Injection Control (UIC) Class I (Non-hazardous) Injection Well shall undergo an annual FOT. While a FOT is not considered to be a MIT, it allows for the monitoring of the capacity of the injection zone to receive effluent for disposal, and other vital formation characteristics over time.

OCD hereby **approves** Navajo's request.

Please contact me if you have questions. Thank you.

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“Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?” (To see how, go to: <http://www.emnrd.state.nm.us/OCD> and see “Publications”)

From: Dade, Lewis (Randy) [mailto:Lewis.Dade@HollyFrontier.com]
Sent: Thursday, July 27, 2017 11:17 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Denton, Scott <Scott.Denton@HollyFrontier.com>; Combs, Robert <Robert.Combs@HollyFrontier.com>; Holder, Mike <Michael.Holder@hollyfrontier.com>; Romine, William (Bill) <William.Romine@HollyFrontier.com>; Newton, Kevin <Kevin.Newton@HollyFrontier.com>; Acosta, Jesus <Jesus.Acosta@HollyFrontier.com>
Cc: Dade, Lewis (Randy) <Lewis.Dade@HollyFrontier.com>
Subject: Fall Off Testing and Shutting in all Wells

Carl,

Regarding FOT on the HollyFrontier Injection System, HollyFrontier has been shutting in the whole injection system for 30 -36 hours. This practice was started to determine if there was interconnectivity between the wells and

formations. HollyFrontier has conducted Fall Off Tests on each well individually while the two wells not being tested are shut in. HollyFrontier asks that OCD approve FOT's that require only shutting in the well on which the FOT is occurring on. WDW-1 (30-015-27592), WDW-2 (30-015-20894), and WDW-3 (30-015-26575) are tested yearly following the UIC Guidelines set by EPA Region 6 and OCD. Your help in this matter is greatly appreciated. Thanks for the help.

Thanks again, Randy



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**2016 ANNUAL BOTTOM-HOLE PRESSURE SURVEY AND
PRESSURE FALLOFF TEST REPORT
NAVAJO REFINING**

**GAINES WELL NO. 3
Artesia, New Mexico**

January 2017

**Parsons Brinckerhoff
Houston, TX**

A Company of



Project No. 50904A

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EXECUTIVE SUMMARY

WSP | Parsons Brinckerhoff was contracted by Navajo Refining Company (Navajo) to perform a pressure falloff test and bottom-hole pressure survey on Navajo's Gaines Well No. 3. The test was performed according to New Mexico Oil Conservation Division (OCD) falloff test guidelines (*New Mexico Oil Conservation Division UIC Class I Well Fall-Off Test Guidance, December 3, 2007*).

The test provides the state regulatory agency with the necessary information to access the validity of requested or existing injection well permit conditions and satisfy the permitting objective of protecting the underground sources of drinking water (USDW). Specifically, 40 CFR Part 146 states "the Director shall require monitoring of the pressure buildup in the injection zone annually, including at a minimum, a shutdown of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve" (40 CFR§146.13 for Non-hazardous Class I Wells).

The falloff testing was conducted according to the testing plan submitted to and approved by the NM OCD. The testing plan stated that, all offset wells that inject into the injection interval would be shut-in for the duration of the test period. The testing consisted of a 30-hour stabilized injection period and a 38-hour falloff period. Bottom-hole pressure gauges were also placed in the offset wells Chukka Well No. 2 and Mewbourne Well No. 1. These wells are owned by Navajo and are used to inject plant waste into the same intervals as the Gaines Well No. 3.

As prescribed by the guidelines, the report discusses supporting and background information in Sections 1 through 9. The one mile area of review (updated since the 2015 falloff testing) is discussed in Section 10 and geology in Section 11. Information on the offset wells is discussed in Section 12, daily testing activities in Section 13, and point of shut-in, in Section 14. The pressure falloff testing and analysis results are discussed in Section 15. The OCD required record keeping statement is discussed in Section 16.

1. FACILITY INFORMATION

- a. Name: Navajo Refining Company (subsidiary of the Holly Corporation)
- b. Facility Location: Highway 82 East, Artesia, New Mexico 88211
- c. Operator's OGRD Number: Section 1, Township 18 South, Range 27 East

2. WELL INFORMATION

- a. OCD UIC Permit Number: UIC-CLI-008-3
- b. Well Classification: Class I Non-hazardous
- c. Well Name and Number: Gaines Well No. 3
- d. API Number: 30-015-26575
- e. Well Legal Location: 760 FSL, 2250 FWL

3. CURRENT WELLBORE SCHEMATIC

The Gaines Well No. 3 wellbore schematic is presented in Figure 1. The schematic contains data, as requested by the guidelines and includes the following:

- a. Tubing: 4-1/2-inch, 11.6 pound per foot, steel construction, API grade J-55, with long thread connections (LT&C).
- b. Packer: Arrow X-1, 7-inch by 2-7/8-inch set in tension (37,000 pounds) at 7575 feet.
- c. Tubing Length: 7568 feet with a 0.54-foot, 4-1/2-inch by 2-7/8-inch crossover in the top of the packer. There are no profile nipples in the tubing or the packer as this was not a requirement of the permit.
- d. Size, Type, and Depth of Casing: There are four casing strings in the well and one below the injection interval. The information for these casing strings was obtained from OCD records on file with the state and geophysical logs. The casing strings are:
 - i. 13-3/8-inch, 54.5 pound per foot, steel construction, API grade J-55, with short thread connections (ST&C), set at a depth of 400 feet. The casing was cemented to the surface with 425 sacks of cement. The casing was set in open hole with a diameter of 17.5 inches. This information was obtained from OCD records.
 - ii. 9-5/8-inch, 36 pound per foot, steel construction, API grade J-55, ST&C, set at a depth of 2600 feet. The casing was cemented to the surface with 1025 sacks of cement. The casing was set in open hole with a diameter of 12.25 inches. This information was obtained from OCD records.
 - iii. 7-inch, 26 pound per foot and 29 pound per foot, steel construction, API grade N-80 and P-110, ST&C, set at a depth of 9450 feet. The casing was cemented with 1350

sacks of cement to 900 feet from surface. The casing was set in open hole with a diameter of 8.75 inches. The top cement and weight of the pipe was verified with a CBL and caliper log run on October 13, 2006. The remainder of the information was obtained from OCD records.

- iv. Below the cement plug at 9022 feet is the top of a 4-1/2-inch liner. The liner is a string of 4-1/2-inch casing installed to a depth of 10,119 feet. There is a cast iron bridge plug set in the liner at 9800 feet, which is above the original perforations, between 9861 feet and 9967 feet. The current injection interval is above the plug at 9022 feet. The cement plug also isolates the lower section of the original wellbore. This information was obtained from OCD records.
- e. The top of cement was determined from a CBL run in the 7-inch casing string on October 13, 2006. The top of cement in the 7-inch casing was found at 900 feet below the surface. The top of cement in the 9-5/8-inch and 13-3/8-inch casing strings was verified through OCD records and volume calculations.
- f. The 7-inch casing was perforated on October 14 and October 15, 2006. The casing was perforated with a 0.5-inch diameter hole at 2 shots per foot on a 60° phasing. The perforations are located between 7660 feet and 8450 feet and from 8540 feet to 8620 feet.

4. ELECTRIC LOG ENCOMPASSING THE COMPLETED INTERVAL

The dual induction log is presented in Appendix A and encompasses the completed interval between 7660 feet and 8620 feet. The dual induction log was submitted to the OCD with the original permit after the well was drilled by the Mewbourne Oil Company. The log was resubmitted to the OCD when the well was re-permitted as a Class I injection well.

5. RELEVANT PORTIONS OF THE POROSITY LOG USED TO ESTIMATE FORMATION POROSITY

The neutron density log is presented in Appendix B and encompasses the completed interval between 7660 feet and 8620 feet. The neutron density log was submitted to the OCD with the original permit after the well was drilled by Mewbourne Oil Company. The log was resubmitted to the OCD when the well was re-permitted as a Class I injection well. The porosity of the formation, 10%, and the reservoir thickness, 175 feet, were determined from this log. These values were used in the analysis of the pressure falloff data (Section 15). Additional information concerning the geology of the injection reservoir is discussed in Section 11.

6. PVT DATA OF THE FORMATION AND INJECTION FLUID

The Gaines Well No. 3 was recompleted in October 2006, prior to the issuance of the current well testing guidelines (December 3, 2007). At the time, no directives were in place to test formation fluids or derive formation characteristics from cores. However, reservoir fluid samples were obtained and the density and total dissolved solids (TDS) were measured at

1.03 g/l and 26,500 mg/l, respectively. The analytical results of the analysis of the formation fluid are summarized in Table I.

The viscosity of the formation fluid, formation water compressibility, and total system compressibility were estimated in reference to bottom-hole temperature using industry accepted correlations. These correlations are found in the Society of Petroleum Engineer's "Advances in Well Test Analysis, Monograph Volume 5" and "Pressure Buildup and Flow Tests in Wells, Monograph Volume 1".

a. Estimation of formation fluid and reservoir rock compressibility:

The fluid compressibility of the formation brine was estimated for a sodium chloride solution (26,500 mg/l) at the bottom-hole temperature of 127°F, using Appendix C (Figure D.16 SPE Monograph 5). This value was $2.9 \times 10^{-6} \text{ psi}^{-1}$. The formation pore volume compressibility was estimated using Appendix D (Figure G.5 SPE Monograph 1). This value was $5.5 \times 10^{-6} \text{ psi}^{-1}$. The total system compressibility is the sum of the fluid compressibility and the pore volume compressibility, $8.4 \times 10^{-6} \text{ psi}^{-1}$. The temperature used with the correlations was recorded during the temperature survey conducted in the Gaines Well No. 3 on October 13, 2006, and included in this report as Appendix E.

d. Formation Fluid Viscosity with Reference Temperature:

The formation fluid had an average TDS concentration of 26,500 mg/l. This equates to an approximate equivalent percentage of NaCl of 4.5%. The average viscosity of the formation fluid was estimated using Appendix F (Figure D.35 SPE Monograph 5). This value was 0.57 centipoise (cp) at 127°F.

e. Formation Fluid Specific Gravity/Density with Reference Temperature:

The average formation fluid specific gravity was measured at 1.03 g/l at 70°F (Table I).

d. Injection Fluid Specific Gravity, Viscosity and Compressibility with Reference Temperature:

The specific gravity of the refinery waste water was measured during the injection portion of the reservoir testing. The specific gravity was 1.01 (8.41 pounds per gallon). Using the same methodology described above, the viscosity of the injected fluid was 0.54 cp at 127°F. The compressibility of the injected plant waste was $2.9 \times 10^{-6} \text{ psi}^{-1}$ at 127°F.

7. DAILY RATE HISTORY DATA (MINIMUM OF ONE MONTH PRECEDING THE FALLOFF TEST)

The rate history used in the analysis of the pressure falloff data began on July 27, 2016 and ends when the well was shut in for the pressure falloff testing on August 28, 2016. The daily rate history is summarized in Appendix G.

8. CUMULATIVE INJECTION INTO THE FORMATION FROM TEST WELL AND OFFSET WELLS

The total volume of fluid injected into all three wells as of August 28, 2016, was 3,392,998,974 gallons. The volume of fluid injected into the Mewbourne Well No. 1 was 1,685,118,375 gallons. The volume of fluid injected into the Chukka Well No. 2 was 1,108,076,964 gallons. The volume of fluid injected into the Gaines Well No. 3 was 599,803,634 gallons. The volumes injected were obtained from plant records.

9. PRESSURE GAUGES

One (1) downhole pressure gauge (with two readings) was used for the Gaines Well No. 3 pressure buildup and falloff testing. The downhole pressure gauge was set at 7660 feet. Bottom-hole pressure gauges were also placed in each of the offset wells: Chukka Well No. 2 and Mewbourne Well No. 1. The pressure gauges were set at 7570 feet in the Chukka Well No. 2 and at 7924 feet in the Mewbourne Well No. 1.

- a. Describe the type of downhole surface pressure readout gauge used including manufacture and type:

In the Chukka Well No. 2, an MRO pressure gauge was used to record the bottom-hole pressure and temperature during the testing of the Gaines Well No. 3. The gauge was a sapphire crystal gauge with Serial No. DC-2050. The gauge is manufactured by DataCan Services.

In the Mewbourne Well No. 1, an MRO pressure gauge was used to monitor the bottom-hole pressure and temperature during the testing of the testing of the Gaines Well No. 3. The gauge was a sapphire crystal gauge with Serial No. SP-21726. The gauge is manufactured by Spartek Systems.

In the Gaines Well No. 3, an MRO pressure gauge was used to monitor the bottom-hole pressure and temperature during the injection/falloff testing. The gauge was a sapphire crystal gauge with Serial No. DC-1031. The gauge is manufactured by DataCan Services.

- b. List the full range, accuracy and resolution of the gauge:

In Gaines Well No. 3, the MRO pressure gauge, Serial No. DC-1031, has a full range of 14.73 psi to 15,000 psi, an accuracy of 0.020% of full scale, and a resolution of 0.01% of full scale.

In Mewbourne Well No. 1, the MRO pressure gauge, Serial No. SP-21726 has a full range of 13.14 psi to 16,000 psi, an accuracy of 0.030% of full scale, and a resolution of 0.01% of full scale.

In Chukka Well No. 2, the MRO pressure gauge, Serial No. DC-2050, has a full range of 14.73 psi to 15,000 psi, an accuracy of 0.020% of full scale, and a resolution of 0.01% of full scale.

- c. Provide the manufacturer's recommended frequency of calibration and a calibration certificate showing date the gauge was last calibrated:

The certificate of calibration for each of the pressure gauges used during the testing are included as Appendix H. The manufacturer's recommended calibration frequency is one year.

10. ONE MILE AREA OF REVIEW (AOR)

Federal Abstract Company was contracted by WSP | Parsons Brinckerhoff and instructed to undertake a review of well changes made within a one-mile area of review (AOR) of the Mewbourne Well No. 1, Chukka Well No. 2, and Gaines Well No. 3. In 2009, an update of the original AOR, submitted with the Discharge Application Permit 2003, was completed within the one-mile AOR for all three wells. The current update includes all existing wells within the one-mile AOR and any changes that have occurred to these wells since the 2015 update.

No new fresh water wells were reported within the search area since the submittal of the 2015 report. The discharge application lists the water wells located in the Area of Review.

- a. Identify wells located within the one mile AOR:

Table II contains a listing of all wells within the one-mile AOR of Mewbourne Well No. 1, Chukka Well No. 2, and Gaines Well No. 3. Figure 6 is a Midland Map Company base map of the area containing the one mile AOR.

- b. Ascertain the status of wells within the one mile AOR:

Table II contains a listing of all wells within the one-mile AOR, with their current status. Tables III through VII contain a list of all wells within the one-mile AOR that have had modifications to the current permit or have had new drilling and/or completion permits issued since the 2015 updated report.

Fifty-nine (59) wells were found in which the owner had changed. No new plugged and abandoned oil and gas wells were found. One (1) well was placed in temporarily abandoned status. No wells were found that were returned to production status. One (1) well was found that had been recompleted.

There were sixty-six (66) new drills and permits to drill, of which none penetrated the Wolfcamp interval. All plugged and abandoned wells were successfully plugged and isolated from the Mewbourne Well No. 1, Chukka Well No. 2, and Gaines Well No. 3 injection intervals according to current OCD records.

- c. Provide details on any offset producers and injectors completed in the same interval:

Navajo has a total of three injection wells injecting into the same interval. Mewbourne Well No. 1 is listed as ID No. 59 in Table II and no changes have occurred to this well. Chukka Well No. 2 is listed as ID No. 120 in Table II and no changes have occurred to this well. The Gaines Well No. 3 is listed as ID No. 861 in Table II. The wellbore schematics for the Mewbourne Well No. 1 and the Chukka Well No. 2 are presented as Figure 2 and Figure 4, respectively.

11. GEOLOGY

The injection zones are porous carbonates of the lower portion of the Wolfcamp Formation, the Cisco Formation, and the Canyon Formation. These formations occur in the Mewbourne Well No. 1, the Chukka Well No. 2, and the Gaines Well No. 3 at the depths shown in the table below.

Injection Zone Formation	Mewbourne Well No. 1 (KB = 3693 ft)		Chukka Well No. 2 (KB = 3623 ft)		Gaines Well No. 3 (KB = 3625 ft)	
	MD below KB	SS Depth	MD below KB	SS Depth	MD below KB	SS Depth
Lower Wolfcamp	7450	-3757	7270	-3647	7303	-3678
Cisco	7816	-4123	7645	-4022	7650	-4025
Canyon	8475	-4782	8390	-4767	8390	-4765
Base of Injection Zone (base of Canyon)	9016	-5323	8894	-5271	8894	-5269

- d. Description of the geological environment of the injection interval:

The lower portion of the Wolfcamp Formation (Lower Wolfcamp) is the shallowest porous unit in the injection interval. The Wolfcamp Formation (Permian-Wolf campaign age) consists of light brown to tan, fine to medium-grained, fossiliferous limestones with variegated shale interbeds (Meyer, 1966, page 69). The top of the Wolfcamp Formation was correlated for this study to be below the base of the massive, dense dolomites of the overlying Abo Formation. The base of the Wolfcamp coincides with the top of the Cisco Formation. The thickness of log porosity greater than 5% in the entire Wolfcamp Formation ranges from 0 feet to 295 feet in a band three miles wide that trends northeast-southwest across the study area.

The Cisco Formation (Pennsylvanian-Virgilian age) of the Northwest Shelf is described by Meyer (1966, page 59) as consisting of uniform, light colored, chalky, fossiliferous

limestones interbedded with variegated shales. Meyer (1966, page 59) also describes the Cisco at the edge of the Permian basin as consisting of bio thermal (mound) reefs composed of thick, porous, coarse-grained dolomites. Locally, the Cisco consists of porous dolomite that is 745 feet thick in Chukka Well No. 2, 659 feet thick in Mewbourne Well No. 1, and 720 feet in Gaines Well No. 3. The total thickness of intervals with log porosity greater than 5% is approximately 310 feet in Mewbourne Well No. 1, 580 feet in Chukka Well No. 2, and 572 feet in Gaines Well No. 3. The total thickness with log porosity greater than 10% is approximately 100 feet in Mewbourne Well No. 1, 32 feet in Chukka Well No. 2, and 65 feet in Gaines Well No. 3. The thickness of the porous intervals in the Cisco ranges from 0 feet in the northwestern part of the study area to nearly 700 feet in a band three miles wide that trends northeast-southwest.

The Canyon Formation (Pennsylvanian-Missourian age) consists of white to tan to light brown fine grained, chalky, fossiliferous limestone with gray and red shale interbeds (Meyer, 1966, page 53). Locally, the Canyon occurs between the base of the Cisco dolomites and the top of the Strawn Formation (Pennsylvanian-Desmoinesian age). The total thickness of intervals with log porosity greater than 5% is 34 feet in Mewbourne Well No. 1, 30 feet in Chukka Well No. 2, and 10 feet in Gaines Well No. 3. No intervals appear to have log porosity greater than 10% in any of the three injection wells.

- e. Discuss the presence of geological features, i.e., pinchouts, channels, and faults, if applicable:

From the geological study completed and submitted in the Discharge Plan Application and Application for Authorization to Inject, the reservoir appears to be continuous, with the possibility of anisotropic conditions extending to the west-southwest. The injection intervals that were studied are well confined by the Abo and Yeso low porosity carbonate beds, Tubbs shale, and Salado salt. The Cisco and Wolfcamp formations follow the Vacuum arch and have a southeasterly dip. No faults existed in the study area although, the study also shows that faulting occurs via the K-M fault located 6 miles northwest of Artesia and trends northeast-southwest. The distance to this fault line occurs no closer than 16 miles. No faults are known to exist in the confining zone within the AOR.

- f. Provide a portion of relevant structure map, if necessary:

The structure map for Strawn is presented as Appendix I. The structure map for the Wolfcamp presented as Appendix J. The structure map for the Cisco is presented as Appendix K.

12. OFFSET WELLS

There are three offset wells identified in the AOR that inject into the same interval: The Chalk Bluff Federal Com Well No. 3, Mewbourne Well No. 1, and the Chukka Well No. 2. The Mewbourne Well No. 1 and the Chukka Well No. 2 were shut-in during the buildup and falloff portions of the testing on the Gaines Well No. 3.

- a. Identify the distance between the test well and any offset well completed in the same injection interval:

The Mewbourne Well No. 1 is approximately 7900 feet from Gaines Well No. 3, the test well. The Gaines Well No. 3 is approximately 3130 feet from the Chukka Well No. 2.

- b. Report the status of the offset wells during both the injection and shut-in portions of the test:

Both the Chukka Well No. 2 and the Mewbourne Well No. 1 were shut-in during the buildup and falloff portions of the testing. Bottom-hole pressure gauges were lowered into each well approximately 72 hours before shutting in the Gaines Well No. 3. The bottom-hole pressure and temperature data are graphically depicted in Figure 5 for the Chukka Well No. 2 and Figure 3 for the Mewbourne Well No. 1.

- c. Describe the impact, if any, the offset wells had on the testing:

The offset wells were shut in prior to beginning the falloff testing on the Gaines Well No. 3.

13. CHRONOLOGICAL LISTING OF THE DAILY TESTING ACTIVITIES (OPERATIONS LOG)

Appendix L contains the formal Chronology of Field Activities. This chronology was developed from the field activity reports.

- a. Date of the testing:

The buildup portion of the testing started at 11:48 a.m. on August 27, 2016 and continued until August 28, 2016, at 5:52 p.m., when the Gaines Well No. 3 was shut-in. The falloff test ended on August 30, 2016 at 8:22 a.m. The total depth of the well was tagged at 9093 feet and five-minute gradient stops were made while pulling the pressure gauges out of the wellbore. After the pressure gauges were pulled out of the well on August 30, 2016, the well was turned over to Navajo plant operations personnel.

- b. Time of the injection period:

The buildup portion of the testing began on August 27, 2016 when the injection rate was set at an average stabilized injection rate of 167.34 gallons per minute (gpm). The injection rate was held constant for 30 hours.

- c. Type of injection fluid:

The injected fluid was non-hazardous waste water from the plant. The density of the injection fluid was periodically measured and averaged 8.41 pounds per gallon during the 30-hour injection period.

- d. Final injection pressure and temperature prior to shutting in the well:

The final flowing pressure (P_{wf}) and temperature (T_{wf}) were 4403.70 psia and 104.54°F, respectively.

- e. Total shut-in time:

The Gaines Well No. 3 was shut-in for 37.63 hours.

- f. Final static pressure and temperature at the end of the fall-off portion of the test:

The final static pressure at 7660 feet was 4289.52 psia. The final temperature was 109.81°F.

14. DESCRIBE THE LOCATION OF THE SHUT-IN VALVE USED TO CEASE FLOW TO THE WELL FOR THE SHUT-IN PORTION OF THE TEST

On the pipeline to the Gaines Well No. 3, there are two, 4-inch motor controlled valves installed on the incoming pipeline before the pod filters. Two 4-inch valves are installed between the pod filters and the wellhead. There is one, 6-inch valve installed in the main line between the pod filters and the booster pump. A 4-1/16-inch wing valve is installed on the wellhead. All valves were closed during the falloff portion of the testing. A diagram of the wellhead is shown in Figure 7 and a diagram of the valve locations are shown in Figure 8.

15. PRESSURE FALLOFF ANALYSIS

The following discussion of the analysis of the pressure data recorded during the falloff testing of the Gaines Well No. 3 satisfies Sections 15 through 19 of Section IX, Report Components, of the OCD's falloff test guidelines. Where appropriate, the specific guideline addressed is annotated. Specific parameters used in the equations and discussed previously in this report are also annotated. The plots included with this report are summarized in Table VIII. The inclusion of these plots in this report satisfies OCD Guideline Section IX.18.

The pressure data obtained during the falloff test were analyzed using the commercially available pressure transient analysis software program PanSystem©. Appendix M contains the output from this software program. Figure 9 shows the pressure data recorded by the bottom-hole pressure gauge from the time the tool was in place through the 37.63-hour shut-in period. Figure 10 shows the pressure and temperature data recorded by the bottom-hole pressure gauge from the time the tool was in place through the 37.63-hour shut-in period. Figure 11 is a Cartesian plot of the injection rates versus time for the injection period used in the pressure falloff analysis. The superposition time function was used to account for all rate changes during the injection period. Figure 12 is a plot of the historical injection rates and surface pressures versus calendar time.

Figure 13 is a log-log diagnostic plot of the falloff data, showing change in pressure and pressure derivative versus equivalent shut-in time. The different flow regimes, wellbore storage, radial flow and change in reservoir characteristics, are indicated on the log-log plot and the superposition Horner plot (OCD Guideline Section IX.18.c and IX.18.d).

Wellbore storage begins at 0.003 hours and continues to an elapsed shut in time of 0.057 hours. Radial flow begins at an elapsed time from shut in of 4.73 hours and continues until 20.34 hours (OCD Guideline Section IX.15.b).

The reservoir permeability was determined from the radial flow region of the superposition semi-log plot, Figure 14. The radial flow regime begins at a Superposition time of 121 and continues until a Superposition time of 30 at which time the pressure data departs the semi-log straight-line. Figure 15 shows an expanded view of the radial flow regime. The slope of the radial flow period, as calculated by the analysis software, is 7.4370 psi/cycle (OCD Guideline Section IX.15.c). The injection rate just prior to shut in was 167.34 gpm which is equivalent to 5737.51 barrels per day (bbls/day).

An estimate of mobility-thickness (transmissibility, OCD Guideline Section IX.15.d), kh/μ , for the reservoir was determined to be 125,443 md-ft/cp using the following equation:

$$\frac{kh}{\mu} = 162.6 \frac{q B}{m}$$

where,

- kh/μ = formation mobility-thickness, millidarcy-feet/centipoise
- q = rate prior to shut in, bpd
- B = formation volume factor, reservoir volume/surface volume
- m = slope of radial flow period, psi/cycle

$$\begin{aligned} \frac{kh}{\mu} &= 162.6 \frac{(5737.51)(1.0)}{7.4370} \\ &= 125,443 \text{ md} - \text{ft/cp} \end{aligned}$$

The permeability-thickness (flow capacity, OCD Guideline Section IX.15.i), kh , was determined to be 71,503 md-ft by multiplying the mobility-thickness, kh/μ , by the viscosity of the reservoir fluid (see Section 6), $\mu_{\text{reservoir}}$, of 0.57 centipoises:

$$\begin{aligned} kh &= \left(\frac{kh}{\mu} \right) \mu_{\text{reservoir}} \\ &= (125,443)(0.57) \\ &= 71,503 \text{ md-ft} \end{aligned}$$

The reservoir permeability (OCD Guideline Section IX.15.e) using the total thickness (see Section 5 and Section 11) of 175 feet was 409 md:

$$\begin{aligned} k &= \frac{kh}{h} \\ &= \frac{71,503}{175} \\ &= 409 \text{ md} \end{aligned}$$

To determine whether the proper viscosity was used in arriving at this permeability, the travel time for a pressure transient to pass beyond the waste front needs to be calculated (OCD Guideline Section VIII.5). The distance to the waste front is determined from the following equation:

$$r_{\text{waste}} = \left(\frac{0.13368 V}{\pi h \phi} \right)^{1/2}$$

where,

r_{waste}	= radius to waste front, feet
V	= total volume injected into the injection interval, gallons
h	= formation thickness, feet
ϕ	= formation porosity, fraction
0.13368	= constant

A cumulative volume of approximately 599,803,634 gallons of waste has been injected into Gaines Well No. 3 (see Section 8). The formation has a porosity of 0.10 (see Section 5 and Section 11).

The distance to the waste front was determined to be 1208 feet:

$$r_{\text{waste}} = \sqrt{\frac{(0.13368)(599,803,634)}{(\pi)(175)(0.10)}}$$

$$= 1208 \text{ feet}$$

The time necessary for a pressure transient to traverse this distance is calculated from the following equation:

$$t_{\text{waste}} = 948 \frac{\phi \mu_{\text{waste}} c_t r_{\text{waste}}^2}{k}$$

where,

- t_{waste} = time for pressure transient to reach waste front, hours
- ϕ = formation porosity, fraction
- μ_{waste} = viscosity of the waste at reservoir conditions, centipoise
- r_{waste} = radius to waste front, feet
- c_t = total compressibility of the formation and fluid, psi
- k = formation permeability, millidarcies
- 948 = constant

The pore volume compressibility is $8.4 \times 10^{-6} \text{ psi}^{-1}$ (see Section 6). The time necessary for a pressure transient to traverse the distance from the wellbore to the leading edge of the waste front would be 1.53 hours:

$$t_{\text{waste}} = 948 \frac{(0.10)(0.54)(8.4 \times 10^{-6})(1208)^2}{409}$$

$$= 1.53 \text{ hours}$$

Since the time required to pass through the waste is less than the 4.73 hours required to reach the beginning of the radial flow period, the assumption that the pressure transient was traveling through reservoir fluid during the period of the semi-log straight line was correct.

The near wellbore skin damage (OCD Guideline Section IX.15.f) was determined from the following equation:

$$s = 1.151 \left[\frac{p_{\text{wf}} - p_{1\text{hr}}}{m_1} - \log \left(\frac{k}{\phi \mu c_t r_w^2} \right) + 3.23 \right]$$

where,

- s = formation skin damage, dimensionless
- 1.151 = constant
- p_{wf} = flowing pressure immediately prior to shut in, psi
- p_{1hr} = pressure determined from extrapolating the first radial flow semi-log line to a Δt of one hour, psi
- m_1 = slope of the first radial flow semi-log line, psi/cycle
- k = permeability of the formation, md
- ϕ = porosity of the injection interval, fraction
- μ = viscosity of the fluid the pressure transient is traveling through, cp
- c_t = total compressibility of the formation plus fluid, psi^{-1}
- r_w = radius of the wellbore, feet
- 3.23 = constant

The final measured flowing pressure was 4403.70 psia. The pressure determined by extrapolating the radial flow semi-log line to a Δt of one hour, p_{1hr} , was 4301.52 psia (calculated from the analysis software). The wellbore radius, r_w , is 0.3246 feet (completion records). Using these values in addition to the previously discussed parameters results in a skin of 8.13:

$$s = 1.151 \left[\frac{4403.70 - 4301.52}{7.4370} - \log \left(\frac{409}{(0.10)(0.57)(8.4 \times 10^{-6})(0.3246)^2} \right) + 3.23 \right]$$

$$= 8.13$$

The change in pressure, Δp_{skin} , in the wellbore associated with the skin factor (OCD Guideline Section IX.15.g) was calculated using the following equation:

$$\Delta p_{skin} = 0.869(m)(s)$$

where,

- 0.869 = constant
- m = slope from superposition plot of the well test, psi/cycle
- s = skin factor calculated from the well test

The change in pressure, Δp_{skin} , using the previously calculated and defined values was determined to be 52.54 psi:

$$\Delta p_{skin} = 0.869(7.4370)(8.13)$$

$$= 52.54 \text{ psi}$$

The flow efficiency (E, OCD Guideline Section IX.15.h) was determined from the following equation:

$$E = \frac{p_{wf} - \Delta p_{skin} - p_{static}}{p_{wf} - p_{static}}$$

where,

- E = flow efficiency, fraction
- p_{wf} = flowing pressure prior to shutting in the well for the fall-off test
- p_{static} = final pressure from the pressure falloff test
- Δp_{skin} = pressure change due to skin damage

Using the previously determined parameters, the flow efficiency was calculated to be 0.54:

$$E = \frac{4403.70 - 52.54 - 4289.52}{4403.70 - 4289.52}$$

$$= 0.54$$

The radius of investigation (OCD Guideline Section IX.15.a) was calculated using the following equation:

$$R_{inv} = 0.029 \sqrt{\frac{k \Delta t_s}{\phi \mu C_t}}$$

where,

- k = formation permeability, millidarcies
- Δt_s = elapsed shut-in time, hours
- ϕ = formation porosity, fraction
- μ = viscosity of the fluid the pressure transient is traveling through, cp
- C_t = total compressibility of the formation plus fluid, psi^{-1}
- 0.029 = constant

The radius of investigation, r_{inv} , using the previously defined values was determined to be 5199 feet:

$$R_{inv} = 0.029 \sqrt{\frac{(409)(37.63)}{(0.10)(0.57)(8.4 \times 10^6)}}$$
$$R_{inv} = 5199 \text{ feet}$$

As indicated on Figure 13, the pressure data departs the radial flow region at an elapsed time from shut in of 20.34 hours. No pressure or temperature anomalies were noted that would cause this type of pressure response observed on the derivative log-log plot (OCD Guideline Section VIII.9). A review of the geology of the injection zones (see Section 11) indicates that all three of the formations in which the Gaines Well No. 3 injects into have varying thicknesses and porosities within the mapped area. Changes in formation thickness, porosity, and fluid viscosity can cause the slope changes seen on the derivative log-log plot. Because these changes occurred during the duration of the pressure falloff test, the reservoir analysis results are considered heterogeneous as opposed to homogeneous (OCD Guideline Section IX.17.b).

The Hall plot (OCD Guideline Section IX.18.h) is presented as Figure 16. No slope changes are seen in the plotted data.

A comparison of the current analysis results with previous analysis results as well as with the reservoir parameters submitted with the permit application is presented in Table IX (OCD Guideline Section IX.19).

On August 30, 2016, a static pressure gradient survey was conducted while pulling the pressure gauges out of the well. Static gradient stops were conducted at 7660 feet, 7000 feet, 6000 feet, 5000 feet, 4000 feet, 3000 feet, 2000 feet, 1000 feet and at the surface. The bottom-hole pressure and temperature, after 37.63 hours of shut-in at 7660 feet, were 4289.52 psia and 109.81°F, respectively. The gradient survey is summarized in Table X. The data are graphically depicted in Figure 17.

16. NEW MEXICO OIL CONSERVATION DIVISION THREE YEAR RECORDING KEEPING STATEMENT

Navajo will keep the raw test data, generated during the testing, on file for a minimum of three years. The raw test data will be made available to OCD upon request.

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MEWBOURNE WELL NO. 1

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TABLE I
FORMATION WATER ANALYSIS SUMMARY

Chemical	Mewbourne Well No. 1	Chukka Well No. 2	Gaines Well No. 3	Average
Date	July 31, 1998	June 14, 1999	Nov 8, 2006	
Fluoride (mg/l)	2.6	9.7	Not Detected	6.15
Chloride (mg/L)	19,000	15,000	10,447	14,815.67
NO3-N (mg/L)	<10	<10	--	<10
SO4 (mg/L)	2,200	2000	1,908	2,036
CaCO3 (mg/L)	1000	1210	--	1105
Specific Gravity (g/L)	1.034	1.0249	--	1.0295
TDS (mg/L)	33,000	20,000	--	26,500
Specific Conductance (uMHOs/cm)	52,000	43,000	--	47,500
Potassium (mg/L)	213	235	85.5	177.83
Magnesium (mg/L)	143	128	155	142
Calcium (mg/L)	390	609	393	464
Sodium (mg/L)	12,770	8,074	6,080	8,974.67
pH (s.u.)	8.1	7.2	--	7.65

The data in the above table was referenced from “Discharge Plan Application and Application for Authorization to Inject per Oil Conservation Division Form C-108, into Class I Wells WDW-1 and Proposed WDW-2 and WDW-3” and the “Discharge Permit Approval Conditions”, “Reentry and Completion Report Waste Disposal Well No. 2”, and “Reentry and Completion Report Waste Disposal Well No. 3”.

TABLE II TABULATION OF WELLS WITHIN 1 MILE OF THE INJECTION WELLS

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1	30-015-00693	GEORGE A CHASE & C SERVICE DELHI #001	36 17S 27E A 330N 330E	528	T/A O	8/30/1941
2	30-015-00694	DELHI OIL CORP. STATE #013	36 17S 27E A 990N 990E	1993	P&A O	6/24/1948 6/24/1948
3	30-015-00646	GEORGE A CHASE & C SERVICE DELHI #007	36 17S 27E A 990N 330E	540	T/A O	4/21/1950
4	30-015-00668	LEGACY RESERVES OPERATING, LP SOUTH RED LAKE GRAYBURG UNIT #010	36 17S 27E G 1650N 2310E	1736	SHUT IN O	12/6/1947
5	30-015-00690	GEORGE A CHASE & C SERVICE CONKLIN #002	36 17S 27E G 1830N 2205E	532	ACTIVE O	3/6/1949
6	30-015-00667	FAIRWAY RESOURCES OPERATING INC SOUTH RED LAKE GRAYBURG UNIT #011	36 17S 27E G 2310N 2310E	1733	ACTIVE I	3/23/1949
7	30-015-00666	GEORGE A CHASE & C SERVICE CONKLIN #001	36 17S 27E G 2310N 2310E	533	ACTIVE 1/12/10 P&A 9/10/07 O	1/10/1942 9/10/2007
8	30-015-00689	GEORGE A CHASE JR & C SERVICE GATES STATE #001	36 17S 27E H 1650N 330E	557	ACTIVE O	8/4/1950
9	30-015-00647	ASPEN OIL INC GATES STATE #002	36 17S 27E H 1650N 990E	551	ACTIVE O	10/21/2003 10/21/2003
10	30-015-00669	GEORGE A CHASE JR & C SERVICE HOMAN #001	36 17S 27E H 2310N 330E	1804	P&A O	5/6/2008 5/6/2008
11	30-015-00688	KERSEY & CO RAMAPO #001	36 17S 27E I 2310S 330E	590	P&A O	10/28/1941 10/28/1941
12	30-015-00670	KERSEY & CO RAMAPO #003	36 17S 27E I 2970N 330E	1857	P&A O	1/3/1950 1/3/1950
13	30-015-00687	KERSEY & CO RAMAPO #002	36 17S 27E I 2310S 990E	1900	P&A G	5/7/1948 5/7/1948

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
14	30-015-00685	ARCO OIL & GAS EMPIRE ABO UNIT G #020	36 17S 27E I 1650S 330E	5980	P&A O	7/10/1989 7/10/1989
15	30-015-00671	ROJO GRANDE COMPANY LLC RAMAPO #003	36 17S 27E J 2310S 2310E	591	ZONE ABAN O	2/13/1942 1/24/2000
16	30-015-01221	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #023	36 17S 27E J 2300S 2300E	1790	ZONE ABAN O	2/27/1948 8/13/2002
17		MARTIN YATES III DOOLEY STATE #3	36 17S 27E J	5865		4/22/1961
18	30-015-05934	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #019A	36 17S 27E J 1650S 1650E	5970	ACTIVE O	2/26/1961
19	30-015-01220	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #022	36 17S 27E K 2310S 2330W	1747	ZONE ABAN O	2/3/1949 7/17/2002
20	30-015-00674	ROJO GRANDE COMPANY LLC RAMAPO #002	36 17S 27E K 2310S 2310W	514	ACTIVE O	5/15/1947
21	30-015-01219	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #021	36 17S 27E K 2310S 1650W	1710	ACTIVE I	1/20/1948
22	30-015-23913	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #043	36 17S 27E K 1650S 1650W	1785	ACTIVE O	12/11/1981
23		MARTIN YATES III DOOLEY STATE ABO #3	36 17S 27E K	5865	ACTIVE O	4/19/1961
24	30-015-00673	ROJO GRANDE COMPANY LLC RAMAPO #001	36 17S 27E K 1650S 2310W	510	ZONE ABAN O	1/24/2000 1/24/2000
25	30-015-00682	ROJO GRANDE COMPANY LLC RAMAPO #004	36 17S 27E N 990S 1650W	541	ZONE ABAN O	1/24/2000 1/24/2000
26	30-015-00683	FAIRWAY RESOURCES OPERATING INC SOUTH RED LAKE GRAYBURG UNIT #028	36 17S 27E N 965S 1650W	1812	ACTIVE I	4/16/1948
27	30-015-01218	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #018	36 17S 27E N 330S 2310W	5925	P&A O	3/11/2009 3/11/2009

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
28	30-015-00684	BURNHAM OIL COMPANY STATE B-6961 NO. 1-A	36 17S 27E O 990S 2310E	1500	P&A O	5/13/1947 5/13/1947
29	30-015-01251	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #019	36 17S 27E O 660S 1980E	6200	P&A O	9/8/1959 4/27/2009
30			36 17S 27E I		MISPLOT OF 14	
31	30-015-00677	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #020	36 17S 27E P 330S 990E	6013	P&A O	4/13/2009 4/10/2009
32	30-015-01616	C F M OIL CO BLAKE STATE #001	30 17S 28E P 330S 990E	615	ACTIVE O	3/7/1953
33	30-015-01638	ALAMO PERMIAN RESOURCES LLC STATE NO. 1	31 17S 28E A 330N 990E	2004	ACTIVE O	7/15/1952 7/15/1952
34	30-015-21594	FINNEY OIL COMPANY POWCO STATE #001	31 17S 28E B 330N 1650E	652	ACTIVE O	11/15/1975
35	30-015-01636	BEDINGFIELD, J E DELHI-STATE NO. 1	31 17S 28E C 330N 2310E	637	P&A O	12/23/1952 12/23/1952
36	30-015-25621	FINNEY OIL COMPANY POWCO STATE #002	31 17S 28E B 980N 1620E	747	ACTIVE O	7/15/1986
37	30-015-01633	GEORGE A CHASE JR DBA G AND C SERVIC ASTON & FAIR A #001	31 17S 28E D 330N 330W	531	ACTIVE O	6/23/1942
38	30-015-01634	ASTON & FAIR STATE 31 NO. 1X	31 17S 28E D 350N 345W	525	NO COMPL O	1/5/1946
39	30-015-01645	MCLAUGHLIN, C T BEDINGFIELD STATE 1 NO. 1	31 17S 28E F 990N 990W	2307	P&A O	2/16/1950 2/16/1950
40	30-015-02666	DORAL ENERGY CORP. HUDSON SAIKIN STATE #001	31 17S 28E E 2310N 330W	1816	ACTIVE O	5/29/1948
41	30-015-24887	DORAL ENERGY CORP. HUDSON SAIKIN STATE #002	31 17S 28E E 2310N 990W	1950	ACTIVE O	7/7/1984

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
42	30-015-01643	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022	31 17S 28E F 2310N 2260W	5971	P&A O	6/7/1960 7/10/2009
43	30-015-01635	GEORGE A CHASE JR DBA G AND C SERVIC ASTON & FAIR #001Y	31 17S 28E F 2310N 2310W	1926	ACTIVE O	5/8/1948
44	30-015-01637	GEORGE A CHASE JR DBA G AND C SERVIC MALCO STATE #001	31 17S 28E G 2310N 2310E	1852	ACTIVE O	10/12/1953
45	30-015-01652	KERSEY & CO BOLING #001	31 17S 28E G 2288N 1625E	6025	ACTIVE O	8/10/1960
46	30-015-10537	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #004	31 17S 28E H 2277N 330E	6180	ACTIVE O	9/23/1965
47	30-015-10833	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #010	31 17S 28E I 1980S 660E	1945	ACTIVE O	6/17/1966
48	30-015-01644	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #024A	31 17S 28E I 1650S 330E	6106	P&A O	4/29/1960 6/12/2009
49	30-015-01642	DORAL ENERGY CORP. STATE FW #001	31 17S 28E J 1650S 2310E	1937	ACTIVE O	12/23/1962
50	30-015-01650	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #023A	31 17S 28E J 1650S 1958E	6094	P&A O	9/17/2003 9/17/2003
51	30-015-01651	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022B	31 17S 28E K 1650S 2387W	6046	P&A O	4/10/1960 10/22/2009
52	30-015-01640	DORAL ENERGY CORP. RAMPO #002	31 17S 28E L 2310S 330W	1996	ACTIVE O	7/16/1955
53	30-015-01648	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #021A	31 17S 28E L 1651S 1089E	5971	ZONE ABAN O	8/24/2002 8/24/2002
54	30-015-01639	DORAL ENERGY CORP. RAMPO #001	31 17S 28E M 990S 330W	1975	ACTIVE O	5/1/1948
55	30-015-01647	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #021	31 17S 28E M 660S 660W	6006	P&A O	1/31/1960 7/23/2005

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
56	30-015-01646	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022A	31 17S 28E N 660S 2082W	6050	P&A O	1/22/1960
57	30-015-10118	DORAL ENERGY CORP. STATE FV #001	31 17S 28E N 766S 2188W	1938	ACTIVE O	3/1/1963
58	30-015-01653	OTIS A ROBERTS PARKER-STATE NO. 1	31 17S 28E O 990S 1650E	742	P&A O	1/18/1942 1/18/1942
59	30-015-27592	NAVAJO REFINING CO. PIPELINE DIVISION WDW #001	31 17S 28E 660S 2310E	10200	ACTIVE I	8/4/1998
60	30-015-01649	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #023	31 17S 28E O 660S 1939E	6094	P&A O	2/24/1960 8/14/2009
61	30-015-20042	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #011	31 17S 28E P 990S 660E	2012	ACTIVE O	5/8/1967
62	30-015-01641	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #024	31 17S 28E P 660S 660E	6122	ACTIVE O	3/12/1960
63	30-015-01654	BEDINGFIELD, J E ASTON-STATE NO. 1	32 17S 28E D 330N 330W	651	P&A O	5/12/1953 5/12/1953
64	30-015-01671	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #025B	32 17S 28E E 2280N 978W	6013	P&A O	9/13/1960 8/14/2008
65	30-015-01657	MARBOB ENERGY CORP AA STATE NO. 1	32 17S 28E F 2280N 1980W	6171	ACTIVE O	8/24/1960
66	30-015-10818	SDX RESOURCES INC NORTHWEST ARTESIA UNIT #008	32 17S 28E K 2310S 2105W	2003	P&A O	11/6/2006 11/6/2006
67	30-015-01661	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #026B	32 17S 28E K 1650S 2310W	6083	ACTIVE O	3/27/1960
68	30-015-10795	LIME ROCK RESOURCES A, LP NORTHWEST ARTESIA UNIT #009	32 17S 28E L 2310S 660W	1930	P&A O	5/15/1966 5/28/2008
69	30-015-01662	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #025A	32 17S 28E L 1650S 990W	6075	ACTIVE O	4/13/1960

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
70	30-015-20043	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #012	32 17S 28E M 990S 760W	1998	ACTIVE O	5/9/1967
71	30-015-01660	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #025	32 17S 28E M 660S 660W	6132	P&A O	3/5/1960 1/14/2009
72	30-015-10834	SDX RESOURCES INC NORTHWEST ARTESIA UNIT #013	32 17S 28E N 990S 2030W	1954	P&A O	9/15/2006 9/15/2006
73	30-015-01659	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #026A	32 17S 28E N 660S 1980W	6172	ACTIVE O	2/14/1960
74	30-015-21539	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #261	32 17S 28E N 150S 1400W	6220	ACTIVE O	7/25/1975
75	30-015-22009	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #272	32 17S 28E O 330S 2481E	6370	ACTIVE O	7/18/1977
76	30-015-02606	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #026E	5 18S 28E C 330N 1941W	6254	ACTIVE O	7/18/1960
77	30-015-22697	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #261A	5 18S 28E C 1080N 1914W	6350	P&A O	1/4/1979 6/16/2009
78	30-015-02607	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #025C	5 18S 28E D 660N 660W	6273	ACTIVE O	3/27/1960
79	30-015-22750	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #251	5 18S 28E D 660N 150W	6250	SHUT IN O	1/12/1979
80	30-015-02608	CONOCOPHILLIPS COMPANY STATE E AI #001	5 18S 28E E 1660N 330W	6265	P&A O	1/13/2006 1/13/2006
81	30-015-24485	CONOCOPHILLIPS COMPANY ILLINOIS CAMP A COM #001	5 18S 28E E 1980N 990W	10450	ACTIVE G	8/10/1983
82	30-015-02602	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #026D	5 18S 28E F 1650N 1650W	6265	ACTIVE O	12/30/1959
83	30-015-25522	I & W INC WALTER SOLT STATE #001	5 18S 28E L 2240S 400W	8500	ACTIVE S	8/12/1983

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
84	30-015-10244	MACK ENERGY CORP STATE AG #001	5 18S 28E L 2310S 330W	6365	ZONE ABAN O	3/27/2001 3/27/2001
87	30-015-20019	LIME ROCK RESOURCES A, LP NORTHWEST ARTESIA UNIT #016	6 18S 28E A 330N 330E	3280	ACTIVE O	3/14/1967
88	30-015-02615	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #024B	6 18S 28E A 660N 660E	6241	ACTIVE O	2/29/1960
89	30-015-02625	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #023C	6 18S 28E B 470N 2170E	6194	T/A O	12/21/1959
90	30-015-21542	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #231	6 18S 28E B 1260N 1580E	6250	ACTIVE O	11/1/1975
91	30-015-02621	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022E	6 18S 28E C 660N 1980W	6033	ACTIVE O	12/29/1959
92	30-015-21626	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #231A	6 18S 28E G 1361N 2531E	6380	SHUT IN O	10/22/1975
93	30-015-02613	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #021B	6 18S 28E D 990N 660W	6119	ACTIVE O	12/30/1959
94	30-015-23116	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #213	6 18S 28E E 2050N 100W	6225	ACTIVE O	6/2/1980
95	30-015-02619	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #021C	6 18S 28E E 1990N 660W	6202	ACTIVE O	10/30/1959
96	30-015-22637	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #212	6 18S 28E E 2450N 400W	6267	ACTIVE O	12/28/1978
97	30-015-21395	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #211	6 18S 28E E 2630N 1300W	6200	ACTIVE O	2/11/1975
98	30-015-22012	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #222	6 18S 28E F 1350N 1572W	6303	ACTIVE O	3/13/1977
99	30-015-02626	SARKIN, DAVID C & OLIVER, HENRY F STATE NO. 1	6 18S 28E F 1650N 1650W	705	P&A O	2/21/1942 2/21/1942

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
100	30-015-10107	DORAL ENERGY CORP STATE FX #001	6 18S 28E F 1874N 1874W	1985	ACTIVE O	8/8/1963
101	30-015-02620	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022D	6 18S 28E F 1990N 2082W	6206	ACTIVE O	11/26/1959
102	30-015-22527	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #223	6 18S 28E F 2630N 1930W	6250	ACTIVE O	5/19/1978
103	30-015-21746	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #221	6 18S 28E F 2610N 2713W	6305	ACTIVE O	4/23/1976
104	30-015-22913	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #235	6 18S 28E G 1750N 1600E	6300	ACTIVE O	7/8/1979
105	30-015-22593	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #234	6 18S 28E G 1900N 2441E	6260	P&A O	8/27/1978 12/3/2008
106	30-015-02614	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #023B	6 18S 28E G 1980N 1980E	6242	ACTIVE O	1/26/1960
107	30-015-21737	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #232	6 18S 28E G 2253N 1576E	6345	P&A O	4/13/1976 5/7/2009
108			6 18S 28E H		MISPLOT OF 107	
109	30-015-22490	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #233	6 18S 28E G 2550N 2050E	6300	P&A O	6/5/1978 4/3/2009
110	30-015-02616	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #024C	6 18S 28E H 1650N 990E	6253	ACTIVE O	3/24/1960
111	30-015-23547	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #241	6 18S 28E H 1950N 660E	6386	P&A O	4/12/1981 9/19/2008
112	30-015-02617	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #024K	6 18S 28E I 2310S 990E	6350	P&A O	12/12/2002 12/12/2002
113	30-015-22528	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #232A	6 18S 28E J 2300S 1570E	6350	P&A O	2/5/1979 4/7/2009

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
114	30-015-02611	BARNEY COCKBURN STATE NO. 1	6 18S 28E J 2310S 2310E	2095	P&A O	8/15/1949 8/15/1949
115	30-015-02628	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #023D	6 18S 28E J 2260S 2270E	6310	ACTIVE O	5/23/1979
116	30-015-22491	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #231B	6 18S 28E J 1700S 2350E	6350	P&A O	8/13/1978 9/2/2009
117	30-015-02618	MILLER BROS OIL CO CAPITOL STATE NO. 1	6 18S 28E J 1647S 2076E	2396	P&A G	3/21/1955 3/21/1955
118	30-015-02623	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022F	6 18S 28E K 2248S 2075W	6210	ACTIVE O	2/22/1960
119			6 18S 28E K		MISPLOT	
120		NAVAJO REFINING COMPANY WDW-2 (ORIGINAL LOCATION)	6 18S 28E L			
121	30-015-02622	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #021D	6 18S 28E L 2219S 660W	6194	ACTIVE O	1/23/1960
122	30-015-23548	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #211A	6 18S 28E L 1950S 1000W	6312	ACTIVE O	7/17/1980
123	30-015-02627	RUTH OIL CO, LLC STATE M-AI #002	6 18S 28E M 949S 990W	6225	ACTIVE O	10/21/1960
124	30-015-26943	MEWBOURNE OIL CO CHALK BLUFF 6 STATE #001	6 18S 28E M 990S 730W	10200	ACTIVE G	4/16/1992
125	30-015-02610	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #022C	6 18S 28E N 955S 1750W	6243	ACTIVE O	8/5/1960
126	30-015-02624	PAN AMERICAN PETROLEUM CO STATE CD NO. 1	6 18S 28E O 968S 2270E	6412	P&A O	5/1/1961 5/1/1961
127	30-015-25503	DICKSON PETROLEUM CO KIMBERLY STATE NO. 1	6 18S 28E P 660S 330E	1750	P&A O	12/30/1985 12/30/1985

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
128	30-015-02612	D & H OIL CO STATE NO. 1	6 18S 28E P 330S 330E	2246	P&A O	5/13/1952 5/13/1952
129	30-015-01215	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #020D	1 18S 27E A 667N 666E	6118	ACTIVE O	11/5/1959
130	30-015-00708	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #019B	1 18S 27E B 660N 1980E	6078	ACTIVE O	7/7/1959
131		MALCO REFINERIES HILL #4	1 18S 27E C	1840	P&A	5/10/1948 5/10/1948
132			1 18S 27E C		MISPLOT	
133	30-015-00710	MARBOB ENERGY CORP AAO FEDERAL No. 013	1 18S 27E C 660N 1980W	6173	ACTIVE O	7/21/2004
134	30-015-26741	MEWBOURNE OIL CO CHALK BLUFF FEDERAL COM #002	1 18S 27E F 1650N 1350W	10140	ACTIVE G	8/24/1991
135	30-015-00706	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #018A	1 18S 27E F 2310N 1980W	6087	ACTIVE O	5/31/1959
136	30-015-00709	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #019C	1 18S 27E G 1980N 1980E	6205	ACTIVE O	8/2/1959
137			1 18S 27E G		MISPLOT	
138	30-015-21552	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #191	1 18S 27E G 2500N 2500E	6259	ACTIVE O	9/7/1975
139	30-015-00711	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #020C	1 18S 27E H 1980N 660E	6218	ACTIVE O	10/13/1959
140	30-015-21783	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #202	1 18S 27E H 2490N 1299E	6296	ACTIVE O	5/13/1976
141	30-015-22656	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #203	1 18S 27E H 2400N 700E	6225	ACTIVE O	10/10/1978

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
142		MANHATTAN OIL CRONIN #1	1 18S 27E H	2900	P&A	7/1/1927 7/1/2027
143	30-015-21553	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #201	1 18S 27E H 2501N 20E	6225	ACTIVE O	7/19/1975
144	30-015-27163	MEWBOURNE OIL CO CHALK BLUFF FEDERAL COM #003	1 18S 27E I 1980S 990E	10150	ACTIVE G	1/16/1993
145	30-015-00697	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #020K	1 18S 27E I 1980S 660E	6185	P&A O	1/5/2003 1/5/2003
146	30-015-22657	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #193	1 18S 27E J 2490S 2200E	6225	ACTIVE O	10/26/1978
147	30-015-00696	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #019Q	1 18S 27E J 1980S 1980E	6180	ACTIVE O	8/20/1959
148	30-015-22560	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #192	1 18S 27E J 220S 1390E	6250	ACTIVE O	6/25/1978
149	30-015-21873	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #191A	1 18S 27E J 1526S 1470E	6350	ACTIVE O	9/23/1976
150	30-015-22658	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #194	1 18S 27E J 1500S 2130E	6325	ACTIVE O	11/14/1978
151	30-015-22559	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #184	1 18S 27E K 2290S 2445W	6200	SHUT IN O	7/25/1978
152	30-015-22096	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #183	1 18S 27E K 2370S 1510W	6210	ACTIVE O	7/24/1977
153	30-015-21554	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #181	1 18S 27E K 1367S 1440W	6203	P&A O	4/17/2003 4/17/2003
154	30-015-00707	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #018B	1 18S 27E K 1980S 1980W	6163	ACTIVE O	5/22/1959
155	30-015-21792	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #182	1 18S 27E K 1533S 2370W	6369	ACTIVE O	6/1/1976

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
156	30-015-00713	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #018D	1 18S 27E N 995S 1644W	6174	P&A O	9/27/2003 9/27/2003
157	30-015-26575	NAVAJO REFINING COMPANY WDW-3	1 18S 27E N 790S 2250W	10120	ACTIVE I	3/7/1991
158	30-015-20394	HUMBLE OIL & REFINING CO EMPIRE ABO FEDERAL NO. 5	1 18S 27E O 953S 2197E	6300	P&A O	4/9/1971 4/9/1971
159	30-015-00698	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #191	1 18S 27E O 660S 1980E	6365	ACTIVE S	11/8/1959
160	30-015-00699	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #020B	1 18S 27E P 940S 330E	6250	ACTIVE O	12/2/1961
161	30-015-26404	DEVON ENERGY PRODUCTION COMPANY L FEDERAL T #001	12 18S 27E A 660N 990E	10141	ACTIVE I	9/13/1990
162	30-015-25099	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #006	12 18S 27E H 1809N 990E	1652	ACTIVE O	9/11/1985
165	30-015-25997	EASTLAND OIL CO LAUREL STATE #001	7 18S 28E C 940N 1757W	1690	ACTIVE O	2/23/1987
166	30-015-25675	EASTLAND OIL CO LAUREL STATE #002	7 18S 28E E 940N 1757W	1690	ACTIVE O	11/10/1988
167	30-015-25236	MOREXCO INC STATE BY #001	7 18S 28E F 1980N 1980W	10400	ACTIVE O	6/10/1985
168	30-015-22636	DYAD PE PRE-ONGUARD WELL #213	7 18S 28E J 1950N 1300W		ABAN LOCATION O	
169	30-015-22635	DYAD PE PRE-ONGUARD WELL #212	8 18S 28E J 1900N 100W		ABAN LOCATION O	
170	30-015-24372	DYAD PE PRE-ONGUARD WELL #001	8 18S 28E J 1980S 990E		ABAN LOCATION O	
171	30-015-27636	PHILLIPS PETROLEUM CHALK BLUFF 6 STATE #002	7 18S 28E H 2310N 810E		ABAN LOCATION O	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
353	30-015-27286	MEWBOURNE OIL CO CHALK BLUFF 36 STATE #001	36 17S 27E M 660S 990W	10060	ACTIVE O	3/30/1993
354	30-015-24612	PRONGHORN MANAGEMENT CORP STATE M #001	36 17S 27E M 790S 990W	1451	P&A O	10/11/1983 4/21/2009
355	30-015-00676	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #017	36 17S 27E M 330N 990W	5797	ACTIVE O	
356	30-015-10184	ASPEN OIL INC STATE #006	36 17S 27E M 330S 920W	1343	ACTIVE O	
358	30-015-21623	GEORGE A CHASE JR & C SERVICE STATE #007	36 17S 27E M 360S 455W	1366	ACTIVE O	
359	30-015-00662	ACREY, B L & F D STATE NO. 2	36 17S 27E M 330S 330W	592	P&A O	10/15/1942 10/15/1942
595	30-015-02605	BP AMERICA PRODUCTION UNIT EMPIRE ABO UNIT NO. 27 E	5 18S 28E B 930N 2271E	6261	P&A O	3/30/1960 6/12/2009
748	30-015-00701	FAIRWAY RESOURCES OPERATING LLC SOUTH RED LAKE GRAYBURG UNIT 37 WIW	1 18S 27E D 330N 330W	1835	ACTIVE O	
748	30-015-00715	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #037	1 18S 27E D 330N 330W	1835	ACTIVE I	
749	30-015-00712	ARCO OIL & GAS EMPIRE ABO UNIT I NO. 17	1 18S 27E D 647N 667W	5900	P&A O	1/24/1987 1/24/1987
750		JONES BRAINARD	1 18S 27E E 1650N 330W	481	P&A O	5/10/1939 5/10/1939
751	30-015-00704	ARCO OIL & GAS EMPIRE ABO UNIT J NO. 17	1 18S 27E E 1980N 660W	5960	P&A O	3/26/1959 3/26/1959
752	30-015-00703	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #017A	1 18S 27E L 1980S 660W	6091	P&A O	5/22/1995 3/27/2009
753	30-015-22815	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #171	1 18S 27E M 670S 330W	6300	ACTIVE O	5/22/1979

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
754			1 18S 27E M		MISPLOT OF 756	
755	30-015-00714	VALLEY REFINING CO HILL #1	1 18S 27E N	2404	P&A	12/20/1943 12/20/1943
756	30-015-00705	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #017B	1 18S 27E M 990S 660W	6150	P&A O	6/25/1959 7/21/2004
757		BRAINARD & GUY STATE 2	2 18S 27E A 330N 610E	530	NO COMPL	1/31/1942 1/31/1942
758	30-015-00721	FAIRWAY RESOURCES OPERATING LLC SOUTH RED LAKE GRAYBURG UNIT #036	2 18S 27E A 330N 990E	1705	SHUT IN O	11/6/1947
765	30-015-00724	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #016B	2 18S 27E A 990N 330E	5920	ACTIVE O	
766	30-015-00737	FAIRWAY RESOURCES OPERATING LLC SOUTH RED LAKE GRAYBURG UNIT #038	2 18S 27E B 905N 1601E	1722	ACTIVE O	5/23/1948
772	30-015-00745	MACK ENERGY CORPORATION STATE H #001	2 18S 27E H 1980N 660E	6140	P&A O	3/7/2008 3/7/2008
773	30-015-00742	S&J OPERATING COMPANY SOUTH RED LAKE GRAYBURG UNIT 39 WIW	2 18S 27E H 1650N 990E	1742	P&A O	2/8/1991 2/8/1991
774	30-015-00740	MCQUADRANGLE, LC SOUTH RED LAKE GRAYBURG UNIT #040	2 18S 27E G 1650N 2197E	1707	P&A I	7/10/2002 7/10/2002
778		RUTTER & WILBANKS HUDSON #2	2 18S 27E G 2310N 1650E		 O	1/1/1957
779	30-015-00741	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #015B	2 18S 27E G 2310N 1980E	5880	ACTIVE O	6/6/1959
781		MALCO REFINING CO STATE B-2	2 18S 27E J 2310S 2310E	4164	P&A O	1/1/1947 1/1/1947
785	30-015-00717	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #016	2 18S 27E I 1980S 660E	6114	ACTIVE O	2/6/1995

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
786	30-015-00716	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #015	2 18S 27E J 1980S 1830E	6100	ACTIVE O	3/23/1959
789	30-015-22896	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #143A	2 18S 27E K 1820S 2550W	6108	ACTIVE O	5/13/1979
791	30-015-22914	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #161	2 18S 27E I 1310S 590E	6225	ACTIVE O	9/13/1979
792			2 18S 27E O		MISPLOT OF 814	
793	30-015-22609	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #143	2 18S 27E N 1200S 1900W	6093	ACTIVE O	12/20/1978
795			2 18S 27E P		MISPLOT OF 765	
796	30-015-21544	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #151	2 18S 27E O 1110S 1322E	6285	T/A O	11/4/1975
797	30-015-22885	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #155	2 18S 27E O 1040S 2025E	6202	T/A O	5/1/1979
799	30-015-00722	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #016A	2 18S 27E P 660S 660E	6115	P&A O	1/20/1959 2/24/2009
800	30-015-22808	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #156	2 18S 27E O 600S 1330E	6225	P&A O	4/12/1979 2/5/2009
801	30-015-00731	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #015A	2 18S 27E O 660S 1980E	6220	P&A O	11/19/1958 2/11/2009
802	30-015-22669	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #154	2 18S 27E O 800S 2500E	6200	P&A O	12/4/1978 1/27/2009
805	30-015-22013	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #153	2 18S 27E O 90S 1456E	6303	P&A O	4/20/1977 10/30/2008
806	30-015-21825	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #152	2 18S 27E O 320S 2602E	6335	T/A O	6/17/1976

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
807	30-015-22608	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #142	2 18S 27E N 100S 1950W	6200	P&A (No Info on dates) O	
808	30-015-21807	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #132	2 18S 27E M 275S 1243W	6200	ACTIVE O	7/1/1976
812	30-015-00730	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #014	2 18S 27E N 660S 1980W	6112	ACTIVE O	10/21/1958
813	30-015-00720	BP AMERICA PRODUCTION COMPANY RIVERWOLF UNIT #004	2 18S 27E A 990N 1650E	5881	P&A O	10/21/1959 12/12/2008
814	30-015-22051	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #141A	2 18S 27E K 1370S 2445W	6203	ACTIVE O	5/17/1977
836	30-015-00869	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #016C	11 18S 27E A 330N 653E	6211	P&A O	10/25/2004 10/25/2004
837	30-015-22568	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #151B	11 18S 27E B 400N 1450E	6310	P&A O	8/16/2006 8/16/2006
838	30-015-22838	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #153B	11 18S 27E B 200N 1925E	6252	P&A O	5/6/1979 1/4/2009
839	30-015-00868	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #015C	11 18S 27E B 660N 1980E	6260	P&A O	7/16/2004 7/16/2004
840	30-015-22569	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #152B	11 18S 27E B 560N 2588E	6300	P&A O	8/23/1978 9/24/2008
841	30-015-22834	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #141B	11 18S 27E C 225N 2280W	6225	ACTIVE O	5/21/1979
842	30-015-00864	ARCO OIL & GAS EMPIRE ABO UNIT M NO. 14	11 18S 27E C 660N 1980W	6315	P&A O	9/5/1957 9/5/1957
843	30-015-22833	BP AMERICA PRODUCTION COMPANY EMPIRE ABO UNIT #133B	11 18S 27E D 450N 1175W	6225	ACTIVE O	5/23/1979
844	30-015-00867	ARCO OIL & GAS EMPIRE ABO UNIT M NO. 13	11 18S 27E D 660N 660W	6114	P&A O	4/26/1958 4/26/1958

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
846	30-015-22556	ARCO OIL & GAS EMPIRE ABO UNIT M NO. 131	11 18S 27E D 1100N 1200W	6325	P&A O	7/10/1978 7/10/1978
848	30-015-20510	AMOCO PRODUCTION CO MALCO S NO. 1	11 18S 27E F 1650N 1653W	10168	P&A O	10/16/1971 10/16/1971
849	30-015-00865	ARCO OIL & GAS EMPIRE ABO UNIT N NO. 14	11 18S 27E F 1650N 1980W	6208	P&A O	2/3/1961 2/3/1961
850	30-015-00866	ARCO OIL & GAS EMPIRE ABO UNIT N NO. 131	11 18S 27E E 1980N 660W	6120	P&A O	3/27/1958 3/27/1958
851	30-015-00870	AMOCO PRODUCTION CO SMITH-MCPHERSON NO. 1	11 18S 27E J 1980S 1980E	7270	P&A O	9/1/1956 9/1/1956
852	30-015-01201	OSCAR HOWARD AN ETZ #3	11 18S 27E N	1828	P&A	4/15/2027
853	30-015-01202	OSCAR HOWARD AN ETZ #2	11 18S 27E O	1827	P&A	2/4/2027
854	30.015-00863	B.R. POLK, JR. VICKERS #1	11 18S 27E N	1794	P&A	10/14/1949 10/14/1949
855	30-015-24857	CHESAPEAKE OPERATING INC FEDERAL DH GAS COM #001	11 18S 27E M 700S 990W	11915	ACTIVE G	5/18/1984
856	30-015-20535	ROBERT G COX FEDERAL EA 2	12 18S 27E D 330N 455W	6248	P&A O	8/7/1973 8/7/1973
857	30-015-00871	RHONDA OPERATING CO FEDERAL EA #001	12 18S 27E D 330N 330W	6253	P&A O	4/12/1994 4/12/1994
858	30-015-23115	RHONDA OPERATING CO FEDERAL EA NO. 3	12 18S 27E D 330N 380W	6295	D&A O	3/16/1980 3/16/1980
859	30-015-25738	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #009	12 18S 27E G 2310N 2310E	1586	ACTIVE O	4/25/1987
860	30-015-25270	BILL MILLER CHUKKA FEDERAL #001	12 18S 27E F 2310N 2310W	1600	ACTIVE O	4/23/1985

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
861	30-015-20894	NAVAJO REFINING COMPANY WDW #002	12 18S 27E E 1980N 660W	10372	ACTIVE I	7/18/1973
862	30-015-00874	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #007	12 18S 27E J 2310S 2355E	3664	ACTIVE O	6/29/1948
863	30-015-00872	MCKEE-JONES MAGRUDER NO. 1	12 18S 27E L 310S 990W	594	D&A O	2/18/1943
864	30-015-25201	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #002	12 18S 27E K 1650S 1770W	1600	ACTIVE O	3/16/1985
865	30-015-25649	FRED POOL DRILLING CO COMSTOCK FEDERAL NO. 8	12 18S 27E L 1650S 990W	2000	D&A O	10/10/1986
866	30-015-25545	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #003	12 18S 27E M 990S 990W	1530	ACTIVE O	5/19/1986
867	30.015-00873	R.E. McKEE ET AL MAGRUDER #2	12 18S 27E M	2510	P&A	2/27/1945 2/27/1945
868	30-015-26017	EASTLAND OIL CO COMSTOCK FEDERAL #010	12 18S 27E N 990S 1650W	2040	P&A O	1/23/2003 1/23/2003
869	30-015-25100	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #001	12 18S 27E N 330S 1650W	2400	ACTIVE O	12/10/1984
870	30-015-25202	HARLOW ENTERPRISES LLC COMSTOCK FEDERAL #005	12 18S 27E O 330S 2310E	1625	ACTIVE O	4/19/1985
871	30-015-06171	PILCHER OIL & GAS MICHAEL CRONIN NO. 3	12 18S 27E I 1069S 251E	2200	P&A O	5/20/2026
872		PILCHER OIL & GAS MICHAEL CRONIN #1	12 18S 27E P	2002	P&A	2/15/1932 2/15/1932
873	30-015-00875	CITIES SERVICE OIL CO MAGRUDER NO. B-4	12 18S 27E P 330S 330E	2000	P&A O	7/30/1952 7/30/1952
874	30-015-00876	ROBERT E MCKEE MAGRUDER NO. 5	12 18S 27E P 100S 500E	1994	P&A O	2/8/1954 2/8/1954

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875	30-015-06170	PILCHER OIL & GAS MICHAEL CRONIN NO. 2	12 18S 27E P 200S 200E	2004	P&A O	2/22/2026
876	30-015-01200	HASSENFUSH-DONNELLY STATE NO. 1	13 18S 27E A 0 0	2030	P&A O	1/1/2026
877	30-015-06137	EASTLAND OIL CO STATE NO. 2	13 18S 27E A 250N 990E	2696	D&A O	1/1/2026
878	30-015-25394	BILL MILLER ARTESIA STATE #002	13 18S 27E C 330N 2310W	1613	ACTIVE O	9/28/1985
879	30-015-25241	BILL MILLER ARTESIA STATE #001	13 18S 27E C 330N 1650W	1575	ACTIVE O	4/13/1985
880	30-015-00884	DALE RESLER STATE NO. 3	13 18S 27E C 990N 1650W	2047	P&A O	1/29/1945 1/29/1945
881	30-015-25370	CBS OPERATING CORP ARTESIA STATE UNIT #002A	13 18S 27E D 480N 940W	1608	ACTIVE O	8/27/1985
882	30-015-00883	CBS OPERATING CORP ARTESIA STATE UNIT #001	13 18S 27E D 990N 990W	1950	ACTIVE O	12/11/1944
883	30-015-00880	DALE RESLER - JONES STATE NO. 1	13 18S 27E E 1650N 990W	2353	P&A O	1/26/1945 1/26/1945
884	30-015-24881	DAVID G HAMMOND ANADARKO 13 FEDERAL #001	13 18S 27E F 1880N 1830W	3020	ACTIVE O	6/18/1984
885	30-015-00888	RALPH NIX & JERRY CURTIS PAGE NO. 1	13 18S 27E F 1980N 1650W	2000	P&A O	11/28/1954 11/28/1954
886	30-015-00879	DALE RESLER JONES-GOVT NO. 1	13 18S 27E F 2310N 1650W	2000	D&A O	3/14/1945 3/14/1945
888	30-015-25078	DICKSON PETROLEUM, INC ANADARKO 13 FEDERAL NO. 1	13 18S 27E G 1724N 2279E	2150	D&A O	12/30/1984 12/30/1984
895	30-015-00891	ANADARKO PETROLEUM CORP ARTESIA STATE UNIT TRACT 4 NO. 1	14 18S 27E A 990N 330E	2060	P&A O	6/30/1944 6/30/1944

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
896	30-015-00893	RESLER STATE NO. 1	14 18S 27E G 1650N 1650E	2375	D&A O	1/1/1900 1/1/1900
897	30-015-00895	CBS OPERATING CORP ARTESIA STATE UNIT #001B	14 18S 27E H 1650N 330E	1888	ACTIVE O	2/8/1945
901	30-015-00695	WILLIAM & EDWARD HUDSON HILL NO. 1	1 18S 27E L 1650S 330W	1763	D&A O	6/18/1948 6/18/1948
910	30-015-00744	COMPTON-SMITH STATE 1	2 18S 27E J 2310S 1640E	1080	P&A O	
911	30-015-31123	LIME ROCK RESOURCES A, LP NO BLUFF 36 STATE COM #002	36 17S 27E H 1980N 760E	10050	ACTIVE G	
912	30-015-31036	GEORGE A CHASE JR & C SERVICE GATES STATE #003	36 17S 27E H 2310N 990E	614	ACTIVE O	
916	30-015-31592	ROJO GRANDE COMPANY LLC RAMAPO #007	36 17S 27E N 330S 2310E	612	P&A O	12/21/2001 12/21/2001
917	30-015-30784	VANGUARD OPERATING LLC NW STATE #012	31 17S 28E A 330N 480E	3300	ACTIVE O	
918	30-015-30893	VANGUARD OPERATING LLC NW STATE #028	31 17S 28E A 973N 959E	2808	ACTIVE O	
919	30-015-32162	VANGUARD OPERATING LLC ENRON STATE #004	31 17S 28E D 460N 990W	3460	ACTIVE O	4/3/2003
920	30-015-30783	VANGUARD OPERATING LLC NW STATE #011	31 17S 28E H 1650N 330E	3205	ACTIVE O	
921	30-015-30849	VANGUARD OPERATING LLC NW STATE #009	31 17S 28E I 2310S 270E	3195	ACTIVE O	
922	30-015-30760	VANGUARD OPERATING LLC NW STATE #010	31 17S 28E P 735S 330E	3210	ACTIVE O	
923	30-015-31920	VANGUARD OPERATING LLC ENRON STATE #002	32 17S 28E D 990N 990W	4030	ACTIVE O	

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924	30-015-30781	LIME ROCK RESOURCES A, LP NW STATE #005	32 17S 28E K 1900S 2146W	3190	ACTIVE I	
925	30-015-30777	VANGUARD OPERATING LLC NW STATE #006	32 17S 28E L 2310S 990W	3204	ACTIVE O	
926	30-015-30685	VANGUARD OPERATING LLC NW STATE #007	32 17S 28E M 990S 990W	3220	ACTIVE O	
927	30-015-30815	VANGUARD OPERATING LLC NW STATE #008	32 17S 28E N 1090S 2126W	3310	ACTIVE I	
928	30-015-32310	MARBOB ENERGY CORP AAO FEDERAL #004	1 18S 27E A 990N 990E	4000	ACTIVE O	5/4/2004
929	30-015-32309	MARBOB ENERGY CORP AAO FEDERAL #003	1 18S 27E B 330N 1690E	4125	ACTIVE O	4/10/2003
930	30-015-32308	MARBOB ENERGY CORP AAO FEDERAL #002	1 18S 27E C 430N 2310W	4150	ACTIVE O	9/19/2002
931	30-015-32307	MARBOB ENERGY CORP AAO FEDERAL #001	1 18S 27E D 330N 990W	3851	ACTIVE O	12/10/2002
932	30-015-22816	ARCO OIL & GAS EMPIRE ABO UNIT L #192	1 18S 27E O 1120S 1440E	6350	ABAN LOCATION O	6/28/1980 6/23/1980
933	30-015-20388	ARCO OIL & GAS EMPIRE ABO #5	1 18S 27E N 990S 2297E	6300	SAME AS 158 O	12/31/9999
934	30-015-27719	MEWBOURNE OIL CO CHALK BLUFF 12 FED #001	12 18S 27E 1650S 990E		ABAN LOCATION G	
935	30-015-27437	YATES PETROLEUM CORPORATION BEAUREGARD ANP STATE COM #001	14 18S 27E B 660N 1980E	0	ABAN LOCATION G	
936	30-015-31086	MARBOB ENERGY CORP LP STATE #001	5 18S 28E E 1650N 990W	4503	P&A O	3/11/2008 3/11/2008
937	30-015-31109	MARBOB ENERGY CORP LP STATE #002	5 18S 28E E 2301N 230W	0	PROPOSED O	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
938	30-015-30785	LIME ROCK RESOURCES A, LP NW STATE #015	6 18S 28E A 430N 330E	3225	ACTIVE O	
939	30-015-00264	BARNEY COCKBURN CAPITAL STATE NO. 1	6 18S 28E J 2310S 2310E	2095	SAME AS 114 O	5/23/1979
940	30-015-31087	MARBOB ENERGY CORP LP STATE #003	6 18S 28E M 990S 330W	4466	P&A O	7/15/2000 3/17/2008
941	30-015-31088	MARBOB ENERGY CORP LP STATE #004	6 18S 28E M 330S 990W	0	PROPOSED O	
942	30-015-06250	BP AMERICA PRODUCTION COMPANY	6 18S 28E O 470S 2170E	0	SAME AS 89 O	
943	30-015-31319	EASTLAND OIL CO LAUREL STATE #003	7 18S 28E E 2310N 330W	1630	ACTIVE O	1/31/2001
944	30-015-26575	NAVAJO REFINING COMPANY WDW-3 (ORIGINAL LOC.)	6 18S 28E D 778N 995W		ACTIVE I	
945	30-015-32959	MARBOB ENERGY CORP AAO FEDERAL #005	1 18S 27E E 1650N 875W	3900	ACTIVE O	10/12/2004
946	30-015-33473	MARBOB ENERGY CORP AAO FEDERAL #007	1 18S 27E G 1750N 1650S	4100	ACTIVE O	4/4/2005
947	30-015-33784	MARBOB ENERGY CORP AAO FEDERAL #008	1 18S 27E H 1650N 330W	4310	ACTIVE O	2/25/2005
948	30-015-34071	MARBOB ENERGY CORP AAO FEDERAL #006	1 18S 27E F 2169N 1963W	4000	ACTIVE O	8/5/2005
949	30-015-34387	MARBOB ENERGY CORP AAO FEDERAL #009	1 18S 27E L 1980S 630W	3950	ACTIVE O	1/17/2006
950	30-015-34555	MARBOB ENERGY CORP AAO FEDERAL #011	1 18S 27E M 890S 660W	4100	ACTIVE O	3/9/2006
951	30-015-34576	MARBOB ENERGY CORP AAO FEDERAL #010	1 18S 27E K 2060S 2160W	4000	ACTIVE O	10/26/2006

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952	30-015-34998	MARBOB ENERGY CORP AAO FEDERAL #012	1 18S 27E N 890S 1650W	4075	ACTIVE O	9/21/2006
953	30-015-34028	BP AMERICA PRODUCTION COMPANY SLIDER 6 STATE NO. 001	6 18S 28E G 2285N 1366E	10433	P&A O	12/17/2006 12/17/2006
954	30-015-35050	VANGUARD OPERATING LLC ENRON STATE NO 012	32 17S 28E D 330N 500W	3810	ACTIVE O	12/21/2006
955	30-015-36939	YATES PETROLEUM CORP VIOLET BIV STATE COM #1	14 18S 27E A 660N 990E	10500	EXT PERMIT TO DRILL O	2/20/2009
956	30-015-33994	EDGE PETROLEUM OPERATING COMPANY, RED LAKE 36 A STATE #2	36 17S 27E A 915N 420E	3650	ACTIVE O	4/20/2005
957	30-015-36116	LEGACY RESERVES OPERATING LP SOUTH RED LAKE UNIT II #57	36 17S 27E G 2305N 1650E	2100	ACTIVE O	6/6/2008
958	30-015-32946	MARBOB ENERGY CORPORATION SCBP STATE #1	2 18S 27E J 2210S 1650E	3880	ACTIVE O	4/26/2005
959	30-015-35814	MACK ENERGY CORPORATION STATE H NO 2	2 18S 27E H 2063N 441E	7545	ACTIVE O	1/11/2008
960	30-015-36343	GEORGE A CHASE JR DBA G AND C SERVIC MALCO STATE NO. 002	31 17S 28E G 1650N 2310E	633	ACTIVE O	7/9/2008
961	30-015-36978	VANGUARD OPERATING LLC ENRON STATE NO. 015	31 17S 28E D 990N 330W	3700	ACTIVE O	7/3/2009
962	30-015-36554	VANGUARD OPERATING LLC NW STATE NO. 029	32 17S 28E L 1770S 550W	3450	ACTIVE O	1/30/2009
963	30-015-36989	VANGUARD OPERATING LLC NW STATE NO. 030	32 17S 28E K 1630S 1710W	3405	ACTIVE O	7/14/2009
964	30-015-37057	VANGUARD OPERATING LLC NW STATE NO. 031	32 17S 28E N 330S 1750W	3500	ACTIVE O	7/28/2009
965	30-015-37058	VANGUARD OPERATING LLC NW STATE NO. 032	32 17S 28E M 330S 330W	3425	ACTIVE O	8/23/2009

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
966	30-015-37428	G&C SERVICE MALCO STATE NO. 3	31 17S 28E G 1980N 1980E	650	ACTIVE O	2/10/2010
967	30-015-38203	COG OPERATING LLC MAPLE STATE 008	30 17S 28E N 330S 990W	4750	PERMIT TO DRILL O	
968	30-015-39029	G AND C SERVICE CONKLIN STATE NO. 1-Y	36 17S 27E G 2210N 2310E	4850	NEW DRILL	
969	30-015-39321	COG OPERATING LLC BIG BOY STATE NO. 1	36 17S 27E M 990S 890W		PERMIT TO DRILL	
970	30-015-39322	COG OPERATING LLC BIG BOY STATE NO. 3	36 17S 27E M 840S 425W		PERMIT TO DRILL	
971	30-015-39323	COG OPERATING LLC BIG BOY STATE NO. 5	36 17S 27E O 870S 1560E		PERMIT TO DRILL	
972	30-015-39324	COG OPERATING LLC BIG BOY STATE NO. 6	36 17S 27E O 480S 2210E		PERMIT TO DRILL	
973	30-015-39325	COG OPERATING LLC BIG BOY STATE NO. 7	36 17S 27E O 990S 2210E		PERMIT TO DRILL	
974	30-015-39326	COG OPERATING LLC BIG BOY STATE NO. 8	36 17S 27E O 275S 1560E		PERMIT TO DRILL	
975	30-015-39401	APACHE CORP EMPIRE ABO UNIT NO. 417	36 17S 27E P 1110S 630E		PERMIT TO DRILL	
976	30-015-39009	APACHE CORP EMPIRE ABO UNIT NO. 415	2 18S 27E G 1650N 2430E		PERMIT TO DRILL	
977	30-015-39066	APACHE CORP EMPIRE ABO UNIT NO. 416	2 18S 27E L 2551S 1170W		PERMIT TO DRILL	
978	30-015-38234	VANGUARD OPERATING LLC ANTHONY NO. 2	30 17S 28E P 430S 800E	4823	ACTIVE	
979	30-015-39299	COG OPERATING LLC MAPLE STATE NO. 5	30 17S 28E M 990S 990W		PERMIT TO DRILL	

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980	30-015-39300	COG OPERATING LLC MAPLE STATE NO. 6	30 17S 28E M 330S 330W		PERMIT TO DRILL	
981	30-015-38512	LIME ROCK RESOURCES ENRON STATE NO. 16	30 17S 28E D 990N 940W	3658	ACTIVE	
982	30-015-39004	APACHE CORP EMPIRE ABO UNIT NO. 401	31 17S 28E P 150S 1300E		PERMIT TO DRILL	
983	30-015-39011	APACHE CORP EMPIRE ABO UNIT NO. 419	31 17S 28E O 1190S 1320E		PERMIT TO DRILL	
984	30-015-39020	APACHE CORP EMPIRE ABO UNIT NO. 408	31 17S 28E O 140S 2560E		T&A	
985	30-015-38513	VANGUARD OPERATING LLC JEFFERS 32 STATE NO. 3	32 17S 28E J 2310S 2032E	5093	ACTIVE	
986	30-015-39006	APACHE CORP EMPIRE ABO UNIT NO. 407	32 17S 28E J 2400S 2450E		PERMIT TO DRILL	
987	30-015-39007	APACHE CORP EMPIRE ABO UNIT NO. 409	32 17S 28E M 70S 100W		PERMIT TO DRILL	
988	30-015-39064	APACHE CORP EMPIRE ABO UNIT NO. 403	32 17S 28E O 1175S 1310E		PERMIT TO DRILL	
989	30-015-39008	APACHE CORP EMPIRE ABO UNIT NO. 410	6 18S 28E D 160N 1300W		PERMIT TO DRILL	
990	30-015-39021	APACHE CORP EMPIRE ABO UNIT NO. 411	6 18S 28E D 40N 145W		PERMIT TO DRILL	
991	30-015-32946	APACHE CORP SCBP STATE NO. 001	2 18S 27E J 2210S 1650E	3880	ACTIVE	
992	30-015-00715	LEGACY RESERVES OPERATING LP SOUTH RED LAKE UNIT NO. 37	1 18S 27E D 330N 330W		ACTIVE	
993	30-015-32307	APACHE CORP AAO FEDERAL NO. 1	1 18S 27E 4 330N 990W		ACTIVE	

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994	30-015-32959	APACHE CORP AAO FEDERAL NO. 5	1 18S 27E E 1650N 875W		ACTIVE	
995	30-015-33473	APACHE CORP AAO FEDERAL NO. 7	1 18S 27E G 1750N 1650E		ACTIVE	
996	30-015-33784	APACHE CORP AAO FEDERAL NO. 8	1 18S 27E H 1650N 330E		ACTIVE	
997	30-015-34071	APACHE CORP AAO FEDERAL NO. 6	1 18S 27E F 2169N 1963W		ACTIVE	
998	30-015-34555	APACHE CORP AAO FEDERAL NO. 11	1 18S 27E M 890S 660W		ACTIVE	
999	30-015-34576	APACHE CORP AAO FEDERAL NO. 10	1 18S 27E K 2060S 2160W		ACTIVE	
1005	30-015-40428	LRE OPERATING LLC BIG BOY STATE NO 2	36 17S 28E M 200S 485W	4934	ACTIVE	
1023	30-015-39927	LRE OPERATING LLC AB STATE 647	32 17S 28E K 1750S 1765W	5016	ACTIVE	
1024	30-015-40339	VANGUARD OPERATING LLC ENRON STATE 18	32 17S 28E D 990N 330W	4250	ACTIVE	
1025	30-015-00643	LEGACY RESERVES OPERATING LLC SOUTH RED LAKE GRAYBURG UNIT NO 26	35 17S 27E O 990S 2310E		ACTIVE	
1026	30-015-37783	TARCO ENERGY LC RUSSELL C 003	35 17S 27E O 990S 2225E		ACTIVE	
1027	30-015-00644	LEGACY RESERVES OPERATING LP SOUTH RED LAKE GRABURG UNIT 31	35 17S 27E N 330S 2310W		ACTIVE	
1028	30-015-20104	LEGACY RESERVES OPERATING LP SOUTH RED LAKE GRAYBURG UNIT 41	35 17S 27E P 990S 990E		ACTIVE	
1029	30-015-34626	LRE OPERATING LLC JEFFERS 36 STATE #4t	36 17S 27E M 935N 2260E	4000	ACTIVE	

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1030	30-015-41829	LRE OPERATING LLC ENRON FEDERAL NO 18	25 17S 27E O 985S 2310E	3157	ACTIVE	
1031	30-015-41890	VANGUARD OPERATING LLC WILLIAMS A FEDERAL NO 12	29 17S 28E N 330S 2200N	3700	ACTIVE	
1032	30-015-40807	LIME ROCK RESOURCES A, LP LOGAN B "35" N FEDERAL #18	35 17S 27E N 330N 2310W	4000	ACTIVE	
1033	30-015-40808	LRE OPERATING LLC LOGAN 35 P FEDERAL #19	35 17S 27E P 970S 990E	4000	ACTIVE	
1034	30-015-41435	LIME ROCK RESOURCES A LP LOGAN 35 FEDERAL 10	35 17S 27E O 720S 1770E	4000	ACTIVE	
1035	30-015-42003	APACHE CORPORATION SB STATE 004	2 18S 27E E 2515N 800W	4114	ACTIVE	
1036	30-015-42002	APACHE COPORATION SB STATE 002	2 18S 27E E 1900N 990W	4115	ACTIVE	
1037	30-015-36979	VANGUARD OPERATING LLC ENRON STATE NO 14	32 17S 28E C 990N 2035W	4205	ACTIVE	
1038	30-015-41833	VANGUARD OPERATING LLC ENRON STATE 19	32 17S 28E C 990N 1700W	4206	ACTIVE	
1039	30-015-39996	VANGUARD OPERATING LLC ENRON STATE 17	32 17S 28E C 230N 2420W	4215	ACTIVE	
1040	30-015-41511	APACHE CORP AB State 647 016	32 17S 28E N 330S 2365W	4297	ACTIVE	
1041	30-015-41498	APACHE CORP Ab State 647 014	32 17S 28E M 330S 1090W	4300	ACTIVE	
1042	30-015-41493	APACHE CORP Ab State 647 009	32 17S 28E N 1080S 2535W	4300	ACTIVE	
1043	30-015-41491	APACHE CORP Ab State 647 007	32 17S 28E L 1650S 950W	4300	ACTIVE	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1044	30-015-41492	APACHE CORP Ab State 647 008	32 17S 28E K 1375S 2320W	4323	ACTIVE	
1045	30-015-40783	LIME ROCK RESOURCES A LP LOGAN 2c STATE NO. 4	2 18S 27E C 990N 1500W	4776	ACTIVE	
1046	30-015-38420	COG OPERATING LLC KIOWA STATE	36 17S 27E G 1460N 1539E	4873	ACTIVE	
1048	30-015-41500	APACHE CORP Ab State 647 002	32 17S 28E K 2355S 2600W	5013	ACTIVE	
1049	30-015-41501	APACHE CORP Ab State 647 003	32 17S 28E K 2370S 1650W	5027	ACTIVE	
1050	30-015-41505	APACHE CORP Ab State 647 004	32 17S 28E L 2250S 1185W	5046	ACTIVE	
1051	30-015-41502	APACHE CORP Ab State 647 005	32 17S 28E L 2310S 330W	5060	ACTIVE	
1052	30-015-41504	APACHE CORP Ab State 647 15	32 17S 28E N 330S 1650W	5063	ACTIVE	
1053	30-015-41497	APACHE CORP Ab State 647 013	32 17S 28E M 220S 350W	5065	ACTIVE	
1054	30-015-41503	APACHE CORP Ab State 647 006	32 17S 28E L 1730S 430W	5065	ACTIVE	
1055	30-015-41495	APACHE CORP Ab State 647 011	32 17S 28E M 920S 960W	5070	ACTIVE	
1056	30-015-41494	APACHE CORP Ab State 647 010	32 17S 28E N 1140S 1650W	5076	ACTIVE	
1057	30-015-41496	APACHE CORP Ab State 647 012	32 17S 28E M 910S 930W	5080	ACTIVE	
1058	30-015-40679	LIME ROCK RESOURCES A LP BLAKE STATE NO. 4	2 18S 27E B 968N 2300E	530	ACTIVE	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1059	30-015-40621	TARCO ENERGY LC BRAD STATE NO. 4	2 18S 27E C 968N 1650W	550	ACTIVE	
1060	30-015-31530	VANGUARD OPERATING LLC ENRON STATE NO. 1	32 17S 28E C 530N 1650W	4000	ACTIVE	
1061	30-015-00681	LEGACY RESERVES OPERATING LP SOUTH RED LAKE GRAYBURG UNIT 027	36 17S 27E M 990S 330W	1200	PLUGGED	
1062	30-015-22526	DEVON ENERGY LOGAN 2c STATE #3	2 18S 27E I 530N 2310W		ACTIVE	
1063	30-015-22536	APACHE CORP EMPIRE ABO UNIT "I" 272a	5 18S 28E B 1300N 2345E		T/A	
1064	30-015-32070	APACHE CORP Bb State Com #1	2 18S 27E I 660S 990W		T/A	
1065	30-015-32899	APACHE CORP Bm State #1	2 18S 27E I 2310S 2310W		T/A	
1066	30-015-32900	APACHE CORP Tdf State #2	2 18S 27E I 1650N 2305W		T/A	
1068	30-015-36513	VANGUARD OPERATING LLC WILLIAMS A FEDERAL NO. 8	29 17S 28E N 1090S 1550W	3150	ACTIVE	
1069	30-015-33232	VANGUARD OPERATING LLC WILLIAMS A FEDERAL NO. 5	29 17S 28E M 690S 530W	3250	RECOMPLETED	
1070	30-015-40480	VANGUARD OPERATING LLC WILLIAMS A FEDERAL NO 10	29 17S 28E M 600S 645W	3800	ACTIVE	
1071	30-015-40677	TARCO ENERGY LC BLAKE STATE NO 1	2 18S 27E B 380N 1650E		PERMIT TO DRILL	
1072	30-015-40678	TARCO ENERGY LC BLAKE STATE NO 2	2 18S 27E B 330N 2300E		PERMIT TO DRILL	
1073	30-015-41766	APACHE CORP LIBBY STATE No. 001	5 18S 28E F 1910N 1505W		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1074	30-015-41767	APACHE CORP LIBBY STATE NO. 002	5 18S 28E F 1570N 2245W		PERMIT TO DRILL	
1075	30-015-41768	APACHE CORP LIBBY STATE NO. 003	5 18S 28E F 1570N 2245W		PERMIT TO DRILL	
1076	30-015-41770	APACHE CORP T REX STATE 001	31 17S 28E B 330N 2270E		PERMIT TO DRILL	
1077	30-015-41771	APACHE CORP T REX STATE 002	31 17S 28E B 575N 1650E		PERMIT TO DRILL	
1078	30-015-41772	APACHE CORP T REX STATE 003	31 17S 28E B 875N 2430E		PERMIT TO DRILL	
1079	30-015-41774	APACHE CORP T REX STATE 004	31 17S 28E B 890N 1750E		PERMIT TO DRILL	
1080	30-015-41892	VANGUARD OPERATING LLC WILLIAMS A FEDERAL 15	29 17S 28E M 330S 975W		ACTIVE	
1081	30-015-41959	APACHE CORP BM State 002	2 18S 27E K 2310S 1750W		PERMIT TO DRILL	
1082	30-015-42024	APACHE CORP AAO FEDERAL #14	1 18S 27E 1 126N 141E		PERMIT TO DRILL	
1083	30-015-42025	APACHE CORP AAO FEDERAL #15	1 18S 27E 1 1130N 2408E		PERMIT TO DRILL	
1084	30-015-42026	APACHE CORP AAO FEDERAL #16	1 18S 27E 1 1305N 2455W		PERMIT TO DRILL	
1085	30-015-42029	APACHE CORP AAO FEDERAL #17	1 18S 27E 1 1650N 865E		PERMIT TO DRILL	
1086	30-015-42035	APACHE CORP AAO FEDERAL #18	1 18S 27E 1 2310N 1650E		PERMIT TO DRILL	
1087	30-015-42036	APACHE CORP AAO FEDERAL #20	1 18S 27E 1 2188N 909W		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1088	30-015-42051	APACHE CORP AAO FEDERAL #19	1 18S 27E 1 2310N 2310W		PERMIT TO DRILL	
1089	30-015-42116	VANGUARD OPERATING LLC WILLIAMS A FEDERAL 16	29 17S 28E M 990S 2160W		ACTIVE	
1090	30-015-42121	TARCO ENERGY LLC BRADE STATE NO. 5	2 18S 27E C 658N 1984W		PERMIT TO DRILL	
1091	30-015-42156	VANGUARD OPERATING LLC ENRON STATE 21	32 17S 28E D 385N 900W		ACTIVE	
1092	30-015-42334	APACHE CORP AAO FEDERAL #21	1 18S 27E 1 1005N 1630W		PERMIT TO DRILL	
1093	30-015-42335	APACHE CORP AAO FEDERAL #22	1 18S 27E 1 790N 330W		PERMIT TO DRILL	
1094	30-015-42336	APACHE CORP AAO FEDERAL #23	1 18S 27E 1 2265N 330E		PERMIT TO DRILL	
1095	30-015-42337	APACHE CORP AAO FEDERAL #24	1 18S 27E 1 984N 243E		PERMIT TO DRILL	
1096	30-015-42338	APACHE CORP AAO FEDERAL #26	1 18S 27E 1 2270S 1650W		PERMIT TO DRILL	
1097	30-015-42339	APACHE CORP AAO FEDERAL #29	1 18S 27E 1 360S 990W		PERMIT TO DRILL	
1098	30-015-42358	APACHE CORP AAO FEDERAL #28	1 18S 27E 1 183S 2497W		PERMIT TO DRILL	
1099	30-015-42359	APACHE CORP AAO FEDERAL #27	1 18S 27E 1 1960S 2063W		PERMIT TO DRILL	
1100	30-015-42360	APACHE CORP AAO FEDERAL #30	1 18S 27E 1 1261S 281W		PERMIT TO DRILL	
1101	30-015-42361	APACHE CORP AAO FEDERAL #25	1 18S 27E 1 2000S 1022W		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1102	30-015-42372	VANGUARD OPERATING LLC ENRON STATE #20	31 17S 28E D 330N 430W		ACTIVE	
1103	30-015-42555	APACHE CORP OUTLAW STATE #005	29 17S 28E O 330S 2310E		ACTIVE	
1104	30-015-42863	APACHE CORP JACKRABBIT STATE #004	32 17S 28E B 330S 2310E		PERMIT TO DRILL	
1105	30-015-42864	APACHE CORP JACKRABBIT STATE #005	32 17S 28E B 1010N 2540E		PERMIT TO DRILL	
1106	30-015-42985	APACHE CORP JACKRABBIT STATE #012	32 17S 28E G 1470N 2405E		PERMIT TO DRILL	
1107	30-015-42986	APACHE CORP JACKRABBIT STATE #013	32 17S 28E G 2460N 2280E		PERMIT TO DRILL	
1108	30-015-42726	VANGUARD OPERATING LLC STALEY STATE #029	30 17S 28E O 505S 2140E		ACTIVE	
1109	30-015-40983	VANGUARD OPERATING LLC STALEY STATE #020	30 17S 28E O 330S 1650E		ACTIVE	
1110	30-015-42597	APACHE CORP RANGER STATE #001	31 17S 28E A 570N 250E		PERMIT TO DRILL	
1111	30-015-42598	APACHE CORP RANGER STATE #002	31 17S 28E A 445N 1090E		PERMIT TO DRILL	
1113	30-015-42599	APACHE CORP RANGER STATE #001	31 17S 28E B 905N 1385E		PERMIT TO DRILL	
1114	30-015-42600	APACHE CORP RANGER STATE #004	31 17S 28E A 645N 250E		PERMIT TO DRILL	
1115	30-015-42673	APACHE CORP RANGER STATE #006	31 17S 28E H 1650N 990E		PERMIT TO DRILL	
1117	30-015-42674	APACHE CORP RANGER STATE #007	31 17S 28E H 2310N 990E		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1118	30-015-42675	APACHE CORP RANGER STATE #008	31 17S 28E H 1875N 110E		PERMIT TO DRILL	
1119	30-015-42677	APACHE CORP RANGER STATE #010	31 17S 28E I 2310S 1130E		PERMIT TO DRILL	
1120	30-015-42676	APACHE CORP RANGER STATE #009	31 17S 28E H 2520N 195E		PERMIT TO DRILL	
1121	30-015-42678	APACHE CORP RANGER STATE #011	31 17S 28E I 1535S 760E		PERMIT TO DRILL	
1122	30-015-42679	APACHE CORP RANGER STATE #012	31 17S 28E I 1760S 245E		PERMIT TO DRILL	
1123	30-015-42680	APACHE CORP RANGER STATE #013	31 17S 28E I 1710S 245E		PERMIT TO DRILL	
1124	30-015-42681	APACHE CORP RANGER STATE #014	16 17S 28E P 225S 1300E		PERMIT TO DRILL	
1125	30-015-42806	APACHE CORP RANGER STATE #016	31 17S 28E P 245S 90E		NEW	
1126	30-015-42682	APACHE CORP RANGER STATE #015	31 17S 28E P 260S 1250E		PERMIT TO DRILL	
1127	30-015-42602	LRE OPERATING LLC JEFFERS 36 STATE #005	36 17S 27E B 330N 2210E		PERMIT TO DRILL	
1128	30-015-42899	LRE OPERATING LLC JEFFERS 36 STATE #006	36 17S 27E B 890N 1655E		PERMIT TO DRILL	
1129	30-015-42027	APACHE CORP AAO FEDERAL #017	1 18S 27E H 1650N 865E		PERMIT TO DRILL	
1130	30-015-42549	APACHE CORP AAO FEDERAL SWD #001	1 18S 27E G 2470N 2380E		PERMIT TO DRILL	
1131	30-015-25270	BILL L MILLER CHUKKA FEDERAL #001	12 18S 27E F 2310N 2310W		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1132	30-015-36252	VANGUARD OPERATING LLC Staley State #004	30 17S 28E N 990S 1980W		ACTIVE	
1133	30-015-37691	VANGUARD OPERATING LLC Anthoney #1	30 17S 28E P 1050S 330E		ACTIVE	
1134	30-015-40028	LRE Operating LLC Anthoney State #4	30 17S 28E P 540S 837E		RECOMPLETE	
1135	30-015-40338	VANGUARD OPERATING LLC Staley State #016	30 17S 28E O 990S 2310E		ACTIVE	
1136	30-015-41065	LRE Operating LLC Staley State #24	30 17S 28E N 990S 2335W		RECOMPLETE	
1137	30-015-40723	Lime Rock Resources II-A LP Logan 2C State #4	30 18S 28E C 990N 1500W		COMPLETED	
1138	30-015-43066	Lime Rock Resources II-A LP Logan B 35 N Federal 24	30 17S 27E N 870S 1640W		PERMIT TO DRILL	
1139	30-015-43252	Lime Rock Resources II-A LP Logan 35 O Federal 22	30 17S 27E O 720S 1670E		PERMIT TO DRILL	
1140	30-015-42556	Apache Corporation The Outlaw State #006	30 17S 28E O 990S 1650E		COMPLETED	
1141	30-015-42557	Apache Corporation The Outlaw State #007	30 17S 28E O 330S 1650E		COMPLETED	
1142	30-015-42558	Apache Corporation The Outlaw State #008	30 17S 28E O 990S 2310E		COMPLETED	
1143	30-015-42725	VANGUARD OPERATING LLC STALEY STATE #28	30 17S 28E O 685S 1630E		ACTIVE	
1144	30-015-42727	VANGUARD OPERATING LLC STALEY STATE #30	30 17S 28E O 850S 1680W		ACTIVE	
1145	30-015-42601	APACE CORPORATION RANGER STATE #005	30 17S 28E H 1825N 110E		PERMIT TO DRILL	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1146	30-015-42984	APACHE CORPORATION JACK RABBIT STATE #11	30 17S 28E G 1535N 1680E		PERMIT TO DRILL	
1147	30-015-32554	VANGUARD OPERATING LLC WILLIAMS A FEDERAL #001Z	29 17S 28E N 590S 2185W		ACTIVE	
1148	30-015-42556	APACHE CORPORATION OUTLAW STATE #006	29 17S 28E O 990S 1650E		ACTIVE	
1149	30-015-42557	APACHE CORPORATION OUTLAW STATE #007	29 17S 28E O 330S 1650E		ACTIVE	
1150	30-015-42558	APACHE CORPORATION OUTLAW STATE #008	29 17S 28E O 990S 2310E		ACTIVE	
1151	30-015-31285	VANGUARD OPERATING LLC STALEY STATE #002	30 17S 28E O 890S 1650E		ACTIVE	
1152	30-015-36564	VANGUARD OPERATING LLC STALEY STATE #009	30 17S 28E O 330S 2210E		ACTIVE	
1153	30-015-37673	VANGUARD OPERATING LLC STALEY STATE #012	30 17S 28E N 330S 1650W		ACTIVE	
1154	30-015-39638	VANGUARD OPERATING LLC ANTHONEY STATE #003	30 17S 28E P 412S 679E		ACTIVE	
1155	30-015-40026	VANGUARD OPERATING LLC STALEY STATE #017	30 17S 28E N 330S 2410W		ACTIVE	
1156	30-015-38512	VANGUARD OPERATING LLC ENRON STATE #016	31 17S 28E P 990N 940W		ACTIVE	
1157	30-015-01665	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #014	32 17S 28E O 940S 1650E		ACTIVE	
1158	30-015-02312	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #005	32 17S 28E G 1980N 1650E		ACTIVE	
1159	30-015-10109	VANGUARD OPERATING LLC NORTHWEST ARTESIA UNIT #003	32 17S 28E B 990N 1650E		ACTIVE	

ID NO	API	OPERATOR, WELL NAME, NUMBER	SEC, TWP, RGE, UL	DEPTH	STATUS TYPE	COMP. DATE PLUG DATE
1160	30-015-30684	VANGUARD OPERATING LLC NW STATE #003	32 17S 28E G 1650N 1650E		ACTIVE	
1161	30-015-30734	VANGUARD OPERATING LLC NW STATE #004	32 17S 28E B 1140N 2277E		ACTIVE	
1162	30-015-30887	VANGUARD OPERATING LLC JEFFERS 32 STATE #001	32 17S 28E J 2141S 1665E		ACTIVE	
1163	30-015-30890	VANGUARD OPERATING LLC NW STATE #016	32 17S 28E B 330N 1650E		ACTIVE	
1164	30-015-31934	VANGUARD OPERATING LLC NW STATE #018	32 17S 28E G 2272N 2273E		ACTIVE	
1165	30-015-34148	VANGUARD OPERATING LLC ASPEN 32 STATE COM #001	32 17S 28E J 1370S 1609E		ACTIVE	
1166	30-015-37045	VANGUARD OPERATING LLC JEFFERS 32 STATE #002	32 17S 28E J 1563S 2207E		ACTIVE	
1167	30-015-39927	APACHE CORPORATION AB STATE 647 #001	32 17S 28E K 1750S 1765W		ACTIVE	

TABLE III

Well Changes in the Combined One Mile Area of Review Since the 2015 PFO TEST for Navajo's WDW-1, WDW-2, and WDW-3

ID	API No.	Unit	Sect	Town	Range	Footages	Well Name	Operator	Changes
33	30 15 32554	29	N	17S	28E	590S 2185W	WILLIAMS A FEDERAL #001Z	VANGUARD OPERATING LLC	NEW OPERATOR
46	30 15 33232	29	M	17S	28E	690S 530W	WILLIAMS A FEDERAL #005	VANGUARD OPERATING LLC	NEW OPERATOR AND RECOMPLETED
47	30 15 36513	29	N	17S	28E	1090S 1550W	WILLIAMS A FEDERAL #008	VANGUARD OPERATING LLC	NEW OPERATOR
61	30 15 40480	29	M	17S	28E	600S 645W	WILLIAMS A FEDERAL #010	VANGUARD OPERATING LLC	NEW OPERATOR
70	30 15 41890	29	N	17S	28E	330S 2200N	WILLIAMS A FEDERAL #012	VANGUARD OPERATING LLC	NEW OPERATOR
917	30 15 41892	29	M	17S	28E	330S 975W	WILLIAMS A FEDERAL #015	VANGUARD OPERATING LLC	NEW OPERATOR
918	30 15 42116	29	M	17S	28E	990S 2160W	WILLIAMS A FEDERAL #016	VANGUARD OPERATING LLC	NEW OPERATOR
919	30 15 42555	29	O	17S	28E	330S 2310E	OUTLAW STATE #005	APACHE CORPORATION	NOW ACTIVE
920	30 15 42556	29	O	17S	28E	990S 1650E	OUTLAW STATE #006	APACHE CORPORATION	NEW
921	30 15 42557	29	O	17S	28E	330S 1650E	OUTLAW STATE #007	APACHE CORPORATION	NEW
922	30 15 42558	29	O	17S	28E	990S 2310E	OUTLAW STATE #008	APACHE CORPORATION	NEW
923	30 15 31285	30	O	17S	28E	890S 1650E	STALEY STATE #002	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
925	30 15 36252	30	N	17S	28E	990S 1980W	STALEY STATE #004	VANGUARD OPERATING LLC	NEW OPERATOR
926	30 15 36564	30	O	17S	28E	330S 2210E	STALEY STATE #009	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
927	30 15 37673	30	N	17S	28E	330S 1650W	STALEY STATE #012	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
954	30 15 37691	30	P	17S	28E	1050S 330E	ANTHONEY #001	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
961	30 15 38234	30	P	17S	28E	430S 800E	ANTHONEY #002	VANGUARD OPERATING LLC	NEW OPERATOR
962	30 15 39638	30	P	17S	28E	412S 679E	ANTHONEY STATE #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
963	30 15 40026	30	N	17S	28E	330S 2410W	STALEY STATE #017	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
964	30 15 40338	30	O	17S	28E	990S 2310E	STALEY STATE #016	VANGUARD OPERATING LLC	NEW OPERATOR
965	30 15 40983	30	O	17S	28E	330S 1650E	STALEY STATE #020	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
978	30 15 42725	30	O	17S	28E	685S 1630E	STALEY STATE #028	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
984	30 15 42726	30	O	17S	28E	505S 2140E	STALEY STATE #029	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
985	30 15 42727	30	O	17S	28E	850S 1680W	STALEY STATE #030	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1024	30 15 1638	31	A	17S	28E	330N 990E	STATE FW #001	ALAMO PERMIAN RESOURCES LLC	NOW ACTIVE AND NEW OPERATOR
1031	30 15 10537	31	H	17S	28E	2277N 330E	NORTHWEST ARTESIA UNIT #004	VANGUARD OPERATING LLC	NEW OPERATOR
1037	30 15 10833	31	I	17S	28E	1980S 660E	NORTHWEST ARTESIA UNIT #010	VANGUARD OPERATING LLC	NEW OPERATOR
1038	30 15 20042	31	P	17S	28E	990S 660E	NORTHWEST ARTESIA UNIT #011	VANGUARD OPERATING LLC	NEW OPERATOR
1039	30 15 30760	31	P	17S	28E	735S 330E	NW STATE #010	VANGUARD OPERATING LLC	NEW OPERATOR
1060	30 15 30783	31	H	17S	28E	1650N 330E	NW STATE #011	VANGUARD OPERATING LLC	NEW OPERATOR
1068	30 15 30784	31	A	17S	28E	330N 480E	NW STATE #012	VANGUARD OPERATING LLC	NEW OPERATOR
1069	30 15 30849	31	I	17S	28E	2310S 270E	NW STATE #009	VANGUARD OPERATING LLC	NEW OPERATOR
1070	30 15 30893	31	A	17S	28E	973N 959E	NW STATE #028	VANGUARD OPERATING LLC	NEW OPERATOR
1080	30 15 32162	31	D	17S	28E	460N 990W	ENRON STATE #004	VANGUARD OPERATING LLC	NEW OPERATOR
1089	30 15 36978	31	D	17S	28E	990N 330W	ENRON STATE#015	VANGUARD OPERATING LLC	NEW OPERATOR
1091	30 15 38512	31	P	17S	28E	990N 940W	ERNORN STATE #016	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1102	30 15 39020	31	O	17S	28E	140S 2560E	EMPIRE ABO UNIT #408	APACHE CORPORATION	TEMPORARILY PLUGGED AND AG ABANDONED
1103	30 15 42372	31	D	17S	28E	330N 430W	ENRON STATE #20	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1108	30 15 42806	31	P	17S	28E	245S 90E	RANGER STATE #016	APACHE CORPORATION	NEW
1109	30 15 1665	32	O	17S	28E	940S 1650E	NORTHWEST ARTESIA UNIT #014	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1125	30 15 2312	32	G	17S	28E	1980N 1650E	NORTHWEST ARTESIA UNIT #005	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1132	30 15 10109	32	B	17S	28E	990N 1650E	NORTHWEST ARTESIA UNIT #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1133	30 15 20043	32	M	17S	28E	990S 760W	NORTHWEST ARTESIA UNIT #12	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1135	30 15 30684	32	G	17S	28E	1650N 1650E	NW STATE #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1143	30 15 30685	32	M	17S	28E	990S 990W	NW STATE #007	VANGUARD OPERATING LLC	NEW OPERATOR
1144	30 15 30734	32	B	17S	28E	1140N 2277E	NW STATE #004	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1147	30 15 30777	32	L	17S	28E	2310S 990W	NW STATE#006	VANGUARD OPERATING LLC	NEW OPERATOR
1148	30 15 30815	32	N	17S	28E	1090S 2126W	NW STATE #008	VANGUARD OPERATING LLC	NEW OPERATOR
1149	30 15 30887	32	J	17S	28E	2141S 1665E	JEFFERS 32 STATE #001	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1150	30 15 30890	32	B	17S	28E	330N 1650E	NW STATE #016	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR

1151	30	15	31530	32	C	17S	28E	530N 1650W	ENRON STATE #001	VANGUARD OPERATING LLC	NEW OPERATOR
1152	30	15	31920	32	D	17S	28E	990N 990W	ENRON STATE #002	VANGUARD OPERATING LLC	NEW OPERATOR
1153	30	15	31934	32	G	17S	28E	2272N 2273E	NW STATE #018	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1154	30	15	35050	32	D	17S	28E	330N 500W	ENRON STATE #012	VANGUARD OPERATING LLC	NEW OPERATOR
1155	30	15	36554	32	L	17S	28E	1770S 550W	NW STATE #029	VANGUARD OPERATING LLC	NEW OPERATOR
1156	30	15	36979	32	C	17S	28E	990N 2035W	ENRON STATE #014	VANGUARD OPERATING LLC	NEW OPERATOR
1157	30	15	36989	32	K	17S	28E	1630S 1710W	NW STATE #030	VANGUARD OPERATING LLC	NEW OPERATOR
1158	30	15	37045	32	J	17S	28E	1563S 2207E	JEFFERS 32 STATE #002	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1159	30	15	37057	32	N	17S	28E	330S 1750W	NW STATE #031	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1160	30	15	37058	32	M	17S	28E	330S 330W	NW STATE #032	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1161	30	15	38513	32	J	17S	28E	2310S 2032E	JEFFERS 32 STATE #003	VANGUARD OPERATING LLC	NEW OPERATOR
1162	30	15	39927	32	K	17S	28E	1750S 1765W	AB STATE 647 #001	APACHE CORPORATION	NEW
1163	30	15	39996	32	C	17S	28E	230N 2420W	ENRON STATE #017	VANGUARD OPERATING LLC	NEW OPERATOR
1164	30	15	40339	32	D	17S	28E	990N 330W	ENRON STATE #018	VANGUARD OPERATING LLC	NEW OPERATOR
1166	30	15	42156	32	D	17S	28E	385N 900W	ENRON STATE #021	VANGUARD OPERATING LLC	NEW OPERATOR
1167	30	15	41833	32	C	17S	28E	990N 1700W	ENRON STATE #019	VANGUARD OPERATING LLC	NEW OPERATOR

TABLE IV
Wells that have been Plugged and Abandoned since the 2015 PFO REPORT
Well Changes in the Combined One Mile Area of Review for Navajo's WDW-1, WDW-2, and WDW-3

[illegible]

TABLE V
Wells that have been Temporally Abandoned since the 2015 PFO REPORT
Well Changes in the Combined One Mile Area of Review for Navajo's WDW-1, WDW-2, and WDW-3

ID	API No.			Unit	Sect	Town	Range	Footages	Well Name	Operator	Changes
984	30	15	39020	31	O	17S	28E	140S 2560E	EMPIRE ABO UNIT #408	APACHE CORPORATION	TEMPORARILY PLUGGED AND AG ABANDONED

TABLE VI
Wells that have been Recompleted in Upper Zones since the 2015 PFO REPORT
Well Changes in the Combined One Mile Area of Review for Navajo's WDW-1, WDW-2, and WDW-3

ID	API No.			Unit	Sect	Town	Range	Footages	Well Name	Operator	Changes
1069	30	15	33232	29	M	17S	28E	690S 530W	WILLIAMS A FEDERAL #005	VANGUARD OPERATING LLC	NEW OPERATOR AND RECOMPLETED

TABLE VII
Newly Drilled Wells in the Area of Review since the 2015 PFO REPORT
Well Changes in the Combined One Mile Area of Review for Navajo's WDW-1, WDW-2, and WDW-3

										Changes
ID	API No.	Unit	Sect	Town	Range	Footages	Well Name	Operator		
33	30 15 32554	29 N	17S	28E	590S 2185W	WILLIAMS A FEDERAL #001Z	VANGUARD OPERATING LLC	NEW OPERATOR		
46	30 15 33232	29 M	17S	28E	690S 530W	WILLIAMS A FEDERAL #005	VANGUARD OPERATING LLC	NEW OPERATOR AND RECOMPLETED		
47	30 15 36513	29 N	17S	28E	1090S 1550W	WILLIAMS A FEDERAL #008	VANGUARD OPERATING LLC	NEW OPERATOR		
61	30 15 40480	29 M	17S	28E	600S 645W	WILLIAMS A FEDERAL #010	VANGUARD OPERATING LLC	NEW OPERATOR		
70	30 15 41890	29 N	17S	28E	330S 2200N	WILLIAMS A FEDERAL #012	VANGUARD OPERATING LLC	NEW OPERATOR		
917	30 15 41892	29 M	17S	28E	330S 975W	WILLIAMS A FEDERAL #015	VANGUARD OPERATING LLC	NEW OPERATOR		
918	30 15 42116	29 M	17S	28E	990S 2160W	WILLIAMS A FEDERAL #016	VANGUARD OPERATING LLC	NEW OPERATOR		
919	30 15 42555	29 O	17S	28E	330S 2310E	OUTLAW STATE #005	APACHE CORPORATION	NOW ACTIVE		
920	30 15 42556	29 O	17S	28E	990S 1650E	OUTLAW STATE #006	APACHE CORPORATION	NEW		
921	30 15 42557	29 O	17S	28E	330S 1650E	OUTLAW STATE #007	APACHE CORPORATION	NEW		
922	30 15 42558	29 O	17S	28E	990S 2310E	OUTLAW STATE #008	APACHE CORPORATION	NEW		
923	30 15 31285	30 O	17S	28E	890S 1650E	STALEY STATE #002	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
925	30 15 36252	30 N	17S	28E	990S 1980W	STALEY STATE #004	VANGUARD OPERATING LLC	NEW OPERATOR		
926	30 15 36564	30 O	17S	28E	330S 2210E	STALEY STATE #009	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
927	30 15 37673	30 N	17S	28E	330S 1650W	STALEY STATE #012	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
954	30 15 37691	30 P	17S	28E	1050S 330E	ANTHONEY #001	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
961	30 15 38234	30 P	17S	28E	430S 800E	ANTHONY #002	VANGUARD OPERATING LLC	NEW OPERATOR		
962	30 15 39638	30 P	17S	28E	412S 679E	ANTHONEY STATE #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
963	30 15 40026	30 N	17S	28E	330S 2410W	STALEY STATE #017	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
964	30 15 40338	30 O	17S	28E	990S 2310E	STALEY STATE #016	VANGUARD OPERATING LLC	NEW OPERATOR		
965	30 15 40983	30 O	17S	28E	330S 1650E	STALEY STATE #020	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
978	30 15 42725	30 O	17S	28E	685S 1630E	STALEY STATE #028	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
984	30 15 42726	30 O	17S	28E	505S 2140E	STALEY STATE #029	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
985	30 15 42727	30 O	17S	28E	850S 1680W	STALEY STATE #030	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
1024	30 15 1638	31 A	17S	28E	330N 990E	STATE FW #001	ALAMO PERMIAN RESOURCES LLC	NOW ACTIVE AND NEW OPERATOR		
1031	30 15 10537	31 H	17S	28E	2277N 330E	NORTHWEST ARTESIA UNIT #004	VANGUARD OPERATING LLC	NEW OPERATOR		
1037	30 15 10833	31 I	17S	28E	1980S 660E	NORTHWEST ARTESIA UNIT #010	VANGUARD OPERATING LLC	NEW OPERATOR		
1038	30 15 20042	31 P	17S	28E	990S 660E	NORTHWEST ARTESIA UNIT #011	VANGUARD OPERATING LLC	NEW OPERATOR		
1039	30 15 30760	31 P	17S	28E	735S 330E	NW STATE #010	VANGUARD OPERATING LLC	NEW OPERATOR		
1060	30 15 30783	31 H	17S	28E	1650N 330E	NW STATE #011	VANGUARD OPERATING LLC	NEW OPERATOR		
1068	30 15 30784	31 A	17S	28E	330N 480E	NW STATE #012	VANGUARD OPERATING LLC	NEW OPERATOR		
1069	30 15 30849	31 I	17S	28E	2310S 270E	NW STATE #009	VANGUARD OPERATING LLC	NEW OPERATOR		
1070	30 15 30893	31 A	17S	28E	973N 959E	NW STATE #028	VANGUARD OPERATING LLC	NEW OPERATOR		
1080	30 15 32162	31 D	17S	28E	460N 990W	ENRON STATE #004	VANGUARD OPERATING LLC	NEW OPERATOR		
1089	30 15 36978	31 D	17S	28E	990N 330W	ENRON STATE#015	VANGUARD OPERATING LLC	NEW OPERATOR		
1091	30 15 38512	31 P	17S	28E	990N 940W	ERNORN STATE #016	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1102	30 15 39020	31 O	17S	28E	140S 2560E	EMPIRE ABO UNIT #408	APACHE CORPORATION	TEMPORARILY PLUGGED AND AG ABANDONED		
1103	30 15 42372	31 D	17S	28E	330N 430W	ENRON STATE #20	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
1108	30 15 42806	31 P	17S	28E	245S 90E	RANGER STATE #016	APACHE CORPORATION	NEW		
1109	30 15 1665	31 O	17S	28E	940S 1650E	NORTHWEST ARTESIA UNIT #014	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1125	30 15 2312	32 G	17S	28E	1980N 1650E	NORTHWEST ARTESIA UNIT #005	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1132	30 15 10109	32 B	17S	28E	990N 1650E	NORTHWEST ARTESIA UNIT #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1133	30 15 20043	32 M	17S	28E	990S 760W	NORTHWEST ARTESIA UNIT #12	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR		
1135	30 15 30684	32 G	17S	28E	1650N 1650E	NW STATE #003	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1143	30 15 30685	32 M	17S	28E	990S 990W	NW STATE #007	VANGUARD OPERATING LLC	NEW OPERATOR		
1144	30 15 30734	32 B	17S	28E	1140N 2277E	NW STATE #004	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1147	30 15 30777	32 L	17S	28E	2310S 990W	NW STATE#006	VANGUARD OPERATING LLC	NEW OPERATOR		
1148	30 15 30815	32 N	17S	28E	1090S 2126W	NW STATE #008	VANGUARD OPERATING LLC	NEW OPERATOR		
1149	30 15 30887	32 J	17S	28E	2141S 1665E	JEFFERS 32 STATE #001	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		
1150	30 15 30890	32 B	17S	28E	330N 1650E	NW STATE #016	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR		

1151	30	15	31530	32	C	17S	28E	530N 1650W	ENRON STATE #001	VANGUARD OPERATING LLC	NEW OPERATOR
1152	30	15	31920	32	D	17S	28E	990N 990W	ENRON STATE #002	VANGUARD OPERATING LLC	NEW OPERATOR
1153	30	15	31934	32	G	17S	28E	2272N 2273E	NW STATE #018	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1154	30	15	35050	32	D	17S	28E	330N 500W	ENRON STATE #012	VANGUARD OPERATING LLC	NEW OPERATOR
1155	30	15	36554	32	L	17S	28E	1770S 550W	NW STATE #029	VANGUARD OPERATING LLC	NEW OPERATOR
1156	30	15	36979	32	C	17S	28E	990N 2035W	ENRON STATE #014	VANGUARD OPERATING LLC	NEW OPERATOR
1157	30	15	36989	32	K	17S	28E	1630S 1710W	NW STATE #030	VANGUARD OPERATING LLC	NEW OPERATOR
1158	30	15	37045	32	J	17S	28E	1563S 2207E	JEFFERS 32 STATE #002	VANGUARD OPERATING LLC	NEW AND NEW OPERATOR
1159	30	15	37057	32	N	17S	28E	330S 1750W	NW STATE #031	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1160	30	15	37058	32	M	17S	28E	330S 330W	NW STATE #032	VANGUARD OPERATING LLC	NOW ACTIVE AND NEW OPERATOR
1161	30	15	38513	32	J	17S	28E	2310S 2032E	JEFFERS 32 STATE #003	VANGUARD OPERATING LLC	NEW OPERATOR
1162	30	15	39927	32	K	17S	28E	1750S 1765W	AB STATE 647 #001	APACHE CORPORATION	NEW
1163	30	15	39996	32	C	17S	28E	230N 2420W	ENRON STATE #017	VANGUARD OPERATING LLC	NEW OPERATOR
1164	30	15	40339	32	D	17S	28E	990N 330W	ENRON STATE #018	VANGUARD OPERATING LLC	NEW OPERATOR
1166	30	15	42156	32	D	17S	28E	385N 900W	ENRON STATE #021	VANGUARD OPERATING LLC	NEW OPERATOR
1167	30	15	41833	32	C	17S	28E	990N 1700W	ENRON STATE #019	VANGUARD OPERATING LLC	NEW OPERATOR

TABLE VIII**FIGURES INCLUDED IN THE REPORT**

Figure	Description	OCD Reference
1	Gaines Well No. 2 Schematic	Section VI.1 and IX.3
2	Mewbourne Well No. 1 Schematic	n/a
3	Plot of Bottom Hole Pressure and Temperature Data Mewbourne Well No. 1	n/a
4	Chukka Well No. 2 Schematic	n/a
5	Plot of Bottom Hole Pressure and Temperature Data Chukka Well No. 2	n/a
6	Midland Map of One Mile Area of Review	n/a
7	Gaines Well No. 3 Wellhead Schematic	Section IX.14
8	Diagram of Valve Locations for Shut-in on Gaines Well No. 3	Section IX.14
9	Gaines Well No. 3 Test Overview	Section IX.18.f
10	Gaines Well No. 3 Cartesian Plot of Bottom-Hole Pressure and Temperature vs. Time	Section IX.18.a
11	Gaines Well No. 3 Cartesian Plot of Injection Rate vs. Time	Section IX.18.b
12	Historical Surface Pressure and Injection Rates vs. Calendar Time	Section IX.18.g

TABLE VIII (cont.)

Figure	Description	OCD Reference
13	Gaines Well No. 3 Derivative Log-Log Plot	Section IX.18.c
14	Gaines Well No. 3 Superposition Horner (Semi-Log) Plot	Section IX.18.d
15	Gaines Well No. 3 Expanded Superposition Horner (Semi-Log) Plot	Section IX.18.d
16	Gaines Well No. 3 Hall Plot	Section IX.18.h
17	Gaines Well No. 3 Static Pressure Gradient Survey	n/a

TABLE IX

**Gaines Well No. 3
Comparison of Permeability, Transmissibility,
Skin, False Extrapolated Pressure, and Fill Depth**

Date of Test	Permeability (k)	Transmissibility (kh/u)	Skin (s)	False Extrapolated Pressure (p*)	Fill Depth
August 27 – 30, 2016	409 md	125,443 md-ft/cp	8.13	4281.04 psia	9093 feet
August 22 – 28, 2014	730 md	224,096 md-ft/cp	10.53	4351.64 psia	8946 feet
November 20 - 25, 2012	1248 md	383,087 md-ft/cp	8.34	3941.88 psia	8972 feet
January 22 - 27, 2012	597 md	183,293 md-ft/cp	27.26	3792.34 psia	8986 feet
November 10 - 13, 2010	568 md	174,376 md-ft/cp	14.64	3622.16 psia	8986 feet
August 27 – 30, 2009	719 md	233,008 md-ft/cp	54.07	3475.68 psia	8986 feet
April 1 – 2, 2008	1322 md	321,411 md-ft/cp	107	3430.27 psia	N/A
Permit Parameters	250 md	40,094 md-ft-cp	N/A	N/A	N/A

TABLE X

STATIC PRESSURE GRADIENT DATA
GAINES WELL No. 3

Gradient Data			
Depth (feet)	Pressure (psia)	Gradient (psi/ft)	Temperature (°F)
0	975.43	-	68.05
1000	1410.85	0.435	84.71
2000	1842.18	0.431	88.77
3000	2274.48	0.432	92.83
4000	2706.69	0.432	96.19
5000	3138.86	0.432	100.58
6000	3571.45	0.433	105.29
7000	4003.71	0.432	109.93
7660	4289.52	0.433	109.81

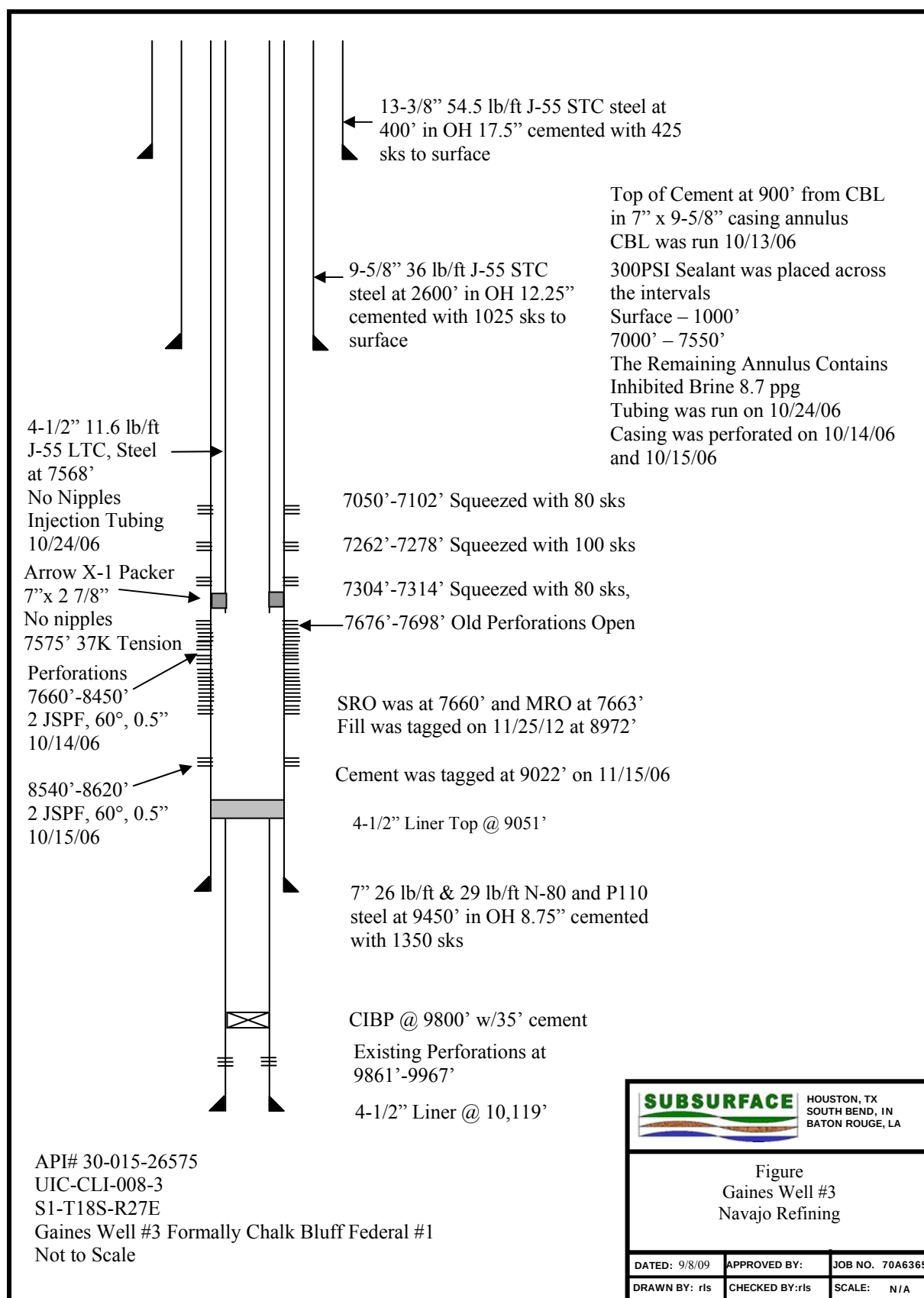


FIGURE 1

BELOW GROUND DETAILS

All depths are referenced to the Kelly bushing elevation of 12.5' above ground level. Ground level elevation is 3,678' above mean sea level.

1. Surface Casing: 13 3/8", 48 lb/ft, J-55, ST&C set at 390' in a 17 1/2" hole. Cemented with 150 sx Class C with 3 % calcium chloride, 375 sx Class C Lite w/3 % calcium chloride and 1/2 lb/sx flocele. Circulated 86 sx to surface.
2. Intermediate Casing: 9 5/8", 36 lb/ft, J-55, ST&C set at 2,555' in a 12 1/4" hole. Cemented w/800 sx of Class C Lite w/ 1/2 lb/sx flocele and 2 lb/sx Gilsonite and 12 % salt. Followed by 200 sx of Class C w/2 % calcium chloride. Circulated 133 sx to surface.
3. Base of the USDW at 493'.
4. Injection Tubing: 4 1/2", 11.6 lb/ft, N-80, SMLS, R3, LT&C set at 7,879'.
5. DV Tool: at 5,498'.

6. Annulus Fluid: 8.7 lb/gal brine water mixed w/UniChem Techni-Hib 370 corrosion inhibitor.

7. Protection Casing: 7", 29 lb/ft, N-80, LT&C: 9094' to 7031'. 7", 29 lb/ft, P-110, LT&C: 7031' to 5845'. 7", 26 lb/ft, P-110, LT&C: 5845' to surface. Casing cemented in two stages as follows:

First Stage - 600 sx modified Class H w/0.4 % CFR-3, 5 lb/sx Gilsonite, 0.5 % Halad-344, and 1 lb/sx salt mixed at 13.0 ppg. Opened DV tool at 5498' and circulated 142 sx to surface.

Second Stage - Lead Slurry: 220 sx Interfill "C" (35:65:6) mixed at 11.7 ppg. Tail Slurry: 550 sx modified Class H w/0.4 % CFR-3, 5 lb/sx, Gilsonite, 0.5 % Halad-344, 0.1 % HR-7, and 1 lb/sx mixed at 13.0 ppg. Circulated 75 sx to surface. Top out w/20 sx permium plus 3 % calcium chloride.

8. Packer: 7" x 3.5" EVI Oil Tools (Arrow), Model X-1 retrievable packer set at 7879'. Minimum I.D. is 3.0". Wireline re-entry guide on bottom. To release: turn 1/4 turn to the right and pick up.

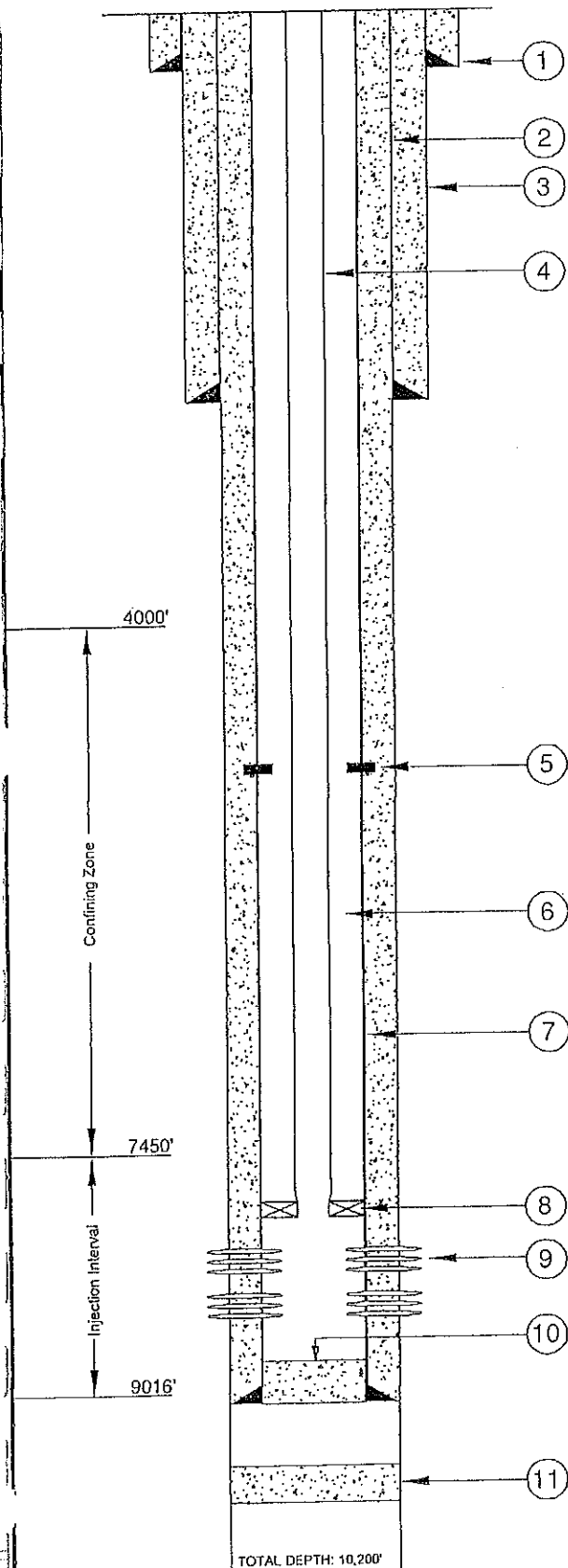
9. Perforations (2 SPF):

Upper Zone - 7924-7942', 7974-8030', 8050-8056', 8066-8080', 8118-8127', 8132-8140', 8160-8164', 8170-8188'.

Lower Zone - 8220-8254', 8260-8270', 8280-8302', 8360-8366', 8370-8378', 8400-8410', 8419-8423', 8430-8446', 8460-8464', 8470-8476'.

10. PBTD: 9004'.

11. Cement Plug: 45 sx Class H from 9624' to 9734'.



SUBSURFACE 		HOUSTON, TX. SOUTH BEND, IN. BATON ROUGE, LA.
NAVAJO REFINING COMPANY ARTESIA, NEW MEXICO BELOW GROUND DETAILS WASTE DISPOSAL WELL NO. 1		
DATE: 07/13/01	CHECKED BY:	JOB NO: 70D5256
DRAWN BY: WDL	APPROVED BY:	DWG. NO:

FIGURE 2

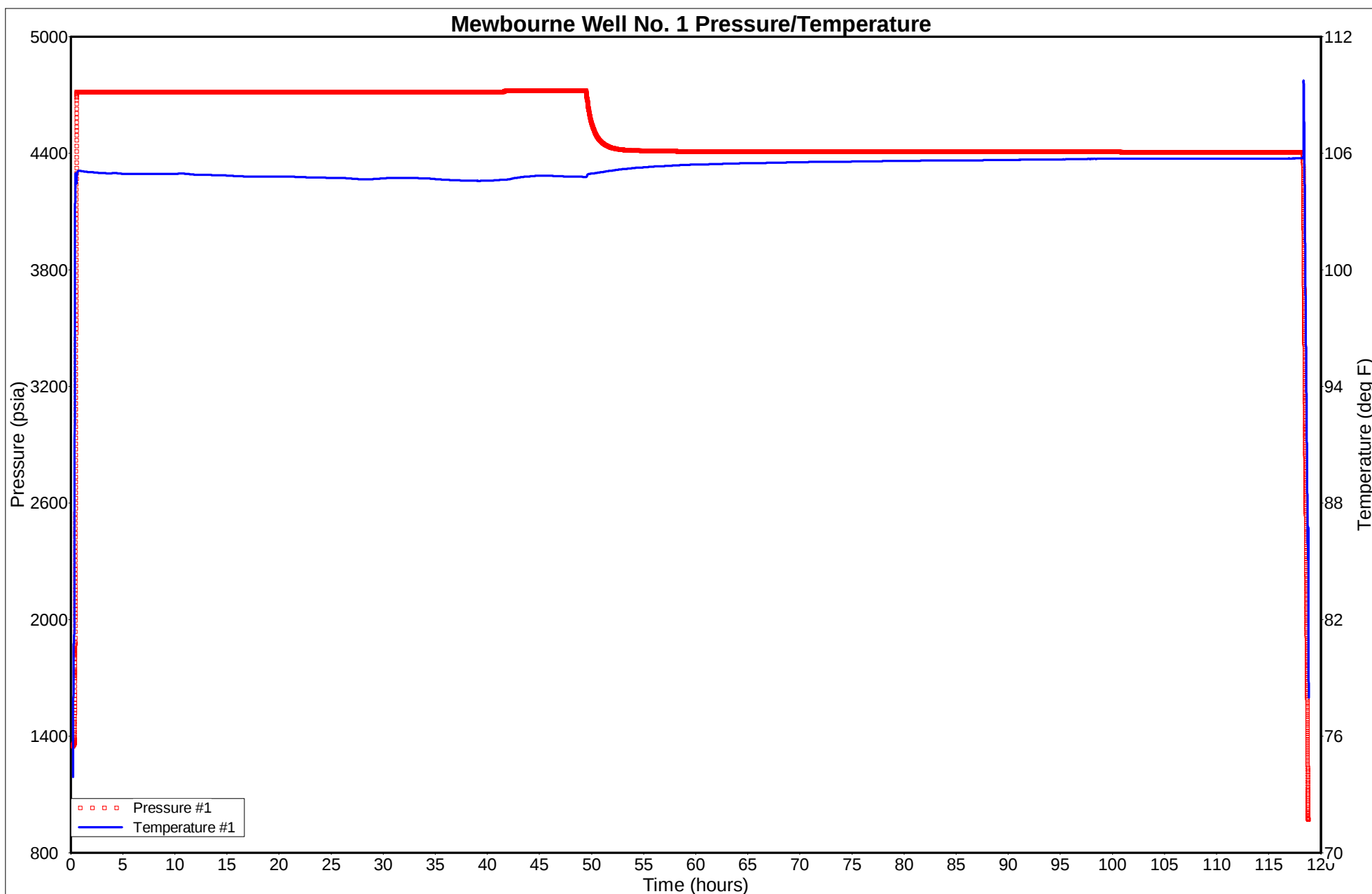


FIGURE 3

BELOW GROUND DETAILS

All depths are referenced to the Kelly bushing elevation of 13' above ground level. Ground level elevation is 3610' above mean sea level.

1. Base of the USDW at 473'.
2. Surface Casing: 8 $\frac{5}{8}$ ", 32 lb/ft, set at 1995' in an 11" hole. Cemented to surface with 800 sacks of cement.
3. Injection Tubing: 3 $\frac{1}{2}$ ", 9.2 lb/ft, J-55, smls, NUE 10 rd. set at 7528'.
4. DV Tool: at 5,785'.
5. Annulus Fluid: 8.7 lb/gal brine water mixed w/UniChem Techni-Hib 370 corrosion inhibitor.

6. Protection Casing: 5 $\frac{1}{2}$ ", 17 lb/ft, L-80, LT&C: 8869' to the surface and set in a 7 $\frac{7}{8}$ " hole. Casing cemented in two stages as follows:

First Stage - 575 sacks of modified Class "H" with 0.4 % CFR-3, 5 lb/sk Gilsonite, 0.5 % Halad-344, and 3 lb/sk salt. Mixed at 13.0 ppg. Opened DV tool at 5785 and circulated 20 sacks to surface.

Second Stage - Lead Slurry: 300 sacks of Interfill "C" (35:65:6) mixed at 11.7 ppg. Tail slurry: 695 sacks modified Class "H" with 0.4% CFR-3, 5 lb/sk Gilsonite, 0.5 % Halad-344 and 3 lb/sk salt mixed at 13.0 ppg. Circulated 150 sacks to surface. Topped out with 10 yards of Redi-mix.

7. Packer: 5 $\frac{1}{2}$ " x 2 $\frac{7}{8}$ " Weatherford Completion Tools (Arrow) Model X-T retrievable packer set at 7528'. Minimum ID is 2.4375". Wireline re-entry guide is on bottom. To release: turn $\frac{1}{4}$ turn to the right and pick up.

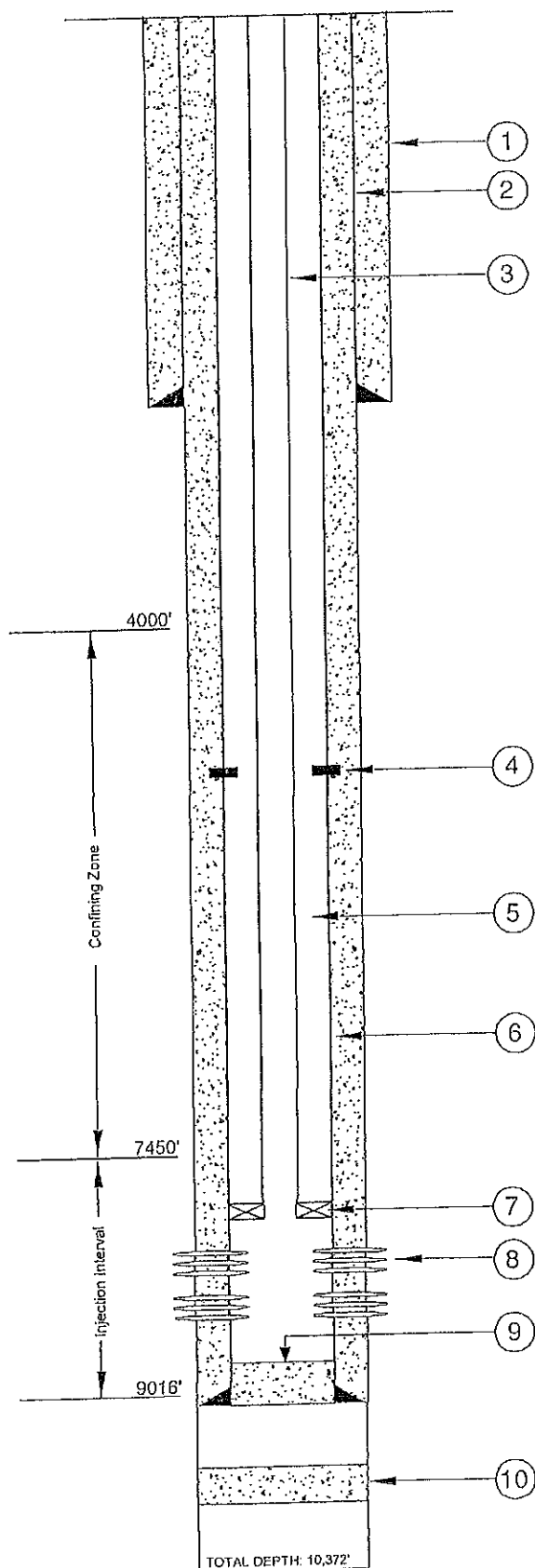
8. Perforations (2 SPF):

Zone 1: 7570-7620', 7676-7736'

Zone 2: 7826-7834', 7858-7880', 7886-7904', 7916-7936', 7944-7964', 7990-8042', 8096-8116', 8191-8201', 8304-8319', 8395-8399'.

9. PBTD: 8770'

10. Cement Plug: 45 sacks from 9675' to 9775'.



SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

NAVAJO REFINING COMPANY
ARTESIA, NEW MEXICO

BELOW GROUND DETAILS WASTE DISPOSAL WELL NO. 2

DATE: 07/13/01	CHECKED BY:	JOB NO: 7005256
DRAWN BY: WDL	APPROVED BY:	DWG. NO:

FIGURE 4

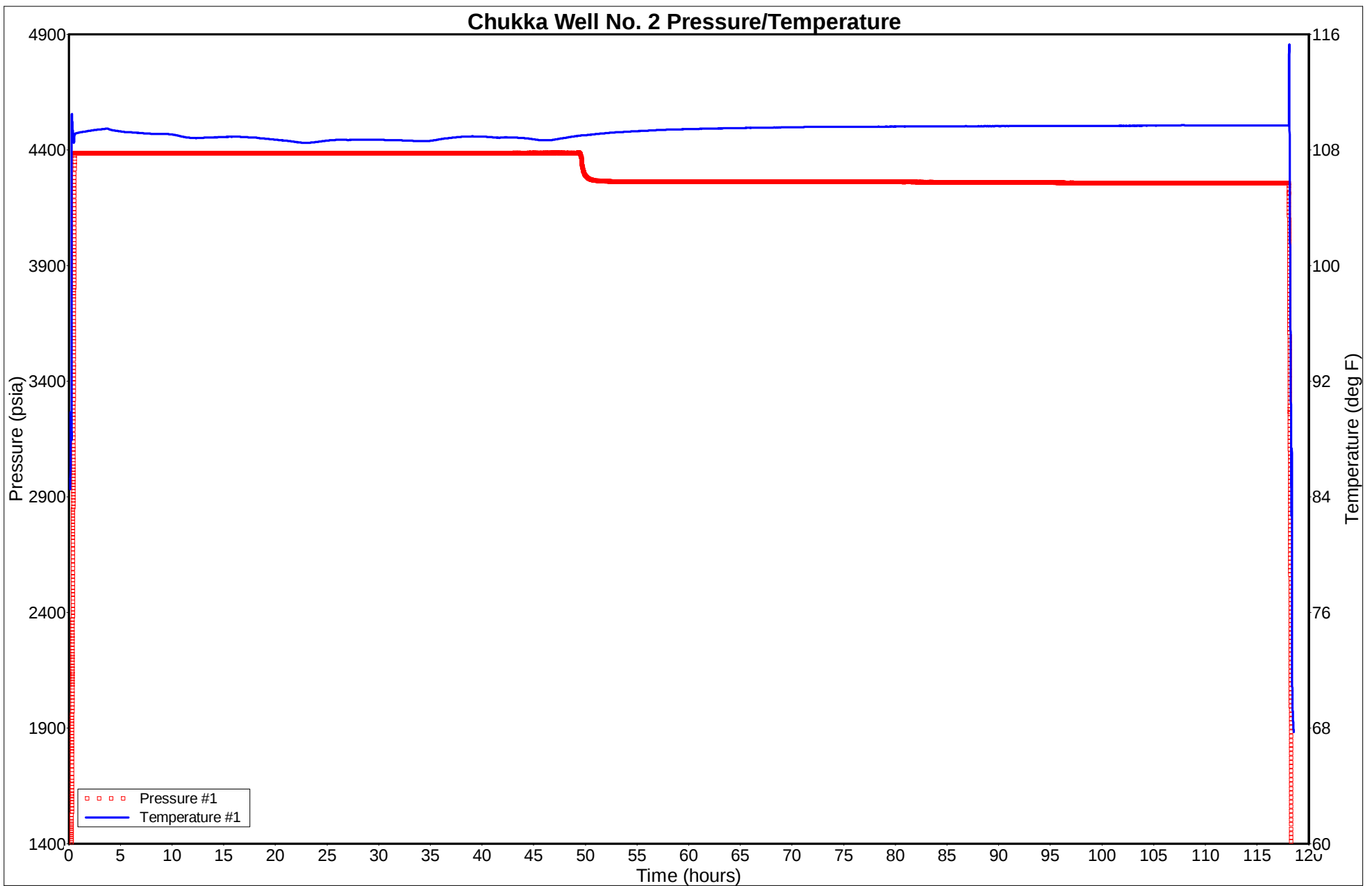
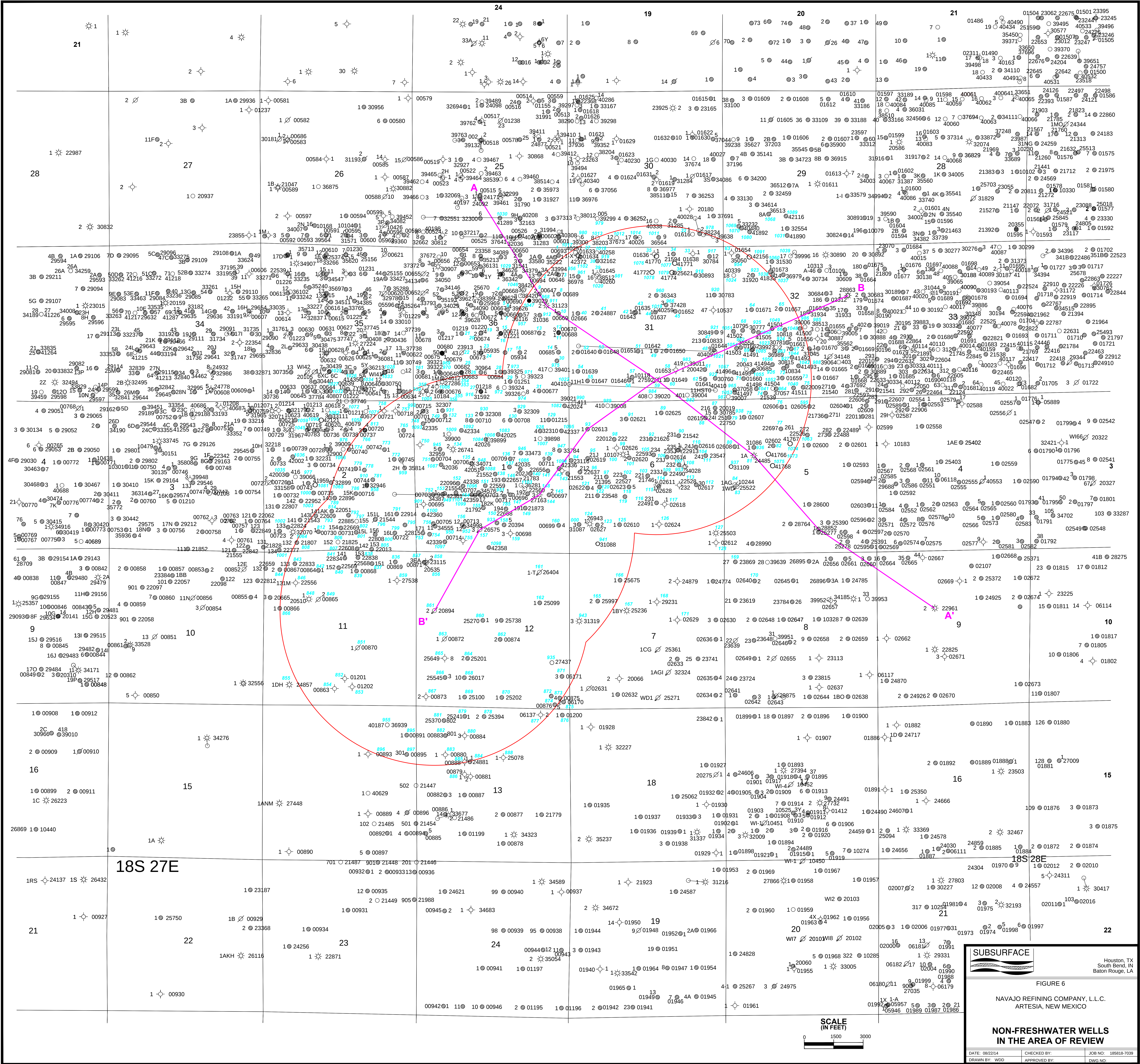


FIGURE 5



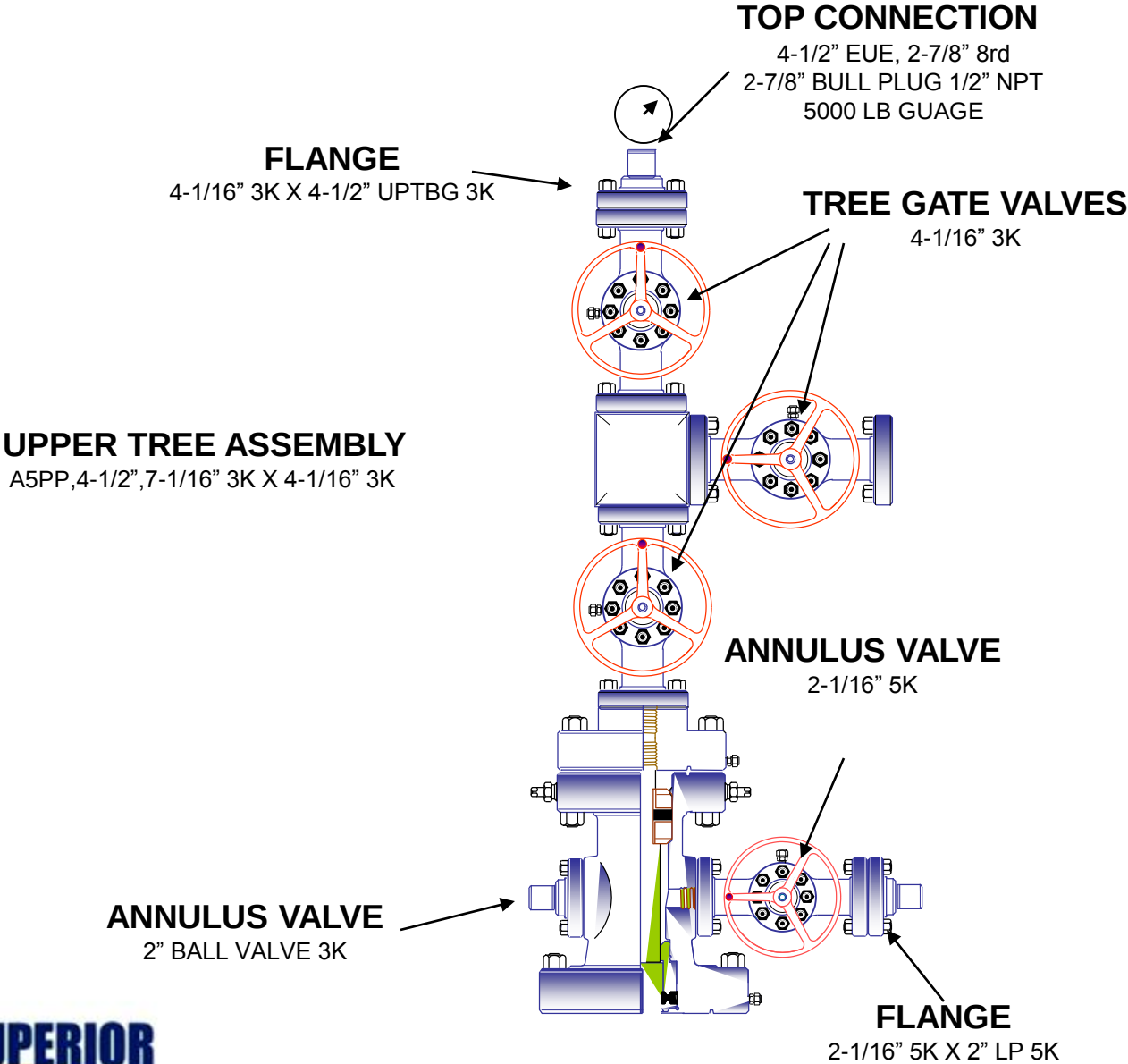
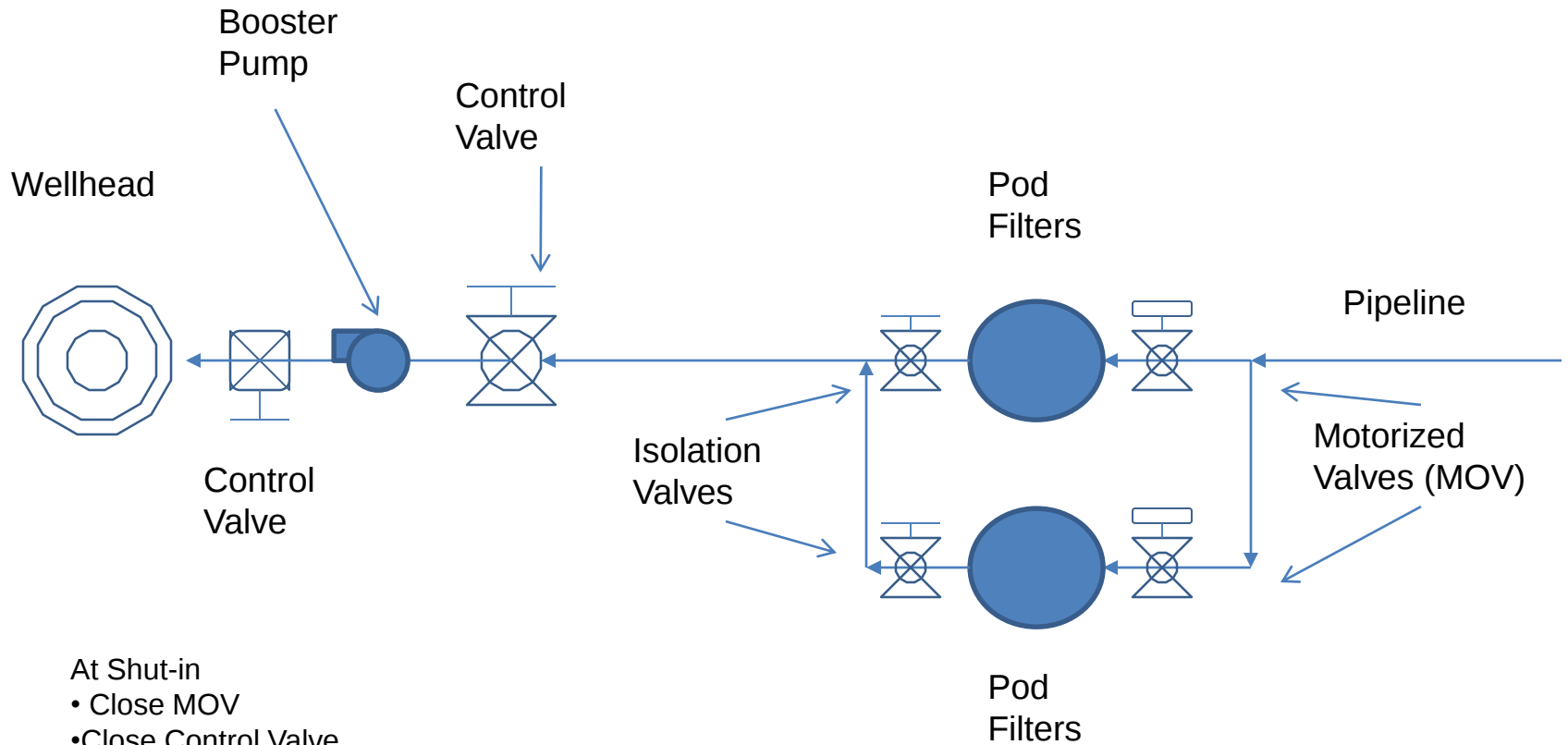


FIGURE 7

FIGURE 8
Gaines Well No. 3
Diagram of Shut-in Valve Control



- At Shut-in
- Close MOV
 - Close Control Valve
 - Close Isolation Valves
 - Close Control Valve
 - Drain POD Filters

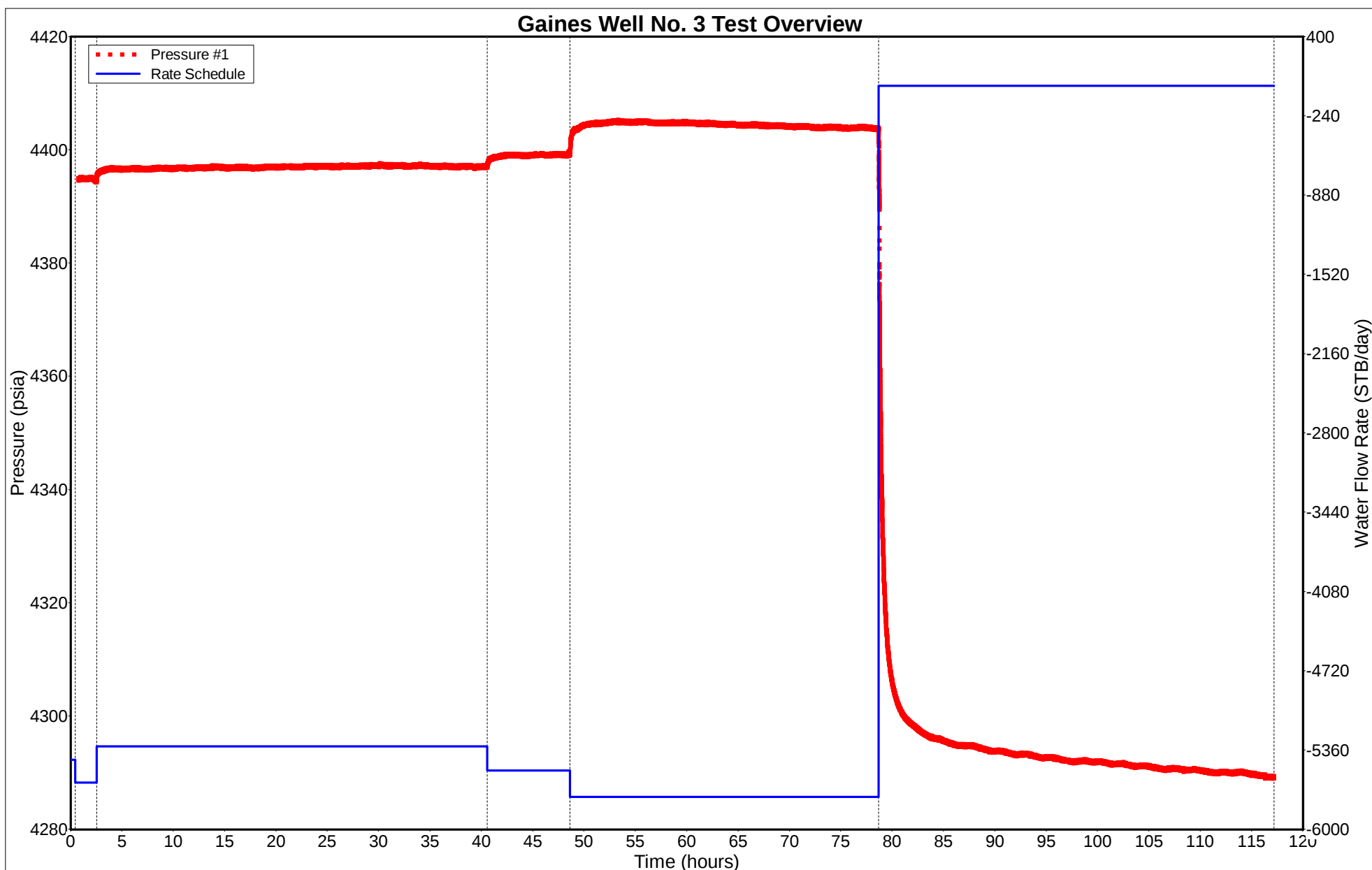


FIGURE 9

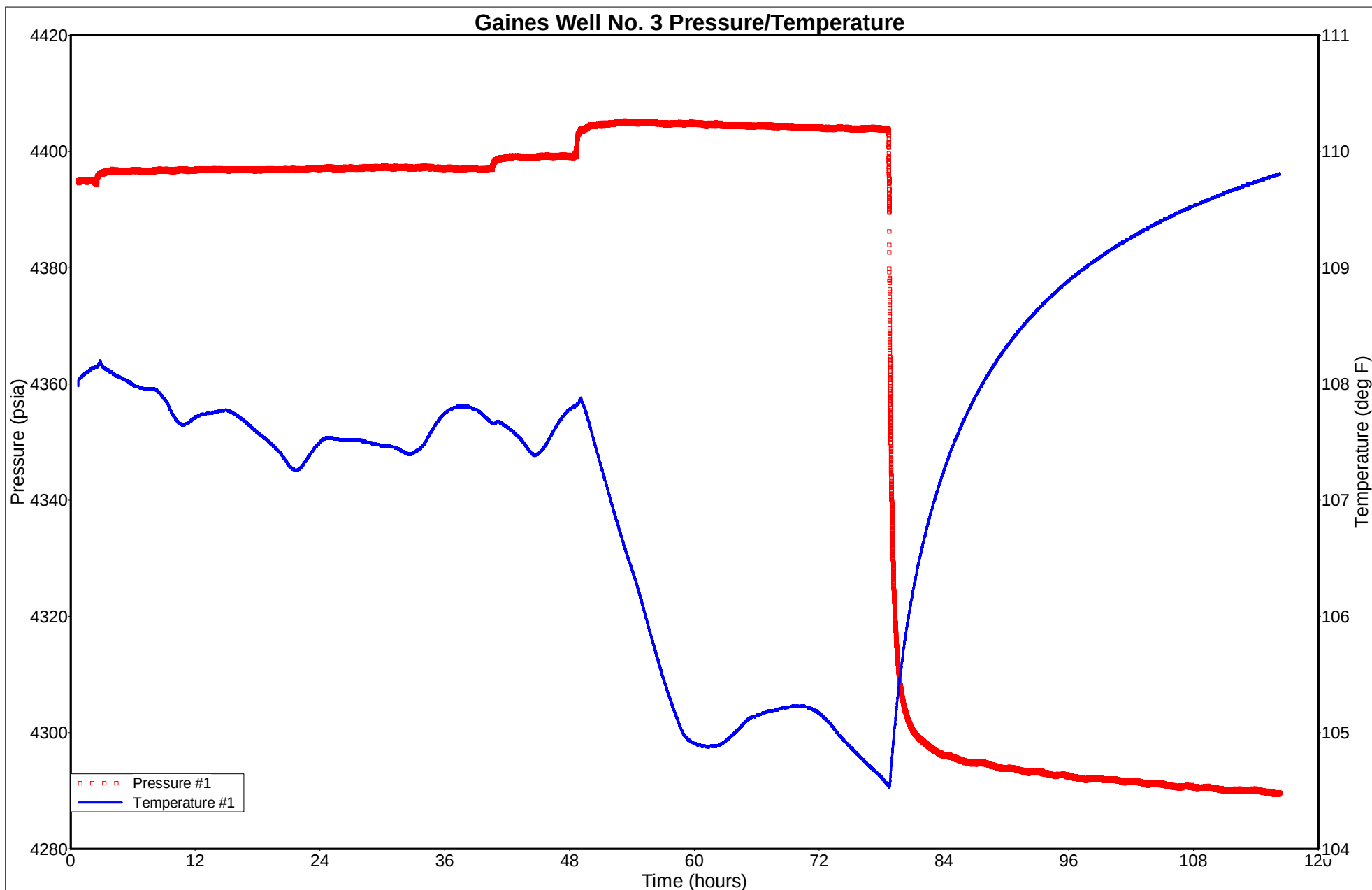


FIGURE 10

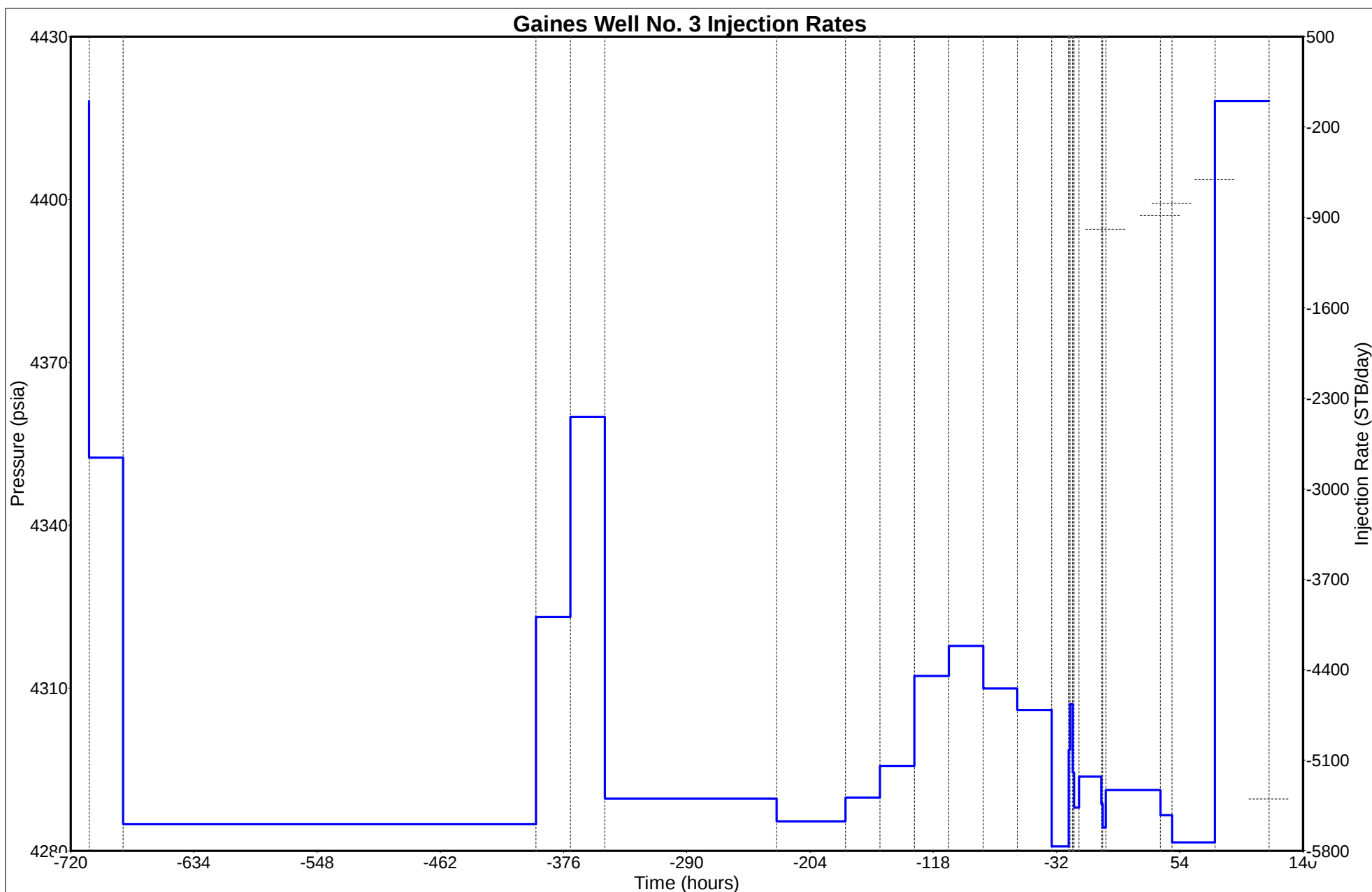


FIGURE 11

Gaines Well No. 3
Cartesian Plot of Surface Pressure and Injection Rates
March 01, 2008 to August 28, 2016

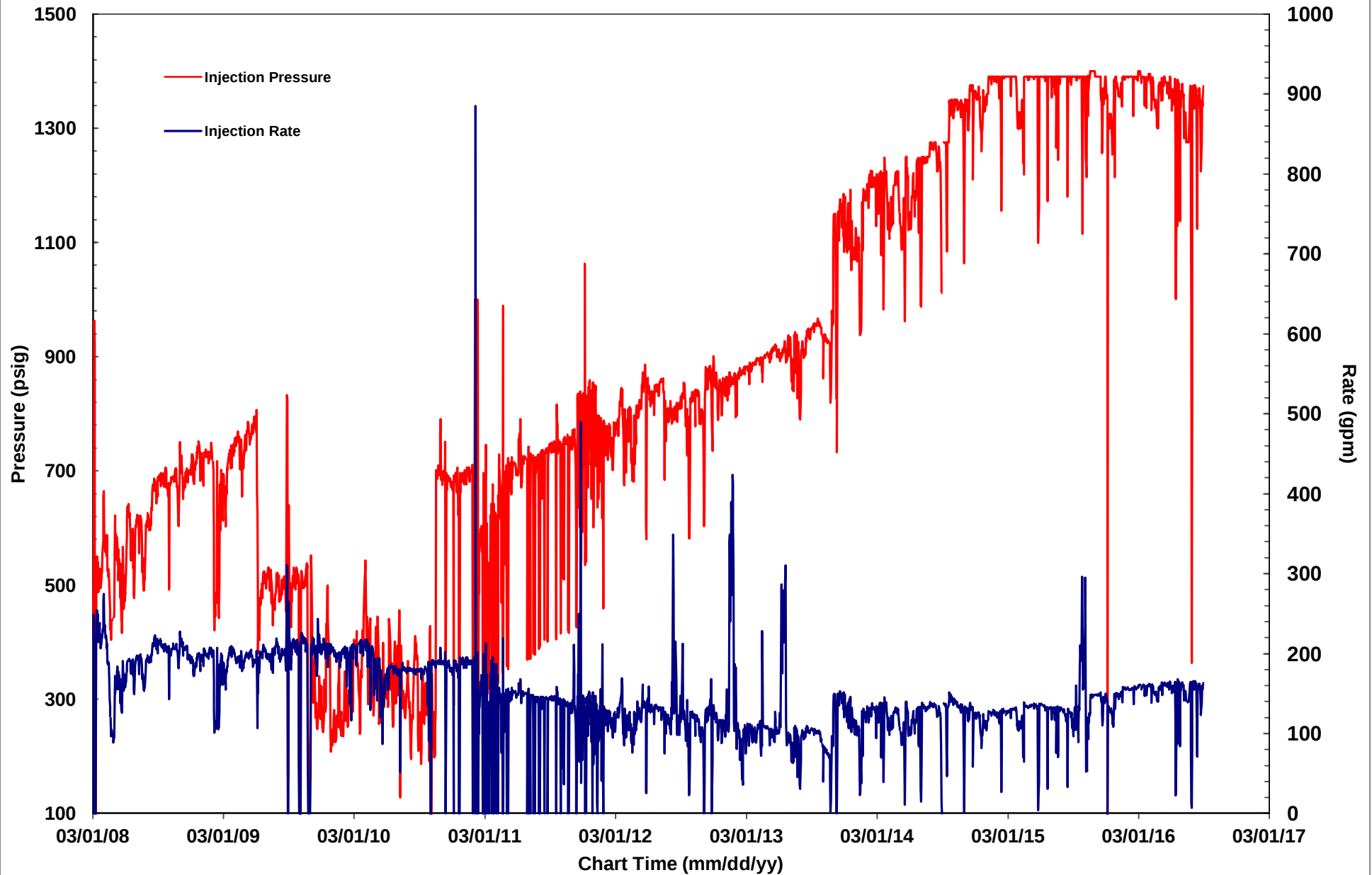


FIGURE 12

Gaines Well No. 3 Log-Log Plot

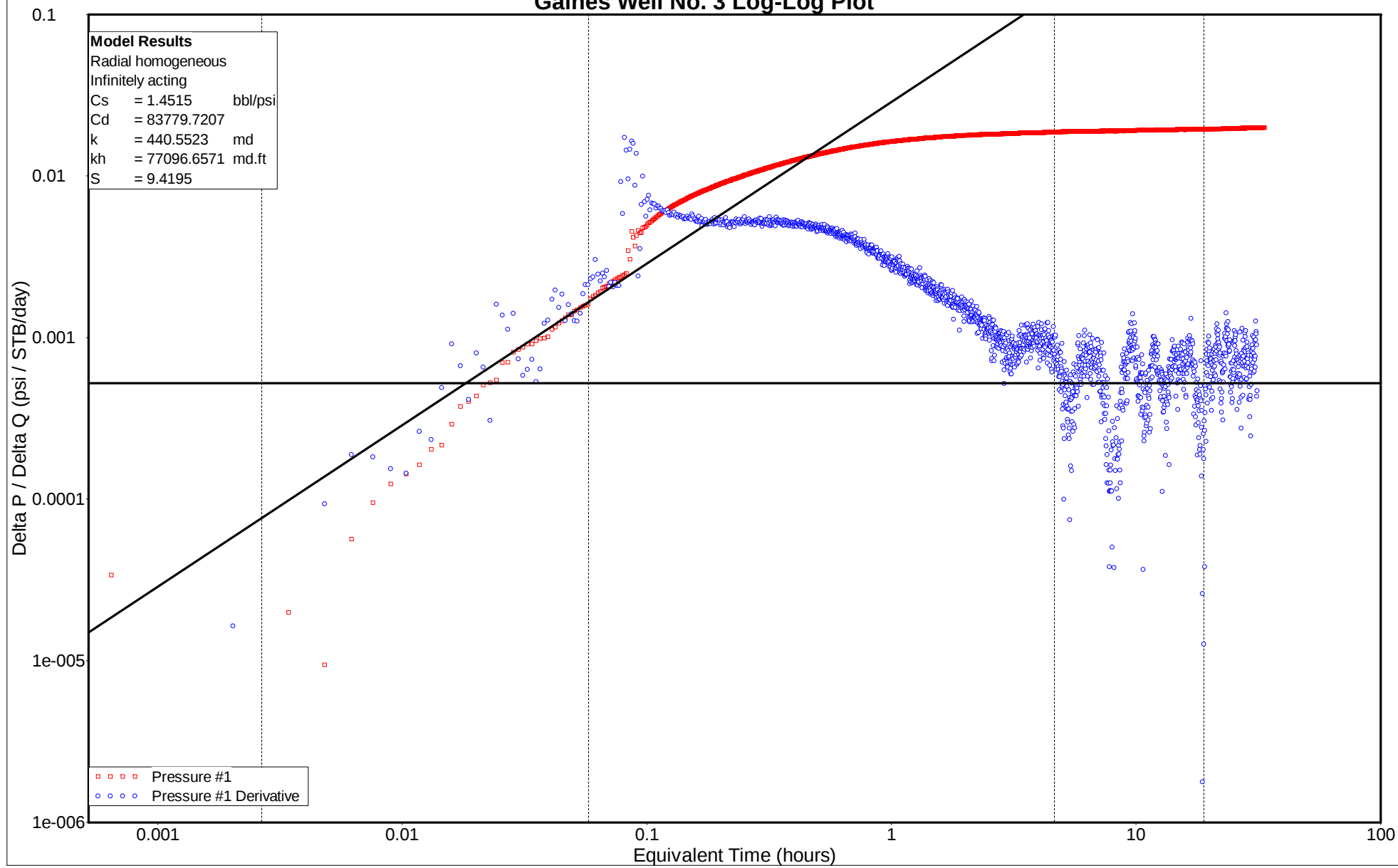


FIGURE 13

Gaines Well No. 3 Radial Flow Plot

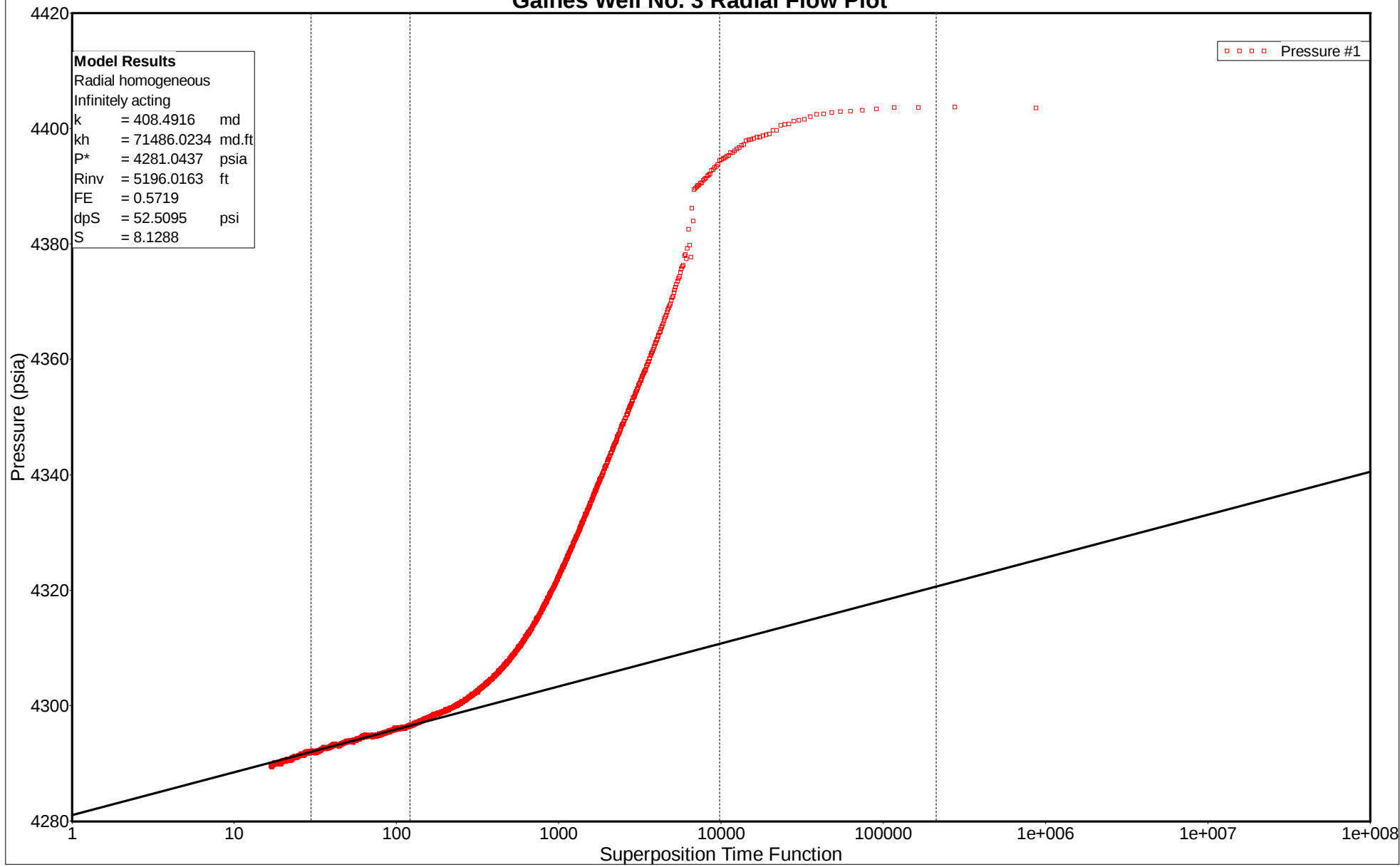


FIGURE 14

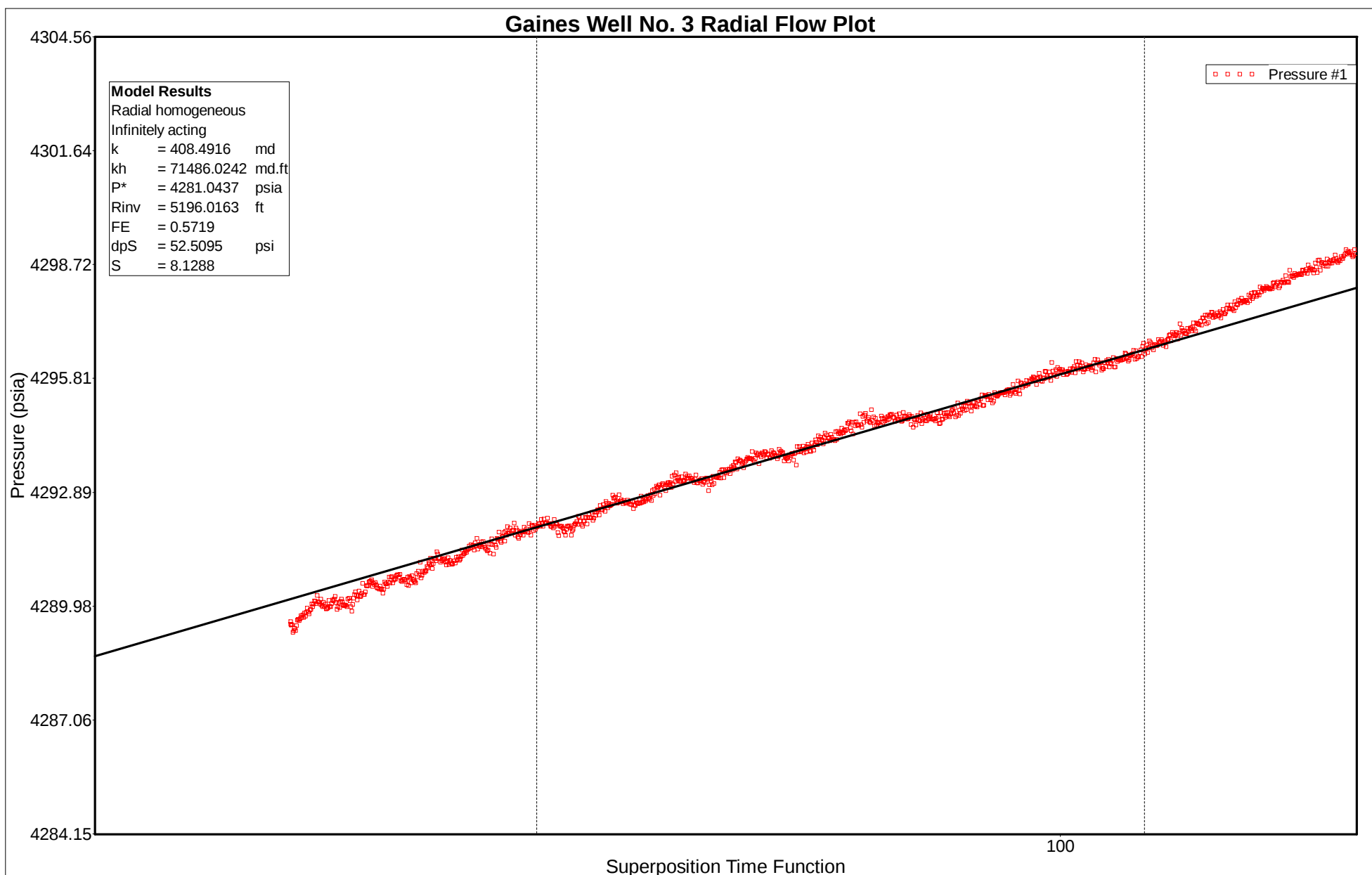


FIGURE 15

Navajo Refining Company
Gaines Well No. 3
July 27, 2016 to August 28, 2016
Hall Plot

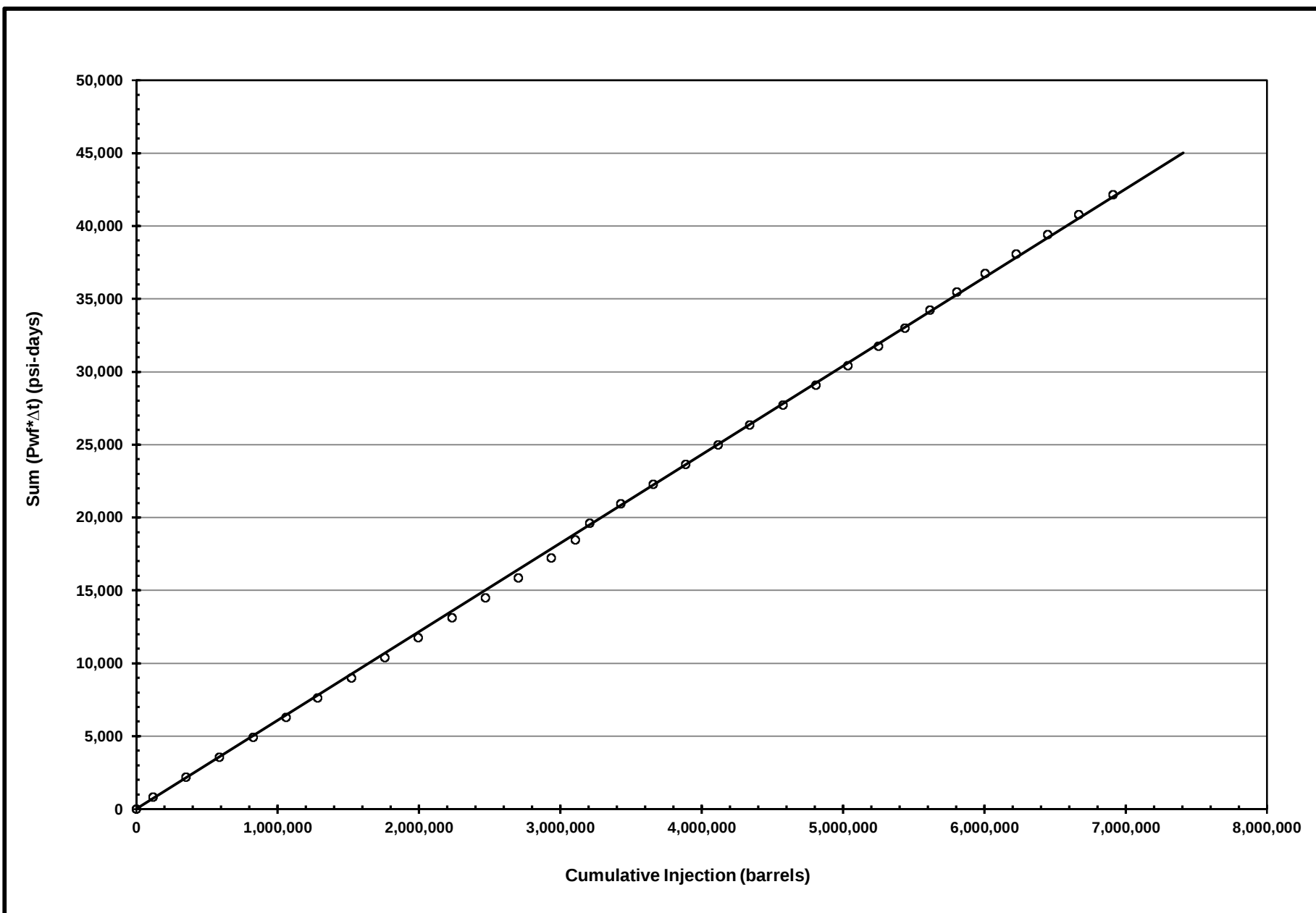


FIGURE 16

Navajo Refining Company
Static Pressure Gradient Survey
Gaines Well No. 3
August 30, 2016

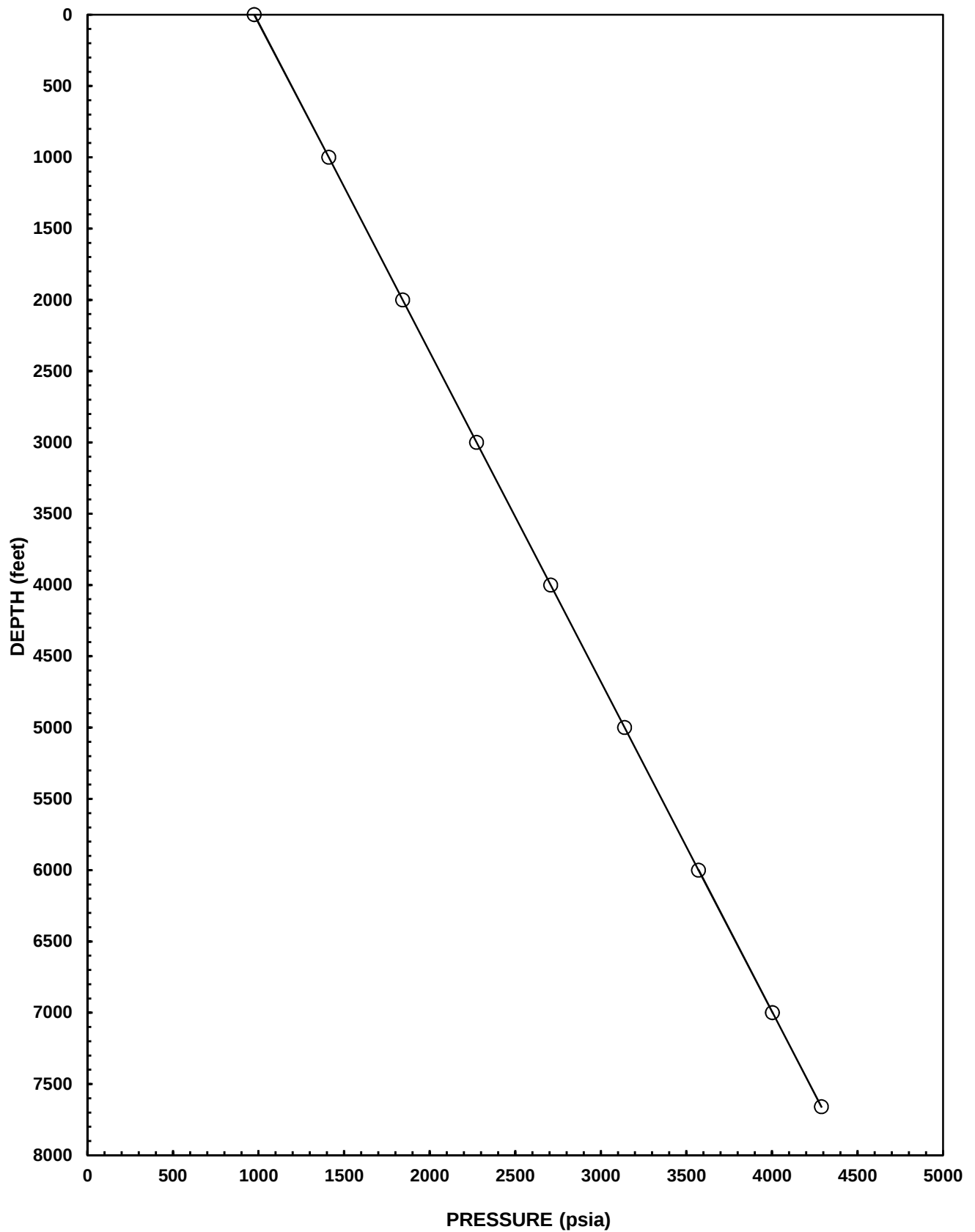


FIGURE 17

APPENDIX A

DUAL INDUCTION LOG SECTIONS FROM 7924 FEET TO 8476 FEET

APPENDIX B

NEUTRON DENSITY LOG SECTIONS FROM 7924 FEET TO 8476 FEET

APPENDIX C

COMPRESSIBILITY OF FLUID

APPENDIX C

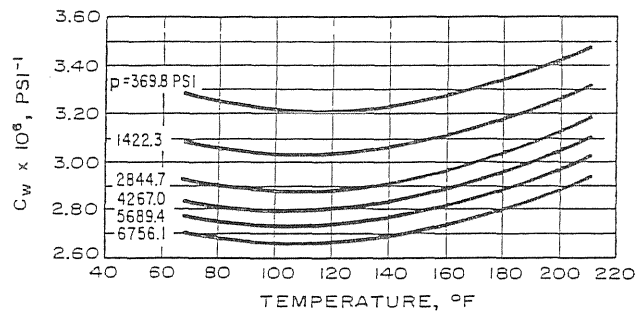


Fig. D.16 Average compressibility of distilled water. After Long and Chierici.¹³

Source: Earlougher, 1977, Advances in Well Test Analysis

COMPRESSIBILITY OF PORE VOLUME AND DISTILLED WATER

APPENDIX D

COMPRESSIBILITY OF PORE VOLUME

APPENDIX D

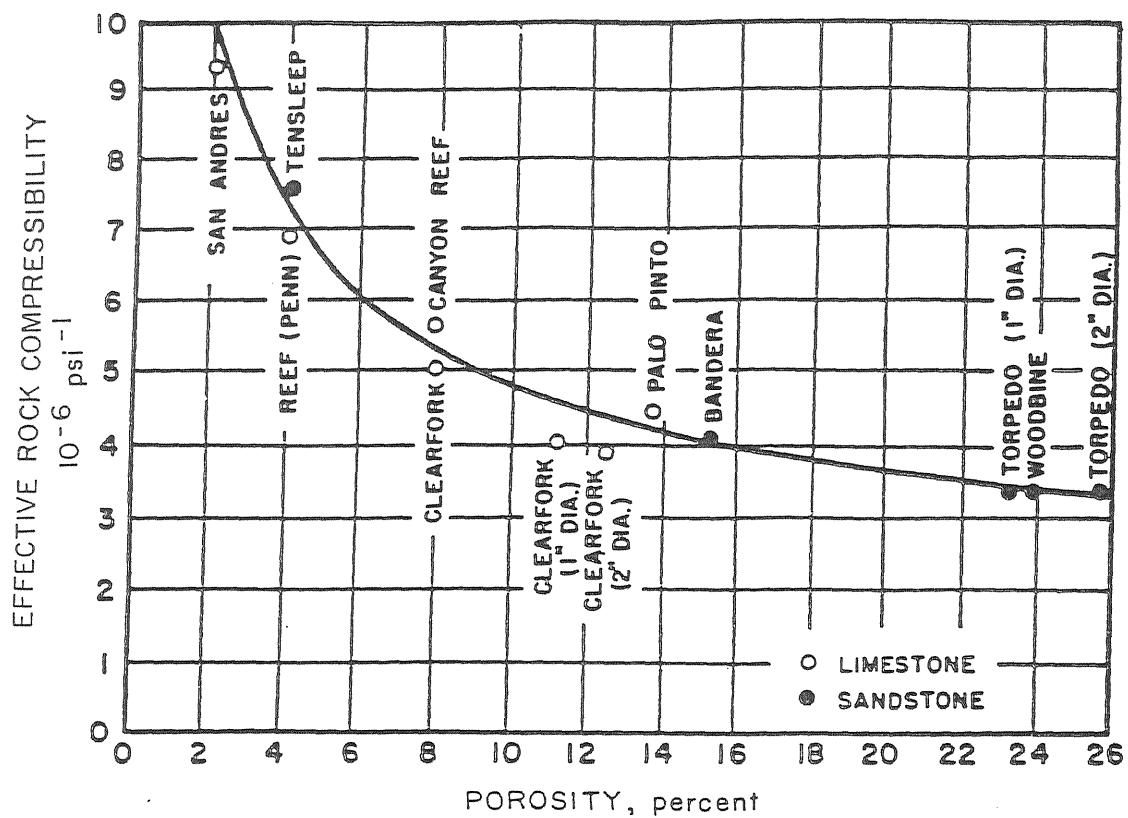


Fig. G.5 Effective formation (rock) compressibility. From Hall, *Trans.*, AIME (1953) 198, 309.

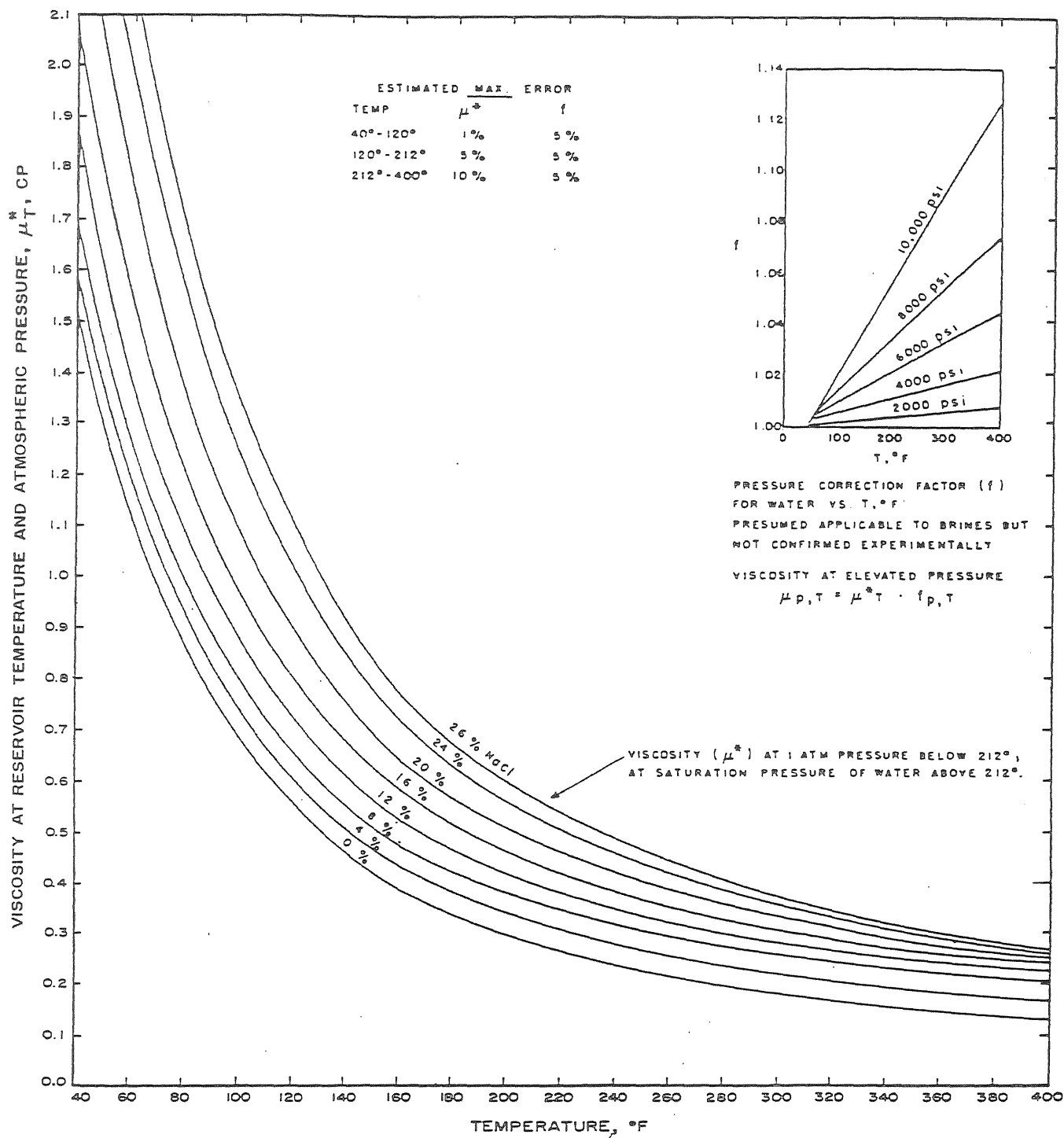
Source: Matthews and Russell, 1967, Pressure Buildup and Flow Tests in Wells

APPENDIX E

MEWBOURNE WELL NO. 1, JULY 23, 1998, TEMPERATURE LOG

APPENDIX F

WATER VISCOSITIES AT VARIOUS SALINITIES AND TEMPERATURES

Fig. D.35 Water viscosity at various salinities and temperatures. After Matthews and Russell, data of Chesnut.¹⁸

FROM: Earlougher, R.C., 1977, "Advances in Well Test Analysis", SPE of AIME, Dallas, Texas

APPENDIX G

DAILY RATE HISTORY DATA

APPENDIX G

Gaines Well No. 3 Daily Rate History One Month Prior to Shut-in

Date/Time	Gaines Injection Rate (gpm)	Gaines Pressure (psig)
07-27-16 00:00	0.00	363.77
07-28-16 00:00	80.48	841.18
07-29-16 00:00	161.61	1354.27
07-30-16 00:00	165.39	1374.07
07-31-16 00:00	165.20	1371.63
08-01-16 00:00	161.84	1362.80
08-02-16 00:00	155.05	1334.41
08-03-16 00:00	165.57	1375.02
08-04-16 00:00	164.57	1374.99
08-05-16 00:00	165.06	1375.04
08-06-16 00:00	165.53	1375.03
08-07-16 00:00	164.18	1371.93
08-08-16 00:00	161.35	1359.21
08-09-16 00:00	162.88	1368.07
08-10-16 00:00	116.45	1251.55
08-11-16 00:00	71.31	1124.06
08-12-16 00:00	152.01	1337.03
08-13-16 00:00	159.95	1356.69
08-14-16 00:00	159.22	1350.02
08-15-16 00:00	158.86	1350.04
08-16-16 00:00	156.74	1345.23
08-17-16 00:00	162.58	1370.22
08-18-16 00:00	162.47	1370.04
08-19-16 00:00	157.23	1348.02
08-20-16 00:00	150.05	1319.07
08-21-16 00:00	129.79	1247.60
08-22-16 00:00	122.99	1225.00
08-23-16 00:00	132.55	1249.97
08-24-16 00:00	137.42	1273.21
08/25/16 00:00	152.68	1328.00
08/26/16 00:00	155.09	1350.09
08/27/16 00:00	154.20	1350.00
08/28/16 00:00	166.52	1390.00
08/28/16 17:52	166.00	1386.94

APPENDIX H

GAUGE CALIBRATION SHEETS

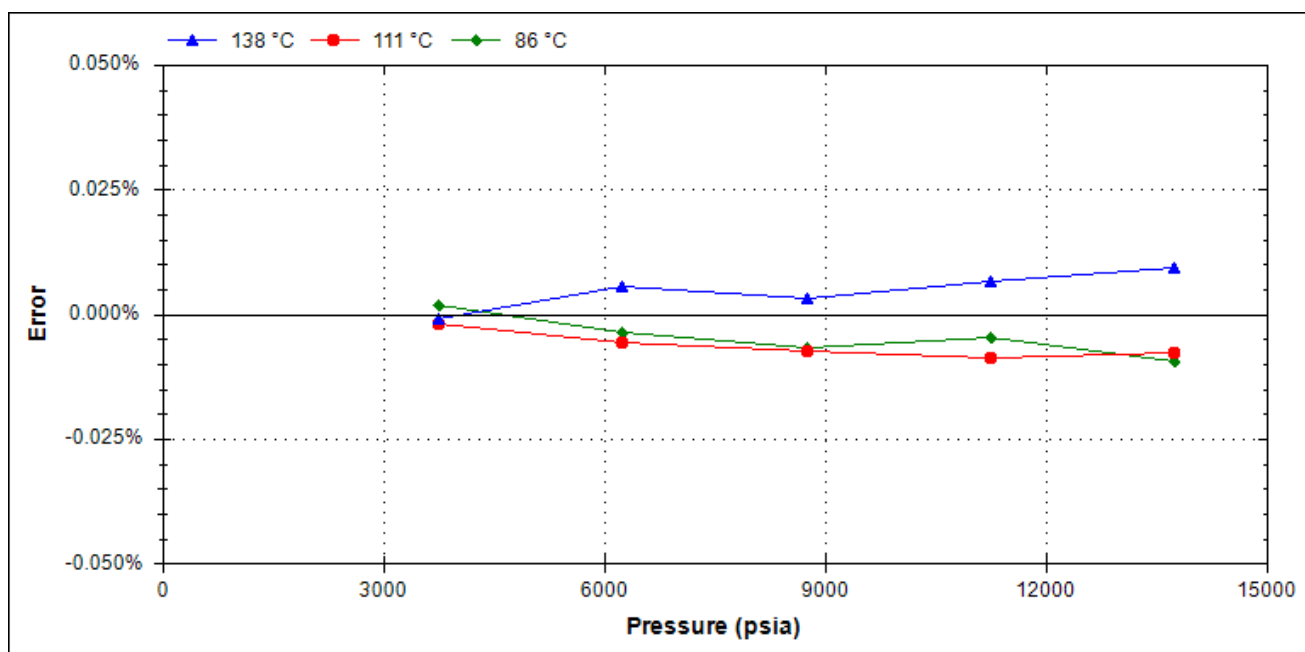
Calibration Date: 16-Mar-16
 Max Pressure Error: 0.010% F.S.
 Max Temperature Error: 0.156 °C
 Part Number: 101250
 Serial Number: DC2050

Calibration System: CALIBRATION02
 Batch Number: 20160314.155156

1.375 OD Welded Piezo IV Calibrated Assy

Max Pressure		Max Temperature	
psi	kPa	°F	°C
15,000	103,421	351	177

Accuracy: As shown in the graph below, this DataCan Pressure gauge conforms to within +/- 0.030% F.S. of the pressure standard used in calibration, which is accurate to within +/- 0.01% of reading.



Working Standards

Sun Electronic Systems Environmental Chamber, Model: EC127, Serial: EC0063
 DHI Instruments Pressure Controller, Model: PPCH-200M (30,000psi Reference), Serial: 614

Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.



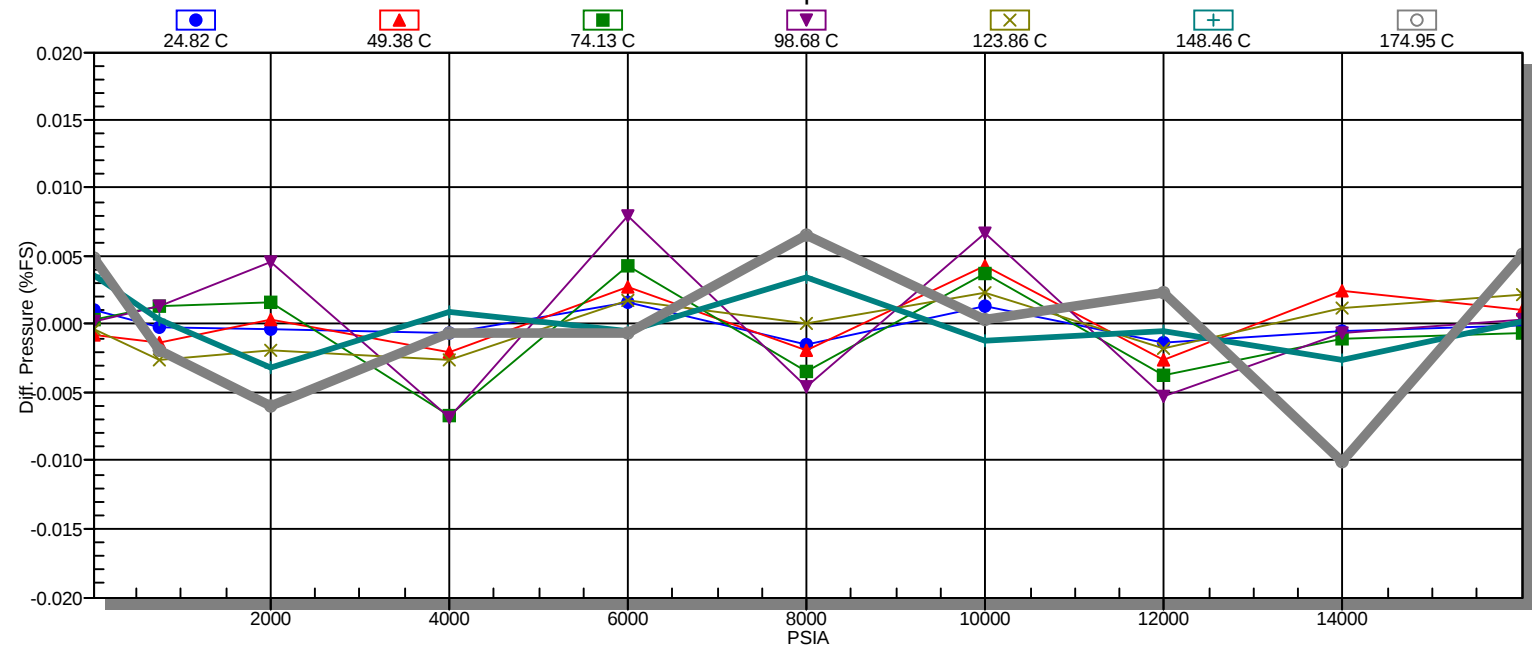
Approved By:
 DataCan Services Corp.

Calibrated By:
 Angelo Pulido



Pressure Gauge Certificate of Calibration

Calibration Report - 21566



GAUGE NUMBER: 21566

2-D POLYNOMIAL LMS CURVEFIT

Source of f: Pres

Fit Order: 3

Prescale: $x_p = m * (f_p - f_{p0})$

m: 0.01

$f_{p0} = 25120$

Temp

4

$x_t = m * (f_t - f_{t0})$

0.01

$f_{t0} = 60780$

Pressure Equation:

$Pressure (PSI) = A + x_p(B + x_p(C + x_p(D)))$

Temperature Compensation:

$A = A_0 + x_t(A_1 + x_t(A_2 + x_t(A_3 + x_t(A_4))))$

$B = B_0 + x_t(B_1 + x_t(B_2 + x_t(B_3 + x_t(B_4))))$

$C = C_0 + x_t(C_1 + x_t(C_2 + x_t(C_3 + x_t(C_4))))$

$D = D_0 + x_t(D_1 + x_t(D_2 + x_t(D_3 + x_t(D_4))))$

0	1	2	3	4
Pressure (psi) STANDARD FIT COEFFICIENTS:				
A 14.88652413	-0.2824377191	-0.01958011869	4.079977308E-06	-1.32351769E-08
B 41.05065827	-0.02082855127	2.725622637E-05	-2.29528527E-08	8.454116478E-11
C -0.001956843652	1.136716788E-05	-1.724170294E-08	7.903995042E-11	-3.609331649E-14
D 6.680992089E-07	-3.577913397E-09	1.209701179E-11	-6.916813055E-14	-6.100916517E-17
Temperature (C) STANDARD FIT COEFFICIENTS				
A 24.87285078				
B -0.7219280038				
C -0.0007614000137				
D -4.707668561E-07				



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Pressure Gauge Certificate of Conformance

SERIAL NUMBER	21566	CALIBRATION DATE	APR 21/15
MODEL NUMBER	1282 FF2	TRACEABILITY DOC.	CAL-STANDARD-001
PRESSURE RANGE	14.80 - 16000.00 psi	PRESSURE REFERENCE	NIST Traceable
TEMP. RANGE	24.82 - 174.95 °C	TEMP. REFERENCE	NIST Traceable

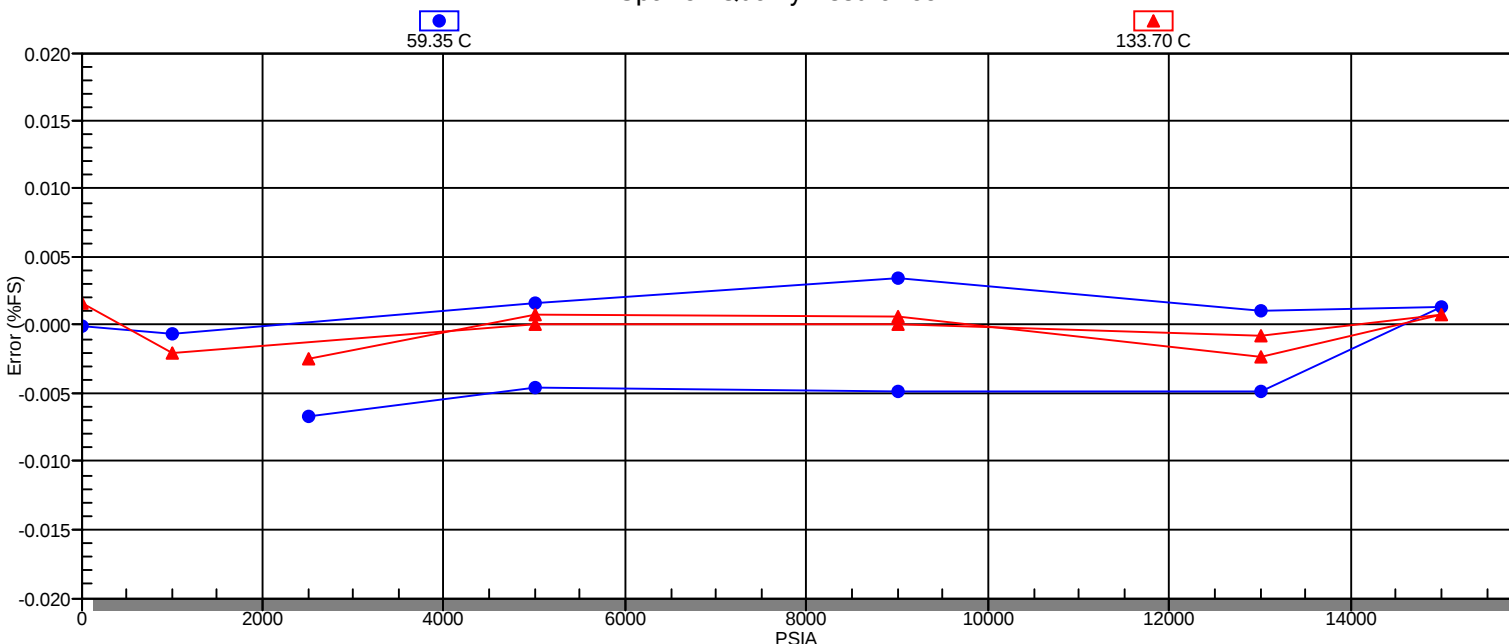
Testing and Verification Completed on APR 15/15. The instrument response is within the stated specifications for this type of pressure gauge.

As shown in the graph below, this Spartek Gauge conformed to within $\pm 0.020\%$ F.S. of the pressure standard used in calibration, which is accurate to within $\pm 0.01\%$ of reading. This gives an overall accuracy of $\pm (0.020\% \text{ F.S.} + 0.01\% \text{ of reading})$

NOTE

Units calibrated with a bellows meet performance specifications from 200 psi to full scale. Operating range is from 0 to full scale.

Spartek Quality Assurance



Accepted By: _____



Date: APR 22/15

Error File: Gauge # 21566

Pressure psi	Temperature Deg. C	Count (Pres)	Count (Temp)	DIFF (press) psi
14.80	24.82	25120.21	60780.42	0.17
750.00	24.78	26912.20	60779.79	-0.03
2000.00	24.84	29966.64	60780.45	-0.06
3999.90	24.88	34871.18	60780.72	-0.09
6000.00	24.85	39797.98	60779.96	0.25
8000.00	24.83	44742.42	60778.71	-0.23
10000.00	24.87	49708.48	60780.63	0.21
12000.00	24.87	54689.76	60777.55	-0.22
14000.00	24.90	59690.15	60779.82	-0.09
16000.00	24.86	64705.40	60776.57	0.00
15.10	49.38	25154.79	57266.10	-0.11
750.00	49.34	26913.79	57265.60	-0.21
2000.00	49.43	29914.67	57266.05	0.06
4000.00	49.37	34734.47	57264.44	-0.32
6000.00	49.34	39581.32	57265.73	0.44
8000.00	49.37	44447.60	57263.74	-0.29
10000.00	49.38	49340.55	57265.92	0.68
12000.00	49.43	54249.08	57263.63	-0.42
14000.00	49.21	59182.60	57264.96	0.39
16000.00	49.42	64132.00	57263.81	0.17
14.90	74.13	25324.08	53425.42	0.05
750.00	74.04	27046.78	53426.00	0.21
2000.00	74.10	29984.79	53427.37	0.27
4000.00	74.08	34705.80	53422.92	-1.07
6000.00	74.08	39461.94	53426.22	0.68
8000.00	74.18	44237.65	53421.70	-0.55
10000.00	74.20	49045.04	53425.54	0.60
12000.00	74.03	53870.59	53420.75	-0.61
14000.00	74.12	58723.84	53423.84	-0.17
16000.00	74.11	63597.48	53422.36	-0.10
15.10	98.68	25663.62	49209.09	0.04
750.00	98.63	27342.58	49211.43	0.22
2000.00	98.61	30209.63	49211.92	0.72
4000.00	98.85	34818.09	49206.66	-1.09
6000.00	98.68	39467.94	49209.52	1.27
8000.00	98.93	44138.64	49204.52	-0.72
10000.10	98.84	48848.12	49210.15	1.06
12000.00	98.87	53576.19	49204.65	-0.85
14000.00	98.88	58337.76	49207.50	-0.11
16000.00	98.95	63122.38	49203.70	0.05
15.10	123.86	26211.95	44590.58	-0.06
750.00	123.88	27839.86	44591.31	-0.42
2000.00	123.81	30622.30	44594.75	-0.30
4000.00	123.88	35105.55	44590.63	-0.42
6000.00	123.92	39627.19	44593.04	0.29
7999.90	123.89	44182.33	44589.14	0.01
10000.00	123.91	48773.35	44594.02	0.37
12000.00	123.86	53394.16	44587.33	-0.29
14000.00	123.89	58048.48	44592.19	0.19
16000.10	123.96	62730.49	44588.18	0.35
15.20	148.46	27020.42	39508.57	0.56
749.90	148.49	28589.29	39509.75	0.07
2000.00	148.53	31273.24	39512.17	-0.50
4000.00	148.43	35607.16	39510.87	0.14
6000.00	148.50	39981.92	39510.29	-0.09
8000.00	148.48	44399.94	39508.92	0.54
10000.00	148.49	48854.29	39511.97	-0.19
12000.00	148.52	53348.28	39507.96	-0.09
14000.00	148.57	57876.62	39508.91	-0.41
16000.10	148.52	62439.82	39505.76	0.03
15.00	174.95	28241.68	33441.82	0.78
750.00	174.92	29735.88	33443.23	-0.31
2000.00	174.95	32295.46	33446.85	-0.97
4000.00	174.92	36437.98	33444.70	-0.10
6000.00	174.96	40628.14	33446.84	-0.11
8000.00	174.95	44870.22	33440.85	1.05
10000.10	174.93	49153.59	33444.05	0.05
12000.00	174.94	53484.27	33438.95	0.38
14000.00	174.94	57851.58	33442.96	-1.62
16000.00	174.95	62267.78	33437.08	0.83



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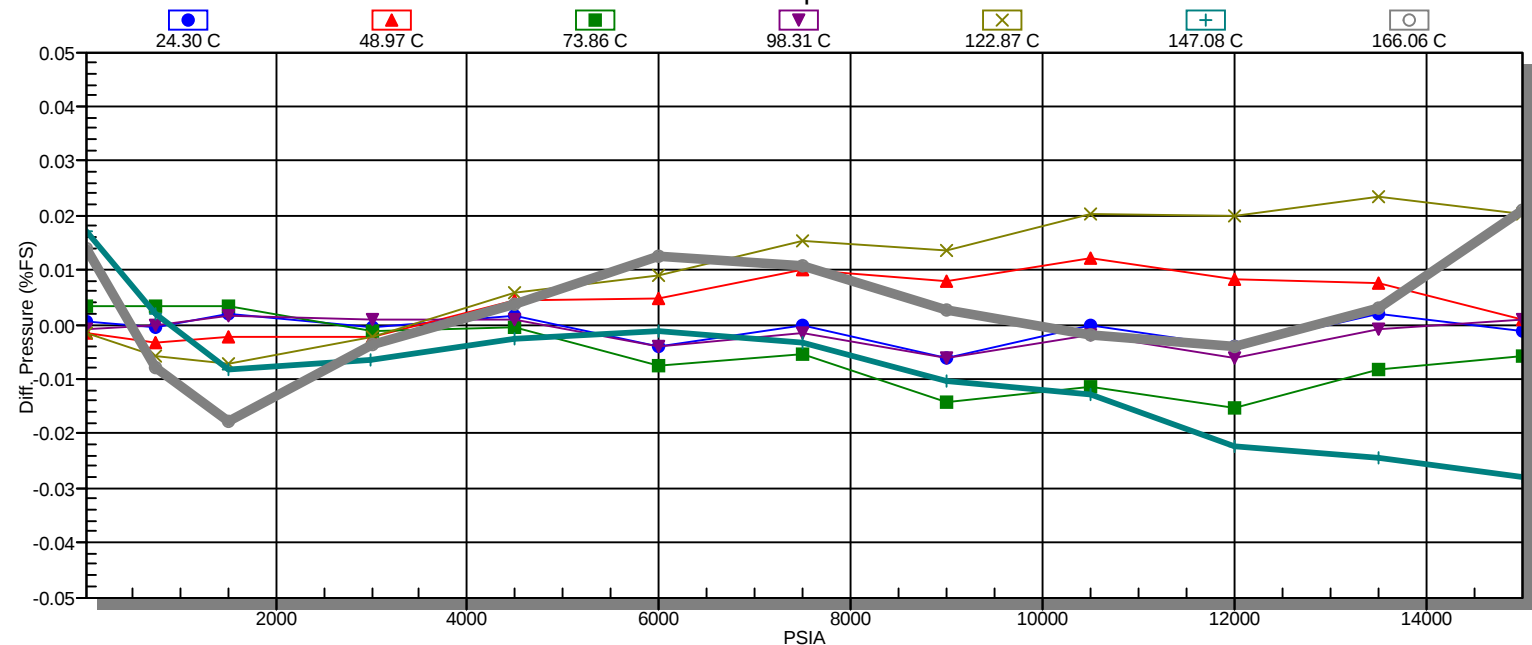
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Pressure Gauge Certificate of Calibration

Calibration Report - 79240



GAUGE NUMBER: 79240

2-D POLYNOMIAL LMS CURVEFIT

Source of f: Pres

Fit Order: 3

Prescale: $x_p = m * (f_p - f_{p0})$

m: 0.01

$f_{p0} = 706553$

Temp

4

$x_t = m * (f_t - f_{t0})$

0.01

$f_{t0} = 169216$

Pressure Equation:

$Pressure (PSI) = A + x_p(B + x_p(C + x_p(D)))$

Temperature Compensation:

$A = A_0 + x_t(A_1 + x_t(A_2 + x_t(A_3 + x_t(A_4))))$

$B = B_0 + x_t(B_1 + x_t(B_2 + x_t(B_3 + x_t(B_4))))$

$C = C_0 + x_t(C_1 + x_t(C_2 + x_t(C_3 + x_t(C_4))))$

$D = D_0 + x_t(D_1 + x_t(D_2 + x_t(D_3 + x_t(D_4))))$

0	1	2	3	4
Pressure (psi) STANDARD FIT COEFFICIENTS:				
A 15.06048423	0.1062621715	0.0006790385736	2.808885004E-06	3.612388973E-09
B 4.349500759	-0.002783187053	5.350177499E-07	1.29123029E-10	3.256089021E-12
C -2.079242425E-05	-1.117988109E-07	-1.865025164E-09	-7.893310697E-12	-1.042701479E-14
D 4.069851823E-10	2.993582973E-11	4.839127738E-13	2.04517194E-15	2.658842901E-18
Temperature (C) STANDARD FIT COEFFICIENTS				
A 24.37226014				
B -0.2791985605				
C 7.045336281E-05				
D -2.514563987E-08				

Error File: Gauge # 79240

Pressure psi	Temperature Deg. C	Count (Pres)	Count (Temp)	DIFF (press) psi
15.00	24.30	706553.33	169216.75	0.08
750.00	24.36	723464.50	169252.00	-0.10
1500.00	24.33	740763.17	169251.13	0.31
3000.00	24.22	775432.17	169287.50	-0.10
4500.00	24.32	810214.17	169274.88	0.23
6000.00	24.34	845094.50	169285.63	-0.61
7500.00	24.48	880059.83	169242.38	-0.02
9000.00	24.39	915109.17	169222.63	-0.93
10500.00	24.46	950202.50	169144.75	-0.03
12000.00	24.36	985373.00	169090.50	-0.60
13500.00	24.51	1020545.17	168982.75	0.30
15000.00	24.40	1055782.67	168894.00	-0.20
15.05	48.97	706672.00	160659.75	-0.21
750.00	48.95	722686.67	160691.75	-0.49
1500.00	49.08	739062.33	160687.75	-0.32
3000.00	49.03	771895.00	160731.63	-0.34
4500.15	49.12	804832.50	160720.13	0.66
6000.00	49.15	837856.83	160739.13	0.70
7500.00	49.05	870948.33	160703.88	1.52
9000.00	49.03	904126.17	160695.00	1.21
10500.00	49.05	937345.17	160638.00	1.85
12000.00	49.10	970631.67	160597.50	1.22
13500.00	49.02	1003926.00	160515.38	1.12
15000.00	48.99	1037276.50	160443.75	0.11
15.05	73.86	706753.50	152254.50	0.51
750.00	73.80	721956.33	152282.00	0.51
1500.00	73.78	737495.50	152283.88	0.51
3000.00	73.78	768648.00	152327.38	-0.19
4500.00	73.95	799893.83	152314.25	-0.10
5999.95	73.84	831234.50	152348.63	-1.11
7500.00	73.88	862627.17	152306.13	-0.80
9000.00	73.80	894104.83	152315.00	-2.13
10500.00	73.81	925604.50	152256.88	-1.69
12000.00	73.98	957191.67	152240.88	-2.29
13500.00	73.91	988769.33	152168.63	-1.24
15000.00	73.84	1020403.00	152118.50	-0.85
15.05	98.31	706822.33	144288.38	-0.14
750.00	98.31	721285.17	144315.38	-0.04
1500.00	98.35	736069.67	144315.13	0.22
3000.00	98.33	765707.67	144358.63	0.12
4500.00	98.49	795419.83	144351.50	0.13
6000.00	98.27	825218.67	144378.63	-0.62
7500.00	98.46	855072.83	144349.50	-0.22
9000.00	98.40	885010.83	144362.13	-0.93
10500.00	98.39	914966.50	144315.00	-0.31
12000.00	98.32	945004.67	144310.63	-0.93
13500.00	98.55	975017.67	144243.50	-0.12
15000.00	98.30	1005120.67	144216.25	0.13
15.05	122.87	706901.83	136781.88	-0.26
750.00	122.92	720665.17	136806.38	-0.87
1500.05	123.06	734737.83	136804.63	-1.10
3000.00	122.86	762976.00	136846.88	-0.34
4500.00	122.91	791285.00	136836.25	0.88
6000.00	123.01	819679.00	136868.50	1.35
7500.00	122.98	848108.50	136842.25	2.28
8999.95	122.95	876621.83	136861.75	2.02
10500.05	122.95	905158.67	136824.13	3.05
12000.00	122.92	933760.83	136815.63	2.96
13500.00	123.23	962364.17	136767.88	3.51
15000.00	122.91	991036.17	136748.00	3.03
15.15	147.08	706979.33	129830.13	2.58
750.00	147.12	720076.50	129852.88	0.31
1500.00	147.02	733478.67	129851.25	-1.22
2999.95	147.02	760418.50	129891.00	-1.00
4500.00	147.18	787432.17	129878.63	-0.37
6000.00	147.39	814540.33	129912.13	-0.18
7500.00	147.14	841670.50	129891.00	-0.49
9000.00	147.14	868890.67	129913.75	-1.56
10500.00	147.23	896110.17	129874.25	-1.95
12000.00	147.05	923422.33	129885.25	-3.38



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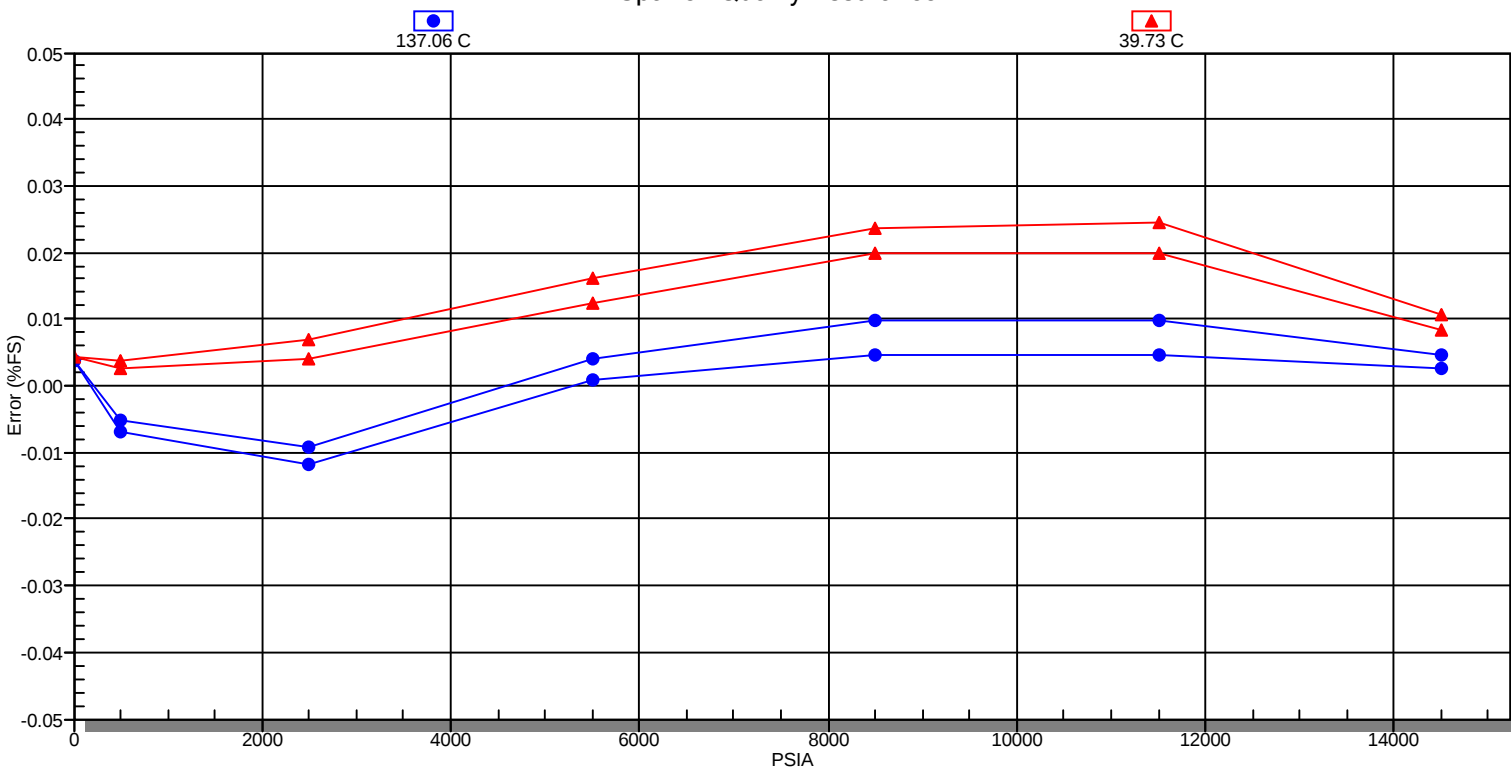
Pressure Gauge Certificate of Conformance

SERIAL NUMBER	79240	CALIBRATION DATE	MAR 09/16
MODEL NUMBER	1227 FF3	TRACEABILITY DOC.	CAL-STANDARD-001
PRESSURE RANGE	15.00 - 15000.00 psi	PRESSURE REFERENCE	NIST Traceable
TEMP. RANGE	24.30 - 166.06 °C	TEMP. REFERENCE	NIST Traceable

Testing and Verification Completed on MAR 03/16. The instrument response is within the stated specifications for this type of pressure gauge.

As shown in the graph below, this Spartek Gauge conformed to within $\pm 0.050\%$ F.S. of the pressure standard used in calibration, which is accurate to within $\pm 0.01\%$ of reading. This gives an overall accuracy of $\pm(0.050\% \text{ F.S.} + 0.01\% \text{ of reading})$

Spartek Quality Assurance



Accepted By:

Jeff Basso



Date: MAR 16/16

13500.00	147.16	950713.83	129840.13	-3.68
15000.05	147.20	978091.33	129830.75	-4.20
15.10	166.06	706900.33	124222.75	2.07
750.00	165.85	719464.33	124239.00	-1.17
1500.00	166.23	732347.33	124240.75	-2.67
3000.00	165.99	758301.67	124278.50	-0.55
4500.00	166.15	784327.67	124267.00	0.54
6000.00	166.31	810482.00	124306.00	1.87
7500.00	166.32	836644.00	124282.75	1.63
9000.00	166.23	862907.00	124317.50	0.41
10500.00	166.30	889152.00	124279.50	-0.28
12000.00	165.93	915495.33	124290.25	-0.59
13500.00	166.21	941814.00	124254.00	0.44
15000.00	166.16	968210.33	124248.25	3.16



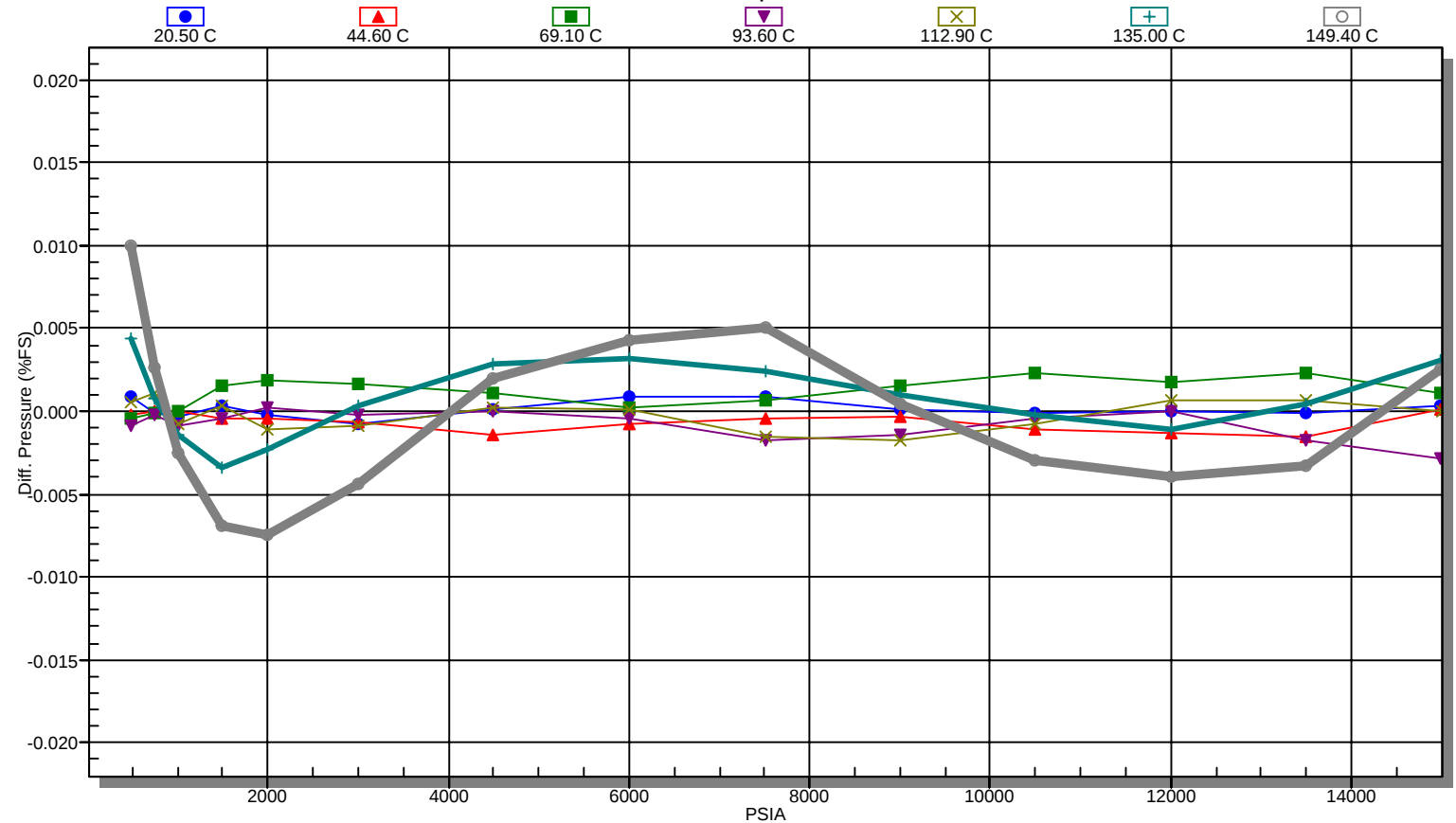
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Pressure Gauge

Certificate of Calibration

Calibration Report - 78527.



GAUGE NUMBER: 78527

2-D POLYNOMIAL LMS CURVEFIT

Source of f: Pres

Fit Order: 3

Prescale: $x_p = m * (f_p - f_{p0})$

m: 0.01

$f_{p0} = 690829$

Temp

4

$x_t = m * (f_t - f_{t0})$

0.01

$f_{t0} = 149063$

Pressure Equation:

Pressure (PSI) = $A + x_p(B + x_p(C + x_p(D)))$

Temperature Compensation:

$A = A_0 + x_t(A_1 + x_t(A_2 + x_t(A_3 + x_t(A_4))))$

$B = B_0 + x_t(B_1 + x_t(B_2 + x_t(B_3 + x_t(B_4))))$

$C = C_0 + x_t(C_1 + x_t(C_2 + x_t(C_3 + x_t(C_4))))$

$D = D_0 + x_t(D_1 + x_t(D_2 + x_t(D_3 + x_t(D_4))))$

0	1	2	3	4
Pressure (psi) STANDARD FIT COEFFICIENTS:				
A 492.8927344	-0.1140480423	0.0001173403626	-8.634862992E-07	-1.568094118E-09
B 5.137265618	-0.004253659152	6.919611456E-08	4.783816734E-10	1.158369822E-11
C -1.124332832E-05	4.304456416E-08	-3.537545481E-10	-4.531192772E-12	-1.073483766E-14
D 3.648417738E-10	-1.112609937E-11	4.697256201E-14	9.395194696E-16	2.422805716E-18
Temperature (C) STANDARD FIT COEFFICIENTS				
A 20.72189773				
B -0.3664520773				
C -5.299327756E-05				
D -3.448809106E-07				

Ramp report: Serial # 79240

Gauge range = 15000.050 PSI. Max. DIFF. = 7.500

Ramp check result: PASS, Max Err = 0.025% F.S.

DW Pressure	Gauge Pressure	RPM4 Pressure	Differential	%F.S.	Oven Temp.	Gauge Temp.
14500.00	14500.39	14500.07	0.39	0.0026	137.06	137.38
11500.00	11500.68	11500.26	0.68	0.0045	137.09	137.19
8500.00	8500.70	8500.30	0.70	0.0047	136.76	137.09
5500.00	5500.14	5500.39	0.14	0.0009	136.89	137.09
2500.00	2498.21	2500.12	-1.79	0.0119	136.79	137.20
500.00	498.95	499.75	-1.05	0.0070	137.01	137.33
15.10	15.67	14.68	0.57	0.0038	136.81	137.40
500.00	499.20	499.72	-0.80	0.0053	136.89	137.36
2500.00	2498.63	2499.96	-1.37	0.0092	137.05	137.28
5500.00	5500.59	5500.21	0.59	0.0039	137.05	137.18
8500.00	8501.48	8500.09	1.48	0.0099	137.07	137.18
11500.00	11501.45	11500.07	1.45	0.0097	137.10	137.29
14500.00	14500.70	14499.99	0.70	0.0047	136.94	137.43
14500.00	14501.25	14500.03	1.25	0.0083	39.73	39.56
11500.00	11502.99	11500.21	2.99	0.0199	39.65	39.12
8500.00	8502.98	8500.19	2.98	0.0199	39.63	38.82
5500.00	5501.84	5500.28	1.84	0.0123	39.71	38.71
2500.00	2500.59	2499.95	0.59	0.0039	39.78	38.78
500.00	500.40	499.66	0.40	0.0027	39.73	38.92
15.00	15.65	14.58	0.65	0.0044	39.89	38.97
500.00	500.55	499.71	0.55	0.0036	39.78	38.94
2500.00	2501.06	2500.03	1.06	0.0070	39.88	38.83
5500.00	5502.42	5500.22	2.42	0.0161	39.80	38.79
8500.00	8503.54	8500.11	3.54	0.0236	39.83	38.91
11500.00	11503.68	11500.06	3.68	0.0246	39.85	39.20
14500.00	14501.59	14500.12	1.59	0.0106	39.89	39.63



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Pressure Gauge

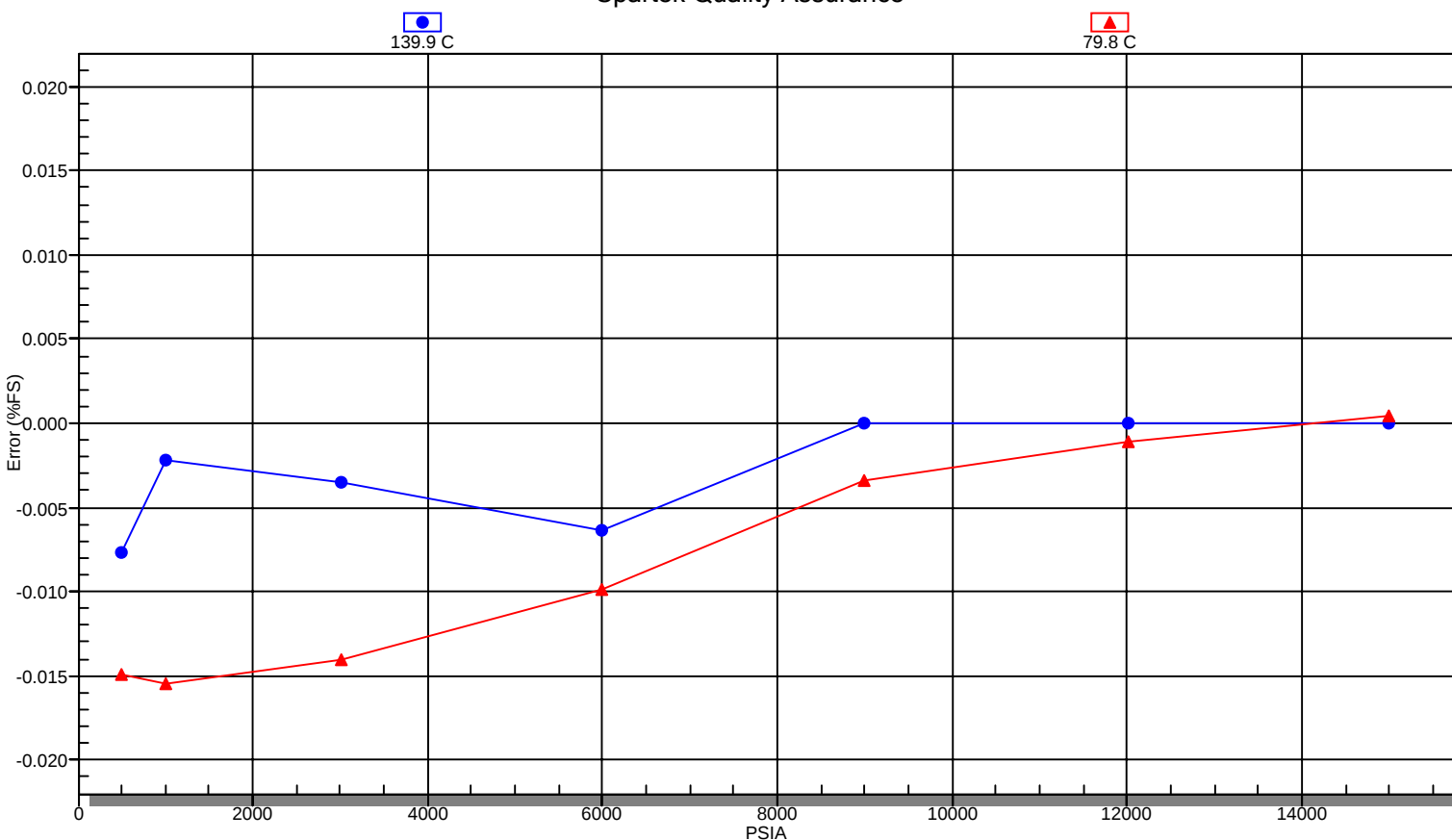
Certificate of Conformance

MODEL	1139	REVISION	0
SERIAL NUMBER	78527	DEADWEIGHT USED	Piston Cylinder No. 528
CALIBRATED	FEB13/09	E.U.B. CERT. DATE	May 09 2007
PRESSURE RANGE	14996.63 psi	TEMPERATURE RANGE	149.50 Deg. C

ACCURACY

As shown in the graph below, this Spartek Gauge conformed to within $\pm 0.022\%$ F.S. of the pressure standard used in calibration, which is accurate to within $\pm 0.01\%$ of reading. This gives an overall accuracy of $\pm(0.022\% \text{ F.S.} + 0.01\% \text{ of reading})$

Spartek Quality Assurance



Accepted By: _____

Date: Wednesday, February 18, 2009

0 points eliminated.

Error File: Gauge # 78527

Pressure psi	Temperature Deg. C	Count (Pres)	Count (Temp)	DIFF (press) psi
492.76	20.50	690829.00	149063.50	0.13
754.15	20.40	695916.33	149087.25	-0.02
1001.65	20.30	700737.00	149096.25	-0.04
1494.94	20.50	710345.00	149070.75	0.05
2002.70	20.40	720251.67	149120.50	-0.04
3004.63	20.40	739812.33	149160.00	-0.11
4498.34	20.30	769010.67	149187.25	0.01
5993.80	20.30	798273.33	149194.75	0.14
7504.15	20.40	827879.33	149217.00	0.13
8999.67	20.30	857224.33	149230.50	0.01
10494.17	20.30	886545.00	149216.75	-0.01
12005.53	20.40	916225.33	149204.75	0.00
13501.13	20.30	945628.00	149196.75	-0.02
14996.62	20.30	974990.33	149161.50	0.05
492.76	44.60	690673.00	142443.75	-0.04
754.16	44.60	695498.00	142449.25	-0.01
1001.65	44.60	700067.67	142455.75	0.00
1494.95	44.60	709178.33	142464.75	-0.06
2002.70	44.60	718563.67	142477.75	-0.07
3004.63	44.70	737098.33	142494.50	-0.10
4498.33	44.60	764772.00	142525.75	-0.22
5993.79	44.60	792523.33	142548.25	-0.12
7504.13	44.60	820585.67	142564.50	-0.06
8999.63	44.60	848394.33	142569.50	-0.05
10494.11	44.60	876215.33	142577.50	-0.16
12005.45	44.60	904354.33	142570.50	-0.20
13501.03	44.60	932208.67	142558.00	-0.23
14996.49	44.60	960073.33	142542.50	0.01
492.73	69.10	690495.33	135742.25	-0.06
754.12	69.10	695077.00	135752.25	-0.01
1001.61	69.10	699416.00	135759.50	0.00
1494.90	69.10	708070.00	135760.00	0.23
2002.65	69.10	716982.33	135776.75	0.28
3004.57	69.10	734580.00	135794.75	0.25
4498.24	69.10	760851.67	135821.50	0.16
5993.70	69.10	787191.67	135841.00	0.03
7504.02	69.10	813831.33	135856.00	0.10
8999.51	69.10	840239.00	135866.25	0.23
10493.98	69.20	866651.67	135871.50	0.35
12005.32	69.10	893376.67	135871.75	0.27
13500.89	69.10	919833.00	135864.25	0.35
14996.35	69.10	946292.33	135853.75	0.17
492.72	93.60	690299.67	129284.75	-0.13
754.11	93.50	694662.00	129290.00	-0.03
1001.61	93.50	698790.33	129293.75	-0.13
1494.90	93.50	707024.67	129293.50	-0.07
2002.66	93.60	715507.33	129305.00	0.03
3004.58	93.50	732254.33	129324.50	-0.04
4498.28	93.50	757256.00	129351.75	-0.01
5993.75	93.60	782316.00	129368.00	-0.07
7504.10	93.60	807657.67	129385.50	-0.26
8999.62	93.50	832787.33	129403.50	-0.22
10494.11	93.50	857920.33	129412.00	-0.06
12005.47	93.50	883350.67	129413.25	0.00
13501.07	93.50	908515.33	129404.50	-0.26
14996.56	93.60	933698.00	129396.50	-0.43
492.70	112.90	690145.67	124390.50	0.09
754.09	112.80	694345.67	124397.50	0.17
1001.59	112.80	698317.67	124403.75	-0.12
1494.89	112.90	706247.33	124400.50	0.04
2002.65	112.90	714410.33	124416.50	-0.17
3004.58	112.90	730534.33	124430.75	-0.13
4498.30	112.80	754602.67	124452.25	0.03
5993.78	112.80	778725.00	124466.75	0.01
7504.14	112.80	803120.00	124488.00	-0.22
8999.67	112.80	827300.00	124500.00	-0.26
10494.17	112.80	851487.00	124507.50	-0.11
12005.54	112.80	875969.33	124513.00	0.10
13501.14	112.80	900203.67	124511.75	0.10



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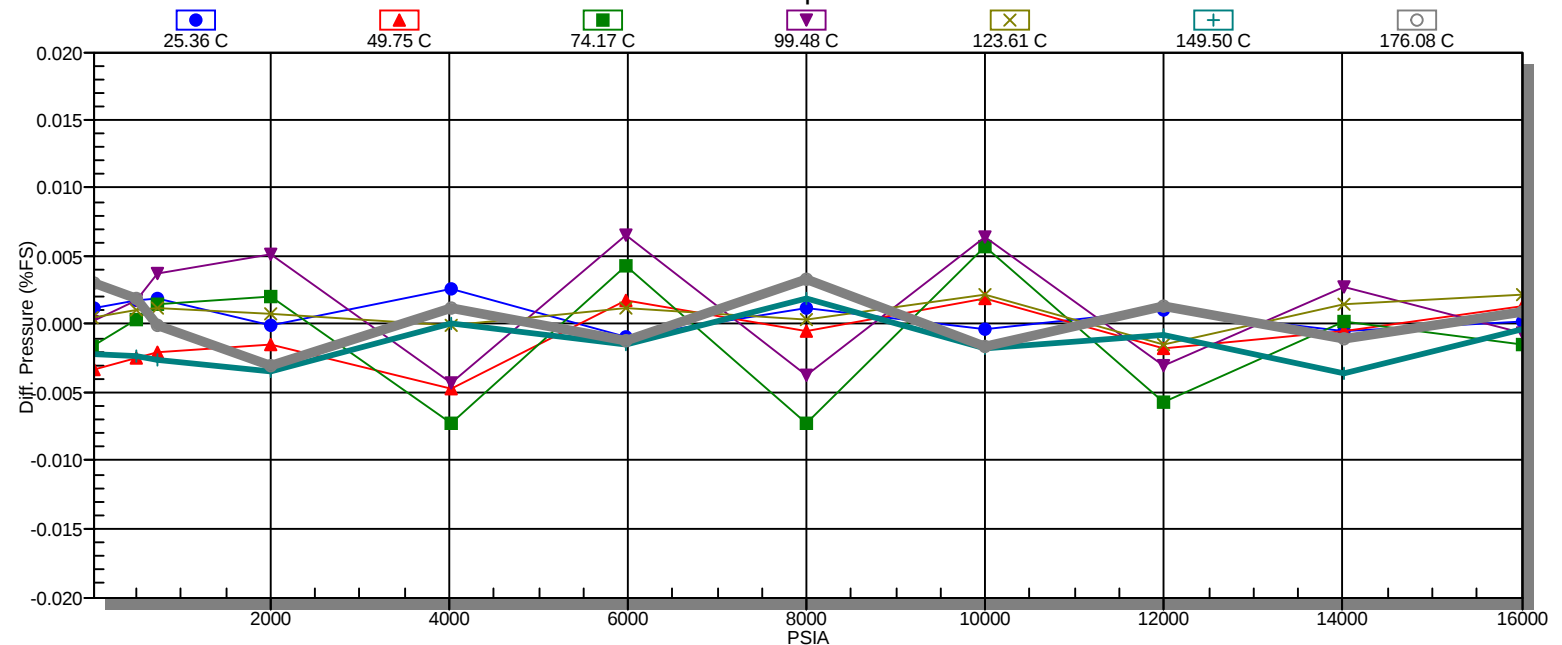
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Pressure Gauge Certificate of Calibration

Calibration Report - 21726



GAUGE NUMBER: 21726

2-D POLYNOMIAL LMS CURVEFIT

Source of f: Pres

Fit Order: 3

Prescale: $x_p = m * (f_p - f_{p0})$

m: 0.01

$f_{p0} = 16759$

Temp

3

$x_t = m * (f_t - f_{t0})$

0.01

$f_{t0} = 64464$

Pressure Equation:

Pressure (PSI) = $A + x_p(B + x_p(C + x_p(D)))$

Temperature Compensation:

$A = A_0 + x_t(A_1 + x_t(A_2 + x_t(A_3 + x_t(A_4))))$

$B = B_0 + x_t(B_1 + x_t(B_2 + x_t(B_3 + x_t(B_4))))$

$C = C_0 + x_t(C_1 + x_t(C_2 + x_t(C_3 + x_t(C_4))))$

$D = D_0 + x_t(D_1 + x_t(D_2 + x_t(D_3 + x_t(D_4))))$

0	1	2	3	4
Pressure (psi) STANDARD FIT COEFFICIENTS:				
A 13.09857717	0.127974273	-0.0186245155	1.046101332E-05	41.65885005
B -0.02111438644	2.462165166E-05	-5.793793432E-08	-0.001862508604	1.174064763E-05
C -2.608216969E-08	6.391731223E-11	4.460150877E-07	-6.422382048E-09	1.390778757E-11
D -2.509008954E-14	1	-13.5	25.33	176.11
Temperature (C) STANDARD FIT COEFFICIENTS				
A 25.4075362				
B -0.723763381				
C -0.0008530980666				
D -6.801162841E-07				

14996.63	112.90	924446.00	124506.75	0.01
492.69	135.00	689983.33	119038.00	0.66
754.09	135.00	693995.67	119039.50	0.12
1001.58	135.10	697798.67	119044.25	-0.22
1494.88	134.90	705388.00	119052.00	-0.51
2002.64	135.10	713211.33	119058.50	-0.34
3004.58	134.90	728663.33	119074.00	0.04
4498.29	135.00	751727.67	119095.75	0.43
5993.76	135.00	774849.00	119116.75	0.47
7504.12	135.10	798228.33	119134.75	0.37
8999.63	135.00	821400.33	119148.00	0.15
10494.13	135.10	844580.00	119159.75	-0.04
12005.50	135.10	868032.00	119163.00	-0.16
13501.10	135.00	891265.33	119168.75	0.06
14996.59	135.00	914502.00	119167.75	0.46
492.70	149.40	689896.67	115737.25	1.50
754.09	149.40	693789.33	115741.00	0.40
1001.59	149.40	697480.33	115743.00	-0.38
1494.88	149.50	704854.67	115749.75	-1.04
2002.65	149.50	712459.33	115754.00	-1.12
3004.58	149.40	727492.00	115770.50	-0.66
4498.29	149.50	749941.33	115787.00	0.29
5993.76	149.40	772452.33	115810.75	0.63
7504.12	149.50	795213.00	115825.00	0.76
8999.64	149.50	817763.00	115835.25	0.07
10494.14	149.50	840321.33	115843.75	-0.45
12005.50	149.50	863149.33	115846.00	-0.58
13501.10	149.50	885752.67	115847.25	-0.49
14996.58	149.50	908374.00	115849.25	0.38



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Pressure Gauge Certificate of Conformance

SERIAL NUMBER	21726	CALIBRATION DATE	JUN 01/15
MODEL NUMBER	1251 FF3	TRACEABILITY DOC.	CAL-STANDARD-001
PRESSURE RANGE	13.14 - 16001.81 psi	PRESSURE REFERENCE	NIST Traceable
TEMP. RANGE	25.36 - 176.08 °C	TEMP. REFERENCE	NIST Traceable

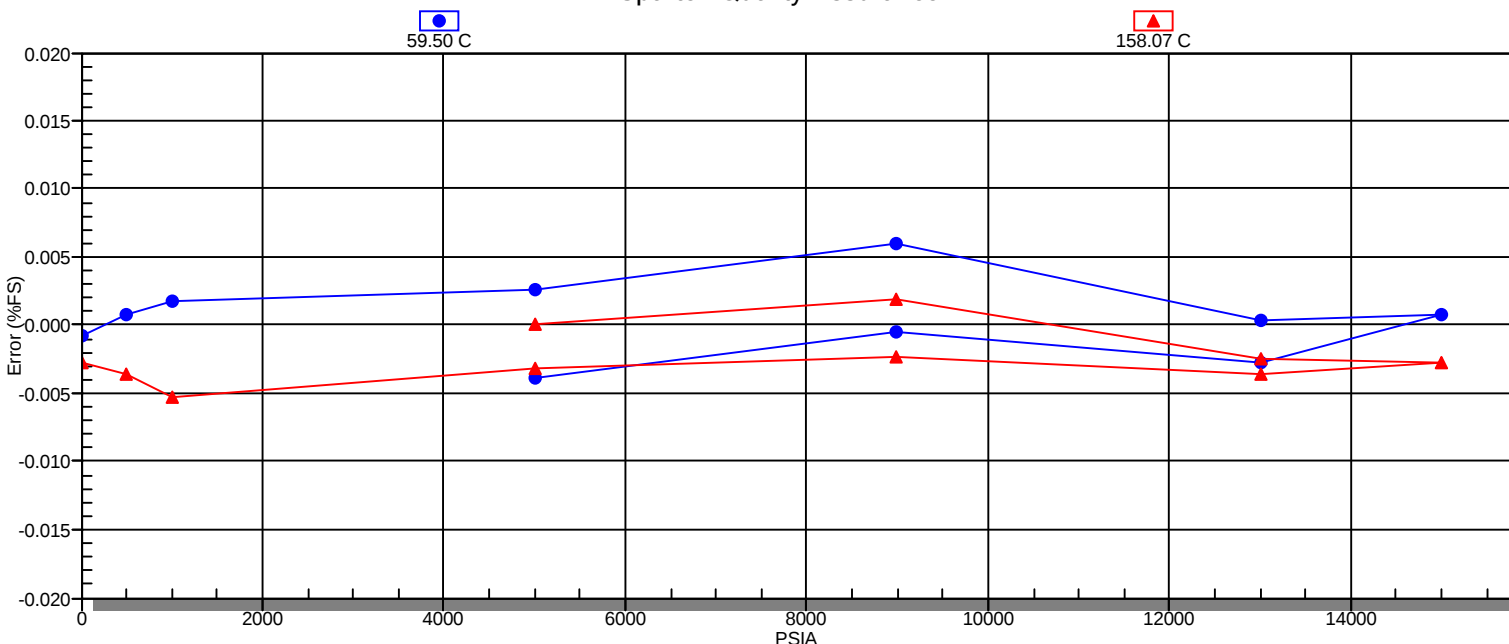
Testing and Verification Completed on JUN 02/15. The instrument response is within the stated specifications for this type of pressure gauge.

As shown in the graph below, this Spartek Gauge conformed to within $\pm 0.020\%$ F.S. of the pressure standard used in calibration, which is accurate to within $\pm 0.01\%$ of reading. This gives an overall accuracy of $\pm(0.020\% \text{ F.S.} + 0.01\% \text{ of reading})$

NOTE

Units calibrated with a bellows meet performance specifications from 200 psi to full scale. Operating range is from 0 to full scale.

Spartek Quality Assurance



Accepted By: _____



Date: JUN 05/15

Ramp report: Serial # 21566

Gauge range = 16000.100 PSI. Max. DIFF. = 3.200

Ramp check result: PASS, Max Err = 0.007% F.S.

DW Pressure	Gauge Pressure	RPM4 Pressure	Differential	%F.S.	Oven Temp.	Gauge Temp.
2500.00	2498.93	2514.00	-1.07	0.0067	59.35	59.17
4999.80	4999.06	5014.00	-0.74	0.0046	59.32	59.18
9000.00	8999.23	9014.00	-0.77	0.0048	59.09	59.19
13000.00	12999.22	13014.00	-0.78	0.0049	59.24	59.19
14999.90	15000.11	15014.00	0.21	0.0013	59.28	59.19
13000.00	13000.16	13014.00	0.16	0.0010	59.26	59.19
8999.90	9000.45	9014.00	0.55	0.0034	59.23	59.18
5000.00	5000.25	5014.00	0.25	0.0016	59.25	59.19
1000.00	999.91	1014.00	-0.09	0.0006	59.24	59.18
14.80	14.79	14.00	-0.01	0.0001	59.35	59.18
2500.00	2499.60	2514.00	-0.40	0.0025	133.70	133.69
5000.00	5000.11	5014.00	0.11	0.0007	133.78	133.70
9000.00	9000.10	9014.00	0.10	0.0006	133.75	133.71
13000.00	12999.62	13014.00	-0.38	0.0024	133.71	133.70
15000.00	15000.12	15014.00	0.12	0.0007	133.70	133.70
13000.00	12999.87	13014.00	-0.13	0.0008	133.75	133.69
9000.00	9000.02	9014.00	0.02	0.0001	133.68	133.68
4999.90	4999.91	5014.00	0.01	0.0001	133.69	133.67
1000.00	999.68	1014.00	-0.32	0.0020	133.67	133.67
15.10	15.35	14.00	0.25	0.0016	133.74	133.69

Error File: Gauge # 21726

Pressure psi	Temperature Deg. C	Count (Pres)	Count (Temp)	DIFF (press) psi
13.14	25.36	16759.58	64464.11	0.20
506.90	25.40	17945.65	64463.05	0.28
740.66	25.38	18507.57	64465.61	0.30
1992.36	25.39	21520.14	64466.13	-0.02
4010.72	25.33	26396.85	64468.40	0.42
5985.66	25.40	31185.37	64464.48	-0.14
8006.60	25.34	36107.33	64466.94	0.19
9993.61	25.35	40963.28	64463.78	-0.07
11996.07	25.37	45876.52	64463.48	0.18
14010.78	25.38	50836.37	64464.11	-0.08
16001.81	25.41	55755.36	64462.74	0.02
13.15	49.75	16823.05	60969.38	-0.54
506.91	49.75	17987.91	60970.17	-0.39
740.67	49.71	18539.91	60970.00	-0.33
1992.38	49.72	21500.59	60971.49	-0.23
4010.75	49.73	26292.40	60970.50	-0.74
5985.69	49.72	31007.22	60970.83	0.28
8006.64	49.77	35850.39	60965.11	-0.07
9993.65	49.74	40635.70	60970.02	0.30
11996.11	49.74	45475.78	60968.01	-0.27
14010.83	49.73	50367.00	60965.86	-0.07
16001.85	49.74	55219.50	60964.93	0.21
13.12	74.17	17020.30	57135.56	-0.26
506.88	74.13	18160.96	57136.28	0.06
740.64	74.15	18701.56	57138.37	0.25
1992.34	74.11	21601.25	57140.60	0.33
4010.72	74.18	26296.00	57137.43	-1.17
5985.66	74.16	30923.44	57136.78	0.69
8006.62	74.13	35675.53	57134.25	-1.15
9993.63	74.12	40381.43	57138.07	0.90
11996.10	74.18	45137.45	57133.32	-0.92
14010.82	74.14	49952.23	57138.42	0.04
16001.85	74.13	54727.45	57135.74	-0.24
13.12	99.48	17402.82	52764.11	0.03
506.89	99.49	18513.60	52765.01	0.28
740.64	99.44	19040.47	52766.66	0.59
1992.35	99.42	21866.83	52769.57	0.81
4010.73	99.46	26447.35	52762.61	-0.69
5985.69	99.49	30966.64	52766.79	1.05
8006.65	99.47	35613.60	52761.18	-0.60
9993.67	99.42	40218.28	52766.21	1.02
11996.15	99.47	44878.26	52762.29	-0.47
14010.88	99.44	49598.31	52764.78	0.44
16001.91	99.46	54282.83	52763.30	-0.09
13.12	123.61	17978.62	48174.80	0.09
506.88	123.58	19055.91	48175.42	0.16
740.64	123.55	19566.85	48174.89	0.19
1992.34	123.56	22310.53	48176.23	0.12
4010.72	123.59	26766.17	48172.09	0.00
5985.66	123.59	31161.53	48176.51	0.18
8006.61	123.57	35694.26	48169.28	0.06
9993.61	123.56	40184.20	48178.46	0.34
11996.09	123.54	44738.58	48170.05	-0.24
14010.80	123.56	49353.01	48174.25	0.23
16001.83	123.57	53939.45	48172.15	0.36
13.14	149.50	18879.80	42723.01	-0.34
506.90	149.50	19915.53	42721.54	-0.37
740.66	149.46	20406.01	42725.10	-0.42
1992.36	149.44	23046.06	42726.60	-0.56
4010.74	149.45	27341.17	42727.88	0.00
5985.68	149.45	31584.06	42729.59	-0.23
8006.64	149.51	35969.30	42724.43	0.31
9993.64	149.50	40316.58	42727.97	-0.29
11996.11	149.49	44736.68	42721.54	-0.12
14010.83	149.46	49217.30	42725.13	-0.58
16001.86	149.47	53679.47	42721.21	-0.05
13.18	176.08	20177.19	36469.09	0.49
506.94	176.11	21162.22	36468.21	0.30
740.70	176.04	21629.28	36467.58	-0.01
1992.40	176.04	24142.94	36471.28	-0.49

Ramp report: Serial # 21726

Gauge range = 16001.910 PSI. Max. DIFF. = 3.200

Ramp check result: PASS, Max Err = 0.006% F.S.

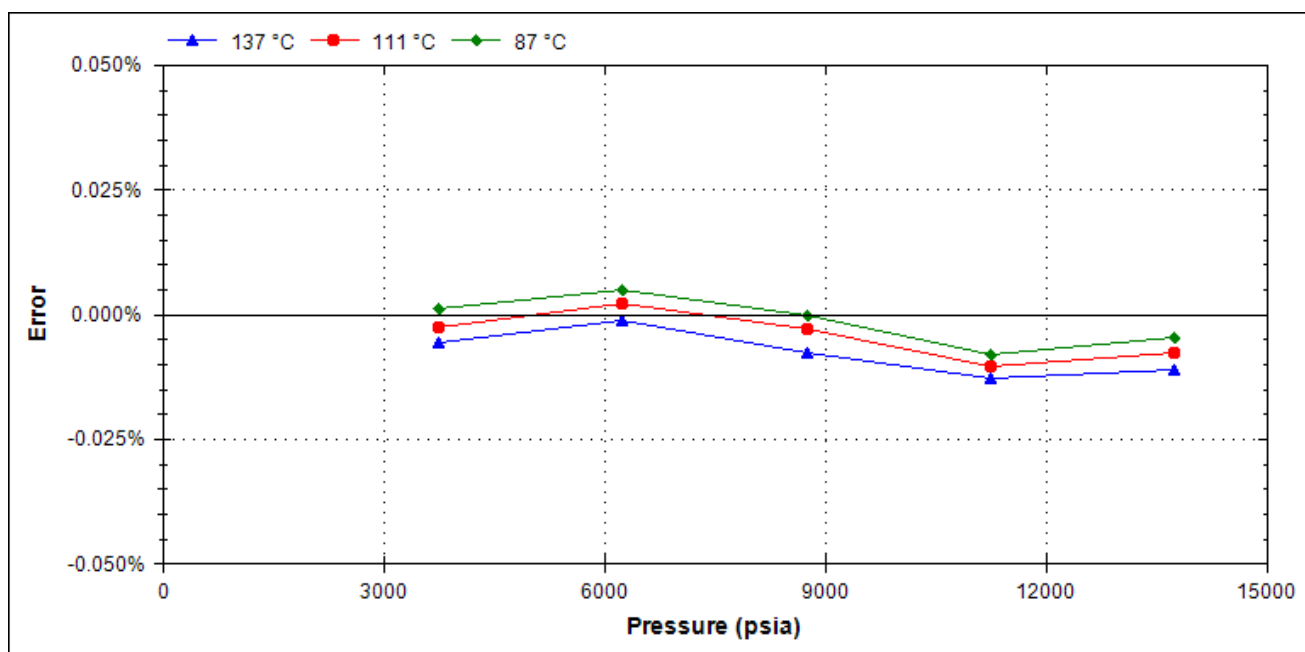
DW Pressure	Gauge Pressure	RPM4 Pressure	Differential	%F.S.	Oven Temp.	Gauge Temp.
4999.88	4999.25	4999.83	-0.63	0.0039	59.50	59.45
8990.61	8990.54	8990.19	-0.07	0.0004	59.50	59.46
12997.68	12997.25	12996.95	-0.43	0.0027	59.47	59.46
14999.84	14999.96	14998.87	0.12	0.0007	59.48	59.46
12997.68	12997.73	12996.82	0.05	0.0003	59.51	59.45
8990.61	8991.58	8990.29	0.97	0.0061	59.49	59.45
4999.87	5000.28	4999.80	0.41	0.0026	59.45	59.45
1002.92	1003.21	1003.08	0.29	0.0018	59.44	59.45
506.88	507.00	507.10	0.12	0.0008	59.48	59.45
13.11	13.00	13.11	-0.11	0.0007	59.51	59.46
4999.91	4999.92	4999.87	0.01	0.0001	158.07	158.01
8990.64	8990.93	8990.08	0.29	0.0018	158.12	158.02
12997.70	12997.31	12996.87	-0.39	0.0024	158.08	158.03
14999.87	14999.44	14998.81	-0.43	0.0027	158.10	158.02
12997.70	12997.13	12996.84	-0.57	0.0036	158.08	158.01
8990.63	8990.26	8990.23	-0.37	0.0023	158.08	157.99
4999.90	4999.40	4999.84	-0.50	0.0031	158.07	157.99
1002.95	1002.10	1003.05	-0.85	0.0053	158.02	157.97
506.91	506.34	507.14	-0.57	0.0036	158.05	157.98
13.15	12.72	13.25	-0.43	0.0027	158.01	157.97

Calibration Date: 01-Aug-14
Max Pressure Error: 0.013% F.S.
Max Temperature Error: 0.112 °C
Part Number: 101250
Serial Number: DC1031

1.375 OD Welded Piezo IV Calibrated Assy

Max Pressure		Max Temperature	
psi	kPa	°F	°C
15,000	103,421	351	177

Accuracy: As shown in the graph below, this DataCan Pressure gauge conforms to within +/- 0.030% F.S. of the pressure standard used in calibration, which is accurate to within +/- 0.01% of reading.



Working Standards

Sun Electronic Systems Environmental Chamber, Model: EC127
 DHI Instruments Pressure Controller, Model: PPCH-200M (30,000psi Reference)

Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.



Approved By:
 DataCan Services Corp.

Calibrated By:
 Angelo Pulido

SO SO37654

Shipping Date Aug 1, 2014

Cal Certificate

Certificate Date Aug 1, 2014

Serial Number DC1031

Max P 15000

Pressure Error

0.013

% FS

Max T 177

Temperature Error

0.112

°C

- ☒ Flash Drive Loaded
- ☒ Calibration files
- ☒ USB cable functions

Tool Info

- ☒ Serial Number
- ☒ Max P
- ☒ Max T

Calibration Date Aug 1, 2014

Part Marking

- ☒ Serial Number
- ☒ Max P
- ☒ Max T

Utilities - Diagnostics - Start Sampling

FW Week

30

Pressure

12.168 psia

FW Year

2014

Temperature

20.995 degC

Sleep Current

1.03 mA

Sampling Current

2.97 mA

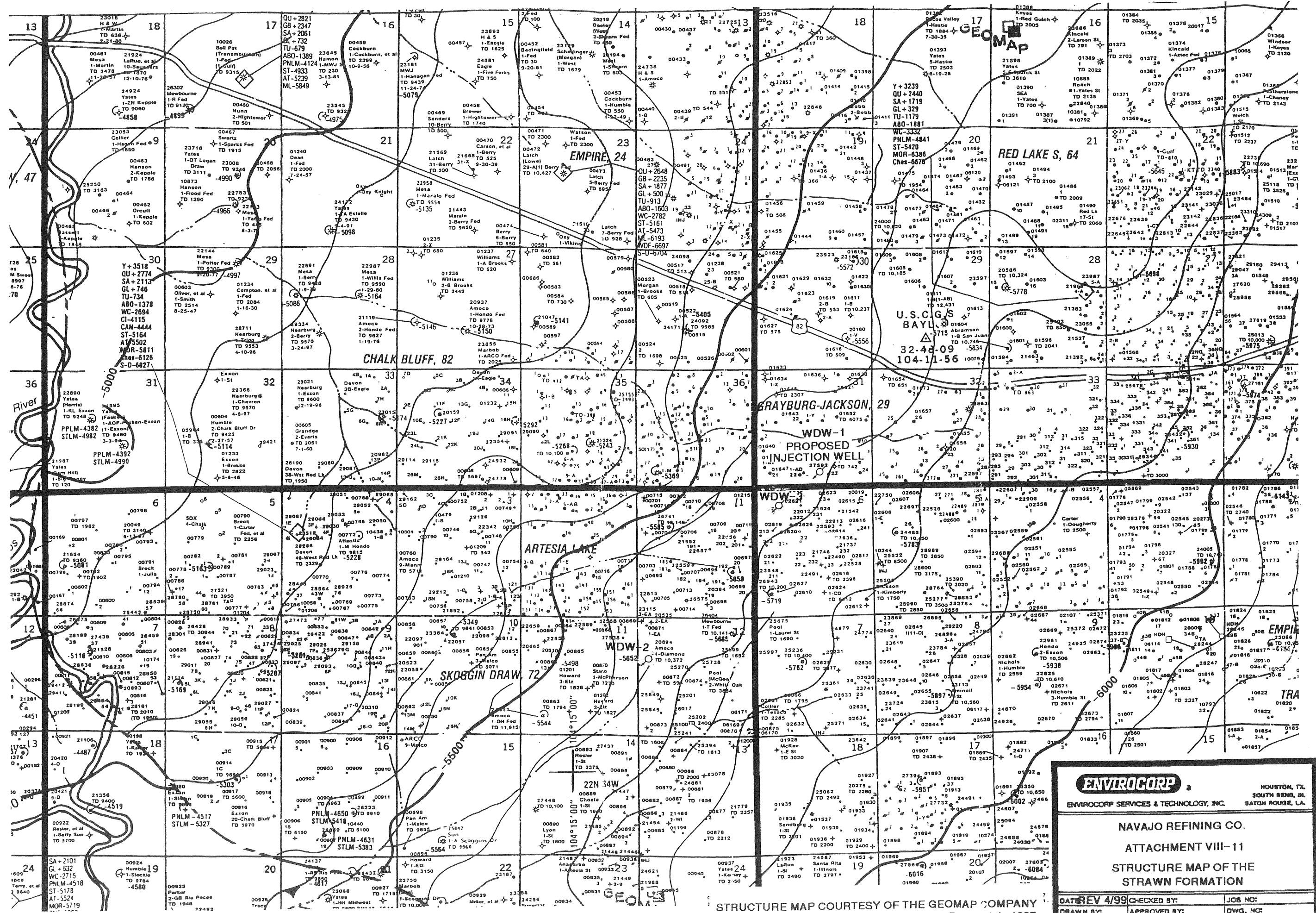
☒ Memory Clear

☒ Checked By

Terry Burch Aug 18, 2014

APPENDIX I

STRAWN STRUCTURE MAPS



STRUCTURE MAP COURTESY OF THE GEOMAP COMPANY
Poster July 1997

ENVIROCORP
ENVIROCORP SERVICES & TECHNOLOGY, INC.

HOUSTON, TX
SOUTH BEND, IN
BATON ROUGE, LA

NAVAJO REFINING CO.

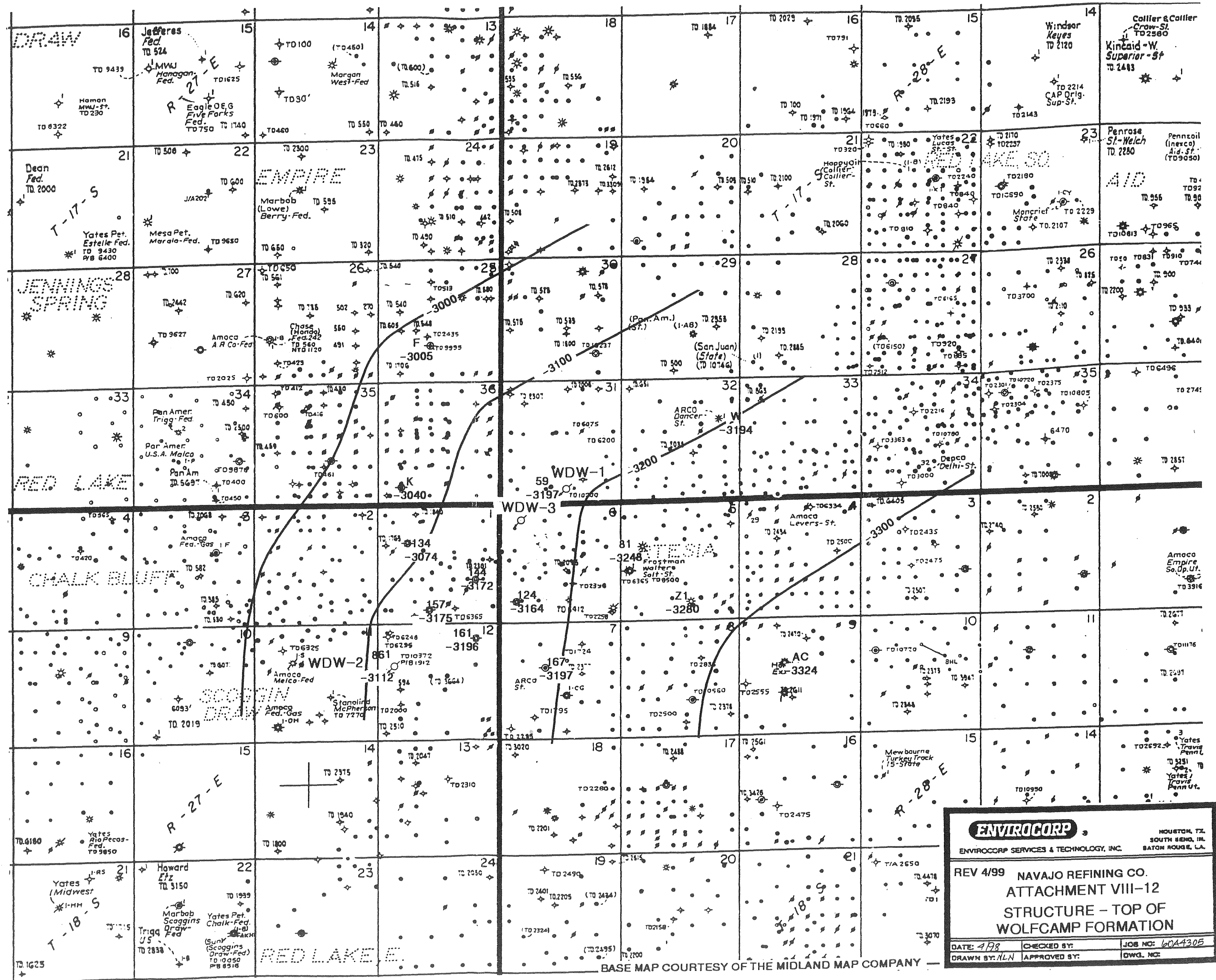
ATTACHMENT VIII-11

STRUCTURE MAP OF THE STRAWN FORMATION

DATE: REV 4/99	CHECKED BY:	JOB NO:
DRAWN BY:	APPROVED BY:	DWG. NO:

APPENDIX J

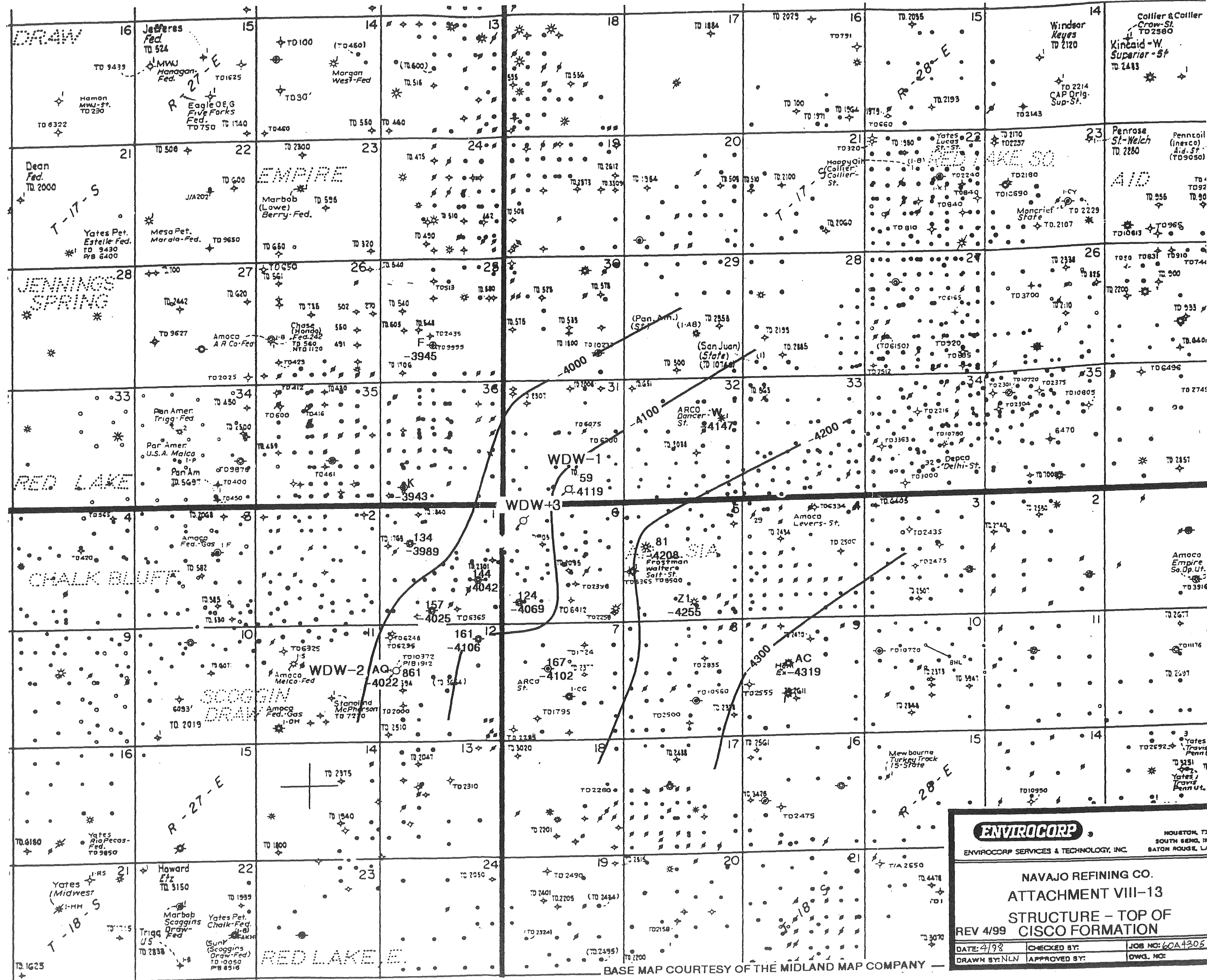
WOLFCAMP STRUCTURE MAPS



BASE MAP COURTESY OF THE MIDLAND MAP COMPANY

APPENDIX K

CISCO STRUCTURE MAPS



		HOUSTON, TX. SOUTH FERRIS, DR. BATON ROUGE, LA.
ENVIROCORP SERVICES & TECHNOLOGY, INC.		
NAVAJO REFINING CO. ATTACHMENT VIII-13 STRUCTURE - TOP OF CISCO FORMATION		
REV 4/99		
DATE: 4/98	CHECKED BY:	JOB NO: 60A4205
DRAWN BY: NLN	APPROVED BY:	DWG. NO:

APPENDIX L

CHRONOLOGY OF FIELD ACTIVITIES

APPENDIX L
CHRONOLOGY OF FIELD ACTIVITIES

Wednesday, August 24, 2016

Hank Lichtenwaldt:

Traveled to Artesia, NM from Houston, TX.

Thursday, August 25, 2016

Hank Lichtenwaldt:

Traveled to WDW-1. Waited on permit and held JSA meeting. Rigged up wireline and completed dummy runs (using sinker bar) on the wells. Tagged bottom in WDW-3 at 9093 feet KB. Set bottom-hole pressure recorders on all three wells. Set at the following depths; WDW-1: 7926.5 feet KB at 10:45 hours, WDW-2: 7570 feet KB at 10:53 hours, WDW-3: 7660 feet KB at 11:55 hours. Secured well and well sites. Refueled. Left location and returned to Houston, TX.

Monday, August 29, 2016

Hank Lichtenwaldt:

Traveled to Artesia, NM from Houston, TX.

Tuesday, August 30, 2016

Hank Lichtenwaldt:

Traveled and arrived on site at WDW-1. Held JSA meeting. Started pulling bottom-hole gauges out of WDW-3 and conducted 7-minute static gradient stops at 7000 feet, 6000 feet, 5000 feet, 4000 feet, 3000 feet, 2000 feet, 1000 feet, and at surface (0 feet). Rigged down at WDW-3. Fesco crews pulled the tools out of WDW-1 and WDW-2 while conducting gradient stops at WDW-3. Secured wells and returned to Navajo to begin injection operations. Refueled. Left location and returned to Houston, TX.

APPENDIX M

PANSYSTEM© ANALYSIS OUTPUT



Company	Navajo Refining Company
Location	Artesia, New Mexico
Well	Gaines Well No. 3
Date	August 25 - 30, 2016
Gauge Type / Serial Number	DataCan/DC-1031
Guage Depth	7660 feet
Injection Interval	7660 feet to 8620 feet
Completion Type	Perforated
Top of Fill	9093 feet
Analyst	LKM
WSP PB Project No.	50904A

Reservoir Description

Fluid type : Water

Well orientation : Vertical

Number of wells : 1

Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	175.0000 ft
Average formation porosity	0.1000
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	4281.043731 psia
Temperature	0.000000 deg F

Well Parameters Data

	Gaines Well No. 3
Well radius	0.3246 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	1.451496 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	0.000000 psia
Check Temperature	0.000000 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	0.570 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

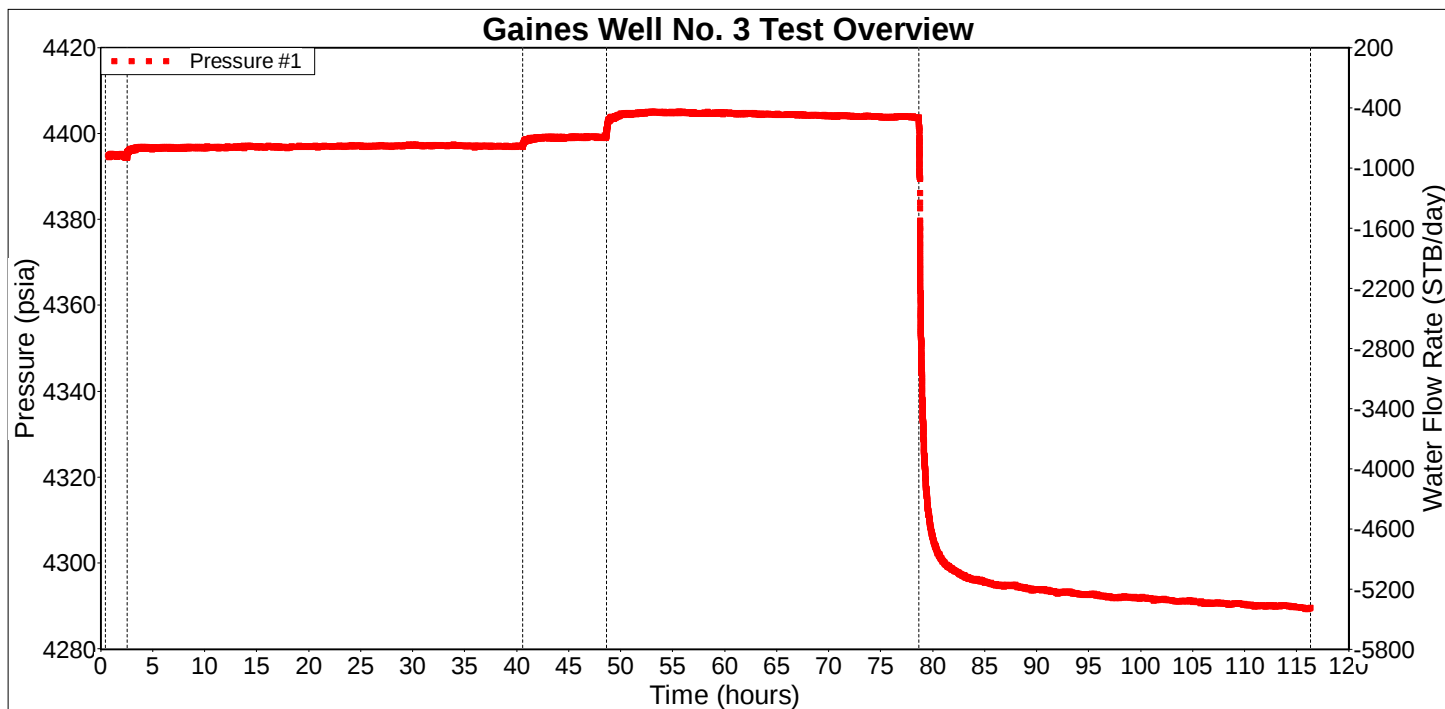
	Layer 1
Permeability	408.491567 md
Skin factor (Well 1)	8.128789

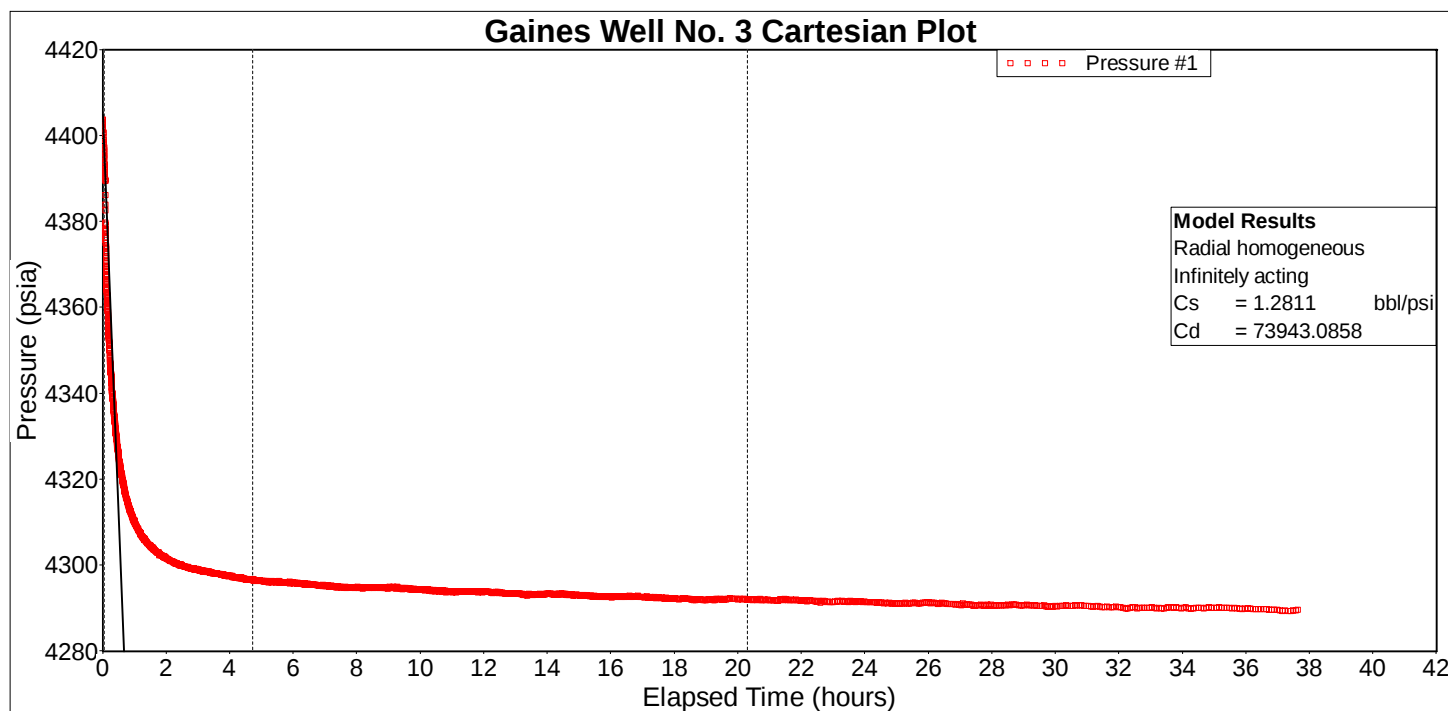
Rate Change Data

Time Hours	Pressure psia	Rate STB/day
-707.170000	0.000000	0.000000
-683.170000	0.000000	-2759.160000
-395.170000	0.000000	-5594.970000
-371.170000	0.000000	-3992.650000
-347.170000	0.000000	-2445.060000
-227.170000	0.000000	-5395.060000
-179.170000	0.000000	-5572.320000
-155.170000	0.000000	-5390.770000
-131.170000	0.000000	-5144.450000
-107.170000	0.000000	-4449.910000
-83.170000	0.000000	-4216.690000
-59.170000	0.000000	-4544.540000
-35.170000	0.000000	-4711.530000
-23.540000	0.000000	-5766.310000

Rate Change Data (cont)

Time Hours	Pressure psia	Rate STB/day
-23.420000	0.000000	-5546.650000
-23.340000	0.000000	-5268.250000
-22.570000	0.000000	-5020.340000
-20.640000	0.000000	-4666.970000
-20.610000	0.000000	-5093.210000
-19.760000	0.000000	-5195.420000
-16.090000	0.000000	-5467.600000
-0.490000	0.000000	-5227.840000
0.460000	0.000000	-5438.790000
2.538330	4394.430000	-5623.180000
40.575830	4397.010000	-5329.570000
48.635560	4399.190000	-5525.380000
78.689073	4403.704000	-5737.510000
116.317500	4289.520000	0.000000





Gaines Well No. 3 Cartesian Plot Model Results

Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Wellbore storage coefficient	1.281075 bbl/psi
Dimensionless wellbore storage	7.3943e4

Gaines Well No. 3 Cartesian Plot Line Details

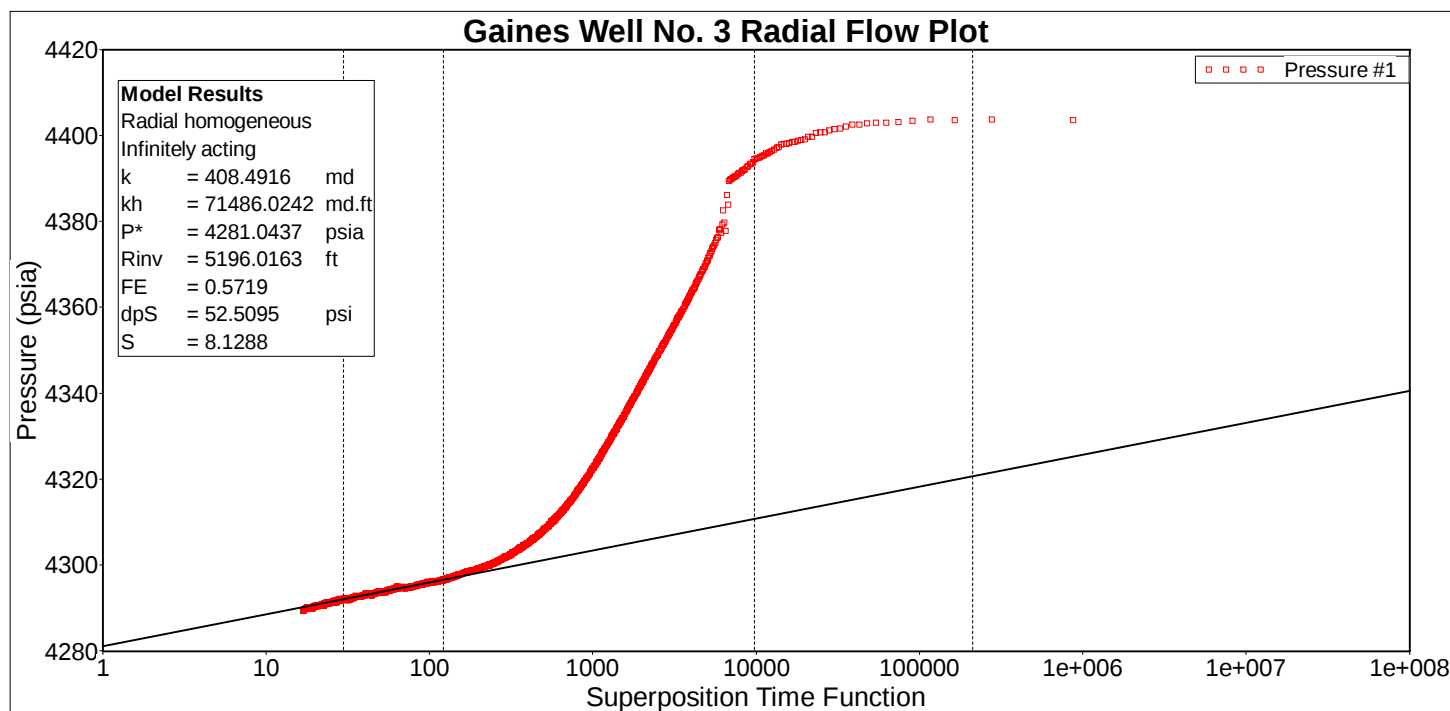
Line type : Wellbore storage

Slope : -186.611

Intercept : 4404.85

Coefficient of Determination : 0.99434

Number of Intersections = 0



Gaines Well No. 3 Radial Flow Plot Model Results

Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Permeability	408.491567 md
Permeability-thickness	7.1486e4 md.ft
Extrapolated pressure	4281.043731 psia
Radius of investigation	5196.016318 ft
Flow efficiency	0.571911
dP skin (constant rate)	52.509477 psi
Skin factor	8.128789

Gaines Well No. 3 Radial Flow Plot Line Details

Line type : Radial flow

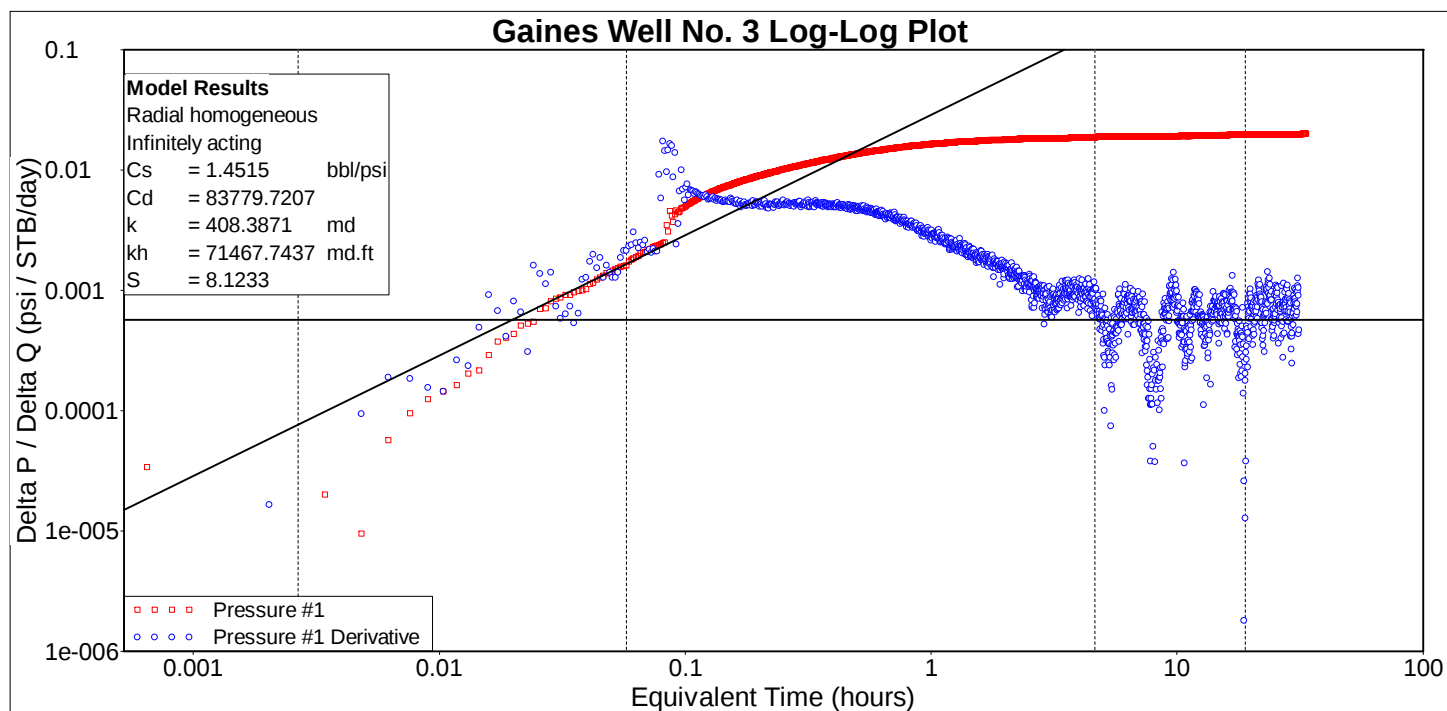
Slope : 7.437

Intercept : 4281.04

Coefficient of Determination : 0.98725

	Radial flow
Extrapolated pressure	4281.043731 psia
Pressure at dt = 1 hour	4301.515359 psia

Number of Intersections = 0



Gaines Well No. 3 Log-Log Plot Model Results

Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Wellbore storage coefficient	1.451496 bbl/psi
Dimensionless wellbore storage	8.3780e4
Permeability	408.387107 md
Permeability-thickness	7.1468e4 md.ft
Skin factor	8.123338

Gaines Well No. 3 Log-Log Plot Line Details

Line type : Wellbore storage

Slope : 1

Intercept : 0.028706

Coefficient of Determination : Not Used

Line type : Radial flow

Slope : 0

Intercept : 0.000563079

Coefficient of Determination : Not Used

Number of Intersections = 0

LOGS

- **Dual Induction Log Sections from 7924 feet to 8476 feet**
- **Neutron Density Log Sections from 7924 feet to 8476 feet**
- **Mewbourne Well No. 1, July 23, 1998, Temperature Log**



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



FLOWING GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Formation: Unavailable

Test Date: 8/25/2016
Location: Eddy County, NM
Status: Injecting

Well Data: Wellhead Connection: 2.5" EUE
Elevation: 15 ft above GL
Tubing: 4.5" Set at 7575 ft (Packer)
Casing: 7" Set at 9022 ft (PBTD)
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Datum: 8140 ft (MD)

Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
0	0	0	1350	90.22	1345.01	0.00	0.0000	
7660	7660	7660	1350	108.05	4394.94	3049.93	0.3982	Monitor IBHP for 78 hours.

BHT at Test Depth: 108.00 °F
Extrapolated BHP at Datum: 4586.00 psia
BHP Gradient at Datum : 0.3982 psi/ft

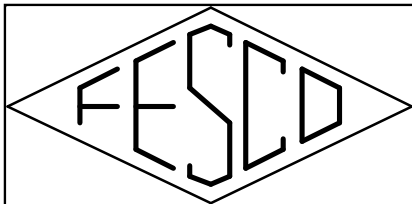
Oil Level: Injecting
Water Level: Injecting
Csg Press: N/A

Previous BHP: U/A
BHP Change: U/A

Remarks: MIRU slickline. RIH with 1.25" weight bar. Tagged bottom at 9093 ft. POOH. RIH with electronic memory gauges to 7924 ft. Continue injecting water for 78 hrs. SI well for 38.5 hr reservoir pressure falloff test. POOH making static gradient stops. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

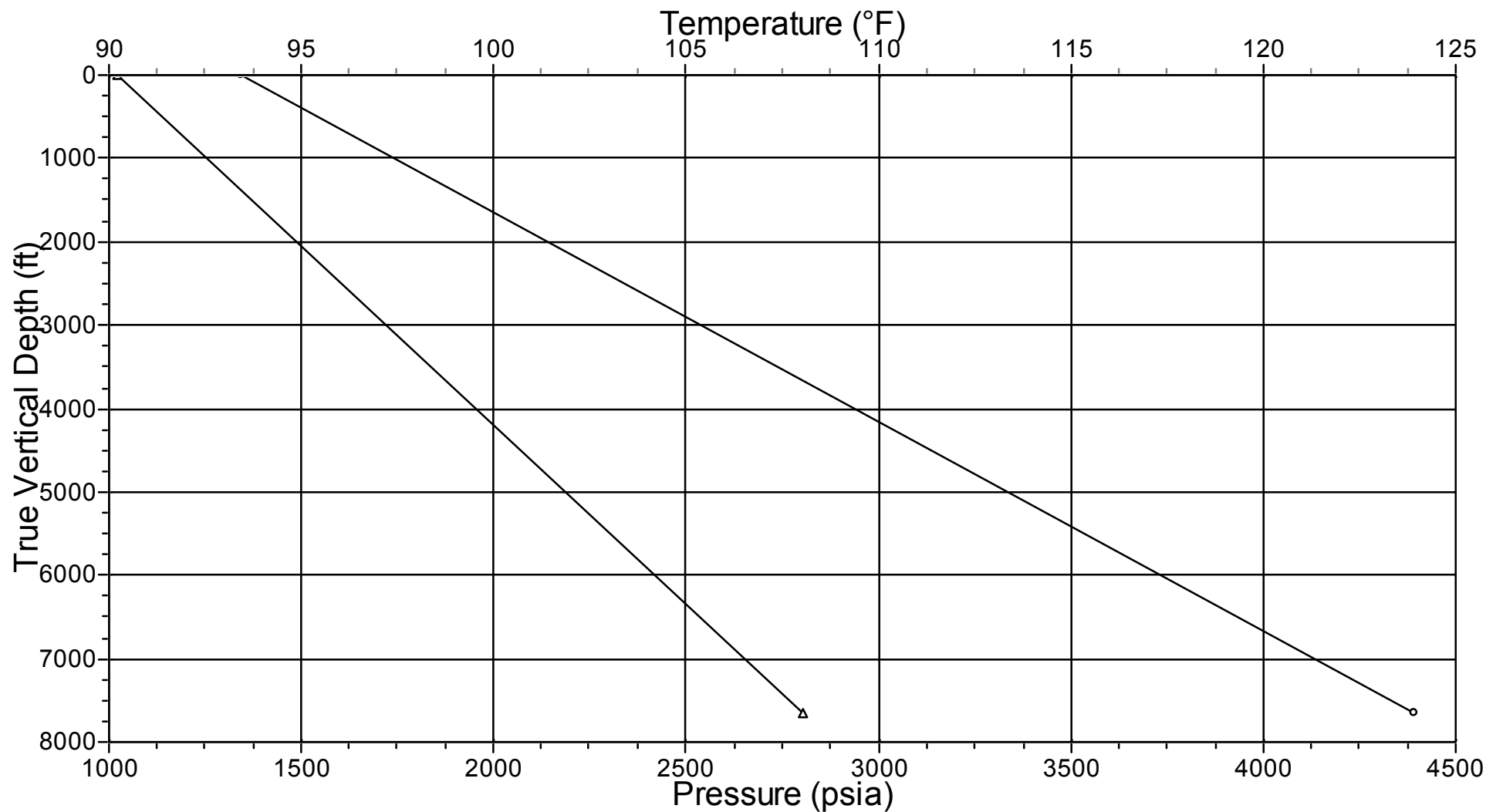


PB Energy Storage Services, Inc.

Well: Gaines Well No. 3
Field: Davonia
Test Date: 08/25/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-1031

Flowing Gradient Plot



J201608310801.001A

—○— Pressure —△— Temperature



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	11:09:01	-78.69389		11.90		68.42	Powered up gauge.
08/25/16	11:10:00	-78.67750		11.17		70.24	
08/25/16	11:20:04	-78.50972		11.52		74.61	
08/25/16	11:29:04	-78.35972		12.89		85.30	
08/25/16	11:31:04	-78.32639		34.96		87.21	
08/25/16	11:31:54	-78.31250		1318.63		89.68	Pressured up lubricator.
08/25/16	11:32:04	-78.30972		1313.42		89.95	
08/25/16	11:33:04	-78.29306		1346.07		90.80	
08/25/16	11:34:04	-78.27639		1346.63		90.70	
08/25/16	11:35:04	-78.25972		1346.63		90.65	
08/25/16	11:36:04	-78.24306		1346.77		90.55	
08/25/16	11:37:04	-78.22639		1346.59		90.45	
08/25/16	11:38:04	-78.20972		1346.67		90.34	
08/25/16	11:39:04	-78.19306		1346.42		90.24	
08/25/16	11:40:04	-78.17639		1345.67		90.18	
08/25/16	11:41:04	-78.15972		1345.51		90.19	
08/25/16	11:41:24	-78.15417		1345.09		90.21	Casing = N/A
08/25/16	11:41:29	-78.15278	1350	1345.01		90.22	RIH with EMP to 7660 ft
08/25/16	11:42:04	-78.14306		1390.68		104.75	
08/25/16	11:43:04	-78.12639		1521.20		108.17	
08/25/16	11:44:04	-78.10972		1699.82		108.32	
08/25/16	11:45:04	-78.09306		1976.21		108.14	
08/25/16	11:46:04	-78.07639		2216.26		107.99	
08/25/16	11:47:04	-78.05972		2501.07		107.85	
08/25/16	11:48:04	-78.04306		2791.36		107.68	
08/25/16	11:49:04	-78.02639		3110.55		107.57	
08/25/16	11:50:04	-78.00972		3438.81		107.52	
08/25/16	11:51:04	-77.99306		3732.36		107.56	
08/25/16	11:52:04	-77.97639		3993.28		107.65	
08/25/16	11:53:04	-77.95972		4245.73		107.81	
08/25/16	11:54:04	-77.94306	1350	4394.77		107.98	Gauge at TD=7660 ft (MD).
08/25/16	11:55:04	-77.92639		4394.87		108.03	
08/25/16	11:56:04	-77.90972		4394.79		108.03	
08/25/16	11:57:04	-77.89306		4394.81		108.04	
08/25/16	11:58:04	-77.87639		4394.60		108.04	
08/25/16	11:59:04	-77.85972		4394.94		108.04	
08/25/16	12:00:04	-77.84306		4394.76		108.04	
08/25/16	12:01:04	-77.82639		4394.76		108.05	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	12:02:04	-77.80972		4394.85		108.04	
08/25/16	12:03:04	-77.79306		4394.67		108.05	
08/25/16	12:04:04	-77.77639		4394.91		108.05	
08/25/16	12:05:04	-77.75972	1350	4394.94		108.05	7660 ft stop.
08/25/16	12:10:04	-77.67639		4395.04		108.05	
08/25/16	12:15:04	-77.59306		4394.94		108.06	
08/25/16	12:20:04	-77.50972		4394.95		108.07	
08/25/16	12:25:04	-77.42639		4394.95		108.08	
08/25/16	12:30:04	-77.34306		4394.76		108.08	
08/25/16	12:45:04	-77.09306		4394.85		108.10	
08/25/16	13:00:04	-76.84306		4394.97		108.12	
08/25/16	14:00:09	-75.84167		4396.10		108.19	
08/25/16	15:00:09	-74.84167		4396.61		108.11	
08/25/16	16:00:09	-73.84167		4396.57		108.05	
08/25/16	17:00:09	-72.84167		4396.61		108.00	
08/25/16	18:00:09	-71.84167		4396.58		107.96	
08/25/16	19:00:09	-70.84167		4396.68		107.95	
08/25/16	20:00:09	-69.84167		4396.67		107.89	
08/25/16	21:00:09	-68.84167		4396.67		107.73	
08/25/16	22:00:09	-67.84167		4396.77		107.65	
08/25/16	23:00:09	-66.84167		4396.80		107.70	
08/26/16	00:00:09	-65.84167		4396.82		107.73	
08/26/16	02:00:09	-63.84167		4396.86		107.77	
08/26/16	04:00:09	-61.84167		4396.93		107.67	
08/26/16	06:00:09	-59.84167		4396.98		107.52	
08/26/16	08:00:09	-57.84167		4396.98		107.31	
08/26/16	10:00:09	-55.84167		4397.05		107.36	
08/26/16	12:00:09	-53.84167		4396.92		107.54	
08/26/16	14:00:09	-51.84167		4397.14		107.52	
08/26/16	16:00:09	-49.84167		4397.11		107.49	
08/26/16	18:00:09	-47.84167		4397.25		107.46	
08/26/16	20:00:09	-45.84167		4397.07		107.40	
08/26/16	22:00:09	-43.84167		4397.12		107.61	
08/27/16	00:00:09	-41.84167		4396.88		107.80	
08/27/16	02:00:09	-39.84167		4397.15		107.78	
08/27/16	04:00:09	-37.84167		4398.34		107.66	
08/27/16	06:00:09	-35.84167		4398.91		107.56	
08/27/16	08:00:09	-33.84167		4398.92		107.39	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	10:00:09	-31.84167		4399.16		107.65	
08/27/16	12:00:09	-29.84167		4402.99		107.83	
08/27/16	14:00:09	-27.84167		4404.40		107.35	
08/27/16	16:00:09	-25.84167		4404.97		106.72	
08/27/16	18:00:09	-23.84167		4404.81		106.15	
08/27/16	20:00:09	-21.84167		4404.87		105.52	
08/27/16	22:00:09	-19.84167		4404.60		105.00	
08/28/16	00:00:09	-17.84167		4404.63		104.88	
08/28/16	02:00:09	-15.84167		4404.63		104.91	
08/28/16	04:00:09	-13.84167		4404.38		105.08	
08/28/16	06:00:09	-11.84167		4404.54		105.17	
08/28/16	08:00:09	-9.84167		4404.38		105.21	
08/28/16	10:00:09	-7.84167		4404.04		105.22	
08/28/16	12:00:09	-5.84167		4403.69		105.09	
08/28/16	14:00:09	-3.84167		4403.94		104.89	
08/28/16	16:00:09	-1.84167		4403.93		104.71	
08/28/16	17:00:09	-0.84167		4403.88		104.62	
08/28/16	17:50:29	-0.00278		4403.70		104.54	Casing Pressure = N/A.
08/28/16	17:50:34	-0.00139		4403.59		104.54	Water Injection Rate = Unavailable.
08/28/16	17:50:39	0.00000		4403.65	0.00	104.54	SI well for BHP falloff test.
08/28/16	17:50:44	0.00139		4403.38	-0.27	104.54	
08/28/16	17:50:49	0.00278		4403.16	-0.49	104.54	
08/28/16	17:50:54	0.00417		4402.99	-0.66	104.54	
08/28/16	17:50:59	0.00556		4402.88	-0.77	104.54	
08/28/16	17:51:04	0.00694		4402.77	-0.88	104.54	
08/28/16	17:51:09	0.00833		4402.54	-1.11	104.54	
08/28/16	17:51:14	0.00972		4402.47	-1.18	104.54	
08/28/16	17:51:19	0.01111		4402.04	-1.61	104.54	
08/28/16	17:51:24	0.01250		4401.56	-2.09	104.54	
08/28/16	17:51:29	0.01389		4401.40	-2.25	104.54	
08/28/16	17:51:34	0.01528		4401.21	-2.44	104.54	
08/28/16	17:51:39	0.01667		4400.78	-2.87	104.54	
08/28/16	17:51:44	0.01806		4400.70	-2.95	104.54	
08/28/16	17:51:49	0.01944		4400.57	-3.08	104.54	
08/28/16	17:51:54	0.02083		4399.69	-3.96	104.54	
08/28/16	17:51:59	0.02222		4399.67	-3.98	104.54	
08/28/16	17:52:04	0.02361		4399.06	-4.59	104.54	
08/28/16	17:52:09	0.02500		4398.86	-4.79	104.54	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	17:52:14	0.02639		4398.72	-4.93	104.54	
08/28/16	17:52:19	0.02778		4398.48	-5.17	104.53	
08/28/16	17:52:24	0.02917		4398.46	-5.19	104.53	
08/28/16	17:52:29	0.03056		4398.23	-5.42	104.54	
08/28/16	17:52:34	0.03194		4398.05	-5.60	104.53	
08/28/16	17:52:39	0.03333		4398.00	-5.65	104.54	
08/28/16	17:52:44	0.03472		4397.89	-5.76	104.53	
08/28/16	17:52:49	0.03611		4397.25	-6.40	104.54	
08/28/16	17:52:54	0.03750		4397.07	-6.58	104.54	
08/28/16	17:52:59	0.03889		4396.65	-7.00	104.53	
08/28/16	17:53:04	0.04028		4396.40	-7.25	104.54	
08/28/16	17:53:09	0.04167		4396.13	-7.52	104.54	
08/28/16	17:53:14	0.04306		4395.76	-7.89	104.53	
08/28/16	17:53:19	0.04444		4395.77	-7.88	104.53	
08/28/16	17:53:24	0.04583		4395.36	-8.29	104.54	
08/28/16	17:53:29	0.04722		4395.18	-8.47	104.53	
08/28/16	17:53:34	0.04861		4394.91	-8.74	104.53	
08/28/16	17:53:39	0.05000		4394.76	-8.89	104.54	
08/28/16	17:53:44	0.05139		4394.60	-9.05	104.54	
08/28/16	17:53:49	0.05278		4394.48	-9.17	104.54	
08/28/16	17:53:54	0.05417		4393.77	-9.88	104.54	
08/28/16	17:54:04	0.05694		4393.22	-10.43	104.54	
08/28/16	17:54:09	0.05833		4392.89	-10.76	104.54	
08/28/16	17:54:14	0.05972		4392.70	-10.95	104.53	
08/28/16	17:54:24	0.06250		4391.92	-11.73	104.54	
08/28/16	17:54:29	0.06389		4391.78	-11.87	104.54	
08/28/16	17:54:34	0.06528		4391.39	-12.26	104.53	
08/28/16	17:54:44	0.06806		4391.00	-12.65	104.54	
08/28/16	17:54:49	0.06944		4390.61	-13.04	104.54	
08/28/16	17:54:59	0.07222		4390.22	-13.43	104.54	
08/28/16	17:55:04	0.07361		4390.12	-13.53	104.54	
08/28/16	17:55:14	0.07639		4389.63	-14.02	104.54	
08/28/16	17:55:24	0.07917		4383.92	-19.73	104.54	
08/28/16	17:55:34	0.08194		4377.73	-25.92	104.54	
08/28/16	17:55:39	0.08333		4379.77	-23.88	104.53	
08/28/16	17:55:49	0.08611		4379.20	-24.45	104.54	
08/28/16	17:55:59	0.08889		4378.20	-25.45	104.54	
08/28/16	17:56:09	0.09167		4376.30	-27.35	104.54	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	17:56:19	0.09444		4375.70	-27.95	104.55	
08/28/16	17:56:29	0.09722		4374.35	-29.30	104.54	
08/28/16	17:56:39	0.10000		4373.54	-30.11	104.54	
08/28/16	17:56:54	0.10417		4372.00	-31.65	104.55	
08/28/16	17:57:04	0.10694		4370.94	-32.71	104.55	
08/28/16	17:57:14	0.10972		4370.19	-33.46	104.55	
08/28/16	17:57:29	0.11389		4368.89	-34.76	104.56	
08/28/16	17:57:39	0.11667		4368.18	-35.47	104.56	
08/28/16	17:57:54	0.12083		4367.07	-36.58	104.56	
08/28/16	17:58:09	0.12500		4365.83	-37.82	104.56	
08/28/16	17:58:19	0.12778		4365.22	-38.43	104.57	
08/28/16	17:58:34	0.13194		4364.18	-39.47	104.57	
08/28/16	17:58:49	0.13611		4363.27	-40.38	104.58	
08/28/16	17:59:04	0.14028		4362.35	-41.30	104.58	
08/28/16	17:59:19	0.14444		4361.39	-42.26	104.58	
08/28/16	17:59:39	0.15000		4360.21	-43.44	104.59	
08/28/16	17:59:54	0.15417		4359.54	-44.11	104.59	
08/28/16	18:00:09	0.15833		4358.71	-44.94	104.60	
08/28/16	18:00:29	0.16389		4357.66	-45.99	104.61	
08/28/16	18:00:49	0.16944		4356.75	-46.90	104.61	
08/28/16	18:01:04	0.17361		4355.92	-47.73	104.62	
08/28/16	18:01:24	0.17917		4355.04	-48.61	104.62	
08/28/16	18:01:44	0.18472		4354.23	-49.42	104.63	
08/28/16	18:02:09	0.19167		4353.28	-50.37	104.64	
08/28/16	18:02:29	0.19722		4352.27	-51.38	104.65	
08/28/16	18:02:49	0.20278		4351.54	-52.11	104.66	
08/28/16	18:03:14	0.20972		4350.59	-53.06	104.66	
08/28/16	18:03:34	0.21528		4349.76	-53.89	104.67	
08/28/16	18:03:59	0.22222		4348.83	-54.82	104.69	
08/28/16	18:04:24	0.22917		4348.18	-55.47	104.69	
08/28/16	18:04:49	0.23611		4347.08	-56.57	104.70	
08/28/16	18:05:19	0.24444		4346.04	-57.61	104.71	
08/28/16	18:05:44	0.25139		4345.22	-58.43	104.71	
08/28/16	18:06:14	0.25972		4344.30	-59.35	104.72	
08/28/16	18:06:44	0.26806		4343.35	-60.30	104.73	
08/28/16	18:07:14	0.27639		4342.49	-61.16	104.74	
08/28/16	18:07:44	0.28472		4341.54	-62.11	104.75	
08/28/16	18:08:14	0.29306		4340.67	-62.98	104.75	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	18:08:49	0.30278		4339.77	-63.88	104.76	
08/28/16	18:09:19	0.31111		4339.15	-64.50	104.77	
08/28/16	18:09:54	0.32083		4338.22	-65.43	104.78	
08/28/16	18:10:34	0.33194		4337.32	-66.33	104.79	
08/28/16	18:11:09	0.34167		4336.41	-67.24	104.80	
08/28/16	18:11:49	0.35278		4335.46	-68.19	104.82	
08/28/16	18:12:29	0.36389		4334.28	-69.37	104.83	
08/28/16	18:13:09	0.37500		4333.50	-70.15	104.85	
08/28/16	18:13:49	0.38611		4332.72	-70.93	104.86	
08/28/16	18:14:34	0.39861		4331.60	-72.05	104.86	
08/28/16	18:15:19	0.41111		4330.96	-72.69	104.88	
08/28/16	18:16:04	0.42361		4330.03	-73.62	104.89	
08/28/16	18:16:49	0.43611		4329.22	-74.43	104.90	
08/28/16	18:17:39	0.45000		4328.40	-75.25	104.92	
08/28/16	18:18:29	0.46389		4327.61	-76.04	104.93	
08/28/16	18:19:24	0.47917		4326.65	-77.00	104.95	
08/28/16	18:20:14	0.49306		4325.76	-77.89	104.96	
08/28/16	18:21:09	0.50833		4324.92	-78.73	104.98	
08/28/16	18:22:09	0.52500		4324.04	-79.61	104.99	
08/28/16	18:23:09	0.54167		4323.36	-80.29	105.01	
08/28/16	18:24:09	0.55833		4322.57	-81.08	105.03	
08/28/16	18:25:09	0.57500		4321.75	-81.90	105.04	
08/28/16	18:26:14	0.59306		4321.09	-82.56	105.05	
08/28/16	18:27:19	0.61111		4320.27	-83.38	105.07	
08/28/16	18:28:29	0.63056		4319.51	-84.14	105.09	
08/28/16	18:29:39	0.65000		4318.82	-84.83	105.11	
08/28/16	18:30:54	0.67083		4318.15	-85.50	105.12	
08/28/16	18:32:09	0.69167		4317.28	-86.37	105.14	
08/28/16	18:33:24	0.71250		4316.75	-86.90	105.17	
08/28/16	18:34:44	0.73472		4315.93	-87.72	105.18	
08/28/16	18:36:09	0.75833		4315.22	-88.43	105.20	
08/28/16	18:37:34	0.78194		4314.54	-89.11	105.22	
08/28/16	18:38:59	0.80556		4314.01	-89.64	105.25	
08/28/16	18:40:29	0.83056		4313.26	-90.39	105.27	
08/28/16	18:42:04	0.85694		4312.82	-90.83	105.29	
08/28/16	18:43:39	0.88333		4312.33	-91.32	105.31	
08/28/16	18:45:19	0.91111		4311.53	-92.12	105.33	
08/28/16	18:46:59	0.93889		4311.05	-92.60	105.35	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	18:48:49	0.96944		4310.43	-93.22	105.37	
08/28/16	18:50:34	0.99861		4310.11	-93.54	105.40	
08/28/16	18:52:29	1.03056		4309.54	-94.11	105.43	
08/28/16	18:54:24	1.06250		4309.09	-94.56	105.45	
08/28/16	18:56:24	1.09583		4308.65	-95.00	105.47	
08/28/16	18:58:24	1.12917		4308.12	-95.53	105.50	
08/28/16	19:00:29	1.16389		4307.63	-96.02	105.53	
08/28/16	19:02:44	1.20139		4307.16	-96.49	105.55	
08/28/16	19:04:59	1.23889		4306.85	-96.80	105.58	
08/28/16	19:07:14	1.27639		4306.39	-97.26	105.60	
08/28/16	19:09:39	1.31667		4305.88	-97.77	105.63	
08/28/16	19:12:04	1.35694		4305.53	-98.12	105.66	
08/28/16	19:14:39	1.40000		4305.23	-98.42	105.69	
08/28/16	19:17:14	1.44306		4304.88	-98.77	105.71	
08/28/16	19:19:59	1.48889		4304.44	-99.21	105.75	
08/28/16	19:22:44	1.53472		4304.13	-99.52	105.78	
08/28/16	19:25:39	1.58333		4303.99	-99.66	105.81	
08/28/16	19:28:34	1.63194		4303.57	-100.08	105.83	
08/28/16	19:31:39	1.68333		4303.20	-100.45	105.86	
08/28/16	19:34:44	1.73472		4302.95	-100.70	105.90	
08/28/16	19:37:59	1.78889		4302.52	-101.13	105.92	
08/28/16	19:41:19	1.84444		4302.27	-101.38	105.96	
08/28/16	19:44:49	1.90278		4302.05	-101.60	105.98	
08/28/16	19:48:24	1.96250		4301.66	-101.99	106.02	
08/28/16	19:52:04	2.02361		4301.41	-102.24	106.05	
08/28/16	19:55:49	2.08611		4301.27	-102.38	106.09	
08/28/16	19:59:44	2.15139		4301.01	-102.64	106.12	
08/28/16	20:03:44	2.21806		4300.77	-102.88	106.15	
08/28/16	20:07:54	2.28750		4300.52	-103.13	106.19	
08/28/16	20:12:09	2.35833		4300.30	-103.35	106.22	
08/28/16	20:16:34	2.43194		4300.24	-103.41	106.25	
08/28/16	20:21:09	2.50833		4300.01	-103.64	106.29	
08/28/16	20:25:49	2.58611		4299.70	-103.95	106.32	
08/28/16	20:30:39	2.66667		4299.62	-104.03	106.36	
08/28/16	20:35:39	2.75000		4299.31	-104.34	106.40	
08/28/16	20:40:44	2.83472		4299.08	-104.57	106.44	
08/28/16	20:46:04	2.92361		4299.08	-104.57	106.47	
08/28/16	20:51:29	3.01389		4298.74	-104.91	106.51	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	20:57:09	3.10833		4298.74	-104.91	106.55	
08/28/16	21:02:59	3.20556		4298.58	-105.07	106.59	
08/28/16	21:08:59	3.30556		4298.63	-105.02	106.62	
08/28/16	21:15:09	3.40833		4298.31	-105.34	106.67	
08/28/16	21:21:29	3.51389		4298.15	-105.50	106.70	
08/28/16	21:28:04	3.62361		4297.78	-105.87	106.74	
08/28/16	21:34:54	3.73750		4297.67	-105.98	106.78	
08/28/16	21:41:49	3.85278		4297.51	-106.14	106.82	
08/28/16	21:49:04	3.97361		4297.53	-106.12	106.86	
08/28/16	21:56:29	4.09722		4297.42	-106.23	106.90	
08/28/16	22:04:09	4.22500		4297.19	-106.46	106.94	
08/28/16	22:12:04	4.35694		4297.02	-106.63	106.98	
08/28/16	22:20:14	4.49306		4296.62	-107.03	107.03	
08/28/16	22:28:34	4.63194		4296.68	-106.97	107.06	
08/28/16	22:37:14	4.77639		4296.63	-107.02	107.11	
08/28/16	22:46:09	4.92500		4296.36	-107.29	107.15	
08/28/16	22:55:24	5.07917		4296.10	-107.55	107.19	
08/28/16	23:04:54	5.23750		4296.15	-107.50	107.23	
08/28/16	23:14:44	5.40139		4295.89	-107.76	107.27	
08/28/16	23:24:49	5.56944		4296.12	-107.53	107.32	
08/28/16	23:35:14	5.74306		4296.04	-107.61	107.36	
08/28/16	23:45:59	5.92222		4296.01	-107.64	107.41	
08/28/16	23:56:59	6.10556		4295.87	-107.78	107.45	
08/29/16	00:08:24	6.29583		4295.70	-107.95	107.49	
08/29/16	00:20:14	6.49306		4295.53	-108.12	107.53	
08/29/16	00:32:19	6.69444		4295.35	-108.30	107.58	
08/29/16	00:44:54	6.90417		4295.26	-108.39	107.62	
08/29/16	00:57:49	7.11944		4295.16	-108.49	107.67	
08/29/16	01:11:04	7.34028		4294.86	-108.79	107.71	
08/29/16	01:24:49	7.56944		4294.91	-108.74	107.75	
08/29/16	01:38:59	7.80556		4294.77	-108.88	107.80	
08/29/16	01:53:34	8.04861		4294.72	-108.93	107.84	
08/29/16	02:08:39	8.30000		4294.59	-109.06	107.88	
08/29/16	02:24:09	8.55833		4294.72	-108.93	107.92	
08/29/16	02:40:09	8.82500		4294.78	-108.87	107.97	
08/29/16	02:56:39	9.10000		4294.74	-108.91	108.01	
08/29/16	03:13:39	9.38333		4294.57	-109.08	108.05	
08/29/16	03:31:14	9.67639		4294.43	-109.22	108.09	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/29/16	03:49:19	9.97778		4294.26	-109.39	108.14	
08/29/16	04:07:59	10.28889		4294.14	-109.51	108.18	
08/29/16	04:27:14	10.60972		4294.02	-109.63	108.23	
08/29/16	04:47:04	10.94028		4293.83	-109.82	108.27	
08/29/16	05:07:29	11.28056		4293.63	-110.02	108.31	
08/29/16	05:28:34	11.63194		4293.96	-109.69	108.35	
08/29/16	05:50:19	11.99444		4293.84	-109.81	108.39	
08/29/16	06:12:49	12.36944		4293.59	-110.06	108.44	
08/29/16	06:35:54	12.75417		4293.40	-110.25	108.48	
08/29/16	06:59:44	13.15139		4293.17	-110.48	108.52	
08/29/16	07:24:19	13.56111		4293.07	-110.58	108.56	
08/29/16	07:49:44	13.98472		4293.28	-110.37	108.61	
08/29/16	08:15:54	14.42083		4293.19	-110.46	108.64	
08/29/16	08:42:49	14.86944		4293.06	-110.59	108.68	
08/29/16	09:10:39	15.33333		4292.93	-110.72	108.73	
08/29/16	09:39:19	15.81111		4292.69	-110.96	108.76	
08/29/16	10:08:54	16.30417		4292.62	-111.03	108.81	
08/29/16	10:39:24	16.81250		4292.74	-110.91	108.85	
08/29/16	11:10:49	17.33611		4292.35	-111.30	108.89	
08/29/16	11:43:14	17.87639		4292.44	-111.21	108.93	
08/29/16	12:16:39	18.43333		4292.19	-111.46	108.97	
08/29/16	12:51:09	19.00833		4291.85	-111.80	109.00	
08/29/16	13:26:39	19.60000		4291.97	-111.68	109.04	
08/29/16	14:03:19	20.21111		4291.96	-111.69	109.08	
08/29/16	14:41:09	20.84167		4291.94	-111.71	109.12	
08/29/16	15:20:09	21.49167		4291.83	-111.82	109.16	
08/29/16	16:00:19	22.16111		4291.70	-111.95	109.20	
08/29/16	16:41:44	22.85139		4291.57	-112.08	109.23	
08/29/16	17:24:29	23.56389		4291.55	-112.10	109.27	
08/29/16	18:08:34	24.29861		4291.47	-112.18	109.30	
08/29/16	18:53:59	25.05556		4291.06	-112.59	109.35	
08/29/16	19:40:49	25.83611		4291.14	-112.51	109.38	
08/29/16	20:29:09	26.64167		4290.98	-112.67	109.42	
08/29/16	21:18:59	27.47222		4290.52	-113.13	109.45	
08/29/16	22:10:24	28.32917		4290.67	-112.98	109.49	
08/29/16	23:03:19	29.21111		4290.60	-113.05	109.53	
08/29/16	23:57:59	30.12222		4290.39	-113.26	109.56	
08/30/16	00:54:19	31.06111		4290.38	-113.27	109.60	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/30/16	01:52:24	32.02917		4290.27	-113.38	109.63	
08/30/16	02:52:19	33.02778		4290.00	-113.65	109.66	
08/30/16	03:54:04	34.05694		4290.17	-113.48	109.69	
08/30/16	04:57:44	35.11806		4290.06	-113.59	109.73	
08/30/16	06:03:24	36.21250		4289.80	-113.85	109.76	
08/30/16	07:11:09	37.34167		4289.49	-114.16	109.80	
08/30/16	08:20:59	38.50556		4289.04	-114.61	109.88	
08/30/16	08:21:34	38.51528	975	4289.13	-114.52	109.88	Ended falloff test
08/30/16	08:21:49	38.51944	975	4292.06		109.87	POOH with gauge from 7660 ft.
08/30/16	08:21:54	38.52083		4288.28		109.86	
08/30/16	08:21:59	38.52222		4279.24		109.85	
08/30/16	08:22:04	38.52361		4269.68		110.00	
08/30/16	08:23:04	38.54028		4157.36		112.77	
08/30/16	08:24:04	38.55694		4058.28		111.47	
08/30/16	08:24:39	38.56667		4003.88		110.38	Arrived at 7000 ft stop.
08/30/16	08:25:09	38.57500		4003.57		110.14	
08/30/16	08:26:09	38.59167		4003.60		110.01	
08/30/16	08:27:09	38.60833		4003.66		109.97	
08/30/16	08:28:09	38.62500		4003.65		109.96	
08/30/16	08:29:09	38.64167		4003.68		109.94	
08/30/16	08:30:09	38.65833		4003.54		109.93	
08/30/16	08:30:49	38.66944		4003.69		109.93	Left 7000 ft stop.
08/30/16	08:31:09	38.67500		3986.14		109.91	
08/30/16	08:32:09	38.69167		3845.11		108.93	
08/30/16	08:33:09	38.70833		3702.39		107.44	
08/30/16	08:34:04	38.72361		3577.70		105.98	Arrived at 6000 ft stop.
08/30/16	08:34:09	38.72500		3574.43		105.84	
08/30/16	08:35:09	38.74167		3571.29		105.38	
08/30/16	08:36:09	38.75833		3571.23		105.31	
08/30/16	08:37:09	38.77500		3571.32		105.28	
08/30/16	08:38:09	38.79167		3571.31		105.28	
08/30/16	08:39:09	38.80833		3571.23		105.29	
08/30/16	08:39:49	38.81944		3571.65		105.29	Left 6000 ft stop.
08/30/16	08:40:09	38.82500		3527.17		105.13	
08/30/16	08:41:09	38.84167		3389.49		103.82	
08/30/16	08:42:09	38.85833		3248.18		102.37	
08/30/16	08:42:54	38.87083		3140.05		101.11	Arrived at 5000 ft stop.
08/30/16	08:43:09	38.87500		3139.24		100.87	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/30/16	08:44:09	38.89167		3138.72		100.64	
08/30/16	08:45:09	38.90833		3138.95		100.59	
08/30/16	08:46:09	38.92500		3138.85		100.58	
08/30/16	08:47:09	38.94167		3138.86		100.58	
08/30/16	08:48:04	38.95694		3138.83		100.58	Left 5000 ft stop.
08/30/16	08:48:09	38.95833		3136.14		100.58	
08/30/16	08:49:09	38.97500		2992.57		99.17	
08/30/16	08:50:09	38.99167		2841.34		97.86	
08/30/16	08:51:04	39.00694		2706.43		96.57	Arrived at 4000 ft stop.
08/30/16	08:51:09	39.00833		2703.79		96.47	
08/30/16	08:52:09	39.02500		2706.65		96.22	
08/30/16	08:53:09	39.04167		2706.58		96.17	
08/30/16	08:54:09	39.05833		2706.64		96.16	
08/30/16	08:55:09	39.07500		2706.68		96.17	
08/30/16	08:56:09	39.09167		2706.61		96.18	
08/30/16	08:56:39	39.10000		2706.65		96.19	Left 4000 ft stop.
08/30/16	08:57:09	39.10833		2660.79		96.04	
08/30/16	08:58:09	39.12500		2507.26		95.08	
08/30/16	08:59:09	39.14167		2349.98		93.91	
08/30/16	08:59:39	39.15000		2274.27		93.33	Arrived at 3000 ft stop.
08/30/16	09:00:09	39.15833		2274.48		93.03	
08/30/16	09:01:09	39.17500		2274.40		92.89	
08/30/16	09:02:09	39.19167		2274.49		92.84	
08/30/16	09:03:09	39.20833		2274.60		92.83	
08/30/16	09:04:09	39.22500		2274.62		92.83	
08/30/16	09:04:59	39.23889		2274.50		92.82	Left 3000 ft stop.
08/30/16	09:05:09	39.24167		2263.77		92.81	
08/30/16	09:06:09	39.25833		2126.09		92.18	
08/30/16	09:07:09	39.27500		1996.34		90.36	
08/30/16	09:08:09	39.29167		1861.01		88.98	
08/30/16	09:08:19	39.29444		1845.00		88.91	Arrived at 2000 ft stop.
08/30/16	09:09:09	39.30833		1842.38		88.61	
08/30/16	09:10:09	39.32500		1842.38		88.50	
08/30/16	09:11:09	39.34167		1842.36		88.47	
08/30/16	09:12:09	39.35833		1842.45		88.46	
08/30/16	09:13:09	39.37500		1842.40		88.46	
08/30/16	09:14:09	39.39167		1842.37		88.47	Left 2000 ft stop.
08/30/16	09:15:09	39.40833		1715.82		88.21	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Location: Eddy County, NM
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7660 ft
Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

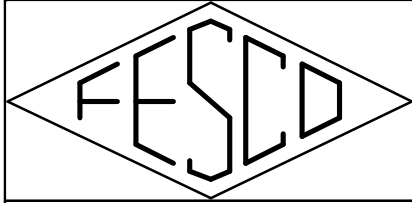
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/30/16	09:16:09	39.42500		1548.61		86.92	
08/30/16	09:16:59	39.43889		1420.15		85.59	Arrived at 1000 ft stop.
08/30/16	09:17:09	39.44167		1419.43		85.38	
08/30/16	09:18:09	39.45833		1410.71		84.85	
08/30/16	09:19:09	39.47500		1410.87		84.73	
08/30/16	09:20:09	39.49167		1410.81		84.70	
08/30/16	09:21:09	39.50833		1410.88		84.69	
08/30/16	09:22:09	39.52500		1410.91		84.70	
08/30/16	09:23:09	39.54167		1410.88		84.72	
08/30/16	09:23:54	39.55417		1410.75		84.72	Left 1000 ft stop.
08/30/16	09:24:09	39.55833		1389.67		84.66	
08/30/16	09:25:09	39.57500		1253.76		85.66	
08/30/16	09:26:09	39.59167		1093.67		81.61	
08/30/16	09:27:09	39.60833		999.54		84.11	
08/30/16	09:27:24	39.61250		992.04		83.76	Gauge at surface.
08/30/16	09:28:09	39.62500		991.78		82.77	
08/30/16	09:30:09	39.65833		977.10		73.19	
08/30/16	09:32:09	39.69167		977.12		70.69	
08/30/16	09:33:09	39.70833		977.24		69.98	
08/30/16	09:34:09	39.72500		977.25		69.39	
08/30/16	09:35:09	39.74167		977.24		68.89	
08/30/16	09:36:09	39.75833		977.38		68.44	
08/30/16	09:37:09	39.77500		975.43		68.05	
08/30/16	09:37:24	39.77917	975	974.72		67.95	Pressured down lubricator.
08/30/16	09:37:39	39.78333		11.22		67.65	Test complete.
08/30/16	09:40:09	39.82500		11.81		65.86	
08/30/16	09:50:09	39.99167		11.69		63.58	
08/30/16	10:09:09	40.30833		11.70		69.05	Powered down gauge.

Remarks: MIRU slickline. RIH with 1.25" weight bar. Tagged bottom at 9093 ft. POOH. RIH with electronic memory gauges to 7660 ft. Continue injecting water for 79 hrs. SI well for 38.5 hr BHP falloff test. POOH making static gradient stops to surface. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

Job No.: J201608310801.001A

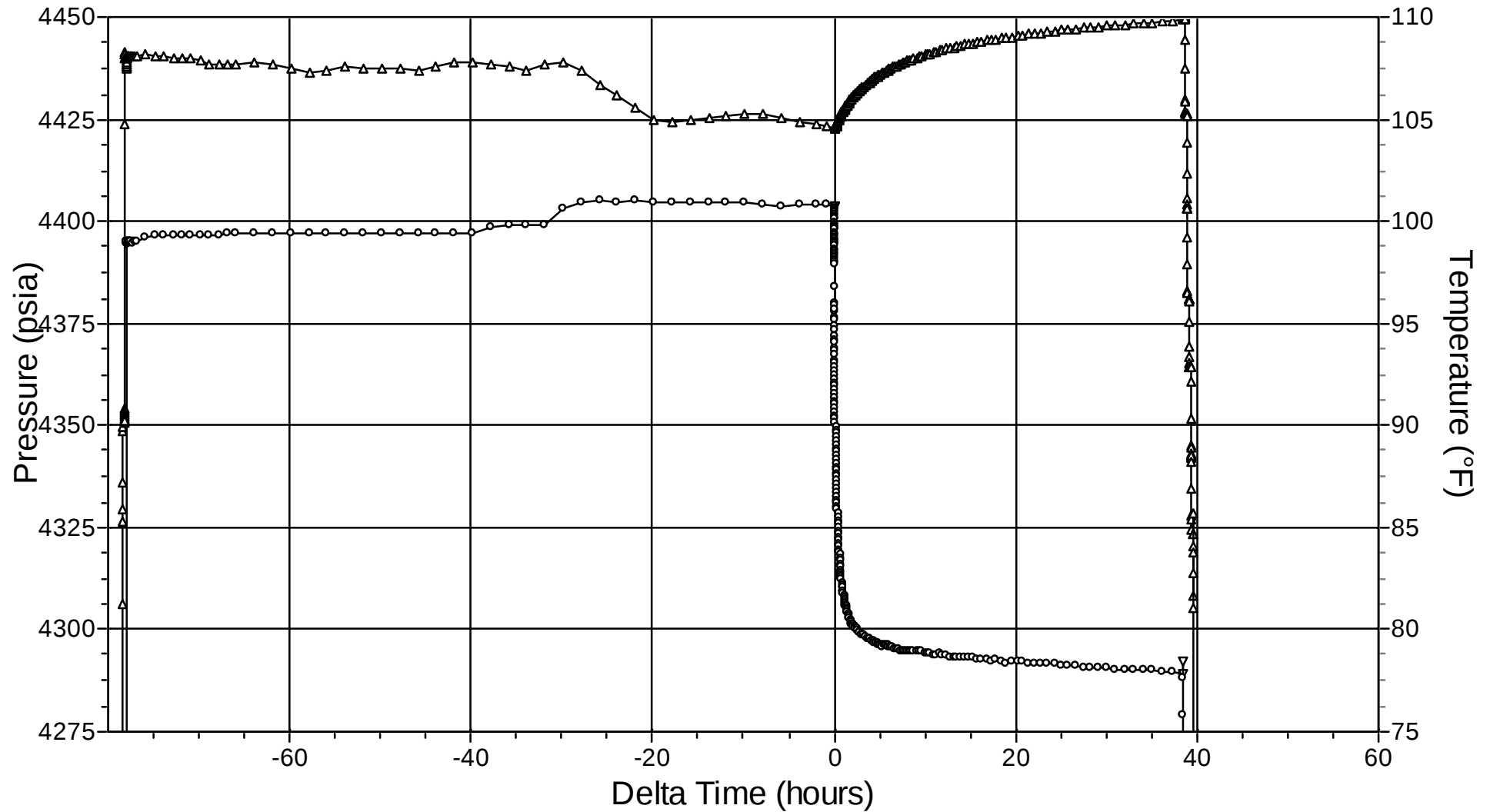


PB Energy Storage Services, Inc.

Well: Gaines Well No. 3
Field: Davonia
Test Date: 08/25 - 08/30/2016

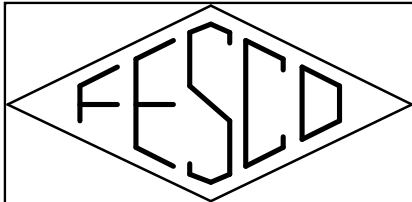
Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-1031

Cartesian Plot



J201608310801.001A

—○— Pressure —△— Temperature

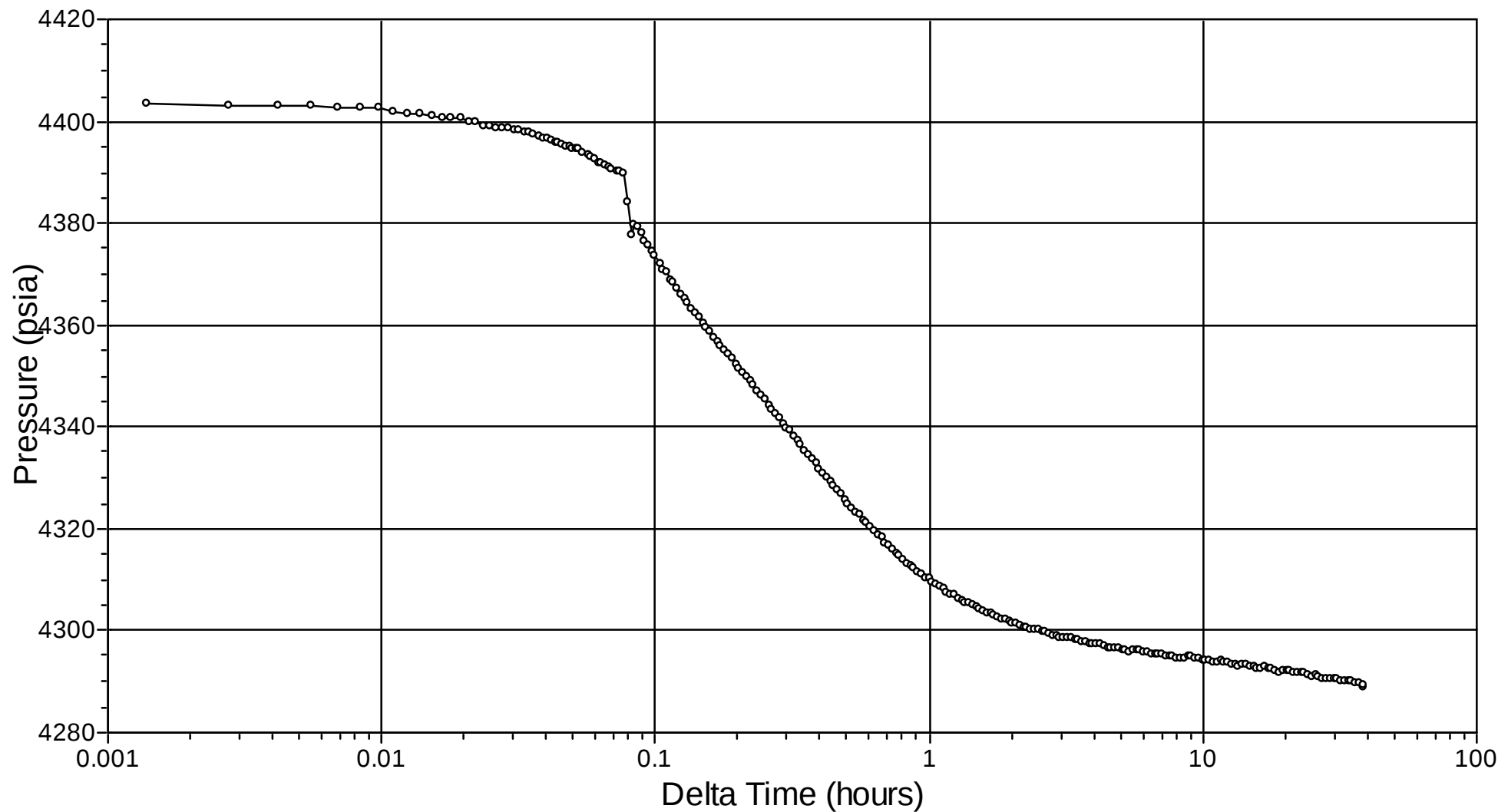


PB Energy Storage Services, Inc.

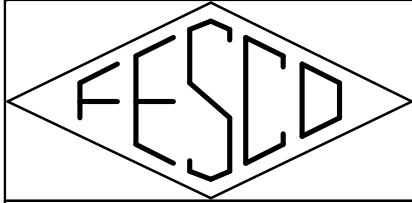
Well: Gaines Well No. 3
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-1031

Semilog Plot (Falloff Test)



J201608310801.001A

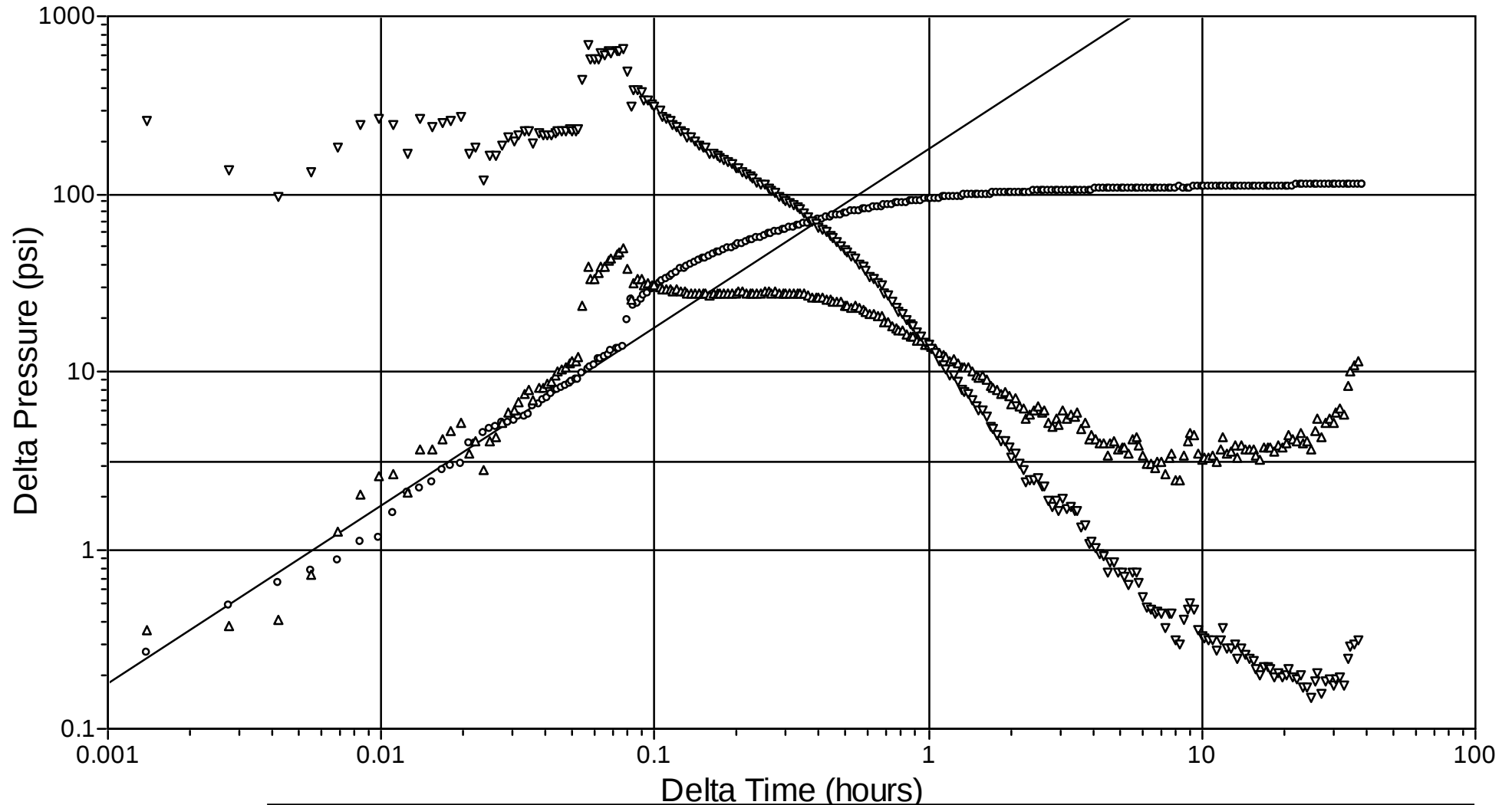


PB Energy Storage Services, Inc.

Well: Gaines Well No. 3
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-1031

**Log
Plot
(Falloff Test)**



J201608310801.001A

— Unit-Slope — Half-Slope ○ Delta Pressure
△ Radial Pressure Derivative ▽ Primary Pressure Derivative



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



STATIC GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Gaines Well No. 3
Field: Davonia
Formation: Unavailable

Test Date: 8/30/2016
Location: Eddy County, NM
Status: Shut in.

Well Data: Wellhead Connection: 2.5" EUE
Elevation: 15 ft above GL
Tubing: 4.5" Set at 7575 ft (Packer)
Casing: 7" Set at 9022 ft (PBTD)
Perfs: 7660 - 8450; 8540 - 8620 ft (MD)
Datum: 8140 ft (MD)

Gauge Type: Electronic
Gauge SN: DC-1031
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
15	15	0	975	67.95	974.72	0.00	0.0000	
1000	1000	985		84.72	1410.75	436.03	0.4427	
2000	2000	1000		88.47	1842.37	431.62	0.4316	
3000	3000	1000		92.82	2274.50	432.13	0.4321	
4000	4000	1000		96.19	2706.65	432.15	0.4322	
5000	5000	1000		100.58	3138.83	432.18	0.4322	
6000	6000	1000		105.29	3571.65	432.82	0.4328	
7000	7000	1000		109.93	4003.69	432.04	0.4320	
7660	7660	660	975	109.87	4292.06	288.37	0.4369	POOH after 38.5 hr BHP falloff test.

BHT at Test Depth: 109.90 °F
Extrapolated BHP at Datum: 4502.00 psia
BHP Gradient at Datum : 0.4369 psi/ft

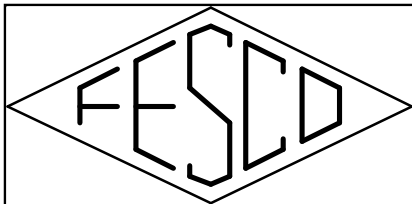
Oil Level: None
Water Level: Surface
Csg Press: N/A

Previous BHP: 4295.86 psia (7/27/16)
BHP Change: 206 psi gain

Remarks: MIRU slickline. RIH with 1.25" weight bar. Tagged bottom at 9093 ft. POOH. RIH with electronic memory gauges to 7924 ft. Continue injecting water for 78 hrs. SI well for 38.5 hr reservoir pressure falloff test. POOH making static gradient stops. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

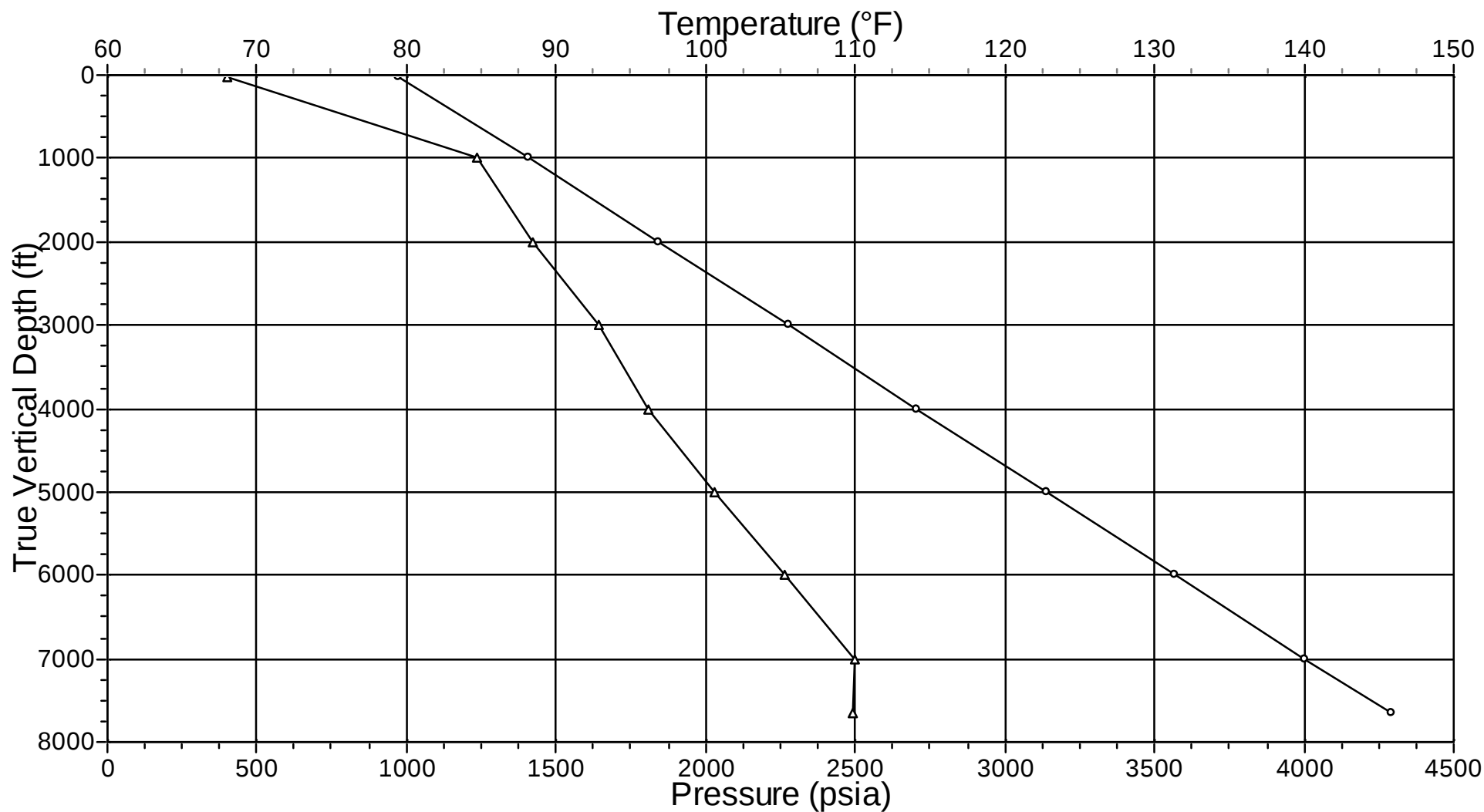


PB Energy Storage Services, Inc.

Well: Gaines Well No. 3
Field: Davonia
Test Date: 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-1031

Static Gradient Plot



J201608310801.001A

—○— Pressure —△— Temperature



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



FLOWING GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Formation: Unavailable

Test Date: 8/25/2016
Location: Eddy County, NM
Status: Injecting

Well Data: Wellhead Connection: 2" EUE
Elevation: 13 ft above GL
Tubing: 4.5" Set at 7829 ft (Packer)
Casing: 7" Set at 9094 ft (PBTD)
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Datum: 8200 ft (MD)

Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
13	13	0	1360	81.24	1356.99	0.00	0.0000	RIH while injecting water.
7924	7924	7911	1360	105.08	4714.08	3357.09	0.4244	Suspended gauges for Inj/Falloff test.

BHT at Test Depth: 105.10 °F
Extrapolated BHP at Datum: 4831.00 psia
BHP Gradient at Datum : 0.4244 psi/ft

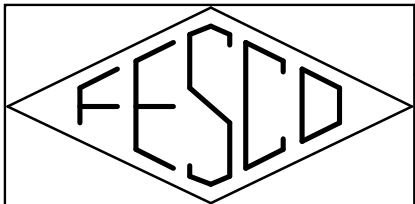
Oil Level: Injecting
Water Level: Injecting
Csg Press: N/A

Previous BHP: U/A
BHP Change: U/A

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 7930 ft. POOH. RIH with electronic memory gauges to 7924 ft.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

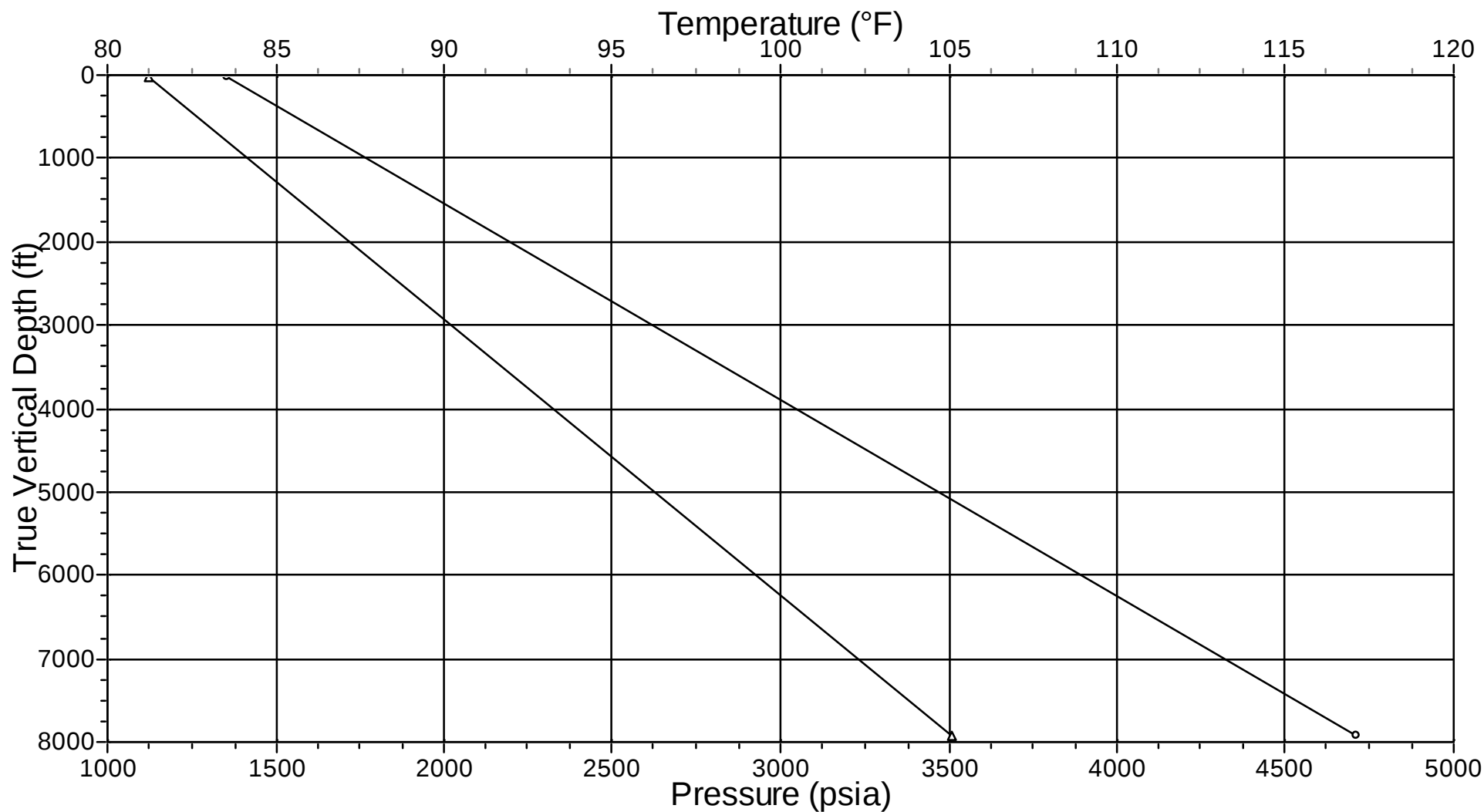


PB Energy Storage Services, Inc.

Well: Mewbourne Well No. 1
Field: Davonia
Test Date: 08/25/2016

Gauge Type: Electronic
Gauge Range: 16000 psi
Gauge SN: SP-21726

Flowing Gradient Plot



J201608310802.001A

—○— Pressure —△— Temperature



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	10:09:05	-49.45278		12.77		70.38	Powered up gauge.
08/25/16	10:10:00	-49.43750		12.54		70.95	
08/25/16	10:15:05	-49.35278		12.65		72.83	
08/25/16	10:20:05	-49.26944		12.67		73.70	
08/25/16	10:22:05	-49.23611		12.75		73.85	
08/25/16	10:23:05	-49.21944		29.43		73.87	
08/25/16	10:23:10	-49.21806		1353.66		73.88	Pressured up lubricator.
08/25/16	10:24:05	-49.20278		1355.81		76.64	
08/25/16	10:25:05	-49.18611		1356.96		79.09	
08/25/16	10:26:05	-49.16944		1357.76		80.19	
08/25/16	10:27:05	-49.15278		1357.10		80.74	
08/25/16	10:28:05	-49.13611		1357.75		81.01	
08/25/16	10:29:05	-49.11944		1357.73		81.17	
08/25/16	10:30:05	-49.10278		1356.26		81.23	
08/25/16	10:30:55	-49.08889	1360	1356.99		81.24	RIH with EMP to 7924 ft.
08/25/16	10:31:05	-49.08611		1361.91		81.24	
08/25/16	10:32:05	-49.06944		1472.81		89.51	
08/25/16	10:33:05	-49.05278		1699.89		97.96	
08/25/16	10:34:05	-49.03611		1813.40		101.88	
08/25/16	10:35:05	-49.01944		1905.10		103.72	
08/25/16	10:36:05	-49.00278		2169.56		104.60	
08/25/16	10:37:05	-48.98611		2444.16		104.92	
08/25/16	10:38:05	-48.96944		2761.89		104.94	
08/25/16	10:39:05	-48.95278		3111.09		104.79	
08/25/16	10:40:05	-48.93611		3474.06		104.59	
08/25/16	10:41:05	-48.91944		3767.87		104.44	
08/25/16	10:42:05	-48.90278		4084.73		104.39	
08/25/16	10:43:05	-48.88611		4407.34		104.44	
08/25/16	10:44:05	-48.86944		4686.70		104.62	
08/25/16	10:44:20	-48.86528	1360	4714.46		104.67	Gauge at TD=7924 ft (MD).
08/25/16	10:45:05	-48.85278		4714.67		104.83	
08/25/16	10:46:05	-48.83611		4714.70		104.94	
08/25/16	10:47:05	-48.81944		4714.61		105.00	
08/25/16	10:48:05	-48.80278		4714.52		105.03	
08/25/16	10:49:05	-48.78611		4714.45		105.05	
08/25/16	10:50:05	-48.76944		4714.39		105.06	
08/25/16	10:51:05	-48.75278		4714.31		105.07	
08/25/16	10:52:05	-48.73611		4714.24		105.07	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	10:53:05	-48.71944		4714.12		105.08	
08/25/16	10:54:05	-48.70278	1360	4714.08		105.08	7924 ft stop.
08/25/16	10:55:05	-48.68611		4714.04		105.08	
08/25/16	10:56:05	-48.66944		4714.00		105.08	
08/25/16	10:57:05	-48.65278		4713.95		105.08	
08/25/16	10:58:05	-48.63611		4713.95		105.08	
08/25/16	10:59:05	-48.61944		4713.93		105.08	
08/25/16	11:00:05	-48.60278		4713.91		105.08	
08/25/16	11:20:05	-48.26944		4713.76		105.06	
08/25/16	11:41:05	-47.91944		4713.72		105.04	
08/25/16	12:01:05	-47.58611		4713.79		105.02	
08/25/16	12:21:05	-47.25278		4713.86		105.00	
08/25/16	12:41:05	-46.91944		4713.97		104.99	
08/25/16	13:01:05	-46.58611		4714.13		104.98	
08/25/16	13:21:05	-46.25278		4714.24		104.97	
08/25/16	13:41:05	-45.91944		4714.32		104.96	
08/25/16	14:01:05	-45.58611		4714.81		104.96	
08/25/16	14:21:05	-45.25278		4714.61		104.97	
08/25/16	14:41:05	-44.91944		4714.68		104.96	
08/25/16	15:01:05	-44.58611		4714.78		104.94	
08/25/16	15:21:05	-44.25278		4714.87		104.92	
08/25/16	15:41:05	-43.91944		4715.06		104.92	
08/25/16	16:01:05	-43.58611		4715.05		104.92	
08/25/16	16:21:05	-43.25278		4715.08		104.92	
08/25/16	16:41:05	-42.91944		4715.15		104.92	
08/25/16	17:01:05	-42.58611		4715.14		104.92	
08/25/16	17:21:05	-42.25278		4715.23		104.92	
08/25/16	17:41:05	-41.91944		4715.25		104.93	
08/25/16	18:01:05	-41.58611		4715.19		104.92	
08/25/16	18:21:05	-41.25278		4715.17		104.92	
08/25/16	18:41:05	-40.91944		4715.19		104.92	
08/25/16	19:01:05	-40.58611		4715.22		104.92	
08/25/16	19:21:05	-40.25278		4715.21		104.93	
08/25/16	19:41:05	-39.91944		4715.24		104.93	
08/25/16	20:01:05	-39.58611		4715.23		104.93	
08/25/16	20:21:05	-39.25278		4715.25		104.93	
08/25/16	20:41:05	-38.91944		4715.16		104.94	
08/25/16	21:01:05	-38.58611		4715.30		104.94	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	21:21:05	-38.25278		4715.34		104.92	
08/25/16	21:41:05	-37.91944		4715.32		104.91	
08/25/16	22:01:05	-37.58611		4715.36		104.89	
08/25/16	22:21:05	-37.25278		4715.39		104.88	
08/25/16	22:41:05	-36.91944		4715.37		104.88	
08/25/16	23:01:05	-36.58611		4715.38		104.87	
08/25/16	23:21:05	-36.25278		4715.41		104.87	
08/25/16	23:41:05	-35.91944		4715.36		104.86	
08/26/16	00:01:05	-35.58611		4715.39		104.86	
08/26/16	00:21:05	-35.25278		4715.39		104.86	
08/26/16	00:41:05	-34.91944		4715.40		104.86	
08/26/16	01:01:05	-34.58611		4715.44		104.85	
08/26/16	01:21:05	-34.25278		4715.42		104.84	
08/26/16	01:41:05	-33.91944		4715.46		104.83	
08/26/16	02:01:05	-33.58611		4715.45		104.82	
08/26/16	02:21:05	-33.25278		4715.42		104.81	
08/26/16	02:41:05	-32.91944		4715.39		104.81	
08/26/16	03:01:05	-32.58611		4715.49		104.80	
08/26/16	03:21:05	-32.25278		4715.47		104.80	
08/26/16	03:41:05	-31.91944		4715.51		104.80	
08/26/16	04:01:05	-31.58611		4715.53		104.80	
08/26/16	04:21:05	-31.25278		4715.55		104.80	
08/26/16	04:41:05	-30.91944		4715.51		104.80	
08/26/16	05:01:05	-30.58611		4715.53		104.80	
08/26/16	05:21:05	-30.25278		4715.50		104.79	
08/26/16	05:41:05	-29.91944		4715.52		104.79	
08/26/16	06:01:05	-29.58611		4715.54		104.79	
08/26/16	06:21:05	-29.25278		4715.50		104.79	
08/26/16	06:41:05	-28.91944		4715.53		104.79	
08/26/16	07:01:05	-28.58611		4715.47		104.78	
08/26/16	07:21:05	-28.25278		4715.50		104.78	
08/26/16	07:41:05	-27.91944		4715.48		104.77	
08/26/16	08:01:05	-27.58611		4715.46		104.77	
08/26/16	08:21:05	-27.25278		4715.51		104.76	
08/26/16	08:41:05	-26.91944		4715.50		104.76	
08/26/16	09:01:05	-26.58611		4715.48		104.75	
08/26/16	09:21:05	-26.25278		4715.47		104.74	
08/26/16	09:41:05	-25.91944		4715.37		104.74	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/26/16	10:01:05	-25.58611		4715.34		104.74	
08/26/16	10:21:05	-25.25278		4715.32		104.74	
08/26/16	10:41:05	-24.91944		4715.32		104.73	
08/26/16	11:01:05	-24.58611		4715.28		104.73	
08/26/16	11:21:05	-24.25278		4715.25		104.73	
08/26/16	11:41:05	-23.91944		4715.21		104.72	
08/26/16	12:01:05	-23.58611		4715.40		104.72	
08/26/16	12:21:05	-23.25278		4715.27		104.71	
08/26/16	12:41:05	-22.91944		4715.26		104.70	
08/26/16	13:01:05	-22.58611		4715.34		104.69	
08/26/16	13:21:05	-22.25278		4715.26		104.68	
08/26/16	13:41:05	-21.91944		4715.35		104.67	
08/26/16	14:01:05	-21.58611		4715.42		104.66	
08/26/16	14:21:05	-21.25278		4715.38		104.66	
08/26/16	14:41:05	-20.91944		4715.38		104.66	
08/26/16	15:01:05	-20.58611		4715.43		104.66	
08/26/16	15:21:05	-20.25278		4715.46		104.67	
08/26/16	15:41:05	-19.91944		4715.58		104.68	
08/26/16	16:01:05	-19.58611		4715.59		104.69	
08/26/16	16:21:05	-19.25278		4715.70		104.70	
08/26/16	16:41:05	-18.91944		4715.64		104.71	
08/26/16	17:01:05	-18.58611		4715.66		104.72	
08/26/16	17:21:05	-18.25278		4715.73		104.72	
08/26/16	17:41:05	-17.91944		4715.63		104.72	
08/26/16	18:01:05	-17.58611		4715.66		104.72	
08/26/16	18:21:05	-17.25278		4715.71		104.72	
08/26/16	18:41:05	-16.91944		4715.76		104.72	
08/26/16	19:01:05	-16.58611		4715.77		104.71	
08/26/16	19:21:05	-16.25278		4715.73		104.71	
08/26/16	19:41:05	-15.91944		4715.78		104.70	
08/26/16	20:01:05	-15.58611		4715.79		104.70	
08/26/16	20:21:05	-15.25278		4715.85		104.69	
08/26/16	20:41:05	-14.91944		4715.89		104.69	
08/26/16	21:01:05	-14.58611		4715.91		104.67	
08/26/16	21:21:05	-14.25278		4715.92		104.65	
08/26/16	21:41:05	-13.91944		4715.92		104.64	
08/26/16	22:01:05	-13.58611		4715.89		104.63	
08/26/16	22:21:05	-13.25278		4715.99		104.62	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/26/16	22:41:05	-12.91944		4715.93		104.61	
08/26/16	23:01:05	-12.58611		4715.91		104.61	
08/26/16	23:21:05	-12.25278		4716.04		104.60	
08/26/16	23:41:05	-11.91944		4716.02		104.59	
08/27/16	00:01:05	-11.58611		4715.98		104.59	
08/27/16	00:21:05	-11.25278		4715.93		104.58	
08/27/16	00:41:05	-10.91944		4715.96		104.57	
08/27/16	01:01:05	-10.58611		4715.96		104.57	
08/27/16	01:21:05	-10.25278		4715.93		104.56	
08/27/16	01:41:05	-9.91944		4715.86		104.57	
08/27/16	02:01:05	-9.58611		4715.87		104.57	
08/27/16	02:21:05	-9.25278		4715.84		104.58	
08/27/16	02:41:05	-8.91944		4715.82		104.59	
08/27/16	03:01:05	-8.58611		4715.80		104.60	
08/27/16	03:21:05	-8.25278		4715.84		104.62	
08/27/16	03:41:05	-7.91944		4715.85		104.63	
08/27/16	04:01:05	-7.58611		4720.78		104.63	
08/27/16	04:21:05	-7.25278		4722.11		104.67	
08/27/16	04:41:05	-6.91944		4722.52		104.71	
08/27/16	05:01:05	-6.58611		4722.67		104.73	
08/27/16	05:21:05	-6.25278		4722.71		104.76	
08/27/16	05:41:05	-5.91944		4722.70		104.78	
08/27/16	06:01:05	-5.58611		4722.74		104.80	
08/27/16	06:21:05	-5.25278		4722.66		104.81	
08/27/16	06:41:05	-4.91944		4722.66		104.82	
08/27/16	07:01:05	-4.58611		4722.69		104.83	
08/27/16	07:21:05	-4.25278		4722.59		104.84	
08/27/16	07:41:05	-3.91944		4722.53		104.83	
08/27/16	08:01:05	-3.58611		4722.51		104.83	
08/27/16	08:21:05	-3.25278		4722.56		104.83	
08/27/16	08:41:05	-2.91944		4722.46		104.82	
08/27/16	09:01:05	-2.58611		4722.41		104.82	
08/27/16	09:21:05	-2.25278		4722.39		104.81	
08/27/16	09:41:05	-1.91944		4722.44		104.80	
08/27/16	10:01:05	-1.58611		4722.35		104.79	
08/27/16	10:21:05	-1.25278		4722.32		104.79	
08/27/16	10:41:05	-0.91944		4722.33		104.78	
08/27/16	11:01:05	-0.58611		4722.30		104.78	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:21:05	-0.25278		4722.31		104.77	
08/27/16	11:36:05	-0.00278		4722.40		104.77	Casing Pressure = N/A.
08/27/16	11:36:10	-0.00139		4722.34		104.77	Water Injection Rate = Unavailable.
08/27/16	11:36:15	0.00000		4722.40	0.00	104.77	Shut in well for 69 hr BHP falloff test.
08/27/16	11:36:20	0.00139		4722.27	-0.13	104.77	
08/27/16	11:36:25	0.00278		4722.15	-0.25	104.77	
08/27/16	11:36:30	0.00417		4721.92	-0.48	104.77	
08/27/16	11:36:35	0.00556		4721.71	-0.69	104.77	
08/27/16	11:36:40	0.00694		4721.46	-0.94	104.77	
08/27/16	11:36:45	0.00833		4721.26	-1.14	104.77	
08/27/16	11:36:50	0.00972		4721.00	-1.40	104.77	
08/27/16	11:36:55	0.01111		4720.72	-1.68	104.77	
08/27/16	11:37:00	0.01250		4720.47	-1.93	104.77	
08/27/16	11:37:05	0.01389		4720.09	-2.31	104.77	
08/27/16	11:37:10	0.01528		4719.69	-2.71	104.77	
08/27/16	11:37:15	0.01667		4719.32	-3.08	104.77	
08/27/16	11:37:20	0.01806		4718.89	-3.51	104.77	
08/27/16	11:37:25	0.01944		4718.51	-3.89	104.77	
08/27/16	11:37:30	0.02083		4718.07	-4.33	104.77	
08/27/16	11:37:35	0.02222		4717.66	-4.74	104.77	
08/27/16	11:37:40	0.02361		4717.11	-5.29	104.77	
08/27/16	11:37:45	0.02500		4716.65	-5.75	104.77	
08/27/16	11:37:50	0.02639		4716.10	-6.30	104.77	
08/27/16	11:37:55	0.02778		4715.53	-6.87	104.77	
08/27/16	11:38:00	0.02917		4714.92	-7.48	104.77	
08/27/16	11:38:05	0.03056		4714.39	-8.01	104.77	
08/27/16	11:38:10	0.03194		4713.80	-8.60	104.77	
08/27/16	11:38:15	0.03333		4713.27	-9.13	104.77	
08/27/16	11:38:20	0.03472		4712.67	-9.73	104.77	
08/27/16	11:38:25	0.03611		4712.17	-10.23	104.77	
08/27/16	11:38:30	0.03750		4711.59	-10.81	104.77	
08/27/16	11:38:35	0.03889		4711.08	-11.32	104.77	
08/27/16	11:38:40	0.04028		4710.50	-11.90	104.77	
08/27/16	11:38:45	0.04167		4710.04	-12.36	104.77	
08/27/16	11:38:50	0.04306		4709.49	-12.91	104.77	
08/27/16	11:38:55	0.04444		4708.99	-13.41	104.77	
08/27/16	11:39:00	0.04583		4708.47	-13.93	104.77	
08/27/16	11:39:05	0.04722		4708.00	-14.40	104.77	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:39:10	0.04861		4707.48	-14.92	104.77	
08/27/16	11:39:15	0.05000		4706.95	-15.45	104.77	
08/27/16	11:39:20	0.05139		4706.28	-16.12	104.77	
08/27/16	11:39:25	0.05278		4705.70	-16.70	104.77	
08/27/16	11:39:30	0.05417		4704.98	-17.42	104.77	
08/27/16	11:39:40	0.05694		4703.71	-18.69	104.78	
08/27/16	11:39:45	0.05833		4703.07	-19.33	104.78	
08/27/16	11:39:50	0.05972		4702.31	-20.09	104.78	
08/27/16	11:40:00	0.06250		4700.88	-21.52	104.78	
08/27/16	11:40:05	0.06389		4700.14	-22.26	104.78	
08/27/16	11:40:10	0.06528		4699.38	-23.02	104.78	
08/27/16	11:40:20	0.06806		4697.97	-24.43	104.78	
08/27/16	11:40:25	0.06944		4697.28	-25.12	104.78	
08/27/16	11:40:35	0.07222		4695.94	-26.46	104.78	
08/27/16	11:40:40	0.07361		4695.32	-27.08	104.78	
08/27/16	11:40:50	0.07639		4694.06	-28.34	104.78	
08/27/16	11:41:00	0.07917		4692.80	-29.60	104.79	
08/27/16	11:41:10	0.08194		4691.62	-30.78	104.79	
08/27/16	11:41:15	0.08333		4691.08	-31.32	104.79	
08/27/16	11:41:25	0.08611		4689.98	-32.42	104.79	
08/27/16	11:41:35	0.08889		4688.92	-33.48	104.79	
08/27/16	11:41:45	0.09167		4687.89	-34.51	104.79	
08/27/16	11:41:55	0.09444		4686.85	-35.55	104.79	
08/27/16	11:42:05	0.09722		4685.88	-36.52	104.79	
08/27/16	11:42:15	0.10000		4684.94	-37.46	104.80	
08/27/16	11:42:30	0.10417		4683.56	-38.84	104.80	
08/27/16	11:42:40	0.10694		4682.70	-39.70	104.80	
08/27/16	11:42:50	0.10972		4681.87	-40.53	104.80	
08/27/16	11:43:05	0.11389		4680.65	-41.75	104.81	
08/27/16	11:43:15	0.11667		4679.87	-42.53	104.81	
08/27/16	11:43:30	0.12083		4678.75	-43.65	104.82	
08/27/16	11:43:45	0.12500		4677.67	-44.73	104.82	
08/27/16	11:43:55	0.12778		4677.00	-45.40	104.82	
08/27/16	11:44:10	0.13194		4676.04	-46.36	104.83	
08/27/16	11:44:25	0.13611		4675.13	-47.27	104.84	
08/27/16	11:44:40	0.14028		4674.24	-48.16	104.84	
08/27/16	11:44:55	0.14444		4672.93	-49.47	104.85	
08/27/16	11:45:15	0.15000		4670.43	-51.97	104.86	



FESCO, Ltd.
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RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:45:30	0.15417		4668.50	-53.90	104.87	
08/27/16	11:45:45	0.15833		4666.49	-55.91	104.87	
08/27/16	11:46:05	0.16389		4664.15	-58.25	104.88	
08/27/16	11:46:25	0.16944		4661.71	-60.69	104.89	
08/27/16	11:46:40	0.17361		4659.92	-62.48	104.89	
08/27/16	11:47:00	0.17917		4657.46	-64.94	104.89	
08/27/16	11:47:20	0.18472		4654.80	-67.60	104.90	
08/27/16	11:47:45	0.19167		4652.00	-70.40	104.90	
08/27/16	11:48:05	0.19722		4649.72	-72.68	104.90	
08/27/16	11:48:25	0.20278		4647.46	-74.94	104.91	
08/27/16	11:48:50	0.20972		4644.76	-77.64	104.91	
08/27/16	11:49:10	0.21528		4642.64	-79.76	104.91	
08/27/16	11:49:35	0.22222		4640.03	-82.37	104.91	
08/27/16	11:50:00	0.22917		4637.50	-84.90	104.91	
08/27/16	11:50:25	0.23611		4635.00	-87.40	104.91	
08/27/16	11:50:55	0.24444		4632.08	-90.32	104.91	
08/27/16	11:51:20	0.25139		4629.70	-92.70	104.92	
08/27/16	11:51:50	0.25972		4626.89	-95.51	104.92	
08/27/16	11:52:20	0.26806		4624.14	-98.26	104.92	
08/27/16	11:52:50	0.27639		4621.45	-100.95	104.92	
08/27/16	11:53:20	0.28472		4618.81	-103.59	104.92	
08/27/16	11:53:50	0.29306		4616.23	-106.17	104.92	
08/27/16	11:54:25	0.30278		4613.27	-109.13	104.92	
08/27/16	11:54:55	0.31111		4610.79	-111.61	104.92	
08/27/16	11:55:30	0.32083		4607.95	-114.45	104.92	
08/27/16	11:56:10	0.33194		4604.77	-117.63	104.92	
08/27/16	11:56:45	0.34167		4602.05	-120.35	104.92	
08/27/16	11:57:25	0.35278		4599.02	-123.38	104.92	
08/27/16	11:58:05	0.36389		4596.05	-126.35	104.93	
08/27/16	11:58:45	0.37500		4593.14	-129.26	104.93	
08/27/16	11:59:25	0.38611		4590.30	-132.10	104.93	
08/27/16	12:00:10	0.39861		4587.16	-135.24	104.93	
08/27/16	12:00:55	0.41111		4584.11	-138.29	104.93	
08/27/16	12:01:40	0.42361		4581.12	-141.28	104.93	
08/27/16	12:02:25	0.43611		4578.21	-144.19	104.93	
08/27/16	12:03:15	0.45000		4575.04	-147.36	104.93	
08/27/16	12:04:05	0.46389		4571.95	-150.45	104.93	
08/27/16	12:05:00	0.47917		4568.64	-153.76	104.93	



FESCO, Ltd.
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RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	12:05:50	0.49306		4565.70	-156.70	104.94	
08/27/16	12:06:45	0.50833		4562.55	-159.85	104.94	
08/27/16	12:07:45	0.52500		4559.21	-163.19	104.94	
08/27/16	12:08:45	0.54167		4555.96	-166.44	104.94	
08/27/16	12:09:45	0.55833		4552.79	-169.61	104.94	
08/27/16	12:10:45	0.57500		4549.71	-172.69	104.94	
08/27/16	12:11:50	0.59306		4546.46	-175.94	104.94	
08/27/16	12:12:55	0.61111		4543.31	-179.09	104.94	
08/27/16	12:14:05	0.63056		4540.01	-182.39	104.94	
08/27/16	12:15:15	0.65000		4536.80	-185.60	104.95	
08/27/16	12:16:30	0.67083		4533.48	-188.92	104.95	
08/27/16	12:17:45	0.69167		4530.26	-192.14	104.95	
08/27/16	12:19:00	0.71250		4527.13	-195.27	104.95	
08/27/16	12:20:20	0.73472		4523.91	-198.49	104.96	
08/27/16	12:21:45	0.75833		4520.60	-201.80	104.96	
08/27/16	12:23:10	0.78194		4517.40	-205.00	104.96	
08/27/16	12:24:35	0.80556		4514.30	-208.10	104.96	
08/27/16	12:26:05	0.83056		4511.14	-211.26	104.96	
08/27/16	12:27:40	0.85694		4507.92	-214.48	104.96	
08/27/16	12:29:15	0.88333		4504.83	-217.57	104.97	
08/27/16	12:30:55	0.91111		4501.69	-220.71	104.97	
08/27/16	12:32:35	0.93889		4498.67	-223.73	104.97	
08/27/16	12:34:25	0.96944		4495.47	-226.93	104.97	
08/27/16	12:36:10	0.99861		4492.55	-229.85	104.98	
08/27/16	12:38:05	1.03056		4489.48	-232.92	104.98	
08/27/16	12:40:00	1.06250		4486.53	-235.87	104.98	
08/27/16	12:42:00	1.09583		4483.60	-238.80	104.98	
08/27/16	12:44:00	1.12917		4480.79	-241.61	104.99	
08/27/16	12:46:05	1.16389		4477.99	-244.41	104.99	
08/27/16	12:48:20	1.20139		4475.11	-247.29	104.99	
08/27/16	12:50:35	1.23889		4472.37	-250.03	105.00	
08/27/16	12:52:50	1.27639		4469.76	-252.64	105.00	
08/27/16	12:55:15	1.31667		4467.08	-255.32	105.00	
08/27/16	12:57:40	1.35694		4464.55	-257.85	105.01	
08/27/16	13:00:15	1.40000		4461.98	-260.42	105.01	
08/27/16	13:02:50	1.44306		4459.55	-262.85	105.01	
08/27/16	13:05:35	1.48889		4457.10	-265.30	105.02	
08/27/16	13:08:20	1.53472		4454.79	-267.61	105.02	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	13:11:15	1.58333		4452.48	-269.92	105.03	
08/27/16	13:14:10	1.63194		4450.30	-272.10	105.03	
08/27/16	13:17:15	1.68333		4448.14	-274.26	105.03	
08/27/16	13:20:20	1.73472		4446.10	-276.30	105.04	
08/27/16	13:23:35	1.78889		4444.09	-278.31	105.04	
08/27/16	13:26:55	1.84444		4442.16	-280.24	105.05	
08/27/16	13:30:25	1.90278		4440.27	-282.13	105.05	
08/27/16	13:34:00	1.96250		4438.46	-283.94	105.06	
08/27/16	13:37:40	2.02361		4436.73	-285.67	105.06	
08/27/16	13:41:25	2.08611		4435.10	-287.30	105.07	
08/27/16	13:45:20	2.15139		4433.51	-288.89	105.07	
08/27/16	13:49:20	2.21806		4432.00	-290.40	105.08	
08/27/16	13:53:30	2.28750		4430.54	-291.86	105.08	
08/27/16	13:57:45	2.35833		4429.17	-293.23	105.09	
08/27/16	14:02:10	2.43194		4427.86	-294.54	105.09	
08/27/16	14:06:45	2.50833		4426.60	-295.80	105.10	
08/27/16	14:11:25	2.58611		4425.43	-296.97	105.11	
08/27/16	14:16:15	2.66667		4424.31	-298.09	105.11	
08/27/16	14:21:15	2.75000		4423.26	-299.14	105.12	
08/27/16	14:26:20	2.83472		4422.27	-300.13	105.12	
08/27/16	14:31:40	2.92361		4421.32	-301.08	105.13	
08/27/16	14:37:05	3.01389		4420.45	-301.95	105.14	
08/27/16	14:42:45	3.10833		4419.62	-302.78	105.14	
08/27/16	14:48:35	3.20556		4418.83	-303.57	105.15	
08/27/16	14:54:35	3.30556		4418.11	-304.29	105.16	
08/27/16	15:00:45	3.40833		4417.42	-304.98	105.16	
08/27/16	15:07:05	3.51389		4416.79	-305.61	105.17	
08/27/16	15:13:40	3.62361		4416.19	-306.21	105.17	
08/27/16	15:20:30	3.73750		4415.63	-306.77	105.18	
08/27/16	15:27:25	3.85278		4415.12	-307.28	105.19	
08/27/16	15:34:40	3.97361		4414.64	-307.76	105.19	
08/27/16	15:42:05	4.09722		4414.19	-308.21	105.20	
08/27/16	15:49:45	4.22500		4413.77	-308.63	105.21	
08/27/16	15:57:40	4.35694		4413.38	-309.02	105.21	
08/27/16	16:05:50	4.49306		4413.02	-309.38	105.22	
08/27/16	16:14:10	4.63194		4412.69	-309.71	105.23	
08/27/16	16:22:50	4.77639		4412.37	-310.03	105.24	
08/27/16	16:31:45	4.92500		4412.08	-310.32	105.24	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	16:41:00	5.07917		4411.80	-310.60	105.25	
08/27/16	16:50:30	5.23750		4411.55	-310.85	105.25	
08/27/16	17:00:20	5.40139		4411.31	-311.09	105.26	
08/27/16	17:10:25	5.56944		4411.10	-311.30	105.27	
08/27/16	17:20:50	5.74306		4410.90	-311.50	105.27	
08/27/16	17:31:35	5.92222		4410.71	-311.69	105.28	
08/27/16	17:42:35	6.10556		4410.53	-311.87	105.29	
08/27/16	17:54:00	6.29583		4410.38	-312.02	105.30	
08/27/16	18:05:50	6.49306		4410.23	-312.17	105.30	
08/27/16	18:17:55	6.69444		4410.09	-312.31	105.31	
08/27/16	18:30:30	6.90417		4409.96	-312.44	105.32	
08/27/16	18:43:25	7.11944		4409.84	-312.56	105.32	
08/27/16	18:56:40	7.34028		4409.73	-312.67	105.33	
08/27/16	19:10:25	7.56944		4409.63	-312.77	105.34	
08/27/16	19:24:35	7.80556		4409.53	-312.87	105.34	
08/27/16	19:39:10	8.04861		4409.44	-312.96	105.35	
08/27/16	19:54:15	8.30000		4409.35	-313.05	105.36	
08/27/16	20:09:45	8.55833		4409.27	-313.13	105.36	
08/27/16	20:25:45	8.82500		4409.20	-313.20	105.37	
08/27/16	20:42:15	9.10000		4409.13	-313.27	105.38	
08/27/16	20:59:15	9.38333		4409.06	-313.34	105.38	
08/27/16	21:16:50	9.67639		4408.99	-313.41	105.39	
08/27/16	21:34:55	9.97778		4408.93	-313.47	105.39	
08/27/16	21:53:35	10.28889		4408.86	-313.54	105.40	
08/27/16	22:12:50	10.60972		4408.81	-313.59	105.41	
08/27/16	22:32:40	10.94028		4408.75	-313.65	105.41	
08/27/16	22:53:05	11.28056		4408.69	-313.71	105.42	
08/27/16	23:14:10	11.63194		4408.64	-313.76	105.42	
08/27/16	23:35:55	11.99444		4408.58	-313.82	105.43	
08/27/16	23:58:25	12.36944		4408.53	-313.87	105.43	
08/28/16	00:21:30	12.75417		4408.48	-313.92	105.44	
08/28/16	00:45:20	13.15139		4408.43	-313.97	105.44	
08/28/16	01:09:55	13.56111		4408.38	-314.02	105.45	
08/28/16	01:35:20	13.98472		4408.32	-314.08	105.46	
08/28/16	02:01:30	14.42083		4408.27	-314.13	105.46	
08/28/16	02:28:25	14.86944		4408.23	-314.17	105.47	
08/28/16	02:56:15	15.33333		4408.17	-314.23	105.47	
08/28/16	03:24:55	15.81111		4408.13	-314.27	105.48	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	03:54:30	16.30417		4408.08	-314.32	105.48	
08/28/16	04:25:00	16.81250		4408.03	-314.37	105.49	
08/28/16	04:56:25	17.33611		4407.97	-314.43	105.50	
08/28/16	05:28:50	17.87639		4407.91	-314.49	105.50	
08/28/16	06:02:15	18.43333		4407.84	-314.56	105.51	
08/28/16	06:36:45	19.00833		4407.78	-314.62	105.51	
08/28/16	07:12:15	19.60000		4407.71	-314.69	105.52	
08/28/16	07:48:55	20.21111		4407.64	-314.76	105.52	
08/28/16	08:26:45	20.84167		4407.57	-314.83	105.53	
08/28/16	09:05:45	21.49167		4407.51	-314.89	105.54	
08/28/16	09:45:55	22.16111		4407.44	-314.96	105.54	
08/28/16	10:27:20	22.85139		4407.37	-315.03	105.55	
08/28/16	11:10:05	23.56389		4407.31	-315.09	105.55	
08/28/16	11:54:10	24.29861		4407.25	-315.15	105.56	
08/28/16	12:39:35	25.05556		4407.18	-315.22	105.56	
08/28/16	13:26:25	25.83611		4407.12	-315.28	105.57	
08/28/16	14:14:45	26.64167		4407.07	-315.33	105.57	
08/28/16	15:04:35	27.47222		4407.01	-315.39	105.58	
08/28/16	15:56:00	28.32917		4406.94	-315.46	105.58	
08/28/16	16:48:55	29.21111		4406.88	-315.52	105.59	
08/28/16	17:43:35	30.12222		4406.81	-315.59	105.59	
08/28/16	18:39:55	31.06111		4406.73	-315.67	105.60	
08/28/16	19:38:00	32.02917		4406.64	-315.76	105.60	
08/28/16	20:37:55	33.02778		4406.55	-315.85	105.61	
08/28/16	21:39:40	34.05694		4406.45	-315.95	105.62	
08/28/16	22:43:20	35.11806		4406.34	-316.06	105.62	
08/28/16	23:49:00	36.21250		4406.22	-316.18	105.63	
08/29/16	00:56:45	37.34167		4406.10	-316.30	105.63	
08/29/16	02:06:35	38.50556		4405.97	-316.43	105.64	
08/29/16	03:18:35	39.70556		4405.84	-316.56	105.64	
08/29/16	04:32:50	40.94306		4405.69	-316.71	105.65	
08/29/16	05:49:25	42.21944		4405.53	-316.87	105.66	
08/29/16	07:08:20	43.53472		4405.37	-317.03	105.66	
08/29/16	08:29:45	44.89167		4405.17	-317.23	105.67	
08/29/16	09:53:45	46.29167		4405.00	-317.40	105.68	
08/29/16	11:20:20	47.73472		4404.86	-317.54	105.69	
08/29/16	12:49:35	49.22222		4404.74	-317.66	105.70	
08/29/16	14:21:40	50.75694		4404.65	-317.75	105.71	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/29/16	15:56:35	52.33889		4404.56	-317.84	105.71	
08/29/16	17:34:25	53.96944		4404.45	-317.95	105.71	
08/29/16	19:15:20	55.65139		4404.29	-318.11	105.71	
08/29/16	20:59:25	57.38611		4404.12	-318.28	105.72	
08/29/16	22:46:45	59.17500		4403.95	-318.45	105.72	
08/30/16	00:37:25	61.01944		4403.80	-318.60	105.71	
08/30/16	02:31:35	62.92222		4403.66	-318.74	105.71	
08/30/16	04:29:15	64.88333		4403.53	-318.87	105.72	
08/30/16	06:30:35	66.90556		4403.37	-319.03	105.72	
08/30/16	08:26:10	68.83194		4403.10	-319.30	105.74	Ended falloff test.
08/30/16	08:27:00	68.84583		4402.82		105.74	
08/30/16	08:27:55	68.86111	110	4403.00		105.74	POOH from 7924 ft to surface.
08/30/16	08:28:00	68.86250		4394.35		105.74	
08/30/16	08:29:00	68.87917		4253.13		107.35	
08/30/16	08:30:05	68.89722		4109.58		109.56	
08/30/16	08:31:05	68.91389		3994.44		109.52	
08/30/16	08:32:05	68.93056		3872.36		108.76	
08/30/16	08:33:05	68.94722		3759.12		108.09	
08/30/16	08:34:05	68.96389		3645.16		106.95	
08/30/16	08:35:05	68.98056		3529.29		105.68	
08/30/16	08:36:05	68.99722		3414.77		104.44	
08/30/16	08:37:05	69.01389		3295.23		103.25	
08/30/16	08:38:05	69.03056		3175.27		102.07	
08/30/16	08:39:05	69.04722		3071.41		100.99	
08/30/16	08:40:05	69.06389		2966.07		99.93	
08/30/16	08:41:05	69.08056		2856.02		98.88	
08/30/16	08:42:05	69.09722		2744.10		97.80	
08/30/16	08:43:05	69.11389		2629.92		96.83	
08/30/16	08:44:05	69.13056		2513.45		95.84	
08/30/16	08:45:05	69.14722		2395.42		94.94	
08/30/16	08:46:05	69.16389		2273.38		93.98	
08/30/16	08:47:05	69.18056		2151.26		93.14	
08/30/16	08:48:05	69.19722		2028.72		92.25	
08/30/16	08:49:05	69.21389		1902.46		91.06	
08/30/16	08:50:05	69.23056		1777.86		89.90	
08/30/16	08:51:05	69.24722		1659.64		89.03	
08/30/16	08:52:05	69.26389		1533.30		88.06	
08/30/16	08:53:05	69.28056		1402.02		87.04	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Location: Eddy County, NM
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7924 ft
Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

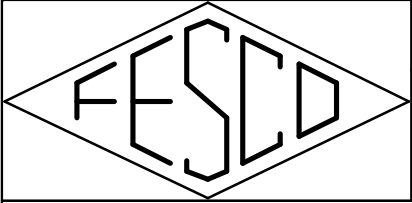
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/30/16	08:54:05	69.29722		1262.82		86.01	
08/30/16	08:55:05	69.31389		1116.55		85.09	
08/30/16	08:56:05	69.33056		1003.09		85.87	
08/30/16	08:56:35	69.33889		969.85		86.67	Gauge at surface.
08/30/16	08:57:05	69.34722		974.65		86.13	
08/30/16	08:58:05	69.36389		970.40		82.09	
08/30/16	08:59:05	69.38056		968.95		79.36	
08/30/16	09:00:05	69.39722		968.74		77.60	
08/30/16	09:01:05	69.41389		969.01		76.32	
08/30/16	09:02:05	69.43056		968.98		75.31	
08/30/16	09:03:05	69.44722		969.07		74.51	
08/30/16	09:04:05	69.46389		969.07		73.83	
08/30/16	09:05:05	69.48056		969.10		73.25	
08/30/16	09:06:05	69.49722		969.12		72.75	
08/30/16	09:07:05	69.51389		969.11		72.33	
08/30/16	09:07:35	69.52222	971	968.94		72.12	Pressured down lubricator.
08/30/16	09:08:05	69.53056		168.31		71.81	
08/30/16	09:08:40	69.54028		12.88		71.47	Test complete.
08/30/16	09:09:05	69.54722		12.68		71.26	
08/30/16	09:10:05	69.56389		13.09		70.60	
08/30/16	09:20:05	69.73056		14.93		67.69	
08/30/16	09:30:05	69.89722		15.01		66.26	
08/30/16	09:40:05	70.06389		14.84		65.90	
08/30/16	09:50:05	70.23056		14.63		65.97	Powered down gauge.

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 7930 ft. POOH. RIH with electronic memory gauges to 7924 ft. Continue injecting water for 48 hrs. SI well for 69 hr falloff test. POOH. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

Job No.: J201608310802.001A

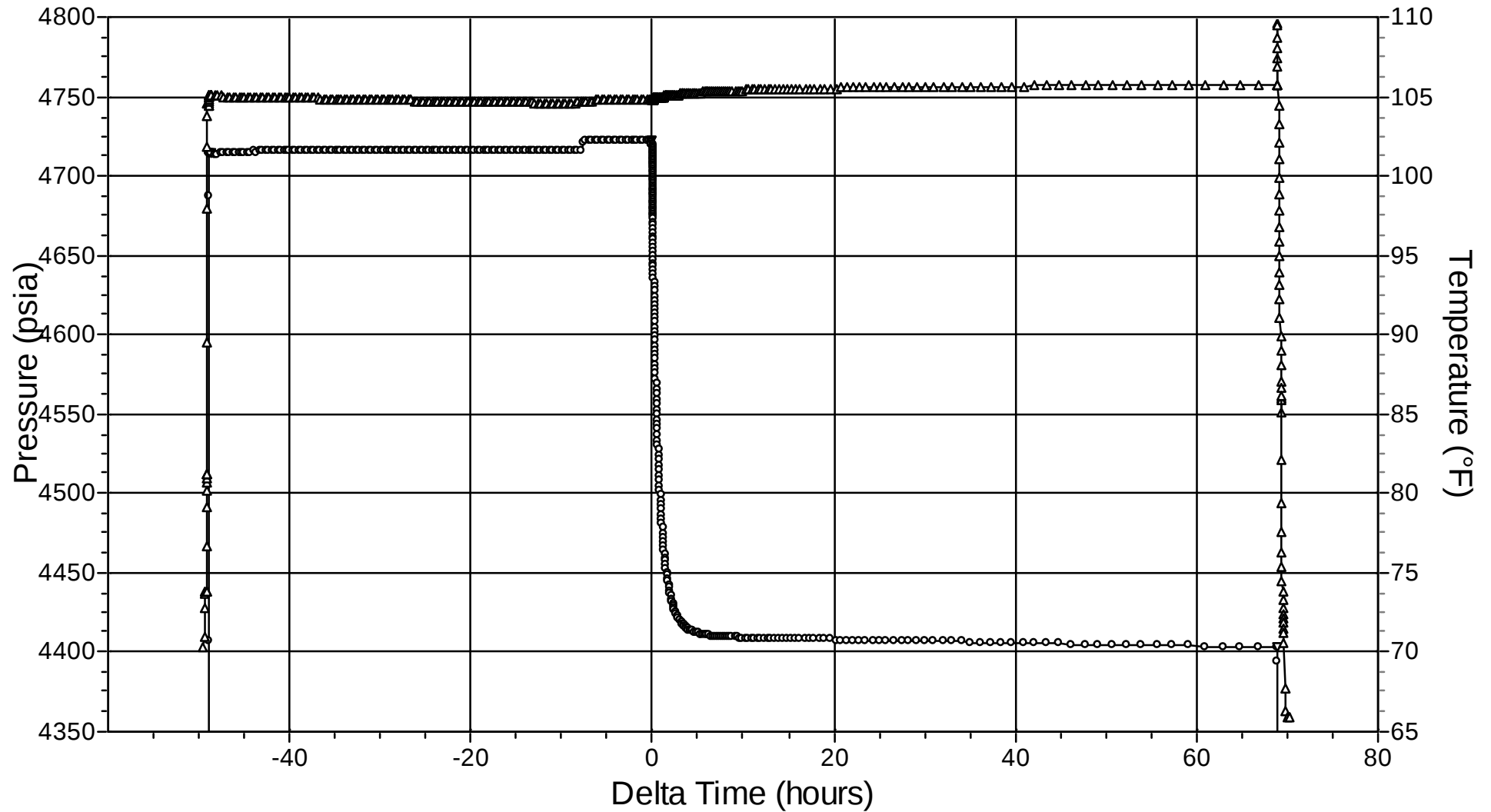


PB Energy Storage Services, Inc.

Well: Mewbourne Well No. 1
Field: Davonia
Test Date: 08/25 - 08/30/2016

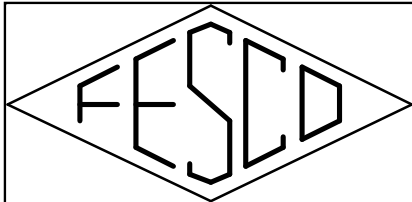
Gauge Type: Electronic
Gauge Range: 16000 psi
Gauge SN: SP-21726

Cartesian Plot



J201608310802.001A

—○— Pressure —△— Temperature

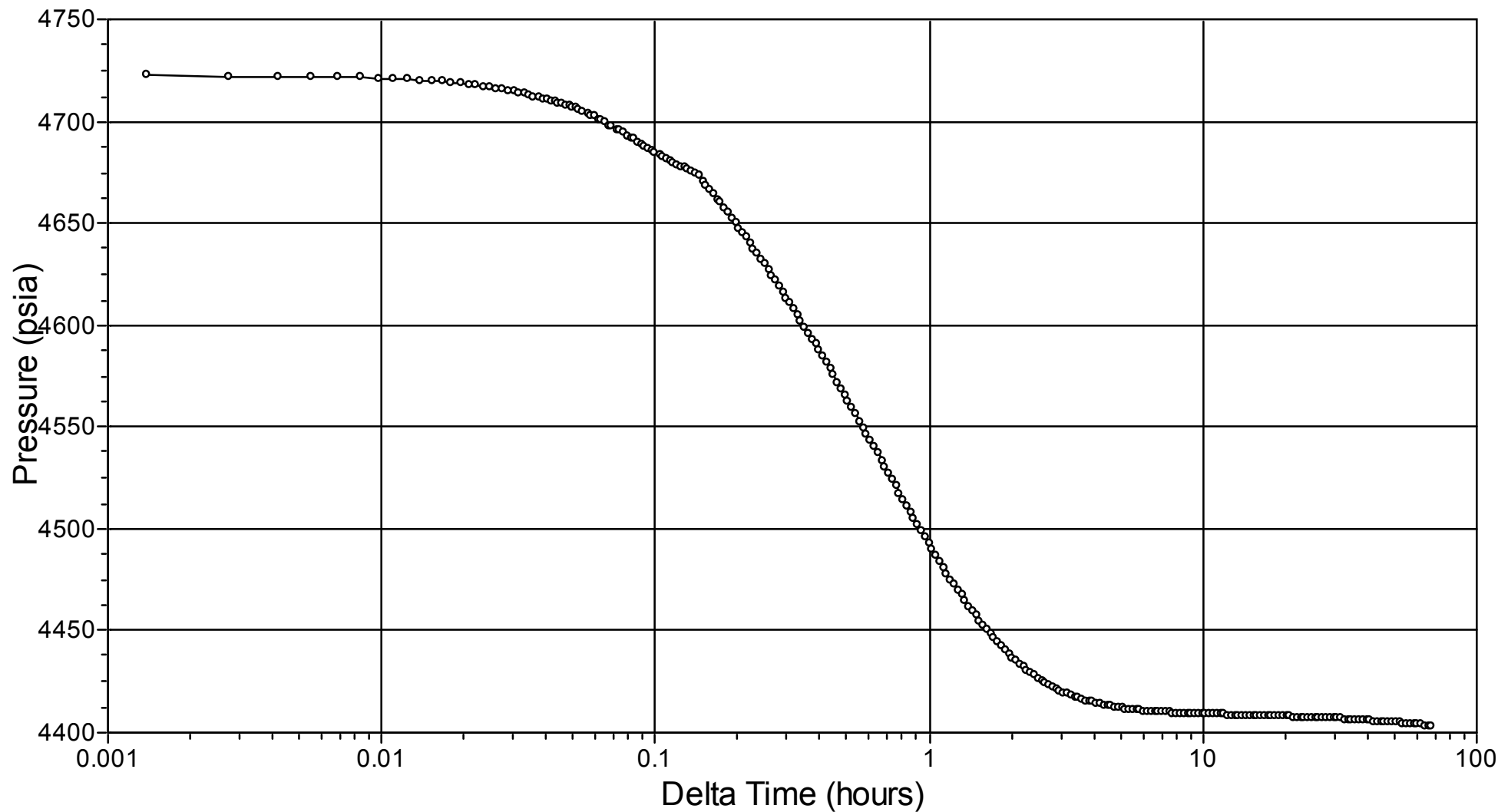


PB Energy Storage Services, Inc.

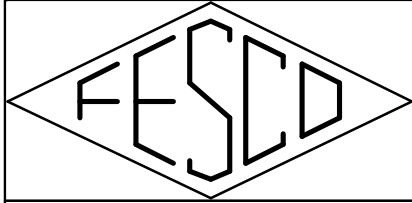
Well: Mewbourne Well No. 1
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 16000 psi
Gauge SN: SP-21726

Semilog Plot (Falloff Test)



J201608310802.001A

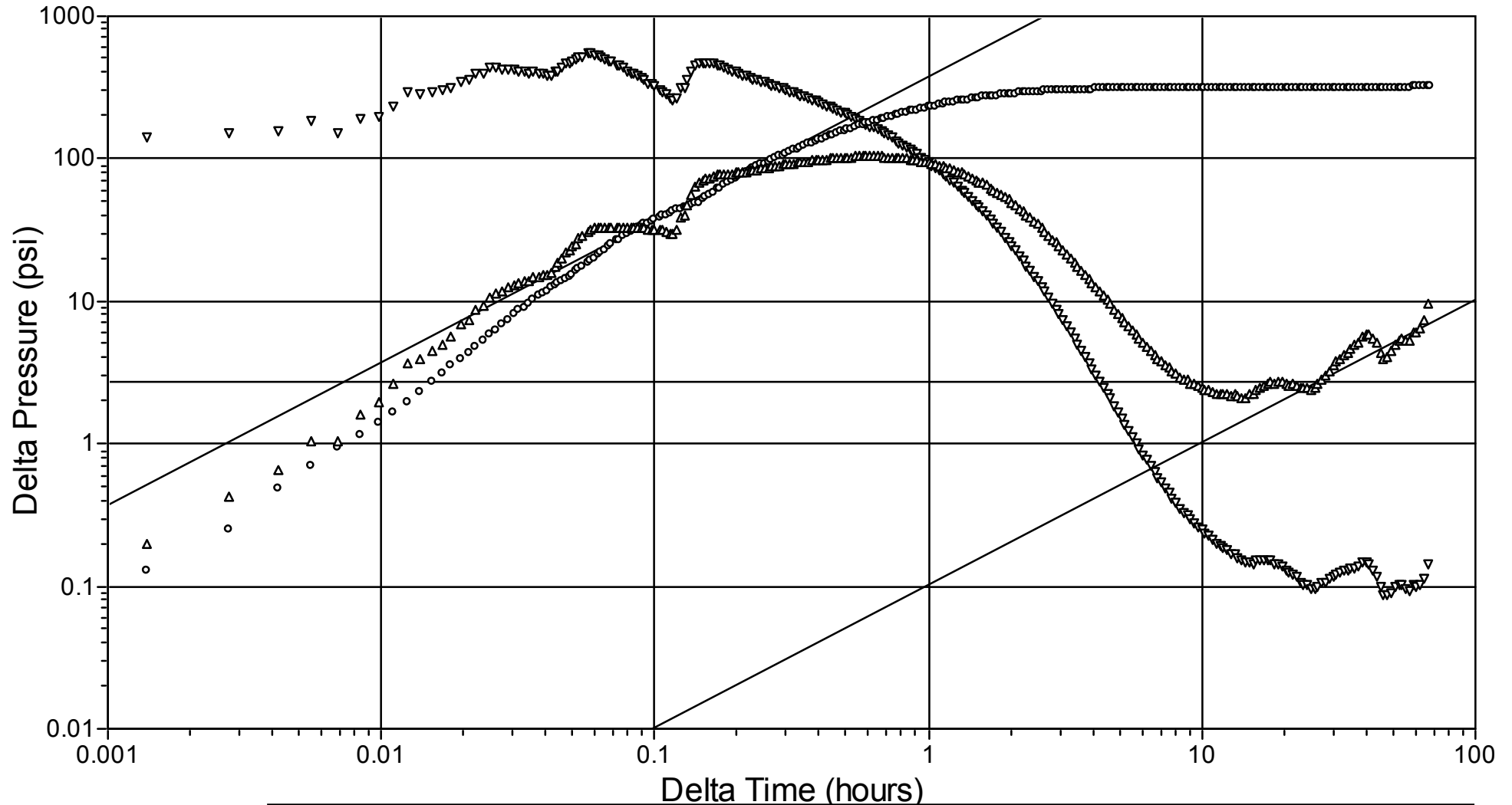


PB Energy Storage Services, Inc.

Well: Mewbourne Well No. 1
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 16000 psi
Gauge SN: SP-21726

Log Plot (Falloff Test)



J201608310802.001A

— Unit-Slope	— Half-Slope	— Quarter-Slope
▽ Primary Pressure Derivative	○ Delta Pressure	△ Radial Pressure Derivative



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



STATIC GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Mewbourne Well No. 1
Field: Davonia
Formation: Unavailable

Test Date: 8/30/2016
Location: Eddy County, NM
Status: Shut in.

Well Data: Wellhead Connection: 2" EUE
Elevation: 13 ft above GL
Tubing: 4.5" Set at 7829 ft (Packer)
Casing: 7" Set at 9094 ft (PBTD)
Perfs: 7924 - 8188; 8220 - 8476 ft (MD)
Datum: 8200 ft (MD)

Gauge Type: Electronic
Gauge SN: SP-21726
Gauge Range: 16000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
13	13	0	971	72.12	968.94	0.00	0.0000	Pressured down lubricator.
7924	7924	7911		105.74	4403.10	3434.16	0.4341	Ended falloff test.

BHT at Test Depth: 105.70 °F
Extrapolated BHP at Datum: 4523.00 psia
BHP Gradient at Datum : 0.4341 psi/ft

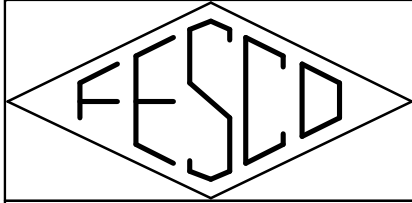
Oil Level: None
Water Level: Surface
Csg Press: N/A

Previous BHP: 4397 psia (7/27/16)
BHP Change: 126 psi gain

Remarks: POOH after 69 hr reservoir pressure falloff test to surface. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

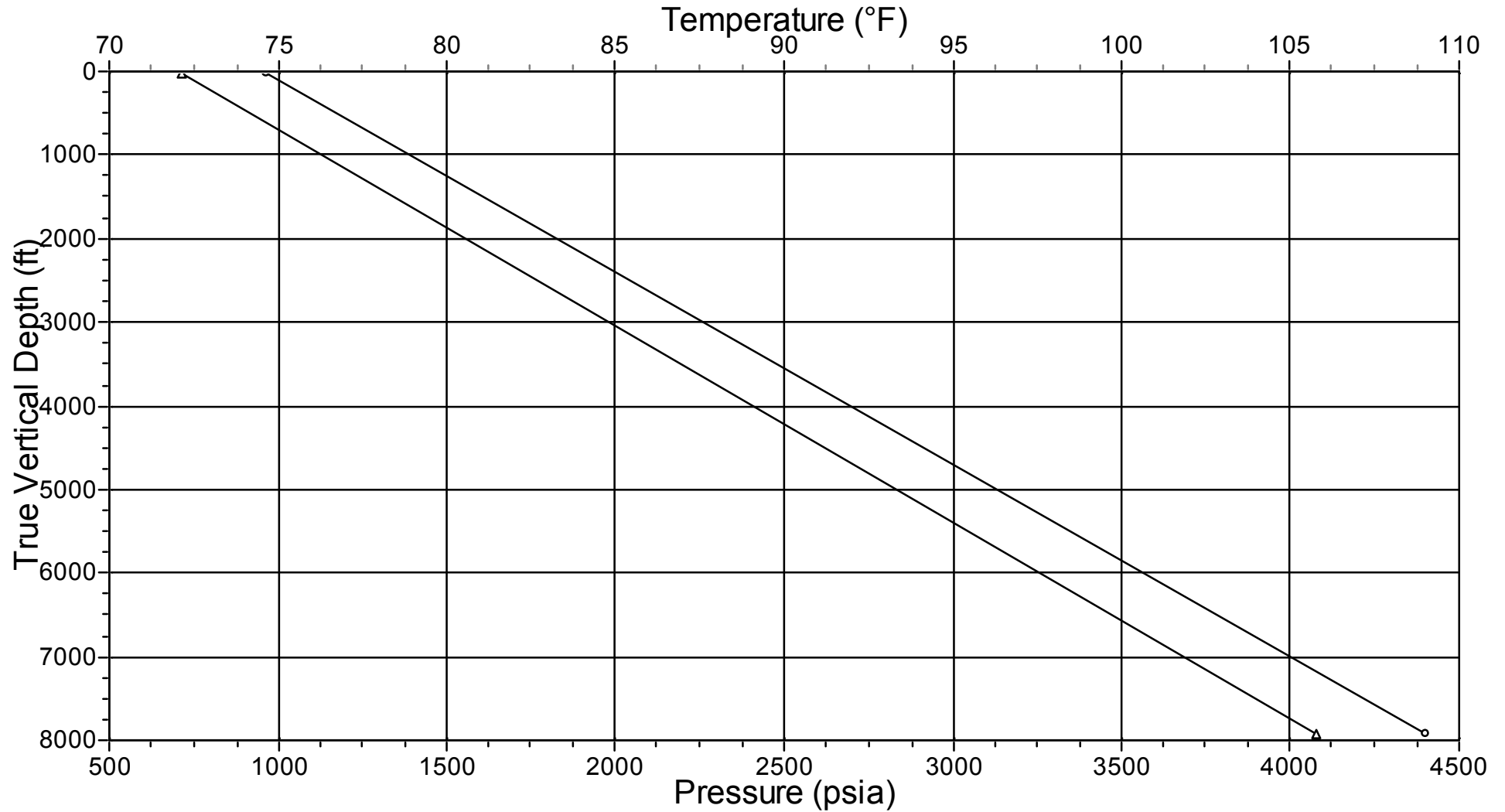


PB Energy Storage Services, Inc.

Well: Mewbourne Well No. 1
Field: Davonia
Test Date: 08/30/2016

Gauge Type: Electronic
Gauge Range: 16000 psi
Gauge SN: SP-21726

Static Gradient Plot



J201608310802.001A

—○— Pressure —△— Temperature



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



FLOWING GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Formation: Unavailable

Test Date: 8/25/2016
Location: Eddy County, NM
Status: Injecting

Well Data: Wellhead Connection: 3" EUE
Elevation: 13 ft above GL
Tubing: 3" Set at 7570 ft (Packer)
Casing: 5.5" Set at 8770 ft (PBTD)
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Datum: 7985 ft (MD)

Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
13	13	0	1350	87.96	1355.91	0.00	0.0000	RIH while injecting water.
7570	7570	7557	1350	109.14	4384.88	3028.97	0.4008	Monitor IBHP for 49 hours.

BHT at Test Depth: 109.00 °F
Extrapolated BHP at Datum: 4551.00 psia
BHP Gradient at Datum : 0.4008 psi/ft

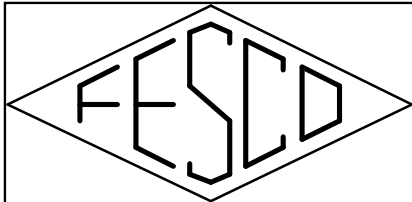
Oil Level: Injecting
Water Level: Injecting
Csg Press: N/A

Previous BHP: U/A
BHP Change: U/A

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 7579 ft. POOH. RIH with electronic memory gauges to 7570 ft. Continue injecting water for 49 hrs. SI well for 69 hr BHP falloff test. POOH. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

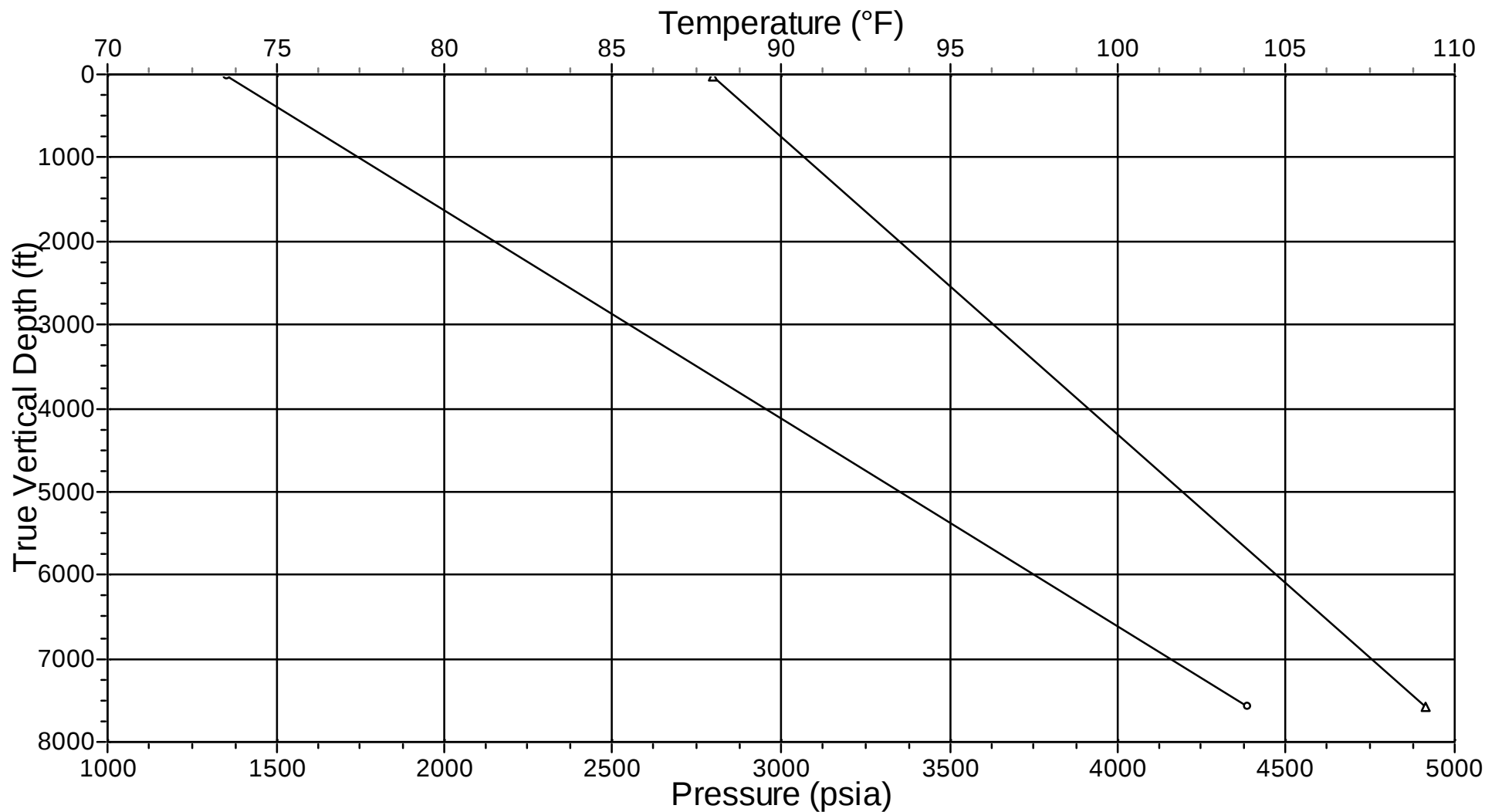


PB Energy Storage Services, Inc.

Well: Chukka Well No. 2
Field: Davonia
Test Date: 08/25/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-2050

Flowing Gradient Plot



J201608310803.001A

—○— Pressure —△— Temperature



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	10:20:01	-49.47028		12.04		72.00	Powered up gauge.
08/25/16	10:25:04	-49.38611		9.29		78.57	
08/25/16	10:29:04	-49.31944		17.36		78.49	
08/25/16	10:30:04	-49.30278		84.24		82.09	
08/25/16	10:30:14	-49.30000	1350	1355.57		84.50	Pressured up lubricator.
08/25/16	10:31:04	-49.28611		1355.95		89.25	
08/25/16	10:32:04	-49.26944		1355.70		89.82	
08/25/16	10:33:04	-49.25278		1355.97		89.50	
08/25/16	10:34:04	-49.23611		1355.71		89.04	
08/25/16	10:35:04	-49.21944		1355.98		88.61	
08/25/16	10:36:04	-49.20278		1356.77		88.19	
08/25/16	10:36:29	-49.19583	1350	1355.91		87.96	RIH with EMP to 7570 ft.
08/25/16	10:37:04	-49.18611		1404.86		104.00	
08/25/16	10:38:04	-49.16944		1524.01		110.44	
08/25/16	10:39:04	-49.15278		1685.13		110.41	
08/25/16	10:40:04	-49.13611		1864.86		110.15	
08/25/16	10:41:04	-49.11944		2031.28		109.86	
08/25/16	10:42:04	-49.10278		2181.45		109.61	
08/25/16	10:43:04	-49.08611		2340.67		109.39	
08/25/16	10:44:04	-49.06944		2523.53		109.16	
08/25/16	10:45:04	-49.05278		2723.35		108.92	
08/25/16	10:46:04	-49.03611		2883.96		108.75	
08/25/16	10:47:04	-49.01944		3043.60		108.63	
08/25/16	10:48:04	-49.00278		3239.78		108.53	
08/25/16	10:49:04	-48.98611		3440.75		108.46	
08/25/16	10:50:04	-48.96944		3628.54		108.47	
08/25/16	10:51:04	-48.95278		3805.28		108.53	
08/25/16	10:52:04	-48.93611		3994.99		108.65	
08/25/16	10:53:04	-48.91944		4198.38		108.84	
08/25/16	10:54:04	-48.90278		4382.76		109.06	
08/25/16	10:54:14	-48.90000		4385.39		109.08	Gauge at TD=7570 ft (MD).
08/25/16	10:55:04	-48.88611		4385.23		109.10	
08/25/16	10:56:04	-48.86944		4385.00		109.11	
08/25/16	10:57:04	-48.85278		4385.27		109.12	
08/25/16	10:58:04	-48.83611		4385.13		109.12	
08/25/16	10:59:04	-48.81944		4385.22		109.13	
08/25/16	11:00:04	-48.80278		4384.92		109.13	
08/25/16	11:01:04	-48.78611		4384.80		109.13	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	11:02:04	-48.76944		4385.00		109.13	
08/25/16	11:03:04	-48.75278		4384.62		109.14	
08/25/16	11:04:04	-48.73611		4384.88		109.14	7570 ft stop.
08/25/16	11:05:04	-48.71944		4384.88		109.14	
08/25/16	11:10:04	-48.63611		4384.75		109.15	
08/25/16	11:15:04	-48.55278		4384.38		109.17	
08/25/16	11:20:04	-48.46944		4384.20		109.17	
08/25/16	11:40:04	-48.13611		4384.27		109.24	
08/25/16	12:00:04	-47.80278		4383.77		109.28	
08/25/16	12:21:04	-47.45278		4383.62		109.31	
08/25/16	12:41:04	-47.11944		4383.79		109.35	
08/25/16	13:01:04	-46.78611		4383.58		109.38	
08/25/16	13:21:04	-46.45278		4383.60		109.40	
08/25/16	13:41:04	-46.11944		4383.41		109.43	
08/25/16	14:01:04	-45.78611		4383.66		109.46	
08/25/16	14:21:04	-45.45278		4383.51		109.39	
08/25/16	14:41:04	-45.11944		4383.80		109.34	
08/25/16	15:01:04	-44.78611		4383.77		109.30	
08/25/16	15:21:04	-44.45278		4383.42		109.27	
08/25/16	15:41:04	-44.11944		4383.48		109.24	
08/25/16	16:01:04	-43.78611		4383.60		109.22	
08/25/16	16:21:04	-43.45278		4383.37		109.20	
08/25/16	16:41:04	-43.11944		4383.50		109.18	
08/25/16	17:01:04	-42.78611		4383.43		109.16	
08/25/16	17:21:04	-42.45278		4383.36		109.15	
08/25/16	17:41:04	-42.11944		4383.36		109.13	
08/25/16	18:01:04	-41.78611		4383.32		109.11	
08/25/16	18:21:04	-41.45278		4383.00		109.10	
08/25/16	18:41:04	-41.11944		4383.16		109.09	
08/25/16	19:01:04	-40.78611		4383.38		109.09	
08/25/16	19:21:04	-40.45278		4383.16		109.09	
08/25/16	19:41:04	-40.11944		4383.66		109.09	
08/25/16	20:01:04	-39.78611		4383.45		109.08	
08/25/16	20:21:04	-39.45278		4383.69		109.05	
08/25/16	20:41:04	-39.11944		4383.68		109.02	
08/25/16	21:01:04	-38.78611		4383.25		108.95	
08/25/16	21:21:04	-38.45278		4383.51		108.90	
08/25/16	21:41:04	-38.11944		4383.45		108.86	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/25/16	22:01:04	-37.78611		4383.73		108.83	
08/25/16	22:21:04	-37.45278		4383.53		108.81	
08/25/16	22:41:04	-37.11944		4383.41		108.81	
08/25/16	23:01:04	-36.78611		4383.38		108.82	
08/25/16	23:21:04	-36.45278		4383.55		108.83	
08/25/16	23:41:04	-36.11944		4383.50		108.85	
08/26/16	00:01:04	-35.78611		4383.65		108.86	
08/26/16	00:21:04	-35.45278		4383.85		108.86	
08/26/16	00:41:04	-35.11944		4383.83		108.87	
08/26/16	01:01:04	-34.78611		4383.70		108.87	
08/26/16	01:21:04	-34.45278		4383.77		108.89	
08/26/16	01:41:04	-34.11944		4383.63		108.89	
08/26/16	02:01:04	-33.78611		4383.90		108.90	
08/26/16	02:21:04	-33.45278		4383.74		108.90	
08/26/16	02:41:04	-33.11944		4383.49		108.90	
08/26/16	03:01:04	-32.78611		4383.93		108.90	
08/26/16	03:21:04	-32.45278		4383.63		108.88	
08/26/16	03:41:04	-32.11944		4383.95		108.86	
08/26/16	04:01:04	-31.78611		4383.70		108.85	
08/26/16	04:21:04	-31.45278		4384.02		108.86	
08/26/16	04:41:04	-31.11944		4383.95		108.82	
08/26/16	05:01:04	-30.78611		4383.72		108.79	
08/26/16	05:21:04	-30.45278		4384.06		108.76	
08/26/16	05:41:04	-30.11944		4383.76		108.74	
08/26/16	06:01:04	-29.78611		4384.00		108.72	
08/26/16	06:21:04	-29.45278		4383.92		108.69	
08/26/16	06:41:04	-29.11944		4383.99		108.67	
08/26/16	07:01:04	-28.78611		4384.03		108.65	
08/26/16	07:21:04	-28.45278		4384.17		108.62	
08/26/16	07:41:04	-28.11944		4384.19		108.60	
08/26/16	08:01:04	-27.78611		4384.53		108.57	
08/26/16	08:21:04	-27.45278		4384.48		108.54	
08/26/16	08:41:04	-27.11944		4384.40		108.50	
08/26/16	09:01:04	-26.78611		4384.35		108.49	
08/26/16	09:21:04	-26.45278		4384.44		108.48	
08/26/16	09:41:04	-26.11944		4384.21		108.49	
08/26/16	10:01:04	-25.78611		4384.21		108.52	
08/26/16	10:21:04	-25.45278		4384.24		108.54	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/26/16	10:41:04	-25.11944		4384.30		108.57	
08/26/16	11:01:04	-24.78611		4384.23		108.60	
08/26/16	11:21:04	-24.45278		4384.25		108.63	
08/26/16	11:41:04	-24.11944		4384.25		108.65	
08/26/16	12:01:04	-23.78611		4384.44		108.67	
08/26/16	12:21:04	-23.45278		4384.77		108.68	
08/26/16	12:41:04	-23.11944		4384.75		108.68	
08/26/16	13:01:04	-22.78611		4384.50		108.68	
08/26/16	13:21:04	-22.45278		4384.38		108.68	
08/26/16	13:41:04	-22.11944		4384.16		108.68	
08/26/16	14:01:04	-21.78611		4384.24		108.68	
08/26/16	14:21:04	-21.45278		4384.56		108.69	
08/26/16	14:41:04	-21.11944		4384.43		108.69	
08/26/16	15:01:04	-20.78611		4384.60		108.69	
08/26/16	15:21:04	-20.45278		4384.51		108.69	
08/26/16	15:41:04	-20.11944		4384.21		108.69	
08/26/16	16:01:04	-19.78611		4384.26		108.69	
08/26/16	16:21:04	-19.45278		4384.19		108.68	
08/26/16	16:41:04	-19.11944		4384.28		108.68	
08/26/16	17:01:04	-18.78611		4384.13		108.67	
08/26/16	17:21:04	-18.45278		4383.91		108.67	
08/26/16	17:41:04	-18.11944		4384.02		108.66	
08/26/16	18:01:04	-17.78611		4384.10		108.66	
08/26/16	18:21:04	-17.45278		4384.00		108.65	
08/26/16	18:41:04	-17.11944		4384.08		108.64	
08/26/16	19:01:04	-16.78611		4383.96		108.63	
08/26/16	19:21:04	-16.45278		4383.77		108.63	
08/26/16	19:41:04	-16.11944		4384.04		108.61	
08/26/16	20:01:04	-15.78611		4384.15		108.60	
08/26/16	20:21:04	-15.45278		4384.24		108.60	
08/26/16	20:41:04	-15.11944		4384.14		108.60	
08/26/16	21:01:04	-14.78611		4384.35		108.60	
08/26/16	21:21:04	-14.45278		4384.42		108.62	
08/26/16	21:41:04	-14.11944		4384.10		108.65	
08/26/16	22:01:04	-13.78611		4384.04		108.69	
08/26/16	22:21:04	-13.45278		4383.91		108.72	
08/26/16	22:41:04	-13.11944		4383.91		108.77	
08/26/16	23:01:04	-12.78611		4383.75		108.80	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/26/16	23:21:04	-12.45278		4383.99		108.83	
08/26/16	23:41:04	-12.11944		4383.99		108.86	
08/27/16	00:01:04	-11.78611		4383.83		108.88	
08/27/16	00:21:04	-11.45278		4383.84		108.89	
08/27/16	00:41:04	-11.11944		4383.61		108.90	
08/27/16	01:01:04	-10.78611		4383.92		108.92	
08/27/16	01:21:04	-10.45278		4384.00		108.92	
08/27/16	01:41:04	-10.11944		4383.99		108.92	
08/27/16	02:01:04	-9.78611		4383.79		108.92	
08/27/16	02:21:04	-9.45278		4384.02		108.91	
08/27/16	02:41:04	-9.11944		4383.93		108.91	
08/27/16	03:01:04	-8.78611		4383.80		108.88	
08/27/16	03:21:04	-8.45278		4383.95		108.86	
08/27/16	03:41:04	-8.11944		4384.15		108.85	
08/27/16	03:46:04	-8.03611		4383.87		108.84	Injection rate increased.
08/27/16	04:01:04	-7.78611		4385.79		108.84	
08/27/16	04:21:04	-7.45278		4386.02		108.86	
08/27/16	04:41:04	-7.11944		4386.06		108.87	
08/27/16	05:01:04	-6.78611		4386.24		108.86	
08/27/16	05:21:04	-6.45278		4386.14		108.85	
08/27/16	05:41:04	-6.11944		4386.35		108.84	
08/27/16	06:01:04	-5.78611		4386.27		108.83	
08/27/16	06:21:04	-5.45278		4386.59		108.81	
08/27/16	06:41:04	-5.11944		4386.35		108.78	
08/27/16	07:01:04	-4.78611		4386.40		108.75	
08/27/16	07:21:04	-4.45278		4386.35		108.72	
08/27/16	07:41:04	-4.11944		4386.41		108.69	
08/27/16	08:01:04	-3.78611		4386.44		108.66	
08/27/16	08:21:04	-3.45278		4386.34		108.65	
08/27/16	08:41:04	-3.11944		4386.38		108.65	
08/27/16	09:01:04	-2.78611		4386.32		108.67	
08/27/16	09:21:04	-2.45278		4386.60		108.70	
08/27/16	09:41:04	-2.11944		4386.56		108.75	
08/27/16	10:01:04	-1.78611		4386.28		108.79	
08/27/16	10:21:04	-1.45278		4386.40		108.82	
08/27/16	10:41:04	-1.11944		4386.52		108.86	
08/27/16	11:01:04	-0.78611		4386.29		108.91	
08/27/16	11:21:04	-0.45278		4386.35		108.94	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:30:04	-0.30278		4386.62		108.96	
08/27/16	11:40:04	-0.13611		4386.90		108.97	
08/27/16	11:48:09	-0.00139		4386.80		108.98	Water Injection Rate = Unavailable.
08/27/16	11:48:14	0.00000		4386.40	0.00	108.97	Shut in well for 69 hr BHP falloff test.
08/27/16	11:48:19	0.00139		4386.37	-0.03	108.98	
08/27/16	11:48:24	0.00278		4386.15	-0.25	108.98	
08/27/16	11:48:29	0.00417		4386.04	-0.36	108.97	
08/27/16	11:48:34	0.00556		4385.87	-0.53	108.98	
08/27/16	11:48:39	0.00694		4385.83	-0.57	108.98	
08/27/16	11:48:44	0.00833		4385.63	-0.77	108.98	
08/27/16	11:48:49	0.00972		4385.49	-0.91	108.98	
08/27/16	11:48:54	0.01111		4385.39	-1.01	108.98	
08/27/16	11:48:59	0.01250		4385.24	-1.16	108.98	
08/27/16	11:49:04	0.01389		4385.05	-1.35	108.98	
08/27/16	11:49:09	0.01528		4384.65	-1.75	108.98	
08/27/16	11:49:14	0.01667		4384.65	-1.75	108.98	
08/27/16	11:49:19	0.01806		4384.47	-1.93	108.98	
08/27/16	11:49:24	0.01944		4384.43	-1.97	108.98	
08/27/16	11:49:29	0.02083		4384.37	-2.03	108.98	
08/27/16	11:49:34	0.02222		4384.12	-2.28	108.98	
08/27/16	11:49:39	0.02361		4384.01	-2.39	108.98	
08/27/16	11:49:44	0.02500		4383.81	-2.59	108.98	
08/27/16	11:49:49	0.02639		4383.42	-2.98	108.98	
08/27/16	11:49:54	0.02778		4383.34	-3.06	108.98	
08/27/16	11:49:59	0.02917		4383.11	-3.29	108.98	
08/27/16	11:50:04	0.03056		4382.94	-3.46	108.98	
08/27/16	11:50:09	0.03194		4382.94	-3.46	108.98	
08/27/16	11:50:14	0.03333		4382.51	-3.89	108.99	
08/27/16	11:50:19	0.03472		4382.54	-3.86	108.98	
08/27/16	11:50:24	0.03611		4382.45	-3.95	108.98	
08/27/16	11:50:29	0.03750		4382.22	-4.18	108.98	
08/27/16	11:50:34	0.03889		4382.17	-4.23	108.98	
08/27/16	11:50:39	0.04028		4382.13	-4.27	108.98	
08/27/16	11:50:44	0.04167		4382.04	-4.36	108.98	
08/27/16	11:50:49	0.04306		4381.71	-4.69	108.98	
08/27/16	11:50:54	0.04444		4381.47	-4.93	108.98	
08/27/16	11:50:59	0.04583		4381.09	-5.31	108.98	
08/27/16	11:51:04	0.04722		4381.10	-5.30	108.98	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:51:09	0.04861		4380.93	-5.47	108.98	
08/27/16	11:51:14	0.05000		4380.34	-6.06	108.98	
08/27/16	11:51:19	0.05139		4380.43	-5.97	108.98	
08/27/16	11:51:24	0.05278		4380.51	-5.89	108.98	
08/27/16	11:51:29	0.05417		4380.04	-6.36	108.98	
08/27/16	11:51:39	0.05694		4379.90	-6.50	108.98	
08/27/16	11:51:44	0.05833		4379.72	-6.68	108.98	
08/27/16	11:51:49	0.05972		4379.89	-6.51	108.98	
08/27/16	11:51:59	0.06250		4379.27	-7.13	108.98	
08/27/16	11:52:04	0.06389		4379.29	-7.11	108.99	
08/27/16	11:52:09	0.06528		4378.99	-7.41	108.98	
08/27/16	11:52:19	0.06806		4378.74	-7.66	108.98	
08/27/16	11:52:24	0.06944		4378.37	-8.03	108.98	
08/27/16	11:52:34	0.07222		4378.15	-8.25	108.98	
08/27/16	11:52:39	0.07361		4377.89	-8.51	108.99	
08/27/16	11:52:49	0.07639		4377.68	-8.72	108.99	
08/27/16	11:52:59	0.07917		4377.19	-9.21	108.99	
08/27/16	11:53:09	0.08194		4376.68	-9.72	108.98	
08/27/16	11:53:14	0.08333		4376.15	-10.25	108.99	
08/27/16	11:53:24	0.08611		4375.51	-10.89	108.99	
08/27/16	11:53:34	0.08889		4374.57	-11.83	108.99	
08/27/16	11:53:44	0.09167		4373.90	-12.50	108.98	
08/27/16	11:53:54	0.09444		4373.26	-13.14	108.98	
08/27/16	11:54:04	0.09722		4372.64	-13.76	108.99	
08/27/16	11:54:14	0.10000		4372.33	-14.07	108.99	
08/27/16	11:54:29	0.10417		4371.45	-14.95	108.99	
08/27/16	11:54:39	0.10694		4371.17	-15.23	108.99	
08/27/16	11:54:49	0.10972		4370.66	-15.74	108.99	
08/27/16	11:55:04	0.11389		4370.09	-16.31	108.99	
08/27/16	11:55:14	0.11667		4369.81	-16.59	108.99	
08/27/16	11:55:29	0.12083		4369.09	-17.31	108.99	
08/27/16	11:55:44	0.12500		4368.88	-17.52	109.00	
08/27/16	11:55:54	0.12778		4368.24	-18.16	108.99	
08/27/16	11:56:09	0.13194		4367.81	-18.59	109.00	
08/27/16	11:56:24	0.13611		4367.34	-19.06	109.00	
08/27/16	11:56:39	0.14028		4366.95	-19.45	108.99	
08/27/16	11:56:54	0.14444		4366.62	-19.78	109.00	
08/27/16	11:57:14	0.15000		4365.85	-20.55	109.00	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	11:57:29	0.15417		4365.11	-21.29	109.00	
08/27/16	11:57:44	0.15833		4364.27	-22.13	109.00	
08/27/16	11:58:04	0.16389		4363.47	-22.93	109.00	
08/27/16	11:58:24	0.16944		4362.06	-24.34	109.00	
08/27/16	11:58:39	0.17361		4355.27	-31.13	108.99	
08/27/16	11:58:59	0.17917		4350.92	-35.48	108.99	
08/27/16	11:59:19	0.18472		4347.73	-38.67	109.00	
08/27/16	11:59:44	0.19167		4344.59	-41.81	109.00	
08/27/16	12:00:04	0.19722		4341.91	-44.49	108.99	
08/27/16	12:00:24	0.20278		4339.61	-46.79	109.00	
08/27/16	12:00:49	0.20972		4336.82	-49.58	108.99	
08/27/16	12:01:09	0.21528		4334.92	-51.48	109.00	
08/27/16	12:01:34	0.22222		4332.63	-53.77	108.99	
08/27/16	12:01:59	0.22917		4330.77	-55.63	108.99	
08/27/16	12:02:24	0.23611		4328.74	-57.66	108.99	
08/27/16	12:02:54	0.24444		4326.50	-59.90	108.99	
08/27/16	12:03:19	0.25139		4324.64	-61.76	108.99	
08/27/16	12:03:49	0.25972		4322.74	-63.66	108.99	
08/27/16	12:04:19	0.26806		4321.15	-65.25	109.00	
08/27/16	12:04:49	0.27639		4319.03	-67.37	108.99	
08/27/16	12:05:19	0.28472		4317.52	-68.88	109.00	
08/27/16	12:05:49	0.29306		4315.78	-70.62	108.99	
08/27/16	12:06:24	0.30278		4314.19	-72.21	109.00	
08/27/16	12:06:54	0.31111		4312.83	-73.57	109.00	
08/27/16	12:07:29	0.32083		4311.31	-75.09	109.00	
08/27/16	12:08:09	0.33194		4309.39	-77.01	109.00	
08/27/16	12:08:44	0.34167		4308.06	-78.34	108.99	
08/27/16	12:09:24	0.35278		4306.35	-80.05	109.00	
08/27/16	12:10:04	0.36389		4304.68	-81.72	108.99	
08/27/16	12:10:44	0.37500		4302.80	-83.60	109.00	
08/27/16	12:11:24	0.38611		4301.08	-85.32	109.00	
08/27/16	12:12:09	0.39861		4300.56	-85.84	109.00	
08/27/16	12:12:54	0.41111		4299.52	-86.88	109.00	
08/27/16	12:13:39	0.42361		4298.74	-87.66	109.00	
08/27/16	12:14:24	0.43611		4297.09	-89.31	109.00	
08/27/16	12:15:14	0.45000		4295.44	-90.96	109.00	
08/27/16	12:16:04	0.46389		4295.04	-91.36	109.00	
08/27/16	12:16:59	0.47917		4292.79	-93.61	109.00	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	12:17:49	0.49306		4291.44	-94.96	109.00	
08/27/16	12:18:44	0.50833		4290.69	-95.71	109.01	
08/27/16	12:19:44	0.52500		4289.05	-97.35	109.01	
08/27/16	12:20:44	0.54167		4288.04	-98.36	109.01	
08/27/16	12:21:44	0.55833		4287.11	-99.29	109.01	
08/27/16	12:22:44	0.57500		4285.97	-100.43	109.01	
08/27/16	12:23:49	0.59306		4284.82	-101.58	109.01	
08/27/16	12:24:54	0.61111		4283.76	-102.64	109.01	
08/27/16	12:26:04	0.63056		4283.01	-103.39	109.02	
08/27/16	12:27:14	0.65000		4281.78	-104.62	109.01	
08/27/16	12:28:29	0.67083		4281.05	-105.35	109.01	
08/27/16	12:29:44	0.69167		4280.16	-106.24	109.01	
08/27/16	12:30:59	0.71250		4279.26	-107.14	109.02	
08/27/16	12:32:19	0.73472		4278.43	-107.97	109.02	
08/27/16	12:33:44	0.75833		4277.63	-108.77	109.02	
08/27/16	12:35:09	0.78194		4276.58	-109.82	109.02	
08/27/16	12:36:34	0.80556		4276.24	-110.16	109.03	
08/27/16	12:38:04	0.83056		4275.25	-111.15	109.03	
08/27/16	12:39:39	0.85694		4274.76	-111.64	109.03	
08/27/16	12:41:14	0.88333		4274.01	-112.39	109.03	
08/27/16	12:42:54	0.91111		4273.33	-113.07	109.03	
08/27/16	12:44:34	0.93889		4272.92	-113.48	109.04	
08/27/16	12:46:24	0.96944		4272.40	-114.00	109.03	
08/27/16	12:48:09	0.99861		4271.77	-114.63	109.04	
08/27/16	12:50:04	1.03056		4271.19	-115.21	109.04	
08/27/16	12:51:59	1.06250		4270.44	-115.96	109.05	
08/27/16	12:53:59	1.09583		4270.16	-116.24	109.05	
08/27/16	12:55:59	1.12917		4269.52	-116.88	109.04	
08/27/16	12:58:04	1.16389		4269.32	-117.08	109.05	
08/27/16	13:00:19	1.20139		4268.92	-117.48	109.05	
08/27/16	13:02:34	1.23889		4268.58	-117.82	109.06	
08/27/16	13:04:49	1.27639		4268.44	-117.96	109.06	
08/27/16	13:07:14	1.31667		4267.71	-118.69	109.06	
08/27/16	13:09:39	1.35694		4267.37	-119.03	109.06	
08/27/16	13:12:14	1.40000		4267.28	-119.12	109.06	
08/27/16	13:14:49	1.44306		4267.02	-119.38	109.07	
08/27/16	13:17:34	1.48889		4266.61	-119.79	109.08	
08/27/16	13:20:19	1.53472		4266.43	-119.97	109.07	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	13:23:14	1.58333		4265.84	-120.56	109.08	
08/27/16	13:26:09	1.63194		4265.82	-120.58	109.08	
08/27/16	13:29:14	1.68333		4265.62	-120.78	109.09	
08/27/16	13:32:19	1.73472		4265.44	-120.96	109.09	
08/27/16	13:35:34	1.78889		4265.49	-120.91	109.09	
08/27/16	13:38:54	1.84444		4265.34	-121.06	109.10	
08/27/16	13:42:24	1.90278		4264.88	-121.52	109.10	
08/27/16	13:45:59	1.96250		4265.03	-121.37	109.11	
08/27/16	13:49:39	2.02361		4264.67	-121.73	109.11	
08/27/16	13:53:24	2.08611		4264.65	-121.75	109.11	
08/27/16	13:57:19	2.15139		4264.36	-122.04	109.12	
08/27/16	14:01:19	2.21806		4264.31	-122.09	109.12	
08/27/16	14:05:29	2.28750		4264.13	-122.27	109.13	
08/27/16	14:09:44	2.35833		4264.16	-122.24	109.13	
08/27/16	14:14:09	2.43194		4263.91	-122.49	109.14	
08/27/16	14:18:44	2.50833		4263.95	-122.45	109.14	
08/27/16	14:23:24	2.58611		4263.40	-123.00	109.15	
08/27/16	14:28:14	2.66667		4263.50	-122.90	109.16	
08/27/16	14:33:14	2.75000		4263.61	-122.79	109.16	
08/27/16	14:38:19	2.83472		4263.50	-122.90	109.17	
08/27/16	14:43:39	2.92361		4263.36	-123.04	109.17	
08/27/16	14:49:04	3.01389		4263.33	-123.07	109.18	
08/27/16	14:54:44	3.10833		4263.15	-123.25	109.18	
08/27/16	15:00:34	3.20556		4263.29	-123.11	109.19	
08/27/16	15:06:34	3.30556		4262.98	-123.42	109.19	
08/27/16	15:12:44	3.40833		4263.05	-123.35	109.20	
08/27/16	15:19:04	3.51389		4263.08	-123.32	109.20	
08/27/16	15:25:39	3.62361		4262.95	-123.45	109.20	
08/27/16	15:32:29	3.73750		4262.65	-123.75	109.22	
08/27/16	15:39:24	3.85278		4262.61	-123.79	109.22	
08/27/16	15:46:39	3.97361		4262.77	-123.63	109.22	
08/27/16	15:54:04	4.09722		4262.48	-123.92	109.23	
08/27/16	16:01:44	4.22500		4262.69	-123.71	109.24	
08/27/16	16:09:39	4.35694		4262.91	-123.49	109.24	
08/27/16	16:17:49	4.49306		4262.70	-123.70	109.25	
08/27/16	16:26:09	4.63194		4262.71	-123.69	109.25	
08/27/16	16:34:49	4.77639		4262.71	-123.69	109.26	
08/27/16	16:43:44	4.92500		4262.66	-123.74	109.26	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/27/16	16:52:59	5.07917		4262.46	-123.94	109.27	
08/27/16	17:02:29	5.23750		4262.59	-123.81	109.28	
08/27/16	17:12:19	5.40139		4262.44	-123.96	109.28	
08/27/16	17:22:24	5.56944		4262.64	-123.76	109.29	
08/27/16	17:32:49	5.74306		4262.39	-124.01	109.30	
08/27/16	17:43:34	5.92222		4262.65	-123.75	109.30	
08/27/16	17:54:34	6.10556		4262.27	-124.13	109.31	
08/27/16	18:05:59	6.29583		4262.55	-123.85	109.31	
08/27/16	18:17:49	6.49306		4262.41	-123.99	109.32	
08/27/16	18:29:54	6.69444		4262.26	-124.14	109.33	
08/27/16	18:42:29	6.90417		4262.06	-124.34	109.34	
08/27/16	18:55:24	7.11944		4261.80	-124.60	109.34	
08/27/16	19:08:39	7.34028		4261.92	-124.48	109.36	
08/27/16	19:22:24	7.56944		4261.93	-124.47	109.37	
08/27/16	19:36:34	7.80556		4261.92	-124.48	109.37	
08/27/16	19:51:09	8.04861		4261.58	-124.82	109.38	
08/27/16	20:06:14	8.30000		4261.75	-124.65	109.38	
08/27/16	20:21:44	8.55833		4261.79	-124.61	109.39	
08/27/16	20:37:44	8.82500		4261.68	-124.72	109.39	
08/27/16	20:54:14	9.10000		4261.98	-124.42	109.40	
08/27/16	21:11:14	9.38333		4261.81	-124.59	109.41	
08/27/16	21:28:49	9.67639		4261.85	-124.55	109.41	
08/27/16	21:46:54	9.97778		4261.74	-124.66	109.42	
08/27/16	22:05:34	10.28889		4261.50	-124.90	109.42	
08/27/16	22:24:49	10.60972		4261.68	-124.72	109.43	
08/27/16	22:44:39	10.94028		4261.72	-124.68	109.44	
08/27/16	23:05:04	11.28056		4261.29	-125.11	109.44	
08/27/16	23:26:09	11.63194		4261.47	-124.93	109.44	
08/27/16	23:47:54	11.99444		4261.58	-124.82	109.45	
08/28/16	00:10:24	12.36944		4261.40	-125.00	109.45	
08/28/16	00:33:29	12.75417		4261.61	-124.79	109.47	
08/28/16	00:57:19	13.15139		4261.45	-124.95	109.47	
08/28/16	01:21:54	13.56111		4261.38	-125.02	109.47	
08/28/16	01:47:19	13.98472		4261.18	-125.22	109.48	
08/28/16	02:13:29	14.42083		4261.48	-124.92	109.49	
08/28/16	02:40:24	14.86944		4261.08	-125.32	109.49	
08/28/16	03:08:14	15.33333		4260.92	-125.48	109.50	
08/28/16	03:36:54	15.81111		4260.92	-125.48	109.50	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/28/16	04:06:29	16.30417		4261.25	-125.15	109.51	
08/28/16	04:36:59	16.81250		4260.82	-125.58	109.51	
08/28/16	05:08:24	17.33611		4260.84	-125.56	109.51	
08/28/16	05:40:49	17.87639		4260.91	-125.49	109.52	
08/28/16	06:14:14	18.43333		4260.94	-125.46	109.53	
08/28/16	06:48:44	19.00833		4260.78	-125.62	109.53	
08/28/16	07:24:14	19.60000		4260.81	-125.59	109.54	
08/28/16	08:00:54	20.21111		4260.89	-125.51	109.55	
08/28/16	08:38:44	20.84167		4260.92	-125.48	109.55	
08/28/16	09:17:44	21.49167		4260.68	-125.72	109.56	
08/28/16	09:57:54	22.16111		4260.52	-125.88	109.57	
08/28/16	10:39:19	22.85139		4260.51	-125.89	109.57	
08/28/16	11:22:04	23.56389		4260.45	-125.95	109.58	
08/28/16	12:06:09	24.29861		4260.45	-125.95	109.58	
08/28/16	12:51:34	25.05556		4260.21	-126.19	109.58	
08/28/16	13:38:24	25.83611		4260.37	-126.03	109.59	
08/28/16	14:26:44	26.64167		4260.09	-126.31	109.59	
08/28/16	15:16:34	27.47222		4260.15	-126.25	109.59	
08/28/16	16:07:59	28.32917		4260.22	-126.18	109.60	
08/28/16	17:00:54	29.21111		4260.04	-126.36	109.60	
08/28/16	17:55:34	30.12222		4259.92	-126.48	109.61	
08/28/16	18:51:54	31.06111		4259.70	-126.70	109.61	
08/28/16	19:49:59	32.02917		4260.02	-126.38	109.62	
08/28/16	20:49:54	33.02778		4259.39	-127.01	109.61	
08/28/16	21:51:39	34.05694		4259.53	-126.87	109.62	
08/28/16	22:55:19	35.11806		4259.19	-127.21	109.62	
08/29/16	00:00:59	36.21250		4258.95	-127.45	109.62	
08/29/16	01:08:44	37.34167		4258.82	-127.58	109.64	
08/29/16	02:18:34	38.50556		4258.77	-127.63	109.63	
08/29/16	03:30:34	39.70556		4258.58	-127.82	109.64	
08/29/16	04:44:49	40.94306		4258.45	-127.95	109.64	
08/29/16	06:01:24	42.21944		4258.32	-128.08	109.64	
08/29/16	07:20:19	43.53472		4258.16	-128.24	109.64	
08/29/16	08:41:44	44.89167		4258.07	-128.33	109.65	
08/29/16	10:05:44	46.29167		4257.73	-128.67	109.65	
08/29/16	11:32:19	47.73472		4257.62	-128.78	109.65	
08/29/16	13:01:34	49.22222		4257.07	-129.33	109.66	
08/29/16	14:33:39	50.75694		4257.14	-129.26	109.66	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/29/16	16:08:34	52.33889		4256.83	-129.57	109.66	
08/29/16	17:46:24	53.96944		4256.35	-130.05	109.67	
08/29/16	19:27:19	55.65139		4256.40	-130.00	109.67	
08/29/16	21:11:24	57.38611		4256.19	-130.21	109.67	
08/29/16	22:58:44	59.17500		4256.32	-130.08	109.69	
08/30/16	00:49:24	61.01944		4256.02	-130.38	109.69	
08/30/16	02:43:34	62.92222		4255.63	-130.77	109.68	
08/30/16	04:41:14	64.88333		4255.66	-130.74	109.69	
08/30/16	06:42:34	66.90556		4255.36	-131.04	109.69	
08/30/16	08:25:34	68.62222	965	4255.25	-131.15	109.70	POOH from 7570 ft to surface,
08/30/16	08:26:04	68.63056		4178.26		112.28	
08/30/16	08:27:04	68.64722		3986.10		114.36	
08/30/16	08:28:09	68.66528		3773.99		111.62	
08/30/16	08:29:09	68.68194		3576.11		108.81	
08/30/16	08:30:09	68.69861		3376.49		105.88	
08/30/16	08:31:09	68.71528		3190.76		102.92	
08/30/16	08:32:09	68.73194		2984.03		100.13	
08/30/16	08:33:09	68.74861		2774.89		98.08	
08/30/16	08:34:09	68.76528		2562.86		95.59	
08/30/16	08:35:09	68.78194		2346.85		93.49	
08/30/16	08:36:09	68.79861		2126.84		91.86	
08/30/16	08:37:09	68.81528		1902.65		89.78	
08/30/16	08:38:09	68.83194		1675.28		87.73	
08/30/16	08:39:09	68.84861		1444.06		85.54	
08/30/16	08:40:09	68.86528		1236.69		83.34	
08/30/16	08:41:09	68.88194		1042.24		85.75	
08/30/16	08:42:09	68.89861	965	966.18		85.47	Gauge at surface.
08/30/16	08:43:09	68.91528		970.48		73.57	
08/30/16	08:44:09	68.93194		970.63		71.29	
08/30/16	08:45:09	68.94861		970.19		70.23	
08/30/16	08:46:09	68.96528		970.00		69.59	
08/30/16	08:47:09	68.98194		970.07		69.16	
08/30/16	08:48:09	68.99861		970.17		68.83	
08/30/16	08:49:09	69.01528		970.05		68.56	
08/30/16	08:50:09	69.03194		969.94		68.32	
08/30/16	08:51:09	69.04861		969.96		68.10	
08/30/16	08:52:09	69.06528		970.01		67.88	
08/30/16	08:53:09	69.08194		970.02		67.69	



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



RESERVOIR PRESSURE FALLOFF TEST

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Location: Eddy County, NM
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Formation: Unavailable

Test Date: 08/25 - 08/30/2016
Gauge Depth: 7570 ft
Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

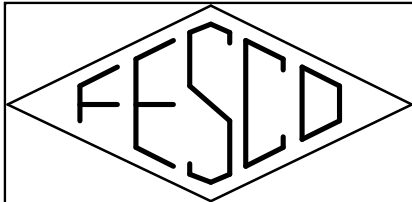
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
08/30/16	08:54:04	69.09722	965	969.67		67.50	Surface stop.
08/30/16	08:54:09	69.09861		960.61		67.45	
08/30/16	08:54:29	69.10417		1077.06		67.36	Close crown valve.
08/30/16	08:55:09	69.11528		1066.63		67.24	
08/30/16	08:56:09	69.13194		1059.72		67.08	
08/30/16	08:57:09	69.14861		1058.47		66.95	
08/30/16	08:57:34	69.15556		1056.57		66.89	Pressured down lubricator.
08/30/16	08:58:04	69.16389		6.65		66.66	Test complete.
08/30/16	08:58:09	69.16528		6.46		66.64	
08/30/16	08:59:09	69.18194		6.65		66.44	
08/30/16	09:00:09	69.19861		8.55		66.27	
08/30/16	09:15:09	69.44861		8.90		66.19	
08/30/16	09:30:09	69.69861		8.67		67.19	
08/30/16	09:45:09	69.94861		8.74		66.56	
08/30/16	10:02:09	70.23194		8.46		67.45	Powered down gauge.

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 7579 ft. POOH. RIH with electronic memory gauges to 7570 ft. Continue injecting water for 49 hrs. SI well for 69 hr BHP falloff test. POOH. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

Job No.: J201608310803.001A

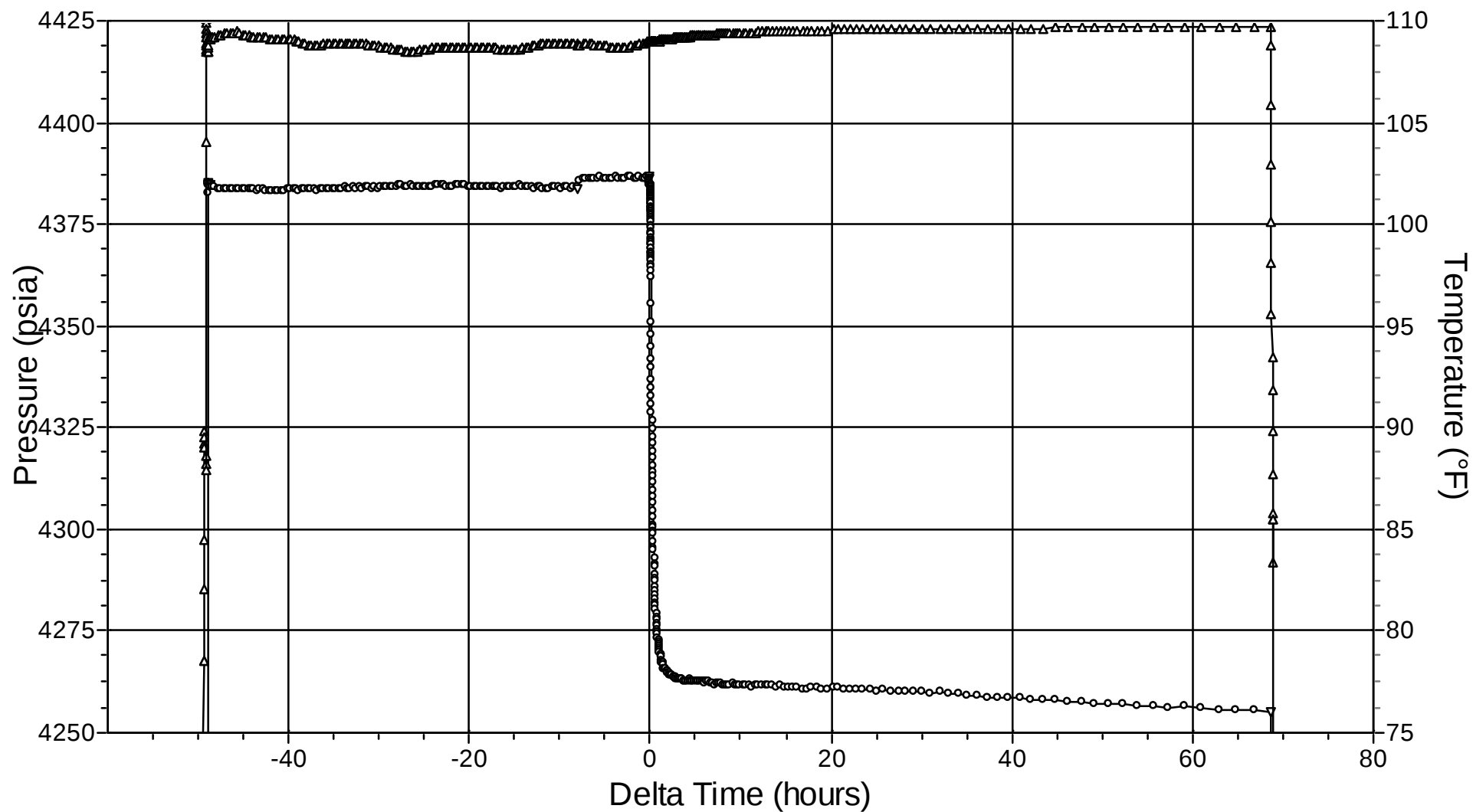


PB Energy Storage Services, Inc.

Well: Chukka Well No. 2
Field: Davonia
Test Date: 08/25 - 08/30/2016

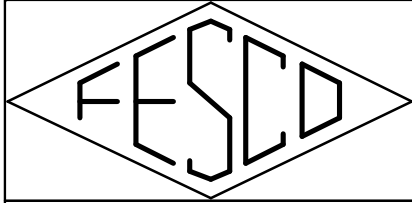
Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-2050

Cartesian Plot



J201608310803.001A

—○— Pressure —△— Temperature

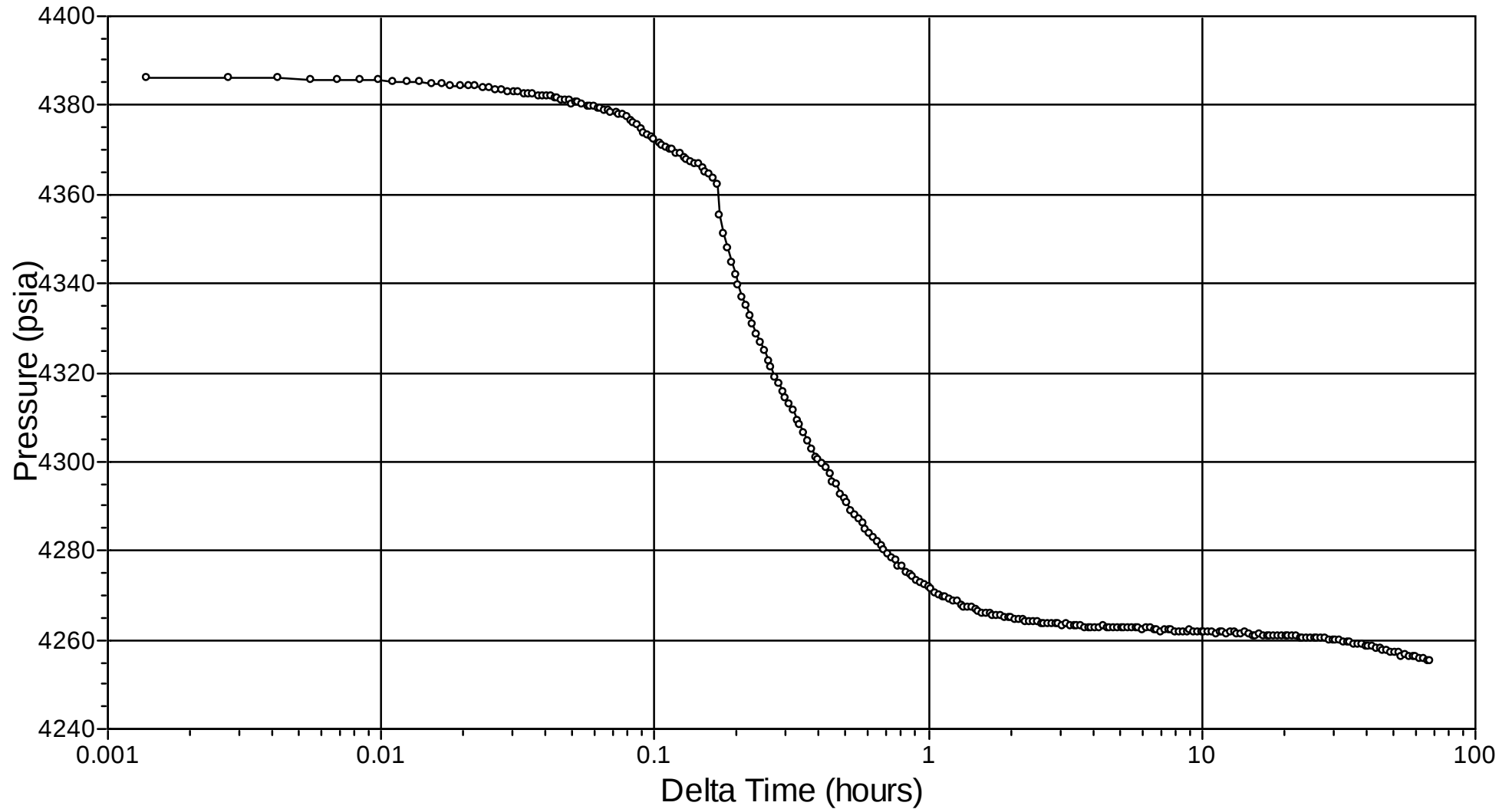


PB Energy Storage Services, Inc.

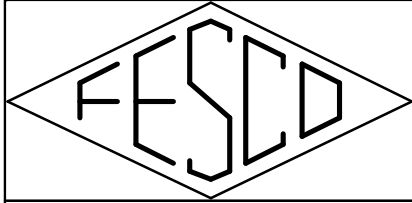
Well: Chukka Well No. 2
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-2050

Semilog Plot (Falloff Test)



J201608310803.001A

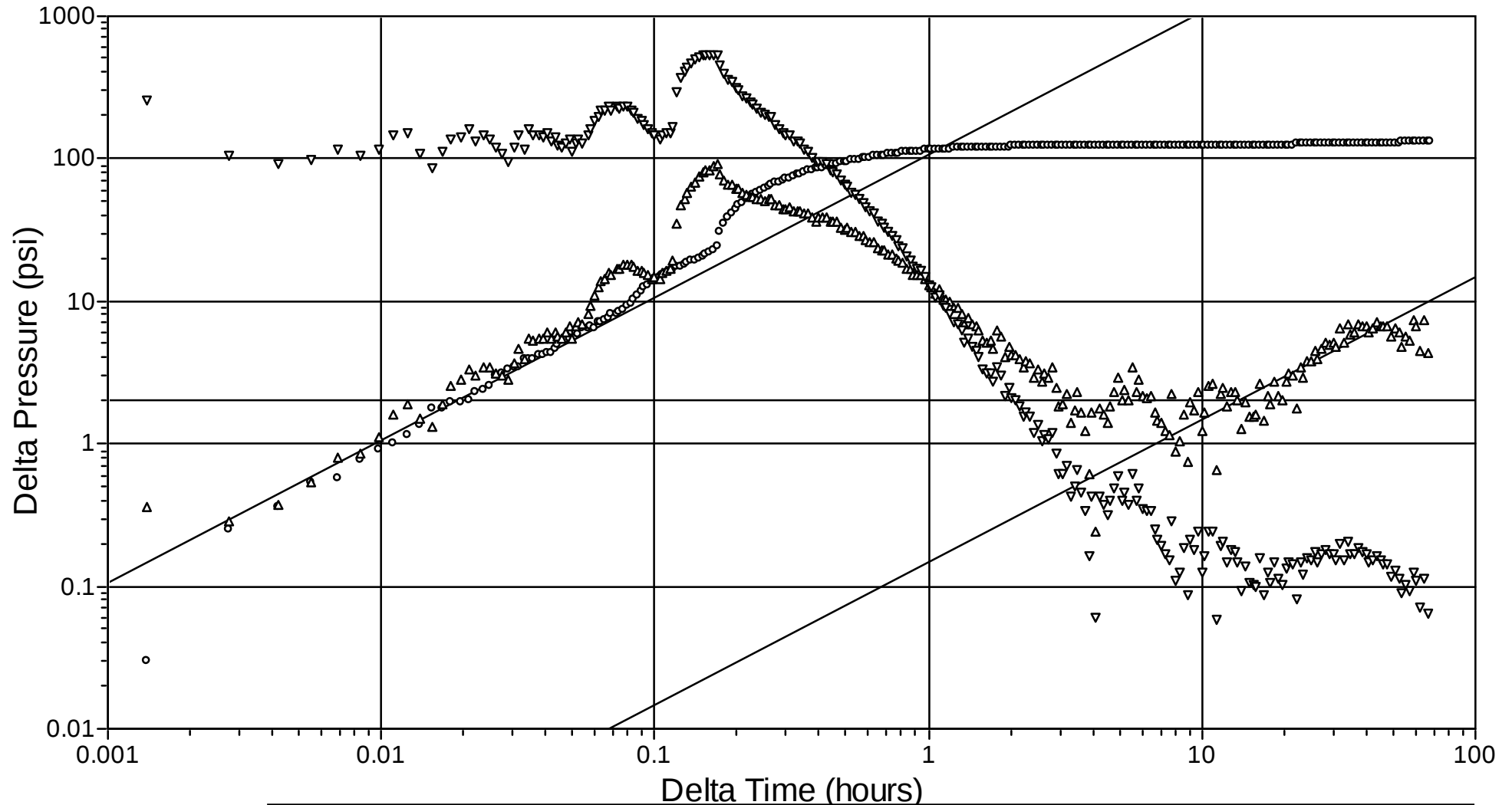


PB Energy Storage Services, Inc.

Well: Chukka Well No. 2
Field: Davonia
Test Date: 08/25 - 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-2050

Log Plot (Falloff Test)



J201608310803.001A

— Unit-Slope	— Half-Slope	— Quarter-Slope
○ Delta Pressure	▲ Radial Pressure Derivative	▼ Primary Pressure Derivative



FESCO, Ltd.
1000 Fesco Ave. - Alice, Texas 78332



STATIC GRADIENT SURVEY

Company: PB Energy Storage Services, Inc.
Well: Chukka Well No. 2
Field: Davonia
Formation: Unavailable

Test Date: 8/30/2016
Location: Eddy County, NM
Status: Shut in.

Well Data: Wellhead Connection: 3" EUE
Elevation: 13 ft above GL
Tubing: 3" Set at 7570 ft (Packer)
Casing: 5.5" Set at 8770 ft (PBTD)
Perfs: 7570 - 7736; 7826 - 8399 ft (MD)
Datum: 7985 ft (MD)

Gauge Type: Electronic
Gauge SN: DC-2050
Gauge Range: 15000 psi
Gauge OD: 1.2500"

Depth			Pressure					Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
13	13	0	965	67.50	969.67	0.00	0.0000	
7570	7570	7557	965	109.70	4255.25	3285.58	0.4348	POOH after 69 hr falloff test.

BHT at Test Depth: 109.70 °F
Extrapolated BHP at Datum: 4436.00 psia
BHP Gradient at Datum : 0.4348 psi/ft

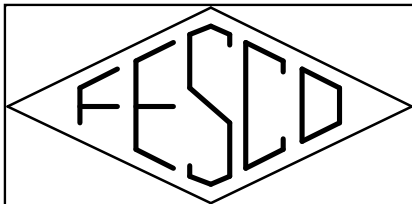
Oil Level: None
Water Level: Surface
Csg Press: N/A

Previous BHP: 4263.60 psia (on 7/27/2016)
BHP Change: 172 psi gain

Remarks: POOH after 69 hr reservoir pressure falloff test to surface. RDMO.

Certified: FESCO, Ltd. - Ozona, Texas

By: Tom Anderson
District Manager - (325) 392-3773

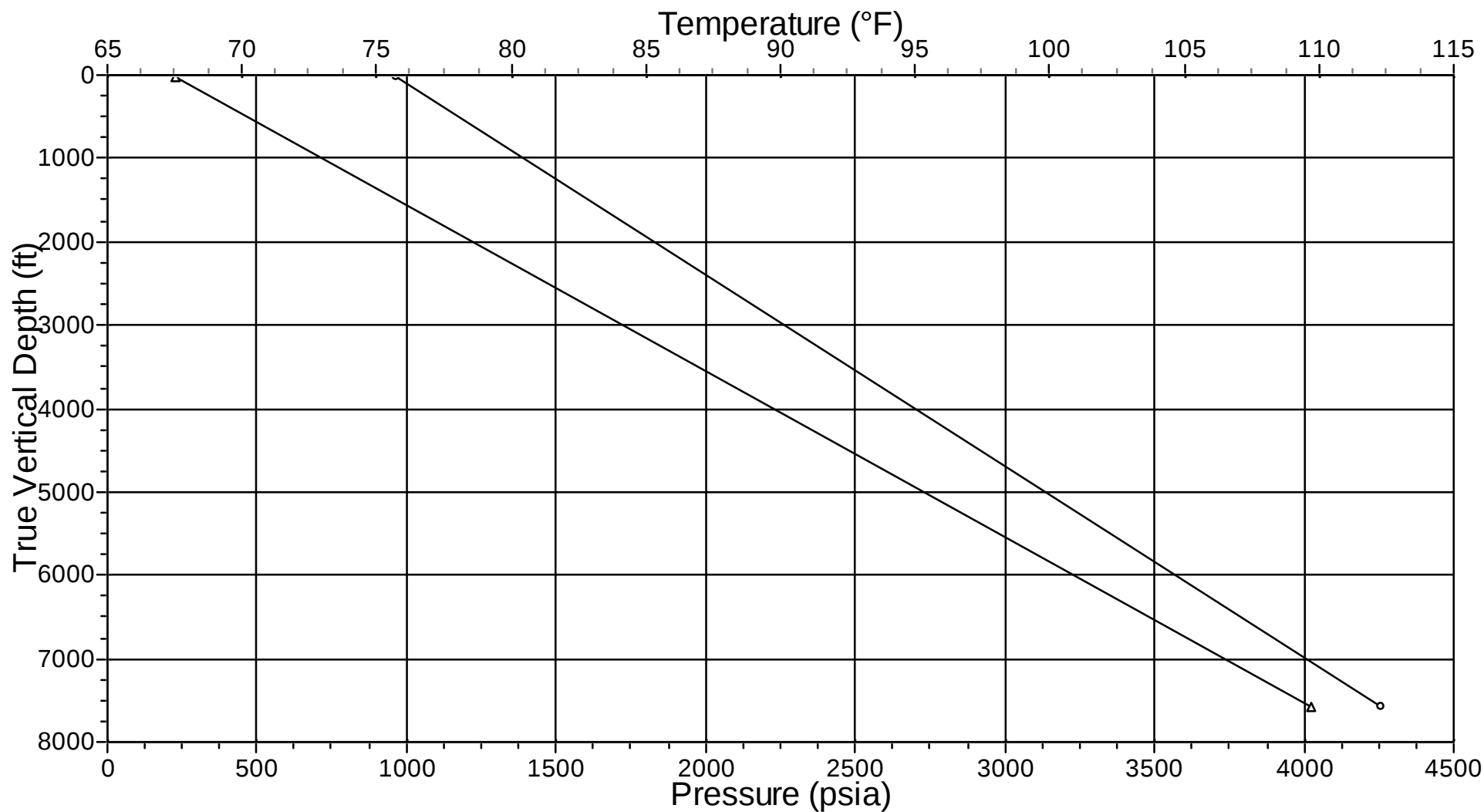


PB Energy Storage Services, Inc.

Well: Chukka Well No. 2
Field: Davonia
Test Date: 08/30/2016

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-2050

Static Gradient Plot



J201608310803.001A

—○— Pressure —△— Temperature

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 12, 2016 11:24 AM
To: Denton, Scott (Scott.Denton@HollyFrontier.com); pthompson@merrion.bz
Cc: Griswold, Jim, EMNRD; Kuehling, Monica, EMNRD; Smith, Cory, EMNRD; Inge, Richard, EMNRD
Subject: New Mexico UIC Class I (non-hazardous) Well MIT & Annual Fall-Off Test Scheduling with Completion by September 30, 2016 (San Juan and Eddy Counties)

Scott and Philana:

Re: Annual Fall-Off Test for Agua Moss, LLC (San Juan County): UICI-005 (API# 30-045-28653); and HollyFrontier Navajo Refining Company (Eddy County): UICI-008-1 (WDW-1) API# 30-015-27592; UICI-008-2 (WDW-2) API# 30-015-20894 & UICI-008-3 (WDW-3) API# 30-015-26575

Good morning. It is that time of year again to remind operators about their annual Underground Injection Control (UIC) Program Fall-Off Tests (FOT) and Mechanical Integrity Tests (MIT) for this season to be completed on or before Friday, September 30, 2016. A C-103 Form with details about your well plans must be submitted to the District Office with a copy to me in Santa Fe.

The list of operator names w/ associated UIC Class I (non-hazardous) Wells affected by this notification are provided above. Operators are aware of the MIT (30 min @ => 300 psig) and Bradenhead Test requirements.

The FOT spans several days with a couple of important notes to operators from past testing, please install your bottom hole gauge(s) with recorder(s) at least 48-hours in advance of the pump shut-off during the pseudo steady-state injection period. OCD recommends that operators clean out the wellbore to eliminate erroneous well bore related FOT results. The OCD District Office would appreciate notifications for the dates and times of the bottom hole gauge installation, and pump shut-off to observe the short term fall-off in pressure in order to make arrangements to witness these actions.

Also, you are accountable for your OCD approved FOT Test Plan and the requirements in the UIC Test Guidance with Reporting Requirements at <http://www.emnrd.state.nm.us/oed/documents/UICGuidance.pdf>. For access to your FOT Plan, please enter your permit information on "OCD Online" at <http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx> and enter the Order Type "UICI" along with your Order number.

For information on New Mexico's UIC Program and training information, please go to: <http://www.emnrd.state.nm.us/OCD/publications.html>.

Please contact me at (505) 476-3490 on or before May 31, 2016 to schedule your MIT and FOT date and time or if you have questions.

Thank you in advance for your cooperation.

Copy: UIC Class I (non-hazardous) Well Files UICI- 5; and UICI 8-1, 8-2 & 8-3

Carl J. Chavez, CHMM
Environmental Engineer
Oil Conservation Division- Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Phone: (505) 476-3490

Main Phone: (505) 476-3440

Fax: (505) 476-3462

E-mail: CarlJ.Chavez@state.nm.us

Website: www.emnrd.state.nm.us/oed

Why not prevent pollution, minimize waste, reduce operation costs, and move forward with the rest of the Nation? To see how, go to “Publications” and “Pollution Prevention” on the OCD Website.