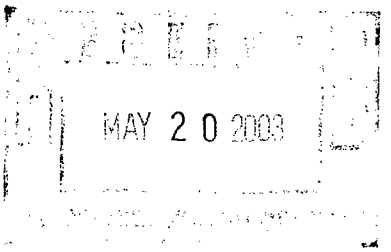
pKRV0314047335 IPI NA WJ

ChevronTexaco

May 13, 2003

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



Attn: Mr. David Catanach

RE: Injection Pressure Increase
North Vacuum Abo West Unit Well #15H
Unit Letter D, Section 27, Township 17-S, Range 34-E
Lea County, New Mexico

Dear Mr. Catanach,

ChevronTexaco is requesting permission to increase the surface injection pressure on North Vacuum Abo West Unit Well #15H (API No. 30-025-23905) from 1700 psig to 3700 psig. The surface location of this well is 660' from the North line and 660' from the West line of Section 27, Unit Letter D, Township 17-S, Range 34-E, Lea County, New Mexico. The well location is shown on the two surface maps attached.

In June 1997, the New Mexico OCD granted approval to increase the surface injection pressure on 13 vertical injection wells, based on step rate tests conducted between March 4 and 26, 1997. The approval letter is also attached. The maximum surface injection pressures for 12 of the 13 wells are above 4000 psig. The remaining well has a max pressure limit of 3870 psig.

Well #15H has two horizontal legs, one to the southwest and one to the northeast. In the past three step rate tests, ChevronTexaco has been unsuccessful in reaching parting pressure. The pumps have not been able to handle the high volumes of injection at the required pressures. In the most recent test, conducted November 4, 2002, the surface injection pressure was increased to 3721 psig at an injection rate of 3225 BWPD before the pumps failed. Parting pressure was never reached. The step rate test is attached.

The last attachment is a cross-section from the southwest to the northeast of water injection wells #17, #15H, and #12. As you can see, the vertical wells are perforated in the same zone through which the two horizontal legs of 15H penetrate. Knowing that the maximum surface injection pressures for #12 and #17 are above 4000 psig, along with the step rate data described above, ChevronTexaco is confident that Well #15H will be below parting pressure at a surface pressure of 3700 psig.

Currently, NVAWU #15H is shut-in. Water injector #17 communicates with #15H, and ChevronTexaco is limited to the 1700 psig surface pressure ruling. We would like

permission to increase from 1700 psig to 3700 psig. Alternatively, with permission, we could pressure Well #15H up to approximately 3000 psig using Well #17, and stand a better chance of obtaining a step rate test.

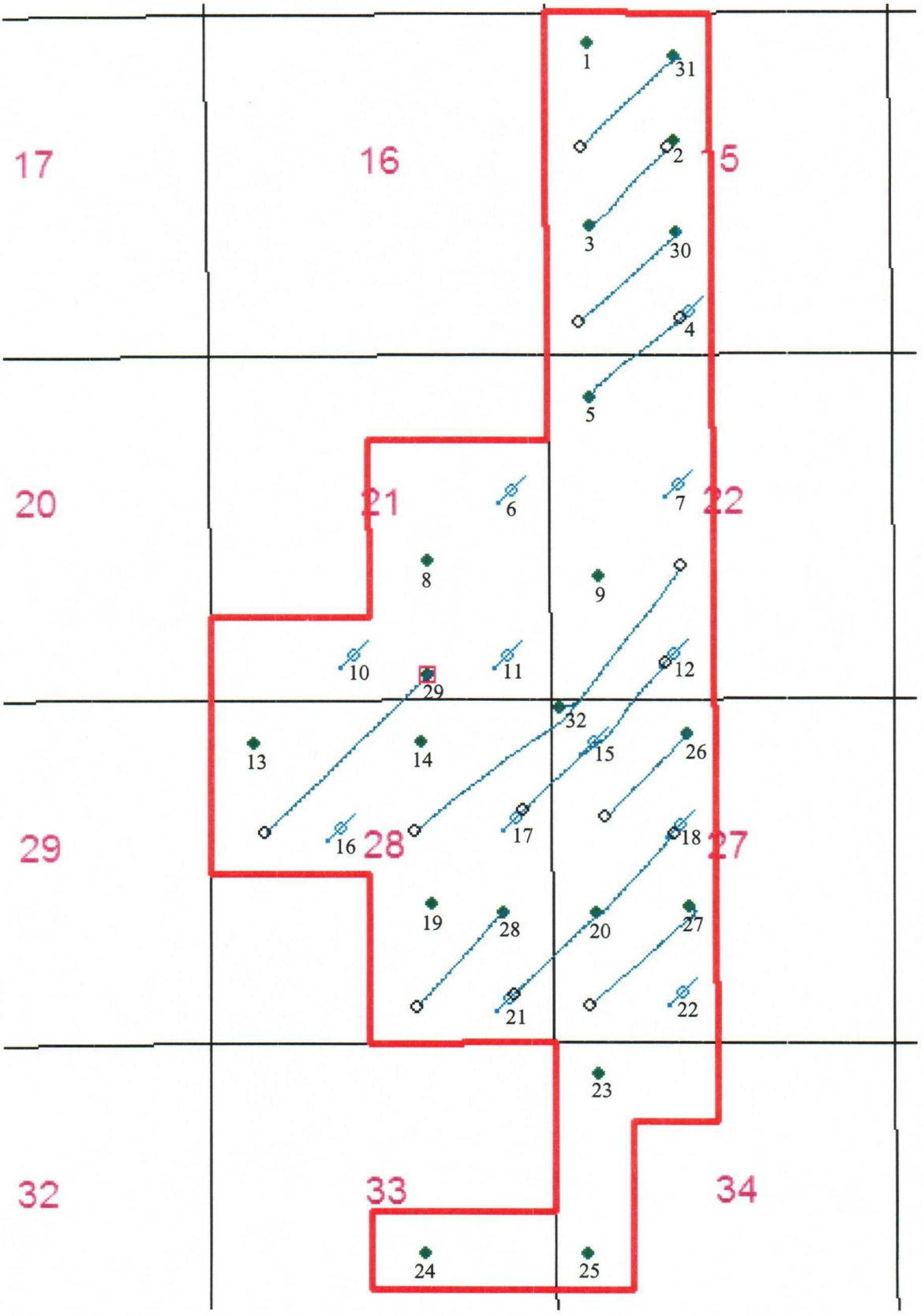
Please review this information and contact me with any questions or concerns. ChevronTexaco would be happy to discuss other options or alternatives that we may have. Thank you.

Sincerely,

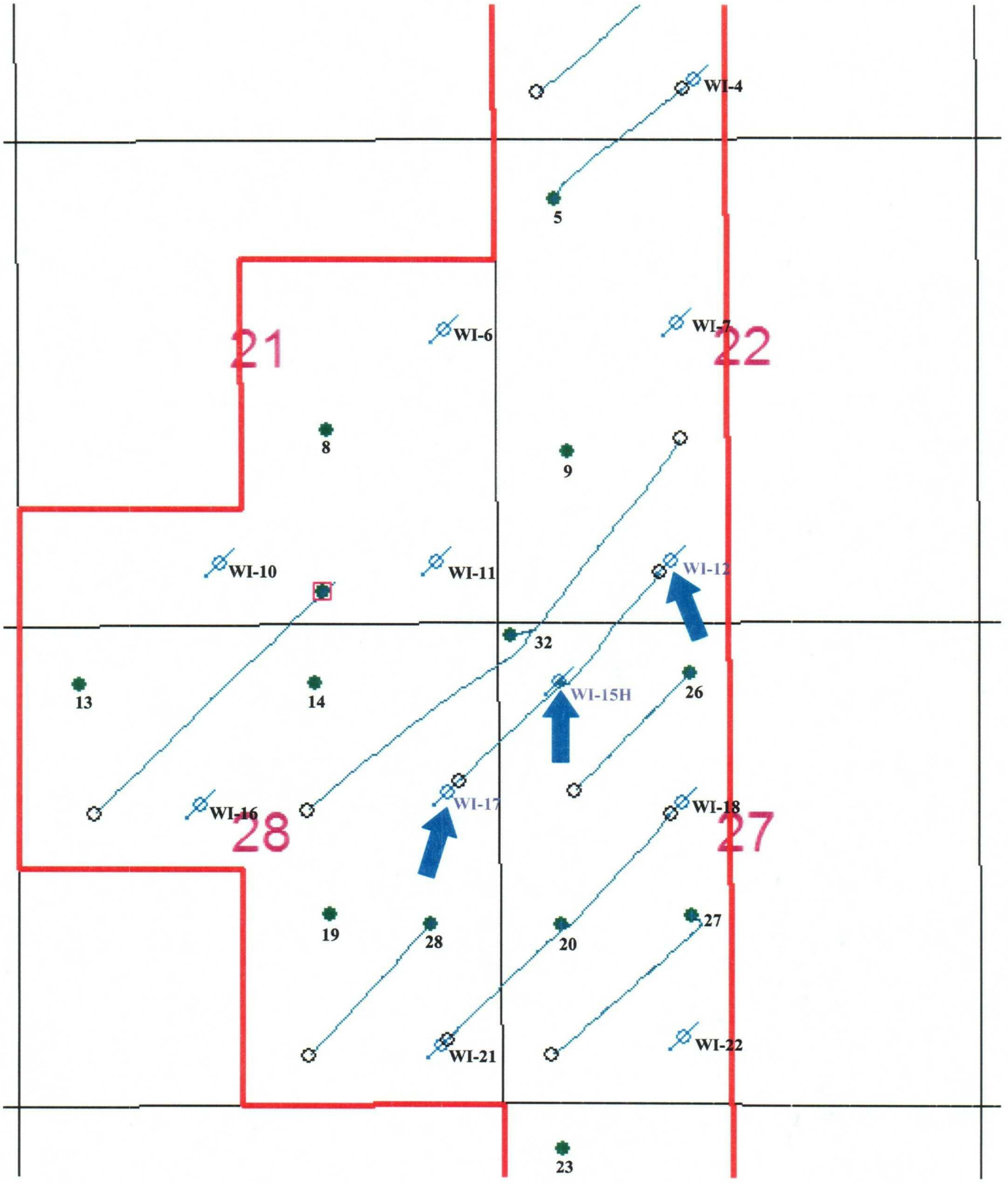
Garrett Luig
Petroleum Engineer
ChevronTexaco

15 Smith Road
Midland, TX 79705
Tel. (915) 687-7298
Fax (915) 687-7871

NORTH VACUUM ABO WEST UNIT



NORTH VACUUM ABO WEST UNIT



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

June 6, 1997

Texaco Exploration & Production, Inc.
P.O. Box 730
Hobbs, New Mexico 88241-0730

Attn: Mr. Robert McNaughton

RE: Injection Pressure Increase,
North Vacuum Abo West Waterflood Unit,
Lea County, New Mexico

Dear Mr. McNaughton:

Reference is made to your request dated March 31, 1997 to increase the surface injection pressure on 13 wells in the above referenced project. This request is based on step rate tests conducted on these wells between March 4 and 26, 1997. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure all of the wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

Well and Location	*Maximum Surface Injection Pressure*
North Vacuum Abo West Unit Well No.2 Unit Letter F, Section 15, Township 15 South, Range 34 East	4075 PSIG
North Vacuum Abo West Unit Well No.4 Unit Letter N, Section 15, Township 15 South, Range 34 East	4300 PSIG
North Vacuum Abo West Unit Well No.6 Unit Letter H, Section 21, Township 15 South, Range 34 East	4300 PSIG
North Vacuum Abo West Unit Well No.7 Unit Letter F, Section 22, Township 15 South, Range 34 East	4250 PSIG
North Vacuum Abo West Unit Well No.10 Unit Letter N, Section 21, Township 15 South, Range 34 East	4500 PSIG
North Vacuum Abo West Unit Well No.11 Unit Letter P, Section 21, Township 15 South, Range 34 East	4385 PSIG

Well and Location	Maximum Surface Injection Pressure
North Vacuum Abo West Unit Well No.12 Unit Letter N, Section 22, Township 15 South, Range 34 East	4275 PSIG
North Vacuum Abo West Unit Well No.16 Unit Letter F, Section 28, Township 15 South, Range 34 East	4165 PSIG
North Vacuum Abo West Unit Well No.17 Unit Letter H, Section 28, Township 15 South, Range 34 East	4135 PSIG
North Vacuum Abo West Unit Well No.18 Unit Letter F, Section 27, Township 15 South, Range 34 East	4285 PSIG
North Vacuum Abo West Unit Well No.21 Unit Letter P, Section 28, Township 15 South, Range 34 East	4100 PSIG
North Vacuum Abo West Unit Well No.22 Unit Letter N, Section 27, Township 15 South, Range 34 East	4110 PSIG
North Vacuum Abo West Unit Well No.25 Unit Letter L, Section 34, Township 18 South, Range 34 East	3870 PSIG

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

William J. LeMay
Director

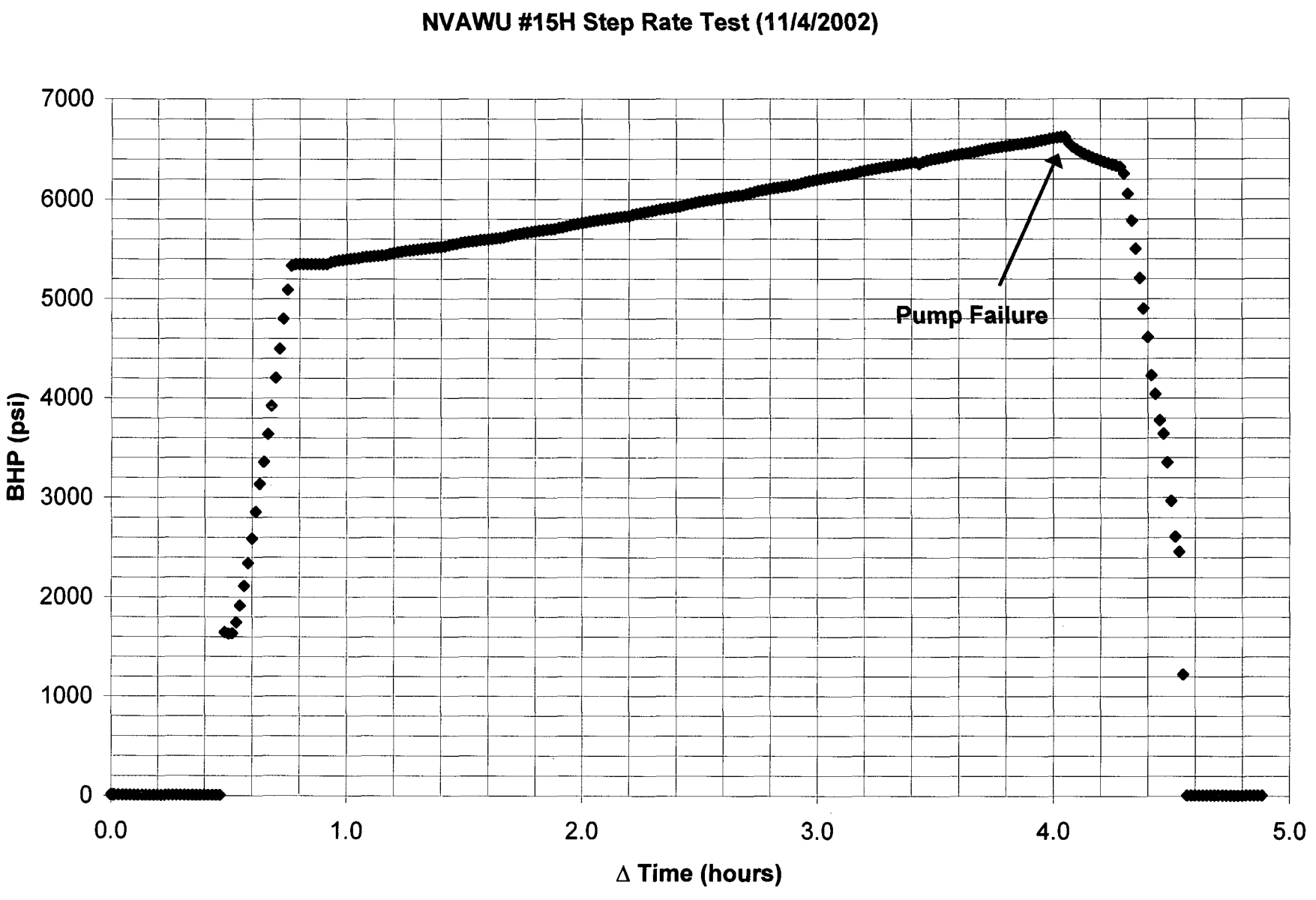
WJL/BES

cc: Oil Conservation Division - Hobbs
Files: 3rd Q97 PSI-X; Case File No.7400

Gray Wireline Service, INC.

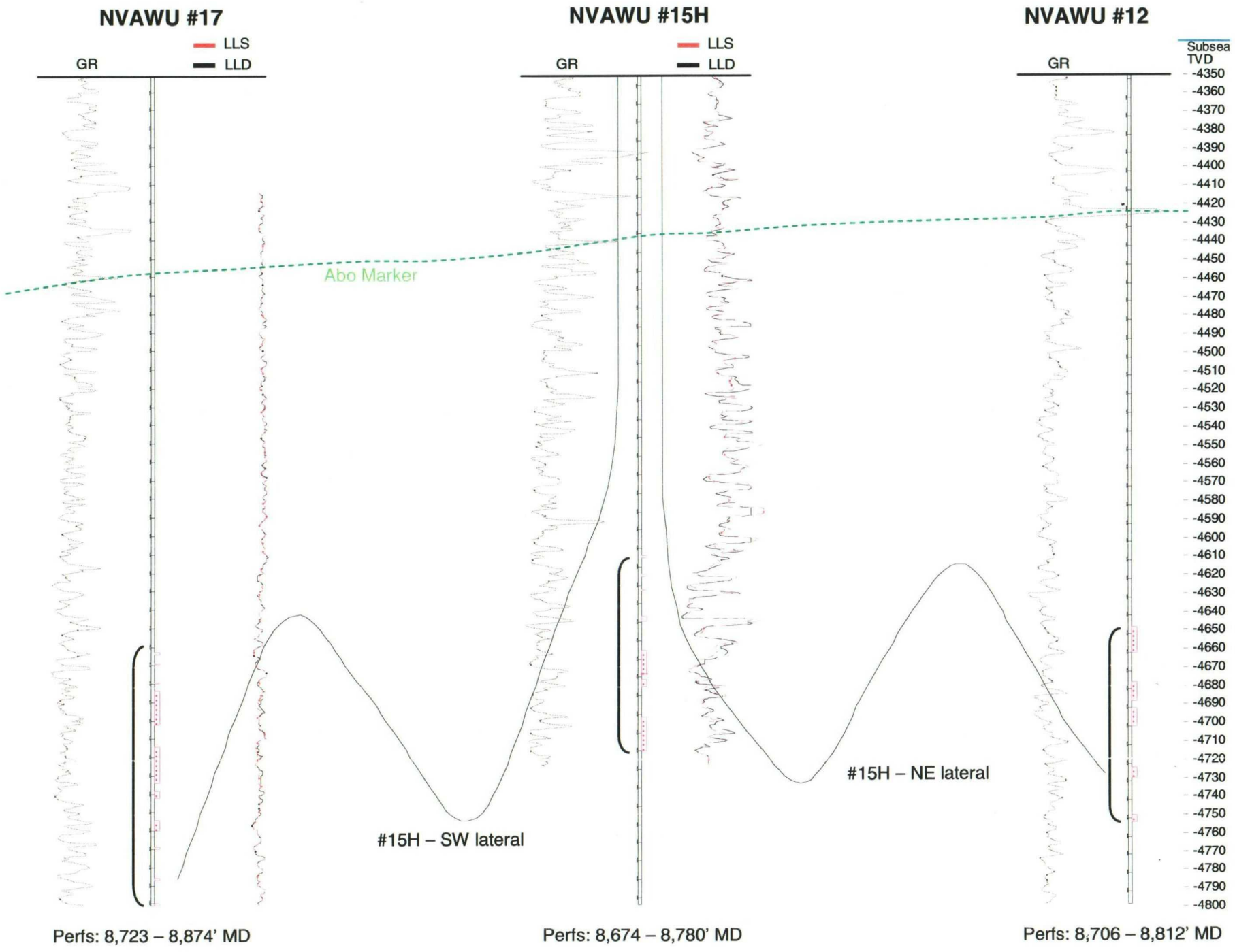
Company: CHEVRON-TEXACO
Well: NVAWU #15H
Test: 15 Minute Steps (Step Rate)
Date Run: November 4, 2002
Tubing: 2 3/8" Duoline
BHP Depth: 8,550'
Current Rate and Pressure: 0 @ 1,627 PSI

TIME	Delta T	RATE	S PRESS	FRICTION	C PRESS	BHP
10:50	0	475	1720	17	1703	5440
11:05	15	725	1833	38	1795	5528
11:20	30	975	1961	68	1893	5618
11:35	45	1225	2132	103	2029	5717
11:50	60	1475	2317	146	2171	5823
12:05	75	1725	2461	195	2266	5928
12:20	90	1975	2654	252	2402	6038
12:35	105	2225	2847	311	2536	6147
12:50	120	2475	3077	381	2696	6260
1:05	135	2725	3293	452	2841	6368
1:20	150	2975	3500	532	2968	6468
1:35	175	3225	3721	616	3105	6570


NVAWU #15H Step Rate Test (11/4/2002)
7000
6000
5000
4000
3000
2000
1000
0
BHP (psi)
0.0
1.0
2.0
3.0
4.0
5.0
Δ Time (hours)
Pump Failure

Time	Δ Time	BHP	Temp	Time	Δ Time	BHP	Temp	Time	Δ Time	BHP	Temp
9:40:00	0.000000	9.627	54.624	11:11:58	1.532778	5579.820	122.858	12:53:58	3.232778	6297.047	98.788
9:40:05	0.001389	9.309	54.563	11:12:58	1.549444	5584.639	122.607	12:54:58	3.249444	6303.326	98.507
9:40:10	0.002778	9.280	54.481	11:13:58	1.566111	5590.481	122.373	12:55:58	3.266111	6310.540	98.244
9:40:15	0.004167	9.235	54.390	11:14:58	1.582778	5594.671	122.154	12:56:58	3.282778	6318.002	98.018
9:40:20	0.005556	9.227	54.299	11:15:58	1.599444	5599.488	121.952	12:57:58	3.299444	6323.866	97.812
9:40:25	0.006944	9.163	54.214	11:16:58	1.616111	5603.768	121.759	12:58:58	3.316111	6330.896	97.617
9:40:30	0.008333	9.124	54.135	11:17:58	1.632778	5609.033	121.584	12:59:58	3.332778	6338.024	97.440
9:40:35	0.009722	9.129	54.068	11:18:58	1.649444	5613.200	121.415	13:00:58	3.349444	6343.592	97.274
9:40:40	0.011111	9.097	54.007	11:19:58	1.666111	5617.959	121.259	13:01:58	3.366111	6349.728	97.110
9:40:45	0.012500	9.119	53.946	11:20:58	1.682778	5629.997	121.073	13:02:58	3.382778	6356.649	96.971
9:40:50	0.013889	9.076	53.889	11:21:58	1.699444	5639.429	120.865	13:03:58	3.399444	6361.916	96.841
9:40:55	0.015278	9.060	53.833	11:22:58	1.716111	5647.223	120.668	13:04:58	3.416111	6367.625	96.717
9:41:58	0.032778	8.893	52.982	11:23:58	1.732778	5654.853	120.434	13:05:58	3.432778	6349.864	96.612
9:42:58	0.049444	8.792	52.291	11:24:58	1.749444	5661.477	120.150	13:06:58	3.449444	6372.858	96.632
9:43:58	0.066111	8.676	51.633	11:25:58	1.766111	5668.067	119.850	13:07:58	3.466111	6384.682	96.832
9:44:58	0.082778	8.568	51.235	11:26:58	1.782778	5674.092	119.558	13:08:58	3.482778	6394.125	96.621
9:45:58	0.099444	8.504	50.895	11:27:58	1.799444	5680.291	119.292	13:09:58	3.499444	6402.272	96.283
9:46:58	0.116111	8.430	50.595	11:28:58	1.816111	5685.933	119.093	13:10:58	3.516111	6410.343	95.964
9:47:58	0.132778	8.388	50.362	11:29:58	1.832778	5691.015	118.926	13:11:58	3.532778	6417.162	95.658
9:48:58	0.149444	8.304	50.068	11:30:58	1.849444	5696.500	118.703	13:12:58	3.549444	6424.664	95.405
9:49:58	0.166111	8.276	50.203	11:31:58	1.866111	5701.789	118.473	13:13:58	3.566111	6431.141	95.188
9:50:58	0.182778	8.244	50.097	11:32:58	1.882778	5707.167	118.251	13:14:58	3.582778	6437.601	95.003
9:51:58	0.199444	8.182	49.784	11:33:58	1.899444	5712.220	118.068	13:15:58	3.599444	6444.108	94.842
9:52:58	0.216111	8.147	49.478	11:34:58	1.916111	5717.316	117.891	13:16:58	3.616111	6449.657	94.689
9:53:58	0.232778	8.136	49.185	11:35:58	1.932778	5730.391	117.692	13:17:58	3.632778	6456.351	94.544
9:54:58	0.249444	8.040	48.906	11:36:58	1.949444	5739.677	117.480	13:18:58	3.649444	6462.166	94.413
9:55:58	0.266111	8.058	48.651	11:37:58	1.966111	5748.386	117.250	13:19:58	3.666111	6467.773	94.293
9:56:58	0.282778	8.000	48.409	11:38:58	1.982778	5755.692	116.952	13:20:58	3.682778	6479.033	94.187
9:57:58	0.299444	7.977	48.258	11:39:58	1.999444	5763.178	116.623	13:21:58	3.699444	6487.710	93.990
9:58:58	0.316111	8.116	48.123	11:40:58	2.016111	5769.999	116.305	13:22:58	3.716111	6495.829	93.720
9:59:58	0.332778	8.052	47.994	11:41:58	2.032778	5776.682	116.011	13:23:58	3.732778	6503.143	93.461
10:00:58	0.349444	8.015	47.868	11:42:58	2.049444	5783.052	115.738	13:24:58	3.749444	6510.304	93.228
10:01:58	0.366111	7.987	47.742	11:43:58	2.066111	5789.193	115.480	13:25:58	3.766111	6517.137	93.029
10:02:58	0.382778	7.958	47.620	11:44:58	2.082778	5795.507	115.239	13:26:58	3.782778	6523.845	92.849
10:03:58	0.399444	7.928	47.502	11:45:58	2.099444	5801.227	115.014	13:27:58	3.799444	6529.968	92.789
10:04:58	0.416111	8.118	47.384	11:46:58	2.116111	5807.053	114.806	13:28:58	3.816111	6536.040	92.640
10:05:58	0.432778	8.315	47.270	11:47:58	2.132778	5812.130	114.614	13:29:58	3.832778	6542.068	92.516
10:06:58	0.449444	8.366	47.158	11:48:58	2.149444	5817.646	114.424	13:30:58	3.849444	6547.864	92.391
10:07:58	0.466111	8.453	47.048	11:49:58	2.166111	5822.965	114.247	13:31:58	3.866111	6553.463	92.289
10:08:58	0.482778	1645.742	44.854	11:50:58	2.182778	5828.092	114.075	13:32:58	3.882778	6558.977	92.177
10:09:58	0.499444	1629.871	44.357	11:51:58	2.199444	5831.564	113.928	13:33:58	3.899444	6564.491	92.081
10:10:58	0.516111	1632.946	54.331	11:52:58	2.216111	5844.938	113.722	13:34:58	3.916111	6569.979	91.990
10:11:58	0.532778	1745.898	66.073	11:53:58	2.232778	5854.603	113.513	13:35:58	3.932778	6580.219	91.854
10:12:58	0.549444	1914.820	71.960	11:54:58	2.249444	5862.951	113.293	13:36:58	3.949444	6587.893	91.685
10:13:58	0.566111	2113.000	78.218	11:55:58	2.266111	5870.001	112.970	13:37:58	3.966111	6594.960	91.528
10:14:58	0.582778	2341.482	83.959	11:56:58	2.282778	5877.923	112.639	13:38:58	3.982778	6601.622	91.322
10:15:58	0.599444	2588.691	87.463	11:57:58	2.299444	5885.127	112.315	13:39:58	3.999444	6608.115	91.149
10:16:58	0.616111	2855.650	90.819	11:58:58	2.316111	5891.276	112.017	13:40:58	4.016111	6614.282	90.991
10:17:58	0.632778	3136.114	94.779	11:59:58	2.332778	5897.656	111.739	13:41:58	4.032778	6620.253	90.854
10:18:58	0.649444	3355.998	98.316	12:00:58	2.349444	5904.407	111.480	13:42:58	4.049444	6620.734	90.728
10:19:58	0.666111	3638.737	101.929	12:01:58	2.366111	5910.528	111.241	13:43:58	4.066111	6557.706	90.767
10:20:58	0.682778	3921.257	106.114	12:02:58	2.382778	5915.995	111.012	13:44:58	4.082778	6522.224	90.942
10:21:58	0.699444	4203.565	110.150	12:03:58	2.399444	5922.167	110.804	13:45:58	4.099444	6493.952	91.214
10:22:58	0.716111	4496.824	115.334	12:04:58	2.416111	5928.019	110.606	13:46:58	4.116111	6469.800	91.496
10:23:58	0.732778	4799.668	119.757	12:05:58	2.432778	5940.079	110.388	13:47:58	4.132778	6449.206	91.770
10:24:58	0.749444	5091.228	124.405	12:06:58	2.449444	5949.711	110.151	13:48:58	4.149444	6432.229	92.190
10:25:58	0.766111	5331.605	128.845	12:07:58	2.466111	5958.433	109.858	13:49:58	4.166111	6414.175	92.422
10:26:58	0.782778	5350.094	129.885	12:08:58	2.482778	5966.489	109.503	13:50:58	4.182778	6400.275	92.816
10:27:58	0.799444	5350.065	129.933	12:09:58	2.499444	5974.058	109.149	13:51:58	4.199444	6384.590	93.043
10:28:58	0.816111	5350.153	129.959	12:10:58	2.516111	5981.171	108.828	13:52:58	4.216111	6370.287	93.292
10:29:58	0.832778	5350.192	129.977	12:11:58	2.532778	5988.304	108.523	13:53:58	4.232778	6356.950	93.581
10:30:58	0.849444	5350.188	129.996	12:12:58	2.549444	5995.150	108.248	13:54:58	4.249444	6344.443	93.881
10:31:58	0.866111	5350.191	130.026	12:13:58	2.566111	6001.470	107.992	13:55:58	4.266111	6332.551	94.187
10:32:58	0.882778	5350.135	130.056	12:14:58	2.582778	6008.075	107.751	13:56:58	4.282778	6321.262	94.464
10:33:58	0.899444	5350.138	130.086	12:15:58	2.599444	6014.475	107.538	13:57:58	4.299444	6255.785	98.477
10:34:58	0.916111	5350.400	130.109	12:16:58	2.616111	6020.529	107.332	13:58:58	4.316111	6054.495	102.960
10:35:58	0.932778	5368.467	130.157	12:17:58	2.632778	6026.286	107.133	13:59:58	4.332778	5787.521	99.907
10:36:58	0.949444	5378.193	130.151	12:18:58	2.649444	6032.153	106.956	14:00:58	4.349444	5506.691	96.903
10:37:58	0.966111	5385.685	130.120	12:19:58	2.666111	6038.272	106.767	14:01:58	4.366111	5211.738	93.082
10:38:58	0.982778	5392.001	130.083	12:20:58	2.682778	6039.508	106.566	14:02:58	4.382778	4905.842	89.585
10:39:58	0.999444	5398.107	130.036	12:21:58	2.699444	6053.480	106.409	14:03:58	4.399444	4614.027	86.822
10:40:58	1.016111	5403.887	129.985	12:22:58	2.716111	6063.890	106.273	14:04:58	4.416111	4229.754	82.305
10:41:58	1.032778	5408.765	129.934	12:23:58	2.732778	6072.749	106.003	14:05:58	4.432778	4041.307	80.178

10:42:58	1.049444	5413.274	129.845
10:43:58	1.066111	5418.079	129.690
10:44:58	1.082778	5421.844	129.479
10:45:58	1.099444	5425.783	129.246
10:46:58	1.116111	5429.470	128.985
10:47:58	1.132778	5433.550	128.736
10:48:58	1.149444	5436.475	128.525
10:49:58	1.166111	5440.049	128.278
10:50:58	1.182778	5452.383	127.969
10:51:58	1.199444	5460.859	127.651
10:52:58	1.216111	5468.185	127.348
10:53:58	1.232778	5474.673	127.066
10:54:58	1.249444	5481.104	126.816
10:55:58	1.266111	5486.231	126.558
10:56:58	1.282778	5492.125	126.278
10:57:58	1.299444	5496.677	125.999
10:58:58	1.316111	5501.643	125.731
10:59:58	1.332778	5506.674	125.484
11:00:58	1.349444	5510.879	125.243
11:01:58	1.366111	5515.594	125.027
11:02:58	1.382778	5519.327	124.825
11:03:58	1.399444	5523.990	124.627
11:04:58	1.416111	5528.122	124.460
11:05:58	1.432778	5539.671	124.245
11:06:58	1.449444	5548.563	124.034
11:07:58	1.466111	5555.401	123.825
11:08:58	1.482778	5561.354	123.634
11:09:58	1.499444	5568.049	123.388
11:10:58	1.516111	5573.678	123.128
12:24:58	2.749444	6080.964	105.656
12:25:58	2.766111	6088.889	105.321
12:26:58	2.782778	6095.987	105.003
12:27:58	2.799444	6103.554	104.725
12:28:58	2.816111	6110.278	104.463
12:29:58	2.832778	6117.046	104.228
12:30:58	2.849444	6123.498	104.015
12:31:58	2.866111	6129.490	103.807
12:32:58	2.882778	6135.886	103.619
12:33:58	2.899444	6141.659	103.444
12:34:58	2.916111	6147.719	103.270
12:35:58	2.932778	6160.499	103.029
12:36:58	2.949444	6170.388	102.785
12:37:58	2.966111	6179.234	102.455
12:38:58	2.982778	6187.506	102.172
12:39:58	2.999444	6195.329	101.924
12:40:58	3.016111	6202.600	101.651
12:41:58	3.032778	6209.539	101.393
12:42:58	3.049444	6216.389	101.159
12:43:58	3.066111	6223.042	100.936
12:44:58	3.082778	6229.646	100.735
12:45:58	3.099444	6235.844	100.549
12:46:58	3.116111	6242.010	100.370
12:47:58	3.132778	6248.389	100.201
12:48:58	3.149444	6254.727	100.039
12:49:58	3.166111	6260.453	99.879
12:50:58	3.182778	6273.902	99.690
12:51:58	3.199444	6282.497	99.438
12:52:58	3.216111	6289.924	99.109
14:06:58	4.449444	3775.990	78.300
14:07:58	4.466111	3642.462	75.719
14:08:58	4.482778	3354.090	73.566
14:09:58	4.499444	2968.386	71.014
14:10:58	4.516111	2612.187	66.629
14:11:58	4.532778	2461.029	63.844
14:12:58	4.549444	1223.275	60.333
14:13:58	4.566111	9.490	59.452
14:14:58	4.582778	9.467	59.429
14:15:58	4.599444	9.421	59.386
14:16:58	4.616111	9.429	59.305
14:17:58	4.632778	9.378	59.197
14:18:58	4.649444	9.423	59.075
14:19:58	4.666111	9.360	58.937
14:20:58	4.682778	9.320	58.778
14:21:58	4.699444	9.317	58.617
14:22:58	4.716111	9.320	58.474
14:23:58	4.732778	9.280	58.059
14:24:58	4.749444	9.239	57.689
14:25:58	4.766111	9.192	57.394
14:26:58	4.782778	9.412	57.143
14:27:58	4.799444	9.216	56.635
14:28:58	4.816111	9.393	55.980
14:29:58	4.832778	9.122	55.783
14:30:58	4.849444	9.139	55.401
14:31:58	4.866111	9.115	55.425
14:32:58	4.882778	9.100	55.540


NVAWU #17
LLS
LLD
GR
NVAWU #15H
LLS
LLD
GR
NVAWU #12
GR
Subsea TVD
-4350
-4360
-4370
-4380
-4390
-4400
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Abo Marker
#15H – SW lateral
#15H – NE lateral
Perfs: 8,723 – 8,874' MD
Perfs: 8,674 – 8,780' MD
Perfs: 8,706 – 8,812' MD