

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505



257

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] **[NSP-Non-Standard Proration Unit]** **[SD-Simultaneous Dedication]**
[DHC-Downhole Commingling] **[CTB-Lease Commingling]** **[PLC-Pool/Lease Commingling]**
[PC-Pool Commingling] **[OLS - Off-Lease Storage]** **[OLM-Off-Lease Measurement]**
[WFX-Waterflood Expansion] **[PMX-Pressure Maintenance Expansion]**
[SWD-Salt Water Disposal] **[IPI-Injection Pressure Increase]**
[EOR-Qualified Enhanced Oil Recovery Certification] **[PPR-Positive Production Response]**

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☒ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
 U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] CERTIFICATION: I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Yolanda Perez
Print or Type Name

Yolanda Perez
Signature

Sr. Regulatory Specialist
Title

09/06/05
Date

Yolanda.perez@conocophillips.com
e-mail Address



Yolanda Perez
Sr. Regulatory Specialist
P.O. Box 2197, WL3 6106
Houston, Texas 77252-2197
Tel: 832-486-2329
Fax: 918-662-3306

September 6, 2005

New Mexico Oil Conservation Division
1220 So. St. Francis Drive
Santa Fe, New Mexico 87505

Attn: Will Jones

RE: STEP RATE INJECTION TEST
SAN JUAN 32-8 #301 SALT WATER DISPOSAL WELL
API #30-045-27935, ORDER NO. SWD-412

DEAR MR. JONES,

ConocoPhillips Company (COP) performed a self-audit on our salt water disposal wells and discovered that the SJ 32-8 #301 SWD well was operating above the permitted surface injection pressure limit of 1689 psi (8444' x 0.2 psi/ft). The initial order issued on April 15, 1991 allowed a maximum injection pressure of 2100 psi. Then Phillips Petroleum, requested to add additional perforations and an amended order was issued on February 6, 1992 reducing the maximum injection pressure to 1689 psi. The additional perforations were added on February 13, 1992. For some reason unbeknownst to COP, our operations personnel thought the maximum injection pressure was still 2100 psi. Since the New Mexico Oil Conservation Division (NMOCD) performs field inspections and witness mechanical integrity test, it is unknown how the NMOCD or COP overlooked this issue. COP contacted Charlie Perrin, NMOCD Aztec District Supervisor, of this discovery and the well was shut in on July 22nd, 2005 when the discrepancy was discovered.

A step-rate test procedure was submitted to the New Mexico Oil Conservation Division Aztec District Office for approval. After several modifications, a final procedure was approved. On August 11th 2005, equipment and personnel were mobilized to conduct the test to determine a new injection pressure.

Prior to beginning the injection test, tandem pressure memory gauges were run in the well to 8822 ft. WLM which is approximately mid-perforation depth of the perforations. Initial SITP, SICP, and bradenhead pressures were recorded. The initial bradenhead pressure was 30 psi., which bled to 0 psi in approximately 5 minutes and remained at 0 psi for the entire step-rate test. The 24-hour stabilized SITP was recorded at 1870 psi. This SITP is equivalent to a 0.2215 psi/ft. gradient based on a perforation top depth of 8444 ft. The measured SICP was 1876 psig.

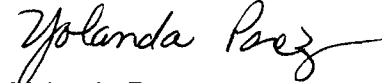
Upon completion of the step-rate test, it was found that no discernable deviation was observed in the injection pressure versus injection rate curve to indicate formation fracturing. As shown in Figure 1, this curve demonstrates that the formation fracture gradient exceeds this test's maximum step-rate injection gradient of 0.6875 psi/ft. In addition to Figure 1, further evidence of this fact is given in Figure 2. This plot demonstrates the linearity of the rate versus pressure relationship; hence, indicating that the fracture gradient was not exceeded. It should be noted that the maximum surface injection pressure recorded for this step-rate test was 2730 psi. for an injection rate of 5.9 bpm. Table 1 lists well parameters and important results associated with step-rate test. Actual test data is given in Tables 2-3.

ConocoPhillips requests that the maximum allowed surface injection pressure be increased to 2730 psi on the San Juan 32-8 #301 SWD well. This request is based on the attached data set derived from the step-rate test conducted on August 11, 2005 and given that this data supports the fact that the formation fracture gradient exceeds 0.6875 psi/ft.

If you need additional information, please contact me at 832-486-2329 or by email at yolanda.perez@conocophillips.com. If your question is technical in nature, please contact Brad Peterson at 832-486-2055 or by email at brad.t.peterson@conocophillips.com.

Sincerely,

CONOCOPHILLIPS COMPANY



Yolanda Perez
Sr. Regulatory Specialist
Mid America Business Unit

ConocoPhillips Company
San Juan Operations
5525 Hwy. 64
Farmington, NM 87401

Figure 1
Step Rate Test (August 11, 2005)
SJ 38-8 #301SWD
API No. 30-045-27935
Rate vs. Bottom Hole Injection Pressure

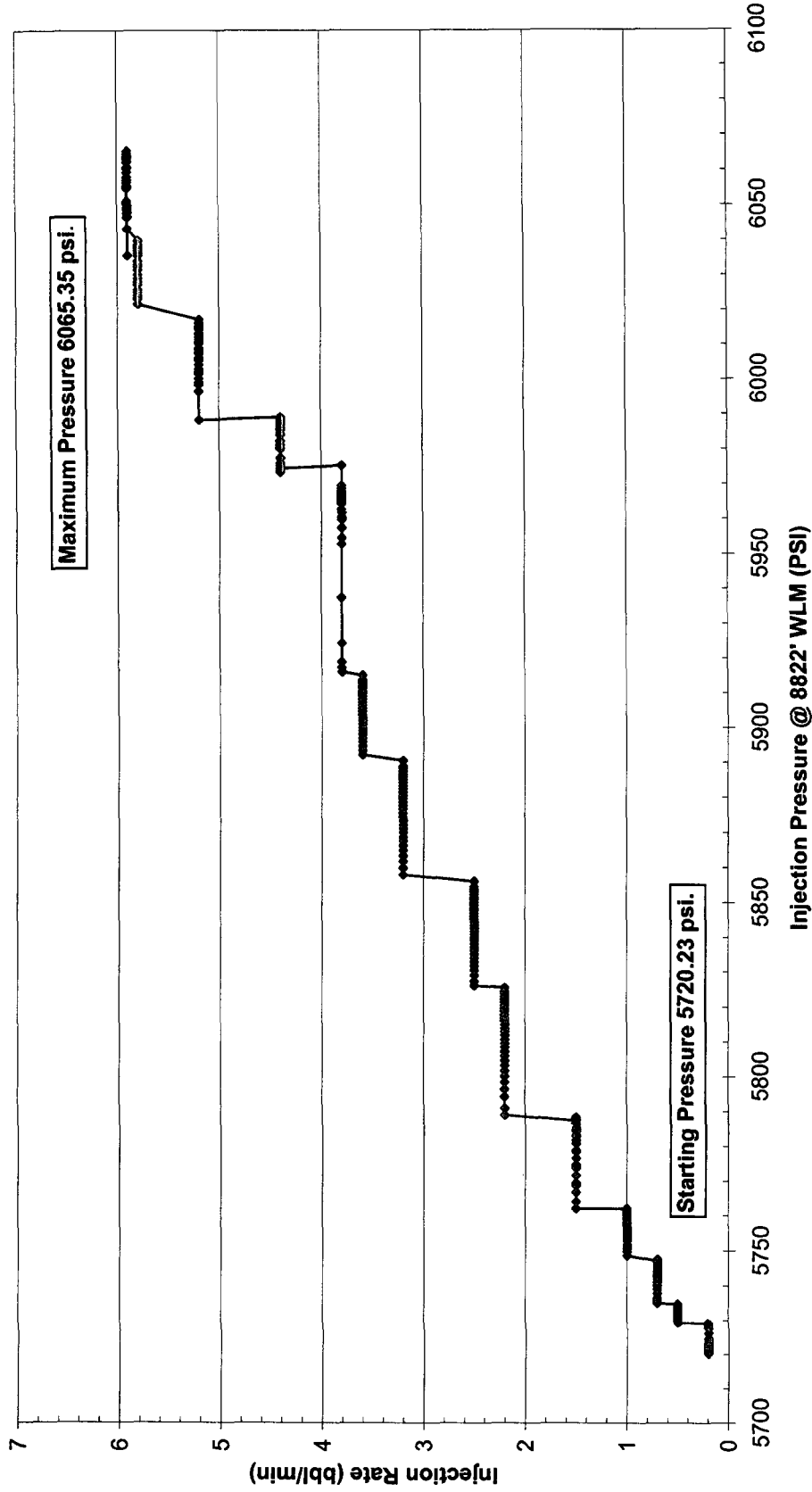


Figure 2
Step Rate Test (August 11, 2005)
SJ 38-8 #301SWD
API No. 30-045-27935
Injection Ratio vs. Rate

ConocoPhillips Company
 San Juan Operations
 5525 Hwy. 64
 Farmington, NM 87401

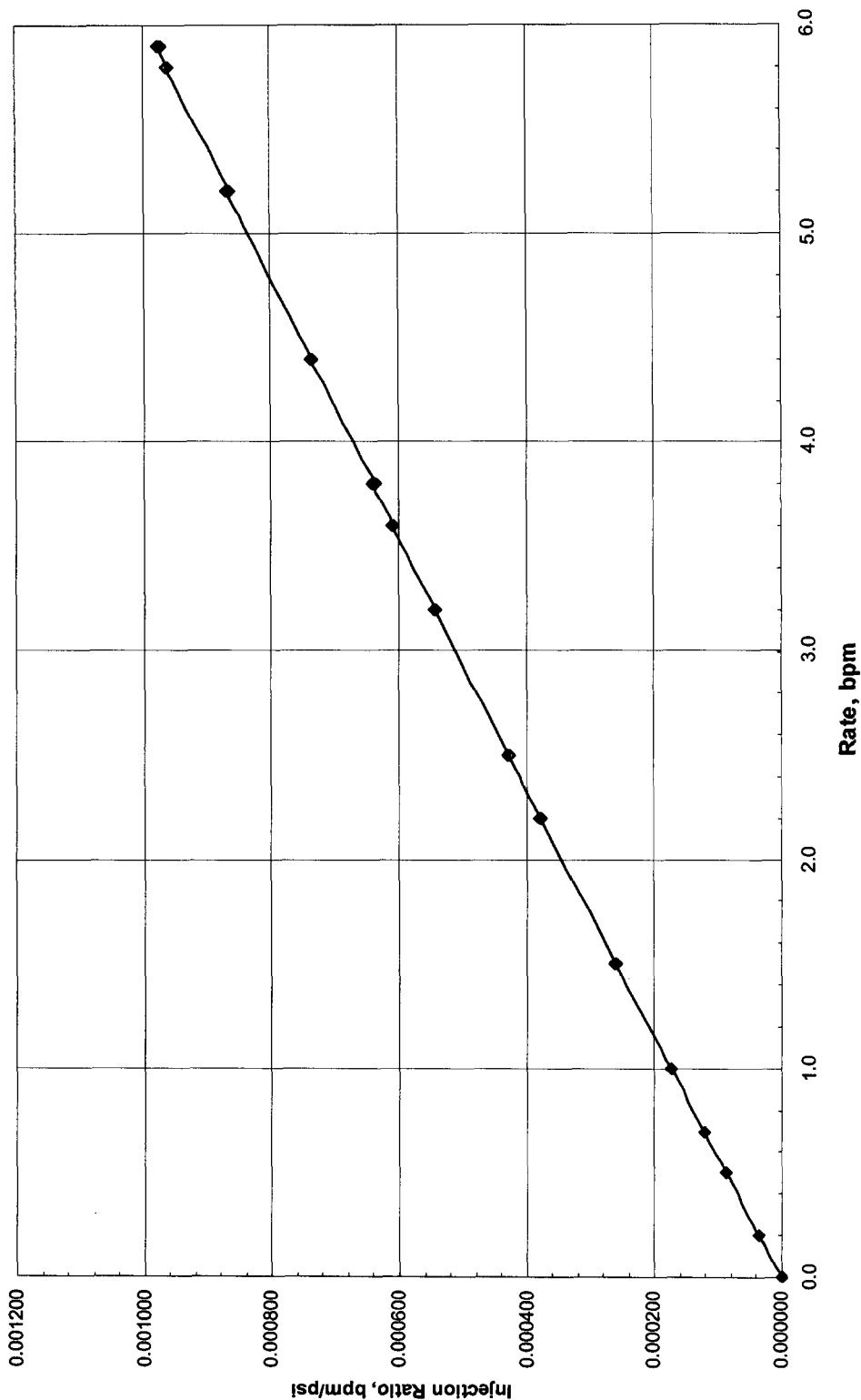




Figure 3
Step Rate Test (August 11, 2005)
SJ 38-8 #301SWD
API No. 30-045-27935
Rate vs. Surface Tubing Pressure

ConocoPhillips Company
San Juan Operations
5525 Hwy. 64
Farmington, NM 87401

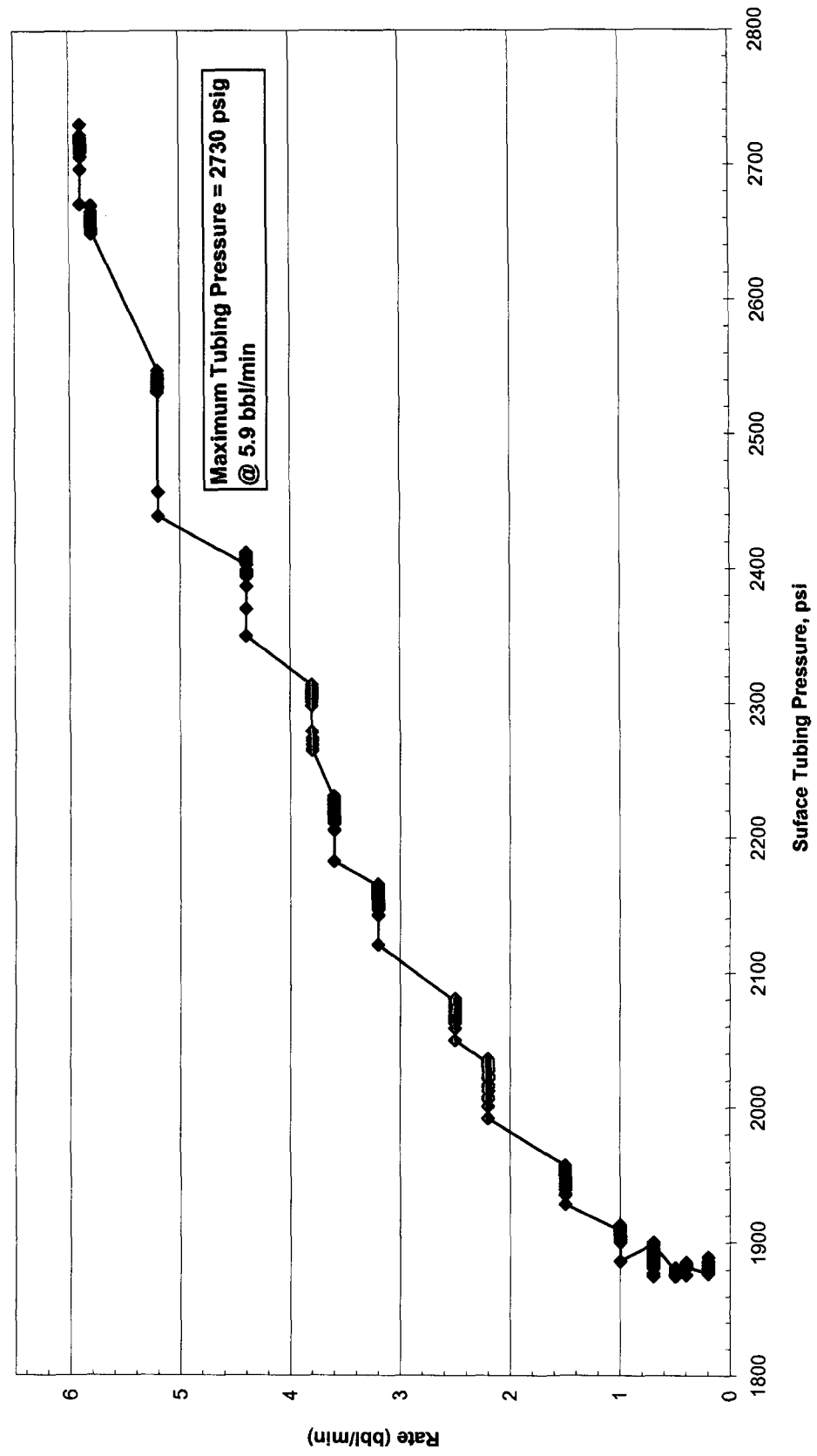


Table 1: Well Parameters and Step-rate Test Results.

Lease/Well No.	San Juan 32-8 #301 SWD
API No.	30-045-27935
Operator	ConocoPhillips Co.
Address	5525 Hwy 64 Farmington, NM 87401
Perforation Depth	8444 – 8636 ft KB
Maximum Surface Injection Pressure, psig.	2730 psig
Maximum Injection Bottom hole Pressure @ 8822 ft. WLM	6065.35 psig.
Maximum Injection Rate, bbl/min.	5.9 bbl/min.
Formation Fracture BH pressure (BHP), psig	Greater than 6065.35 psig
Formation Fracture pressure (Surface Tubing), psig.	Greater than 2730 psig.
Instantaneous Shut-in BHP, psig.	6029.33 psig.
Instantaneous Shut-in Pressure (Surface Measurement), psig.	2390 psig.

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
10:25:02	0	5722.22
10:25:05	0	5718.76
10:26:02	0	5718.85
10:26:05	0	5718.95
10:27:02	0	5719.20
10:27:05	0	5719.79
10:28:02	0.2	5720.23
10:28:05	0.2	5720.63
10:29:02	0.2	5721.06
10:29:05	0.2	5721.23
10:30:02	0.2	5721.49
10:30:05	0.2	5721.88
10:31:02	0.2	5722.20
10:31:05	0.2	5722.33
10:32:02	0.2	5722.58
10:32:05	0.2	5722.62
10:33:02	0.2	5722.91
10:33:05	0.2	5723.07
10:34:02	0.2	5723.15
10:34:05	0.2	5723.28
10:35:02	0.2	5723.03
10:35:05	0.2	5723.15
10:36:02	0.2	5723.52
10:36:05	0.2	5723.70
10:37:02	0.2	5723.72
10:37:05	0.2	5723.88
10:38:02	0.2	5724.03
10:38:05	0.2	5723.90
10:39:02	0.2	5723.72
10:39:05	0.2	5724.22
10:40:02	0.2	5724.30
10:40:05	0.2	5724.35
10:41:02	0.2	5724.51
10:41:05	0.2	5724.62
10:42:02	0.2	5724.43
10:42:05	0.2	5724.72
10:43:02	0.2	5726.31
10:43:05	0.5	5727.72
10:44:02	0.5	5728.06
10:44:05	0.5	5728.36
10:45:02	0.5	5728.83
10:45:05	0.5	5729.30
10:46:02	0.5	5729.38
10:46:05	0.5	5729.97
10:47:02	0.5	5730.35

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
10:47:05	0.5	5730.54
10:48:02	0.5	5730.74
10:48:05	0.5	5731.34
10:49:02	0.5	5731.93
10:49:05	0.5	5732.11
10:50:02	0.5	5732.17
10:50:05	0.5	5732.39
10:51:02	0.5	5732.64
10:51:05	0.5	5732.71
10:52:02	0.5	5733.17
10:52:05	0.5	5733.23
10:53:02	0.5	5733.90
10:53:05	0.5	5733.82
10:54:02	0.5	5734.09
10:54:05	0.5	5734.43
10:55:02	0.5	5734.59
10:55:05	0.5	5734.86
10:56:02	0.5	5735.14
10:56:05	0.5	5735.24
10:57:02	0.5	5735.79
10:57:05	0.5	5735.94
10:58:02	0.5	5736.60
10:58:05	0.7	5737.93
10:59:02	0.7	5737.98
10:59:05	0.7	5739.26
11:00:02	0.7	5739.07
11:00:05	0.7	5740.31
11:01:02	0.7	5740.10
11:01:05	0.7	5741.23
11:02:02	0.7	5741.05
11:02:05	0.7	5742.17
11:03:02	0.7	5741.82
11:03:05	0.7	5742.83
11:04:02	0.7	5742.65
11:04:05	0.7	5743.00
11:05:02	0.7	5743.44
11:05:05	0.7	5743.94
11:06:02	0.7	5744.18
11:06:05	0.7	5743.96
11:07:02	0.7	5744.98
11:07:05	0.7	5744.53
11:08:02	0.7	5745.53
11:08:05	0.7	5745.22
11:09:02	0.7	5745.88
11:09:05	0.7	5745.37

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
11:10:02	0.7	5746.45
11:10:05	0.7	5746.05
11:11:02	0.7	5747.07
11:11:05	0.7	5746.60
11:12:02	0.7	5747.68
11:12:05	0.7	5747.20
11:13:02	0.7	5748.75
11:13:05	1	5749.82
11:14:02	1	5750.77
11:14:05	1	5751.58
11:15:02	1	5751.92
11:15:05	1	5752.96
11:16:02	1	5753.44
11:16:05	1	5754.04
11:17:02	1	5754.31
11:17:05	1	5755.13
11:18:02	1	5755.53
11:18:05	1	5755.93
11:19:02	1	5756.47
11:19:05	1	5756.89
11:20:02	1	5757.23
11:20:05	1	5757.82
11:21:02	1	5758.14
11:21:05	1	5758.23
11:22:02	1	5759.08
11:22:05	1	5759.37
11:23:02	1	5759.48
11:23:05	1	5760.26
11:24:02	1	5760.43
11:24:05	1	5761.01
11:25:02	1	5761.16
11:25:05	1	5761.22
11:26:02	1	5761.84
11:26:05	1	5762.19
11:27:02	1	5762.11
11:27:05	1.5	5764.07
11:28:02	1.5	5766.82
11:28:05	1.5	5768.67
11:29:02	1.5	5769.46
11:29:05	1.5	5769.13
11:30:02	1.5	5771.66
11:30:05	1.5	5773.96
11:31:02	1.5	5773.75
11:31:05	1.5	5774.74
11:32:02	1.5	5774.67

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
11:32:05	1.5	5776.58
11:33:02	1.5	5778.55
11:33:05	1.5	5778.46
11:34:02	1.5	5778.94
11:34:05	1.5	5778.96
11:35:02	1.5	5780.82
11:35:05	1.5	5782.87
11:36:02	1.5	5781.88
11:36:05	1.5	5781.76
11:37:02	1.5	5783.22
11:37:05	1.5	5784.56
11:38:02	1.5	5785.41
11:38:05	1.5	5785.01
11:39:02	1.5	5784.33
11:39:05	1.5	5786.57
11:40:02	1.5	5787.63
11:40:05	1.5	5788.20
11:41:02	1.5	5788.46
11:41:05	1.5	5787.33
11:42:02	1.5	5788.96
11:42:05	1.5	5790.90
11:43:02	1.5	5794.22
11:43:05	2.2	5796.38
11:44:02	2.2	5798.42
11:44:05	2.2	5800.10
11:45:02	2.2	5801.66
11:45:05	2.2	5803.23
11:46:02	2.2	5804.52
11:46:05	2.2	5805.87
11:47:02	2.2	5807.09
11:47:05	2.2	5808.40
11:48:02	2.2	5809.50
11:48:05	2.2	5810.63
11:49:02	2.2	5811.78
11:49:05	2.2	5812.89
11:50:02	2.2	5813.85
11:50:05	2.2	5814.81
11:51:02	2.2	5815.91
11:51:05	2.2	5816.81
11:52:02	2.2	5817.74
11:52:05	2.2	5818.69
11:53:02	2.2	5819.53
11:53:05	2.2	5820.46
11:54:02	2.2	5821.35
11:54:05	2.2	5822.18

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
11:55:02	2.2	5822.99
11:55:05	2.2	5823.86
11:56:02	2.2	5824.46
11:56:05	2.2	5825.48
11:57:02	2.2	5826.16
11:57:05	2.2	5827.41
11:58:02	2.5	5829.07
11:58:05	2.5	5830.56
11:59:02	2.5	5831.76
11:59:05	2.5	5832.92
12:00:02	2.5	5834.06
12:00:05	2.5	5835.15
12:01:02	2.5	5836.13
12:01:05	2.5	5837.17
12:02:02	2.5	5838.17
12:02:05	2.5	5839.09
12:03:02	2.5	5839.91
12:03:05	2.5	5840.87
12:04:02	2.5	5841.67
12:04:05	2.5	5842.55
12:05:02	2.5	5843.40
12:05:05	2.5	5844.34
12:06:02	2.5	5845.21
12:06:05	2.5	5846.00
12:07:02	2.5	5846.87
12:07:05	2.5	5847.68
12:08:02	2.5	5848.42
12:08:05	2.5	5849.22
12:09:02	2.5	5850.01
12:09:05	2.5	5850.85
12:10:02	2.5	5851.50
12:10:05	2.5	5852.27
12:11:02	2.5	5853.13
12:11:05	2.5	5853.75
12:12:02	2.5	5854.55
12:12:05	2.5	5856.07
12:13:02	3.2	5857.95
12:13:05	3.2	5859.92
12:14:02	3.2	5861.75
12:14:05	3.2	5863.40
12:15:02	3.2	5864.87
12:15:05	3.2	5866.28
12:16:02	3.2	5867.59
12:16:05	3.2	5868.73
12:17:02	3.2	5870.05

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
12:17:05	3.2	5871.12
12:18:02	3.2	5872.15
12:18:05	3.2	5873.41
12:19:02	3.2	5874.42
12:19:05	3.2	5875.56
12:20:02	3.2	5876.70
12:20:05	3.2	5877.64
12:21:02	3.2	5878.66
12:21:05	3.2	5879.64
12:22:02	3.2	5880.54
12:22:05	3.2	5881.47
12:23:02	3.2	5882.47
12:23:05	3.2	5883.31
12:24:02	3.2	5884.25
12:24:05	3.2	5885.10
12:25:02	3.2	5885.94
12:25:05	3.2	5886.70
12:26:02	3.2	5887.47
12:26:05	3.2	5888.36
12:27:02	3.2	5888.95
12:27:05	3.2	5890.59
12:28:02	3.6	5892.23
12:28:05	3.6	5893.43
12:29:02	3.6	5894.67
12:29:05	3.6	5895.96
12:30:02	3.6	5897.03
12:30:05	3.6	5898.13
12:31:02	3.6	5899.08
12:31:05	3.6	5900.03
12:32:02	3.6	5901.06
12:32:05	3.6	5902.01
12:33:02	3.6	5902.90
12:33:05	3.6	5903.87
12:34:02	3.6	5904.80
12:34:05	3.6	5905.63
12:35:02	3.6	5906.43
12:35:05	3.6	5907.41
12:36:02	3.6	5908.24
12:36:05	3.6	5909.08
12:37:02	3.6	5909.77
12:37:05	3.6	5910.58
12:38:02	3.6	5911.48
12:38:05	3.6	5912.17
12:39:02	3.6	5912.90
12:39:05	3.6	5913.74

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
12:40:02	3.6	5903.72
12:40:05	3.6	5912.74
12:41:02	3.6	5910.18
12:41:05	3.6	5912.06
12:42:02	3.6	5913.40
12:42:05	3.6	5915.17
12:43:02	3.8	5916.07
12:43:05	3.8	5917.25
12:44:02	3.8	5918.95
12:44:05	3.8	5924.27
12:45:02	3.8	5937.30
12:45:05	3.8	5952.70
12:46:02	3.8	5954.38
12:46:05	3.8	5957.33
12:47:02	3.8	5960.03
12:47:05	3.8	5959.56
12:48:02	3.8	5960.42
12:48:05	3.8	5961.60
12:49:02	3.8	5962.54
12:49:05	3.8	5964.22
12:50:02	3.8	5964.11
12:50:05	3.8	5965.20
12:51:02	3.8	5965.82
12:51:05	3.8	5964.63
12:52:02	3.8	5965.07
12:52:05	3.8	5964.26
12:53:02	3.8	5964.51
12:53:05	3.8	5965.72
12:54:02	3.8	5966.15
12:54:05	3.8	5967.02
12:55:02	3.8	5966.55
12:55:05	3.8	5967.82
12:56:02	3.8	5967.54
12:56:05	3.8	5968.54
12:57:02	3.8	5969.39
12:57:05	3.8	5975.09
12:58:02	4.4	5974.38
12:58:05	4.4	5975.84
12:59:02	4.4	5977.35
12:59:05	4.4	5973.12
1:00:23	4.4	5973.80
1:00:53	4.4	5975.05
1:01:23	4.4	5975.74
1:01:53	4.4	5977.11
1:02:23	4.4	5977.05

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
1:02:53	4.4	5980.91
1:03:23	4.4	5979.83
1:03:53	4.4	5980.19
1:04:23	4.4	5981.01
1:04:53	4.4	5981.96
1:05:23	4.4	5982.19
1:05:53	4.4	5983.77
1:06:23	4.4	5984.22
1:06:53	4.4	5985.19
1:07:23	4.4	5985.36
1:07:53	4.4	5986.16
1:08:23	4.4	5986.12
1:08:53	4.4	5986.82
1:09:23	4.4	5987.44
1:09:53	4.4	5985.53
1:10:23	4.4	5986.78
1:10:53	4.4	5986.73
1:11:23	4.4	5987.97
1:11:53	4.4	5988.49
1:12:23	4.4	5988.90
1:12:53	5.2	5988.15
1:13:23	5.2	5996.27
1:13:53	5.2	5998.20
1:14:23	5.2	5998.91
1:14:53	5.2	5999.98
1:15:23	5.2	6001.40
1:15:53	5.2	6002.00
1:16:23	5.2	6002.77
1:16:53	5.2	6003.92
1:17:23	5.2	6005.14
1:17:53	5.2	6005.54
1:18:23	5.2	6005.99
1:18:53	5.2	6007.06
1:19:23	5.2	6007.58
1:19:53	5.2	6008.19
1:20:23	5.2	6008.76
1:20:53	5.2	6010.50
1:21:23	5.2	6010.57
1:21:53	5.2	6012.03
1:22:23	5.2	6012.79
1:22:53	5.2	6010.12
1:23:23	5.2	6011.17
1:23:53	5.2	6011.97
1:24:23	5.2	6013.08
1:24:53	5.2	6014.16

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
1:25:23	5.2	6014.59
1:25:53	5.2	6015.10
1:26:23	5.2	6016.17
1:26:53	5.2	6015.87
1:27:23	5.2	6017.02
1:27:53	5.8	6021.34
1:28:23	5.8	6022.82
1:28:53	5.8	6023.05
1:29:23	5.8	6023.08
1:29:53	5.8	6023.89
1:30:23	5.8	6024.71
1:30:53	5.8	6025.50
1:31:23	5.8	6026.95
1:31:53	5.8	6027.74
1:32:23	5.8	6028.77
1:32:53	5.8	6029.87
1:33:23	5.8	6031.24
1:33:53	5.8	6032.12
1:34:23	5.8	6032.73
1:34:53	5.8	6033.76
1:35:23	5.8	6033.71
1:35:53	5.8	6035.25
1:36:23	5.8	6035.99
1:36:53	5.8	6036.69
1:37:23	5.8	6037.48
1:37:53	5.8	6037.79
1:38:23	5.8	6038.37
1:38:53	5.8	6039.42
1:39:23	5.8	6039.70
1:39:53	5.9	6042.98
1:40:23	5.9	6046.54
1:40:53	5.9	6046.21
1:41:23	5.9	6047.47
1:41:53	5.9	6048.44
1:42:23	5.9	6049.89
1:42:53	5.9	6050.35
1:43:23	5.9	6047.65
1:43:53	5.9	6049.02
1:44:23	5.9	6049.74
1:44:53	5.9	6049.53
1:45:23	5.9	6049.80
1:45:53	5.9	6050.43
1:46:23	5.9	6051.01
1:46:53	5.9	6054.65
1:47:23	5.9	6055.13

Table 1: Time versus Bottom Hole Pressure.

<i>Time (Rate and BHP Measurements)</i>	<i>Injection rate, bbl/min.</i>	<i>BHP @ 8822 ft. WLM, psi</i>
1:47:53	5.9	6054.99
1:48:23	5.9	6055.33
1:48:53	5.9	6056.23
1:49:23	5.9	6057.05
1:49:53	5.9	6057.00
1:50:23	5.9	6057.90
1:50:53	5.9	6059.20
1:51:23	5.9	6060.26
1:51:53	5.9	6062.30
1:52:23	5.9	6060.75
1:52:53	5.9	6060.39
1:53:23	5.9	6062.09
1:53:53	5.9	6062.12
1:54:23	5.9	6062.31
1:54:53	5.9	6063.50
1:55:23	5.9	6063.10
1:55:53	5.9	6063.96
1:56:23	5.9	6063.63
1:56:53	5.9	6064.57
1:57:23	5.9	6065.35
1:57:53	5.9	6035.36
1:58:23	0.0	6029.33
Instantaneous Shut-in Pressure (ISIP),psig.		

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
10:32:31	1886	0.9
10:33:01	1889	1
10:33:31	1885	1
10:34:01	1885	1.1
10:34:31	1883	1.2
10:35:01	1883	1.3

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
10:35:31	1880	1.4
10:36:01	1881	1.5
10:36:31	1881	1.6
10:37:01	1878	1.7
10:37:31	1879	1.8
10:38:01	1879	1.8
10:38:31	1877	1.9
10:39:01	1877	2
10:39:31	1877	2.1
10:40:01	1879	2.2
10:40:31	1879	2.3
10:41:01	1878	2.4
10:41:31	1877	2.5
10:42:01	1877	2.6
10:42:31	1877	2.7
10:43:01	1882	2.7
10:43:17	1881	2.9
10:43:31	1884	3
10:44:01	1883	3.2
10:44:32	1885	3.4
10:45:02	1881	3.7
10:45:32	1876	3.9
10:46:02	1881	4.1
10:46:32	1878	4.3
10:47:02	1875	4.6
10:47:32	1877	4.8
10:48:02	1877	5
10:48:32	1880	5.3
10:49:02	1877	5.5
10:49:32	1878	5.7
10:50:02	1880	6
10:50:32	1877	6.2
10:51:02	1877	6.4
10:51:32	1880	6.6
10:52:02	1879	6.9
10:52:32	1878	7.1
10:53:02	1881	7.3
10:53:32	1877	7.6
10:54:02	1881	7.8
10:54:32	1878	8
10:55:02	1876	8.3
10:55:32	1881	8.5
10:56:03	1878	8.7
10:56:33	1881	9

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
10:57:03	1879	9.2
10:57:33	1879	9.4
10:58:03	1898	9.6
10:58:11	1900	9.7
10:58:33	1889	10
10:59:03	1888	10.3
10:59:33	1883	10.6
11:00:03	1887	11
11:00:33	1875	11.3
11:01:03	1885	11.6
11:01:33	1891	12
11:02:03	1885	12.3
11:02:33	1891	12.6
11:03:03	1890	13
11:03:33	1888	13.3
11:04:03	1887	13.6
11:04:33	1884	14
11:05:03	1889	14.3
11:05:33	1877	14.6
11:06:03	1888	15
11:06:33	1887	15.3
11:07:03	1881	15.6
11:07:34	1895	16
11:08:04	1892	16.3
11:08:34	1893	16.7
11:09:04	1889	17
11:09:34	1894	17.3
11:10:04	1895	17.7
11:10:34	1887	18
11:11:04	1893	18.3
11:11:34	1886	18.7
11:12:04	1889	19
11:12:34	1899	19.3
11:13:04	1886	19.7
11:13:12	1910	19.8
11:13:34	1908	20.1
11:14:04	1909	20.6
11:14:34	1910	21.1
11:15:04	1909	21.5
11:15:34	1909	22
11:16:04	1908	22.5
11:16:34	1900	22.9
11:17:04	1906	23.4
11:17:34	1902	23.9

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
11:18:04	1906	24.3
11:18:34	1913	24.8
11:19:05	1905	25.3
11:19:38	1904	25.8
11:20:08	1908	26.3
11:20:38	1909	26.7
11:21:08	1910	27.2
11:21:38	1910	27.7
11:22:08	1909	28.1
11:22:38	1909	28.6
11:23:08	1911	29.1
11:23:38	1911	29.5
11:24:08	1910	30
11:24:38	1912	30.5
11:25:08	1912	30.9
11:25:38	1912	31.4
11:26:08	1910	31.9
11:26:38	1910	32.3
11:27:08	1910	32.8
11:27:38	1909	33.3
11:28:05	1928	33.7
11:28:08	1935	33.8
11:28:38	1936	34.6
11:29:08	1939	35.3
11:29:38	1935	36
11:30:08	1940	36.8
11:30:38	1941	37.5
11:31:09	1939	38.3
11:31:39	1944	39.1
11:32:09	1943	39.8
11:32:39	1942	40.6
11:33:09	1947	41.3
11:33:39	1943	42
11:34:09	1947	42.8
11:34:39	1948	43.5
11:35:09	1945	44.3
11:35:39	1949	45
11:36:09	1947	45.8
11:36:39	1947	46.5
11:37:09	1951	47.3
11:37:39	1947	48
11:38:09	1947	48.8
11:38:39	1953	49.5
11:39:09	1950	50.3

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
11:39:39	1952	51
11:40:09	1955	51.8
11:40:39	1951	52.5
11:41:09	1953	53.3
11:41:39	1956	54
11:42:09	1952	54.7
11:42:40	1957	55.5
11:43:10	1992	56.3
11:43:13	2001	56.4
11:43:40	2006	57.4
11:44:10	2006	58.6
11:44:40	2008	59.7
11:45:10	2012	60.8
11:45:40	2015	61.9
11:46:10	2017	63
11:46:40	2015	64.1
11:47:10	2015	65.2
11:47:40	2017	66.3
11:48:10	2021	67.4
11:48:40	2023	68.5
11:49:10	2024	69.6
11:49:40	2023	70.8
11:50:10	2022	71.9
11:50:40	2024	73
11:51:10	2027	74.1
11:51:40	2029	75.2
11:52:10	2029	76.3
11:52:40	2027	77.4
11:53:10	2027	78.5
11:53:40	2030	79.6
11:54:11	2032	80.8
11:54:41	2033	81.9
11:55:11	2032	83
11:55:41	2031	84.1
11:56:11	2031	85.2
11:56:41	2034	86.3
11:57:11	2036	87.5
11:57:41	2033	88.6
11:58:06	2050	89.5
11:58:11	2059	89.7
11:58:41	2063	91
11:59:11	2064	92.2
11:59:41	2064	93.5
12:00:11	2066	94.8

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
12:00:41	2067	96
12:01:11	2067	97.3
12:01:41	2068	98.5
12:02:11	2067	99.8
12:02:41	2069	101.1
12:03:11	2071	102.3
12:03:41	2071	103.6
12:04:11	2072	104.8
12:04:41	2071	106.1
12:05:11	2072	107.3
12:05:42	2072	108.6
12:06:12	2072	109.9
12:06:42	2074	111.2
12:07:12	2074	112.4
12:07:42	2075	113.7
12:08:12	2075	114.9
12:08:42	2076	116.2
12:09:12	2077	117.5
12:09:42	2077	118.7
12:10:12	2077	120
12:10:42	2078	121.2
12:11:12	2079	122.5
12:11:42	2080	123.8
12:12:12	2081	125
12:12:42	2079	126.3
12:13:12	2121	127.5
12:13:14	2143	127.6
12:13:42	2148	129.1
12:14:12	2147	130.7
12:14:42	2149	132.3
12:15:12	2151	133.9
12:15:42	2151	135.4
12:16:12	2154	137
12:16:42	2152	138.6
12:17:13	2155	140.2
12:17:43	2152	141.8
12:18:13	2156	143.4
12:18:43	2154	145
12:19:13	2158	146.6
12:19:43	2155	148.2
12:20:13	2159	149.7
12:20:43	2156	151.3
12:21:13	2159	152.9
12:21:43	2157	154.5

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
12:22:13	2160	156.1
12:22:43	2161	157.7
12:23:13	2163	159.3
12:23:43	2162	160.8
12:24:13	2163	162.4
12:24:43	2162	164
12:25:13	2164	165.6
12:25:43	2165	167.2
12:26:13	2165	168.8
12:26:43	2165	170.4
12:27:13	2166	171.9
12:27:43	2165	173.5
12:28:04	2183	174.6
12:28:13	2206	175.2
12:28:44	2211	177
12:29:14	2213	178.8
12:29:44	2213	180.5
12:30:14	2214	182.3
12:30:44	2214	184.1
12:31:14	2214	185.8
12:31:44	2214	187.6
12:32:14	2216	189.3
12:32:44	2218	191.1
12:33:14	2219	192.9
12:33:44	2220	194.6
12:34:14	2220	196.4
12:34:44	2220	198.2
12:35:14	2219	199.9
12:35:44	2219	201.7
12:36:14	2220	203.5
12:36:44	2222	205.2
12:37:14	2224	207
12:37:44	2225	208.7
12:38:14	2227	210.5
12:38:44	2228	212.3
12:39:14	2227	214
12:39:44	2227	215.8
12:40:15	2227	217.6
12:41:45	2231	222.9
12:42:15	2229	224.7
12:42:45	2229	226.4
12:43:10	2266	228
12:43:15	2269	228.3
12:43:45	2274	230.2

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
12:44:15	2269	232.1
12:44:45	2265	234.1
12:45:15	2272	236
12:45:45	2279	237.9
12:46:15	2301	239.8
12:46:45	2298	241.7
12:47:15	2306	243.6
12:47:45	2303	245.5
12:48:15	2305	247.4
12:48:45	2308	249.3
12:49:15	2304	251.2
12:49:45	2307	253.1
12:50:15	2308	255
12:50:45	2310	256.9
12:51:15	2307	258.8
12:51:45	2310	260.7
12:52:16	2306	262.6
12:52:46	2309	264.5
12:53:16	2304	266.4
12:53:46	2305	268.3
12:54:16	2312	270.2
12:54:46	2304	272.1
12:55:16	2307	274
12:55:46	2306	275.8
12:56:16	2311	277.7
12:56:46	2312	279.6
12:57:16	2307	281.5
12:57:46	2314	283.4
12:58:16	2350	285.4
12:58:20	2370	285.7
12:58:46	2397	287.6
12:59:16	2396	289.8
12:59:46	2412	292
13:00:16	2387	294.2
13:00:46	2394	296.3
13:01:16	2404	298.5
13:01:46	2397	300.7
13:02:16	2394	302.9
13:02:46	2396	305.1
13:03:16	2406	307.3
13:03:47	2397	309.6
13:04:17	2399	311.8
13:04:47	2404	313.9
13:05:17	2396	316.2

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
13:05:47	2397	318.3
13:06:17	2403	320.6
13:06:47	2408	322.8
13:07:17	2408	325
13:07:47	2394	327.2
13:08:17	2408	329.4
13:08:47	2399	331.6
13:09:17	2406	333.8
13:09:47	2410	336
13:10:17	2398	338.2
13:10:47	2410	340.4
13:11:17	2411	342.6
13:11:47	2411	344.8
13:12:17	2408	347
13:12:47	2403	349.2
13:13:15	2439	351.3
13:13:17	2457	351.5
13:13:47	2531	354.1
13:14:17	2533	356.7
13:14:47	2532	359.2
13:15:18	2532	361.9
13:15:48	2534	364.4
13:16:18	2536	367
13:16:48	2534	369.6
13:17:18	2535	372.2
13:17:48	2536	374.7
13:18:18	2535	377.3
13:18:48	2540	379.9
13:19:18	2533	382.4
13:19:48	2538	385
13:20:18	2531	387.6
13:20:48	2538	390.2
13:21:18	2541	392.7
13:21:48	2541	395.3
13:22:18	2544	397.9
13:22:48	2539	400.5
13:23:18	2539	403
13:23:48	2537	405.6
13:24:18	2540	408.2
13:24:48	2542	410.7
13:25:18	2541	413.3
13:25:48	2541	415.9
13:26:18	2538	418.4
13:26:49	2542	421.1

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
13:27:19	2538	423.7
13:27:49	2547	426.2
13:28:18	2651	428.9
13:28:19	2655	429
13:28:49	2654	431.9
13:29:19	2656	434.7
13:29:49	2649	437.6
13:30:19	2652	440.4
13:30:49	2652	443.3
13:31:19	2656	446.1
13:31:49	2653	449
13:32:19	2652	451.8
13:32:49	2654	454.7
13:33:19	2655	457.5
13:33:49	2657	460.4
13:34:19	2651	463.2
13:34:49	2660	466.1
13:35:19	2657	468.9
13:35:49	2655	471.8
13:36:19	2655	474.6
13:36:49	2655	477.4
13:37:19	2657	480.3
13:37:49	2660	483.1
13:38:20	2658	486.1
13:38:50	2662	488.9
13:39:20	2658	491.7
13:39:50	2659	494.6
13:40:20	2663	497.4
13:40:50	2669	500.2
13:41:20	2661	503.1
13:41:50	2669	505.9
13:42:20	2670	508.8
13:42:50	2665	511.6
13:43:20	2670	514.5
13:43:25	2671	514.9
13:43:50	2697	517.3
13:44:20	2712	520.2
13:44:50	2706	523.2
13:45:20	2706	526.1
13:45:50	2711	529
13:46:20	2711	532
13:46:50	2710	534.9
13:47:20	2713	537.9
13:47:50	2710	540.8

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
13:48:20	2709	543.8
13:48:50	2717	546.7
13:49:20	2719	549.7
13:49:51	2718	552.7
13:50:21	2712	555.6
13:50:51	2719	558.6
13:51:21	2717	561.5
13:51:51	2718	564.5
13:52:21	2714	567.4
13:52:51	2712	570.3
13:53:21	2713	573.3
13:53:51	2716	576.2
13:54:21	2717	579.2
13:54:51	2722	582.1
13:55:21	2720	585
13:55:51	2715	588
13:56:21	2716	590.9
13:56:51	2720	593.9
13:57:21	2719	596.8
13:57:51	2730	599.7
(Shut-down Pump) 13:58:14	(ISIP) 2390	
13:58:14	2215	600.9
13:58:21	2119	600.9
13:58:51	2125	600.9
13:59:21	2119	600.9
13:59:51	2116	600.9
14:00:21	2113	600.9
14:00:51	2110	600.9
14:01:22	2107	600.9
14:01:52	2106	600.9
14:02:22	2103	600.9
14:02:52	2101	600.9
14:03:00	(5 min.)	
14:03:00	2101	600.9
14:03:22	2099	600.9
14:03:52	2097	600.9
14:04:22	2096	600.9
14:04:52	2094	600.9
14:05:22	2092	600.9
14:05:52	2091	600.9
14:06:22	2089	600.9
14:06:52	2088	600.9
14:07:22	2086	600.9

Table 2 : Time versus Surface Tubing Pressure

<i>Time (Tubing Pressure and Total Volume Measurements)</i>	<i>Tubing Pressure, psi</i>	<i>Total Volume Pumped, Bbls.</i>
14:07:52	2085	600.9
14:08:10	(10 min.)	
14:08:10	2084	600.9
14:08:22	2084	600.9
14:08:52	2082	600.9
14:09:22	2081	600.9
14:09:52	2080	600.9
14:10:22	2078	600.9
14:10:52	2077	600.9
14:11:22	2076	600.9
14:11:52	2075	600.9
14:12:23	2074	600.9
14:12:53	2073	600.9
14:12:53	15 minutes	
14:13:01	2129	
14:13:01	2072	600.9
14:13:07	Shut-in Well	
14:13:07	2072	600.9
14:13:23	2072	600.9
14:13:53	2071	600.9
14:14:23	-79	600.9
14:14:53	-6	600.9
14:15:21	Bleed Off Pressure	
14:15:21	-6	600.9

