Colorado Oil and Gas Conservation Commission

Monitor Wells Summary Report August 2009

3M Project Monitoring Program La Plata County, Colorado

Prepared By
Colorado Oil and Gas Conservation Commission
NORWEST Corporation
Denver, Colorado

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1.0 INTRODUCTION

The 3M Project Monitoring Program in La Plata County, Colorado was initiated by the Colorado Oil and Gas Conservation Commission (COGCC) in January 2001. This report describes the results of wellhead and bottomhole pressure monitoring at four monitoring well sites through June 25, 2009. The monitoring work was carried out by staff of the COGCC and Norwest Applied Hydrology (Norwest) on behalf of the COGCC. Figure 1 shows the location of the four monitoring well sites. Table 1 identifies the monitoring wells, locations, and the depths of completion at the four monitoring well sites. Table 2 lists the depth and type of pressures transducers used in each monitoring well. Table 3 provides a chronology of monitoring well installation, operation and maintenance activities from January 2001 through July 17, 2009.

2.0 MONITORING ACTIVITIES AND DATA SUMMARY

2.1 MONITORING ACTIVITIES – FIRST HALF 2009

Monitoring site activities performed during this reporting period included continuation of automated well pressure data collection program by Hermit 3000 Data Loggers, inspection of each monitor well site, extraction of recorded logger data and removal of Hermit 3000 Data Logger systems on June 25, 2009, and installation of Level Troll Data Loggers on June 29 and 30 and July 17, 2009.

2.2 MONITOR WELL PRESSURE DATA SUMMARY

Well pressure was measured and recorded twice daily (12-hour interval) by Hermit 3000 Data Loggers through June 25, 2009. There were no data records missed or lost at any of the sites during this reporting period.

Applicable well pressure and calculated water level data for the entire period of record for each monitoring well are plotted in annotated charts. The water level in a well is calculated using the depth of the lower transducer and the difference in pressure between upper and lower transducers. This calculation is applicable at sites where the water level in a well is above the lower pressure transducer and below the upper pressure transducer.

Well pressure data analysis and interpretation by site and monitor well for the entire period of record are summarized below. Well pressure measurements recorded by the data logger at each monitor well site are available to all interested parties upon request.

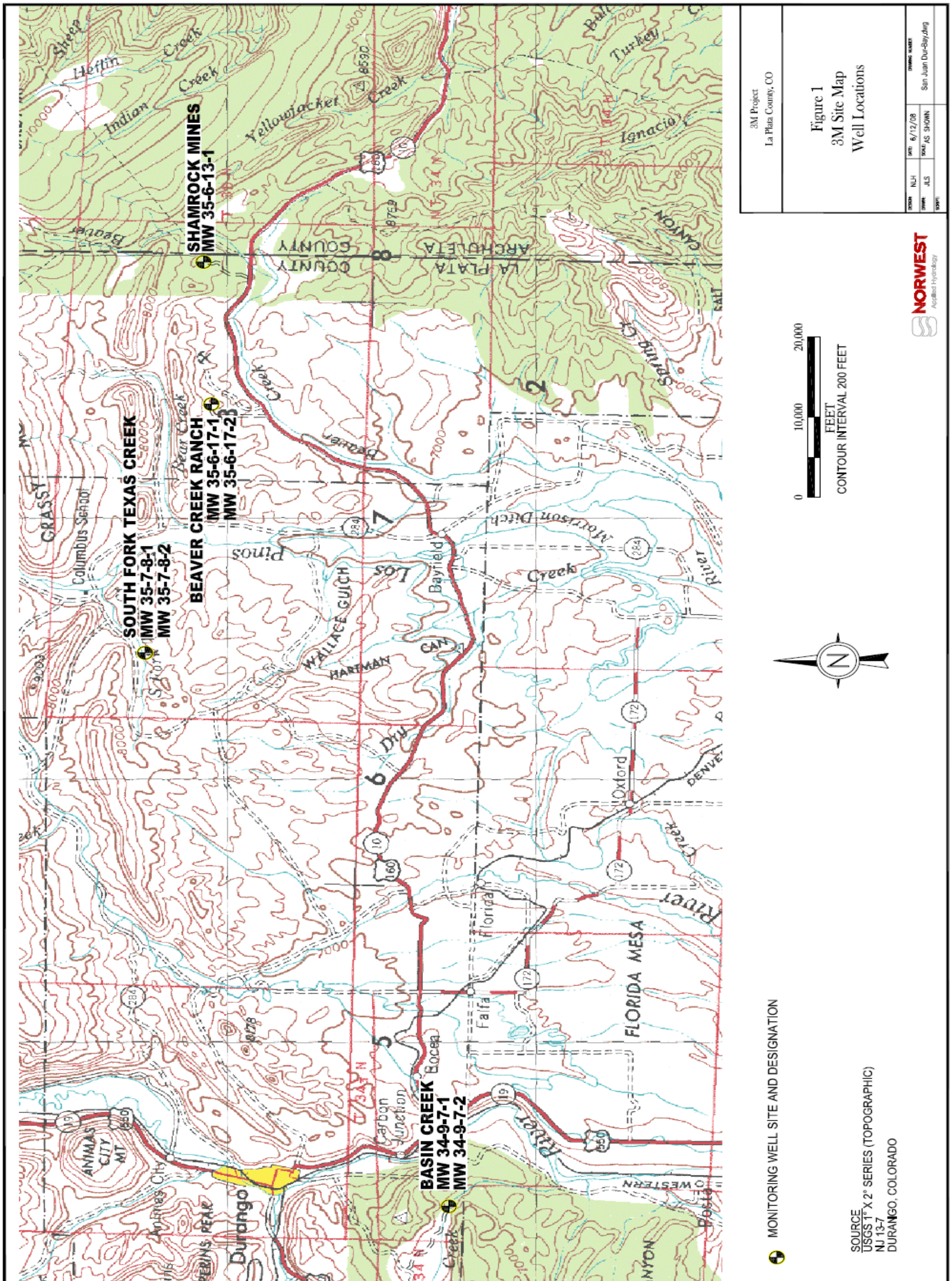

SHAMROCK MINES
MW 35-6-13-1
SOUTH FORK TEXAS CREEK
MW 35-7-8-1
MW 35-7-8-2
BEAVER CREEK RANCH
MW 35-6-17-1
MW 35-6-17-2
BASIN CREEK
MW 34-9-7-1
MW 34-9-7-2
MONITORING WELL SITE AND DESIGNATION
SOURCE
USGS 1° X 2° SERIES (TOPOGRAPHIC)
NJ 13-7
DURANGO, COLORADO
0
10,000
20,000
FEET
CONTOUR INTERVAL 200 FEET
3M Project
La Plata County, CO
Figure 1
3M Site Map
Well Locations
NORWEST
Applied Hydrology
Durango
Bayfield
Florida Mesa
Oxford

Table 1
3M Project Monitor Well Completion Summary

Location	Well ID	Construction Completion Date	Drilled Depth (fbgs)	Cored Intervals (fbgs)	Casing Depth (fbgs)	Casing Stickup (fags)	Well Casing Material	Perforated Interval in Coal seam(s) (fbgs)	Log Type	Logged Depth (fbgs)	Log Date
Basin Creek	MW 34-9-7-1	01/28/01	820		802	1	2 ", Schedule 40 galvanized steel pipe	578 - 609	gamma ray, bulk density, caliper, resistance	819	01/27/01
									64" normal resistivity, 16" normal resistivity, sp	822	01/27/01
									temperature, differential temperature	822	01/27/01
									gamma ray, casing collar locator	763	09/27/01
	MW 34-9-7-2	04/25/02	570	359 - 374 * 498 - 513 578 - 593	561	1.5	2.875" & 2.375", Oilfield steel tubing	496 - 526	gamma ray, casing collar locator	550	05/02/02
South Fork Texas Creek	MW 35-7-8-1	09/20/01	486		463	1.6	2 ", Schedule 40 galvanized steel pipe	403 - 416	gamma ray, bulk density, caliper, resistance	485	09/19/01
									64" normal resistivity, 16" normal resistivity, sp	485	09/19/01
									temperature, differential temperature	485	09/19/01
									gamma ray, casing collar locator	462	09/27/01
	MW 35-7-8-2	09/21/01	420	410 - 425	425	1.6	2", Schedule 40 galvanized steel pipe	235 - 241 254 - 258 264 - 274	gamma ray, casing collar locator	420	09/27/01
Beaver Creek Ranch	MW 35-6-17-1	04/04/02	1,645	1,457 - 1,467 1,564 - 1,572	1,631	1.5	2.875", Oilfield steel tubing	1,572 - 1,576 1,582 - 1,584	64" normal resistivity, 16" normal resistivity, sp	1,645	04/03/02
									temperature, differential temperature	1,640	04/03/02
									gamma ray, bulk density, caliper, resistance	1,643	04/03/02
									gamma ray, casing collar locator	1,618	05/02/02
	MW 35-6-17-2	10/04/01	1,550		1,500	2	2", Schedule 40 galvanized steel pipe	1,437 - 1,449 1,458 - 1,472	gamma ray, neutron	1,499	10/10/01
									temperature, 4Pi density	1,493	11/14/01
									signal amplitude, travel time \ D T, VDL	1,484	11/14/01
									gamma ray, casing collar locator	1,483	11/27/01
Shamrock Mines	MW 35-6-13-1	05/07/02	627		606	1.5	2.375", Oilfield steel tubing	507 - 511 517 - 533 539 - 562	gamma ray, bulk density, caliper, resistance	626	05/06/02
									64" normal resistivity, 16" normal resistivity, sp	626	05/06/02
									gamma ray, casing collar locator	626	05/10/02

* Cored interval from initial well drilled, plugged and abandoned in February 2001.

Table 2
3M Project Monitor Well Pressure Transducers

Location	Well ID	Upper Transducer		Lower Transducer	
		Depth (fbgs)	Type and Rating	Depth (fbgs)	Type and Rating
Basin Creek	MW 34-9-7-1	0.5	PXD-261-30 psig	570	PXD-461-500 psia
	MW 34-9-7-2	4.6[1]	PXD-461-500 psia	485	PXD-461-500 psia
South Fork Texas Creek	MW 35-7-8-1	5	PXD-261-30 psig	390	PXD-461-500 psia
	MW 35-7-8-2	4	PXD-461-500 psia	225	PXD-461-500 psia
Beaver Creek Ranch	MW 35-6-17-1	5	PXD-461-500 psia	1,565	PXD-461-1,000 psia
	MW 35-6-17-2	2.5 ftags[2]	PXD-461-1,000 psia	None[3]	PXD-461-1,000 psia
Shamrock Mines	MW 35-6-13-1	5	PXD-461-500 psia	500	PXD-461-1,000 psia

1 MW34-9-7-2 upper transducer raised from 4.6 fbgs to ground surface April 23, 2004 and to 1.65 ftags August 25, 2004; upper transducer lowered from 1.65 ftags to 4.6 fbgs June 14, 2005
2 MW 35-6-17-2 lower transducer raised from 1420 fbgs to 1415 fbgs August 22, 2003
3 MW 35-6-17-2 lower transducer removed and upper transducer raised to 2.5 ftags April 22, 2004

Table 3
3M Project Monitor Well Chronology

Location	Well	2001				2002									2003					2004
		Jan	Sept	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Oct - Nov	December	Jan	Feb - Apr	May - Jun	Aug	Oct - Dec	Jan - Mar
Basin Creek	MW 34-9-7-1	Jan. 24-28: Drill & install well	Sept. 27: Perforate well	Nov. 28: Set up telemetry unit; replace bad xds cables	Survey	Jan. 18:Tighten wellhead fittings; rewire telemetry sys	Replace telemetry 12v battery sys, In-Situ assist							Lost telemetry communitcation with data logger	Jan 20: New well 34-9-7-1 upper xd (30 psig, sn 7201); rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up	Telemetry system malfunction	May 20: Replace modem and cell phone	Aug 21: Vent both wells and tighten wellhead xd	Oct 8: Conduct rapid blowdown & shutin test	
	MW 34-9-7-2								April 24-25: Drill & install well	May 5: Perforate well May 9: Fish out cable May 22: Install xds	Survey							Aug 21: Vent both wells and tighten wellhead xd cable strain relief fittings	Oct 8: Conduct rapid blowdown & shut-in test	
South Fork Texas Creek	MW 35-7-8-1		Sept. 17-20: Drill/install well; Sept. 27: Perforate well	Nov. 29: Set up telemetry unit; replace bad xd cables	Survey	Jan. 18: Tighten wellhead fittings; rewire telemetry sys	Replace telemetry 12v battery sys, In-Situ assist			May 21: Ck for leaks				Dec. 4: Data lost through end of year due to Hermit internal battery failure; lost telemetry communitcation with data logger Dec 7: Tightened wellhead fittings	Jan 20: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up	Telemetry system malfunction;	June 16: lower xd failed		Oct 8: Well pressure buildup test	No data reported for 6/16/03 to 4/22/04 -lower xd failed
	MW 35-7-8-2		Sept. 20-21: Drill/install well Sept. 27: Perforate well	Nov. 29: Set up telemetry unit; replace bad xd cables	Survey	Jan. 18: Tighten wellhead fittings				May 21: Ck for leaks			Oct 25: Vent well; replaced strain relief fittings; shut in well				May 20: Replace modem and cell phone		Oct 8: Well pressure buildup test	Well pressure data suggest that wellhead xd cable strain relief fittings leak intermittently in winter
Beaver Creek Ranch	MW 35-6-17-1						Replace telemetry 12v battery sys, In-Situ assist	Mar. 5-Apr 4: Drill & install well		May 2: Perforate well; May 20-21: Install xds	Survey	July 10: Replace lower xd cable with unvented cable		Dec 13: Insp by Raymond Const.- no wellhead gas leak; ; logger batt @ 0% capacity; modem problem Dec. 19: Data lost through end of year due to bad data logger bkup battery	Jan 7 & Jan 21: No wellhead gas leak @ MW35-6-17-2; Jan 21: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up	Telemetry system malfunction	May 20: Replace modem and cell phone;		Oct 7 & 21: Well pressure buildup test	
	MW 35-6-17-2		Sept. 22-Oct. 4: Drill/install well	Nov. 26: Perforate well Nov. 27: Set up telemetry unit	Survey	Jan. 17 - Install new xd cables with SwageLok fittings; rewire telemetry unit			Apr 8: Pull lower xd cable; no data Apr 8 to May 20	May 21: Install unvented, heavy duty xd cable; shut in well		Gas leak @ top bushing; July 10: Vent well & ck bushing galls; July 11: shut in well	Nov. 14: Vent well; replaced valve and reseal all connections			Wellhead bushing leak	May 20: Wellhead bushing leak; wellhead assembly to be redesigned	Aug 20: New flanged wellhead assembly; xd cable leak at swagelok fitting	Oct 8 & 21: Well pressure buildup test; wellhead leaks @ pressure >570 psia;	Wellhead leaks @ pressure >570 psia
Shamrock Mines	MW 35-6-13-1									May 3-7: Drill/install well; May 10: Perforate well; May 20, 21: Install pad, telemetry & data logger systems, & xds	Survey			Lost telmetry communitcation with data logger	Jan 21: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up	Telemetry system malfunction	May 20: Replace modem and cell phone;	Aug 20: Modem pwr down; replaced 12v battery	Oct 7: Replaced 12v battery pack; Oct 8: well pressure buildup tests; Oct 21: Replaced solar panel	

Table 3, Continued
3M Project Monitor Well Chronology

Location	Well	2004		2005			2006			2007			2008			2009
		April	August	March	June	Oct - Dec	January	June -Nov	December	June	August	Nov - Dec	May	September	December	June-July
Basin Creek	MW 34-9-7-1		Aug 25: New data logger battery pack; vent well; gas sample		June 14: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	Analog modem telemtry sys. off line; local telecom. service changed to digital by provider; Hermit logger data must be extracted to a PC on site.	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	Sept 3: Inspection and Hermit logger data extraction	Dec 10: Inspection and Hermit logger data extraction	June 25: Inspection and Hermit logger data extraction, removal of data logger equipment from well; June 30: Installation of Level Troll data logger equipment
	MW 34-9-7-2	Apr 23: vent well & raise upper xd from 5 fbgs to ground surface	Aug 25: vent well; raise upper xd to 1.65 ft above ground; gas sample		June 14: Inspection; pressure gauge leaking; vented well (artesian flow < 0.5 gpm); lowered upper xd to 4.6 fbgs (under water); replaced gauge with plug			June 21: Inspection								
South Fork Texas Creek	MW 35-7-8-1	Apr 22: vent well; temperarily replaced lower xd with 1000 psia xd	Aug 25: New data logger battery pack; vent well; tighten xd		June 13: Inspection; new data logger test started			June 21: Inspection		June 20: Inspection; replace logger battery; start	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	Sept 3: Inspection and Hermit logger data extraction	Dec 10: Inspection and Hermit logger data extraction	June 25: Inspection and Hermit logger data extraction, removal of data logger equipment from well; June 30: Installation of Level Troll data logger equipment
	MW 35-7-8-2	Apr 22: vent well; replaced strain relief fittings	Aug 25: vent well; tighten xd fittings replace lwr 1000 psia xd with new 500 psia xd; gas sample	Mar: Well pressure deviation from previous norm; possible wellhead leak or xd failure or decline in well gas pressure	June 13: Wellhead fitting leaks detected; June 14: Vented well and replaced both 500 psia xds; new data logger test started	Oct 25: Vent well; replaced strain relief fittings Dec 7: Tightened wellhead fittings	Jan 3: Tightened wellhead fittings	June 21: Tightened wellhead fittings October 31: Replaced all well head fittings November 10: Developed well and water sample collected	Dec 11 &13: Tightened wellhead strain relief fittings	June 20: Wellhead fittings leak; vent well; replaced xd cables with rugged polyethylene cables;		Dec 12: Wellhead strain relief cable fitting leak; vent well; installed Swaglok tube fitting on upper xd cable at wellhead	May 6: Inspection and Hermit logger data extraction; Slight leak at lower xd cable wellhead strain relief fitting	Sept 3: Inspection and Hermit logger data extraction; Very slight leak at lower xd cable wellhead strain relief fitting	Dec 10: Inspection and Hermit logger data extraction; Slight leak at lower xd cable wellhead strain relief fitting	
Beaver Creek Ranch	MW 35-6-17-1		Aug 24: New data logger battery pack; vent well; Aug 25: gas sample		June 13: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	Sept 3:: Inspection and Hermit logger data extraction	Dec 10: Inspection and Hermit logger data extraction	June 25: Inspection and Hermit logger data extraction, removal of data logger equipment from well; June 30: Installation of Level Troll data logger equipment
	MW 35-6-17-2	Apr 22: vent well/removed lower xd; attached upper xd externally to wellhead; no leaks	Aug 24: vent well; Aug 25: gas sample		June 13: Inspection; slight leak detected from wellhead xd bushing			June 21: Inspection; slight leak detected from wellhead xd bushing October 31: Leaky wellhead xd bushing sealed								
Shamrock Mines	MW 35-6-13-1		Aug 24: New data logger battery pack; vent well, no gas to sample		June 13: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	Sept 3:: Inspection and Hermit logger data extraction	Dec 10: Inspection and Hermit logger data extraction	June 25: Inspection and Hermit logger data extraction, removal of data logger equipment from well; June 30: Installation of Level Troll data logger equipment

2.2.1 BASIN CREEK

Monitor well MW 34-9-7-1 has been monitored since November 29, 2001 and monitor well MW 34-9-7-2 has been monitored since May 24, 2002. Initial and ending monitoring well pressures and calculated water levels in the wells for each period of record are summarized in Table 4.

Table 4
Well Pressure Data Summary for Basin Creek Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 34-9-7-1 Upper XD	11/29/01 to 6/25/09	11.46	19.13	7.67	20.97	132.83	-111.86
Lower XD		249.34	208.55	-40.79			
MW 34-9-7-2 Upper XD[1]	5/24/02 to 6/25/09	33.26[1]	21.39[1]	-11.87[1]	Well water level is above ground level; see discussion and Figure 3 for more details		
Lower XD		241.42	223.43	-17.99			

1 MW 34-9-7-2 upper XD at 4.6 ft below ground level is under water; initial value corrected June 2008.

MW 34-9-7-1

Figure 2 charts the upper and lower pressure transducer data and the calculated water level in the well. Table 2 and Figure 2 show an overall 7.67 psi net increase in wellhead pressure for the entire 7.5-year period of record from November 29, 2001 (11.46 psia) to June 25, 2009 (19.13 psia). Figure 2 shows a gradual buildup of about 8.3 psi in wellhead pressure, from 11.46 psia to 19.75 psia, during the first 11-month period following the initial well shut in on November 29, 2001. Since October 1, 2002, Figure 2 generally shows a pattern of minor seasonal fluctuations within an overall flat trend in wellhead pressure. Two spikes on the wellhead curve are due to a pressure buildup test (October 2003) and a gas sampling event (August 2004). The chart also shows two erratic fluctuations in the wellhead pressure and calculated well water level curves between January 15, 2007 and April 15, 2007 and between January 1, 2008 and March 15, 2008. The cause of these erratic fluctuations may be wellhead pressure transducer performance related rather than an erratic change in wellhead pressure since the bottomhole pressure curve does not exhibit the same erratic pattern for the same period of record.

In contrast to the wellhead pressure patterns, Table 2 and Figure 2 show a net decline of about 111.86 feet in the calculated well water level and a corresponding net decline in bottomhole pressure of about 40.79 psi for the period of record. Figure 2 also shows a pattern of slight seasonal fluctuations within the overall declining trend in the water level and corresponding bottomhole pressure for the period of record.

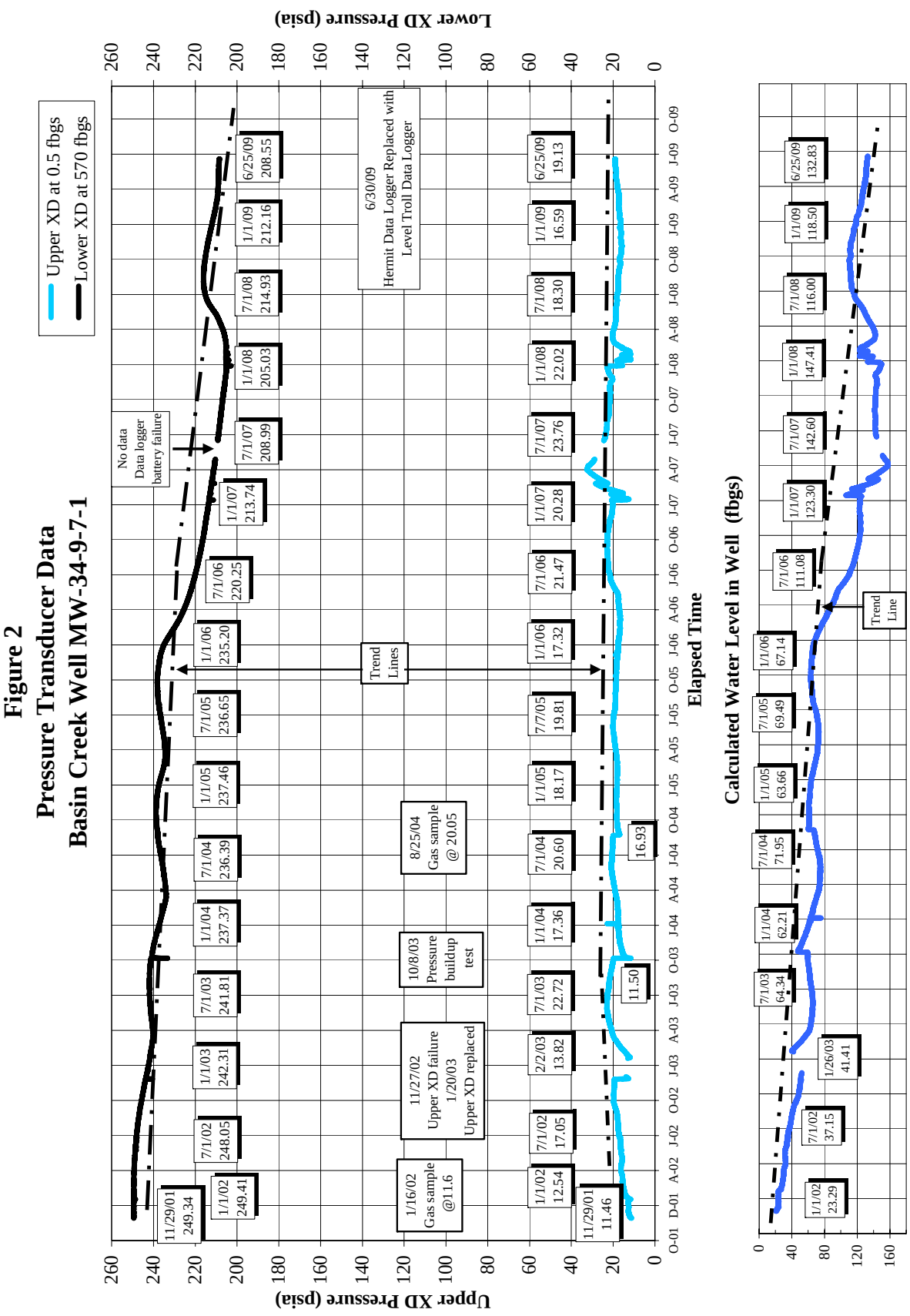


Figure 2
Pressure Transducer Data
Basin Creek Well MW-34-9-7-1

MW 34-9-7-2

Recorded pressure data and calculated bottomhole and wellhead differential pressures for well MW-34-9-7-2 are charted on Figures 3. Initial and ending monitoring well pressures and apparent water level in the well are summarized in Table 4 for the period of record with the upper transducer set at 4.6 feet below ground surface (fbgs).

Figures 3 continues to show a trend of gradually declining well pressure and slight seasonal fluctuations in bottomhole pressures within the overall declining trend for the period of record. A record low bottomhole pressure of 223.43 psia was recorded on June 25, 2009. Between February 18, 2008 and June 25, 2009, Figure 3 shows an apparent seasonal fluctuation within the overall declining trend. As indicated in Table 4, there has been a net decline in well pressure of about 11.87 psi (wellhead pressure) to 17.99 psi (bottomhole pressure) for the 7-year period of record. Since March of 2008, Figure 3 also shows slight seasonal fluctuations in wellhead pressures within a gradually increasing trend. Between March 1, 2008 and June 25, 2009, wellhead pressure increased 3.6 psia, from about 17.8 psia about 21.4 psia.

A wellhead differential pressure test was conducted on April 23, 2004 to verify whether or not the upper transducer is under water when set in the well at a depth of 4.6 feet below ground surface. Figure 3 shows a notable difference in wellhead pressure relative to the location of the upper transducer. On April 23, 2004, the wellhead shut-in pressure at 4.6 fbgs was 27.80 psia versus 26.00 psia at ground level, a difference of about 1.8 psia. On August 25, 2004, the wellhead pressure transducer was raised to 1.65 feet above ground surface (ftags). The shut-in pressure at ground level was 25.66 psia verses 25.08 psia at 1.65 ftags, a difference of about 0.5 psi. Since there was no corresponding measurable difference in the bottomhole pressure, the observed wellhead pressure differential between 4.6 fbgs and 1.65 ftags confirmed that the upper transducer was under water at 4.6 fbgs with complete well shut in.

On June 14, 2005, the upper pressure transducer was set to the original installation level of 4.6 fbgs to monitor the overall trend of wellhead pressures over time. The calculated differential well pressure curve in Figure 3 for the period of record with the upper transducer set at 4.6 fbgs shows minor seasonal fluctuations in differential pressure within an overall gradually declining trend between January 2006 and February 2009. The well differential pressure was about 208.09 psi on January 1, 2006 and about 206.36 psi on February 16, 2009, a decline of about 1.7 psi in 2.1 years. Acceleration in the well differential pressure rate of decline is apparent after February 2009. During the 4-month period between February 16, 2009 and June 25, 2009, well differential pressure declined about 4.3 psi, from 206.36 psi to 202.04 psi. A wellhead pressure increase of about 2 psi and bottomhole pressure decrease of about 2.3 psi account for the 4.3 psi decline in well pressure differential since February 2009. This apparent acceleration in well differential pressure decline may be indicative of a potential change in the well pressure regime, including the possibility of a new declining trend in the water level in the well. Continued monitoring of is required to confirm any potential changes in the well pressure regime.

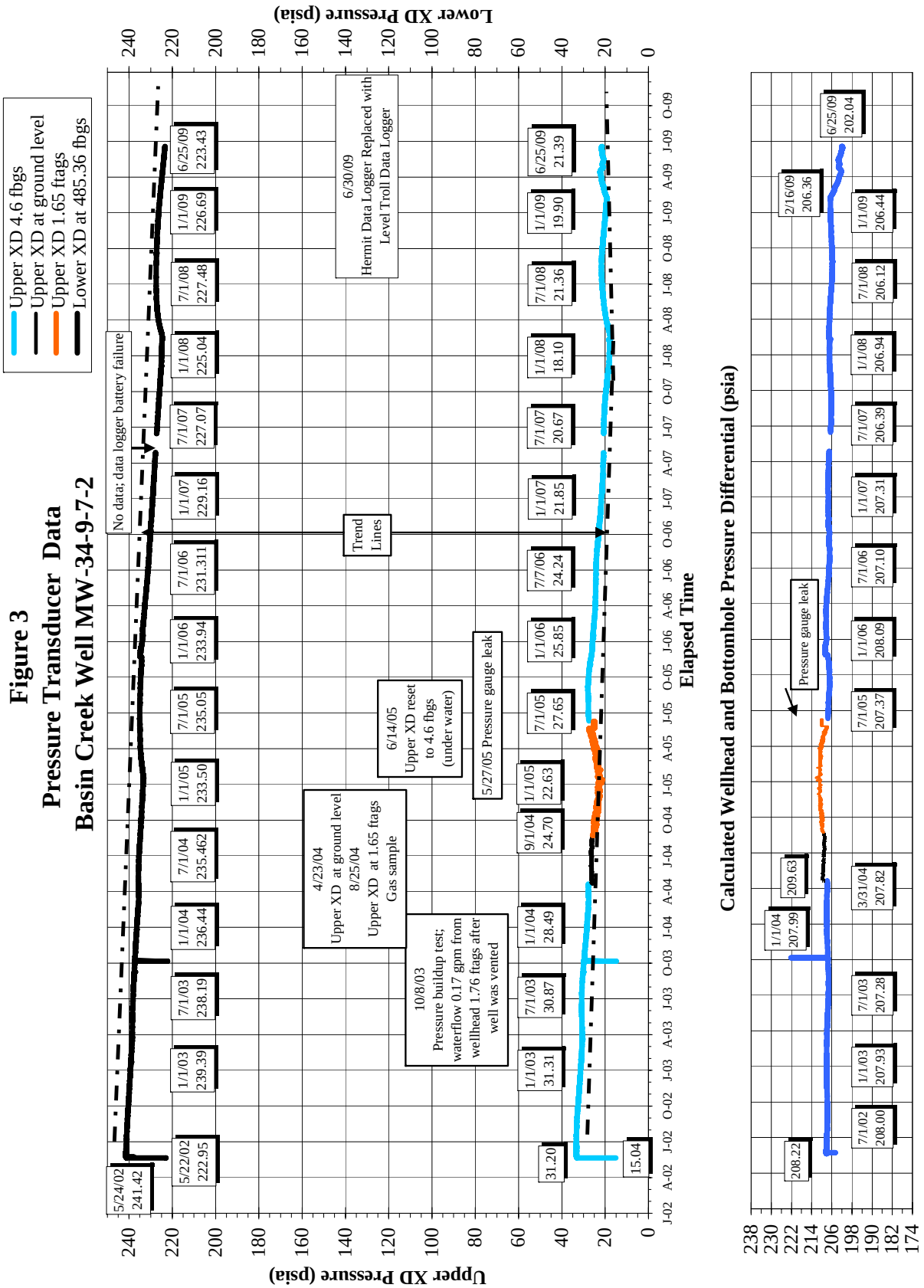


Figure 3
Pressure Transducer Data
Basin Creek Well MW-34-9-7-2
Upper XD 4.6 fbgs
Upper XD at ground level
Upper XD 1.65 ftags
Lower XD at 485.36 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
No data; data logger battery failure
6/30/09
Hermit Data Logger Replaced with Level Troll Data Logger
Trend Lines
4/23/04
Upper XD at ground level
8/25/04
Upper XD at 1.65 ftags
Gas sample
6/14/05
Upper XD reset to 4.6 fbgs (under water)
5/27/05 Pressure gauge leak
10/8/03
Pressure buildup test; waterflow 0.17 gpm from wellhead 1.76 ftags after well was vented
Calculated Wellhead and Bottomhole Pressure Differential (psia)
Pressure gauge leak

2.2.2 SOUTH FORK TEXAS CREEK

Monitor wells MW 35-7-8-1 and MW 35-7-8-2 have been monitored since November 29, 2001. Initial and ending well pressures and calculated water levels in the monitor wells are summarized in Table 5 for the indicated period of record.

Table 5
Well Pressure Data Summary for South Fork Texas Creek Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 35-7-8-1 Upper XD	12/01/01 to 6/25/09	13.79	12.57	-1.22	88.39	209.84	-121.45
Lower XD		144.47	90.63	-53.84			
MW 35-7-8-2 Upper XD	1/15/02 to 6/25/09	91.32[1]	86.97	-4.35	Water level in well is >225 fbgs with complete shut-in;		
Lower XD		91.91[1]	87.14	-4.77			

1 Both bottomhole and wellhead pressure are typically the same in MW 35-7-8-2 with complete shut in.

MW 35-7-8-1

Monitoring data for MW 35-7-8-1 are charted in Figure 4. As summarized in Table 5 for the 7.5-year period of record, the net change in wellhead and bottomhole pressures are -1.22 psi and -53.84 psi respectively. The net change in the calculated water level in the well is -121.45 feet, which corresponds to an equivalent well pressure change of -52.62 psia. Figure 4 shows a relatively stable wellhead pressure for the period of record, with well pressures consistently ranging between 12.4 psia and 13.8 psia, about 1 to 2.5 psi above the atmospheric pressure of 11.25 psi recoded on June 25, 2009.

Figure 4 shows a trend of gradually rising water level and corresponding increasing bottomhole pressure in the well for the period of record between November 2001 and May 2005, followed by a gradually declining trend between May 2005 and October 2008. Figure 4 also shows slight seasonal fluctuations in bottomhole pressure and the calculated water level in the well within the overall increasing trend prior to May 2005, and slight to moderate seasonal fluctuations within the overall declining trend between May 2005 and October 2008.

Between October 2008 and June 2009, the water level and corresponding bottomhole pressure curves show an apparent accelerated rate of decline, as compared with the gradually declining trend shown in Figure 4 during the 3.4-year period between May 2005 and October 2008. Since there was no corresponding measurable difference in wellhead pressure, the observed bottomhole pressure decline may be attributed to a decline in the well water level. However, pressure spikes within the declining bottomhole curve shown on Figure 4 since March 2009, may reflect erratic transducer performance rather than anomalous well pressure spikes. New Level Troll well pressure monitoring system data will be used to further evaluate the well pressure regime.

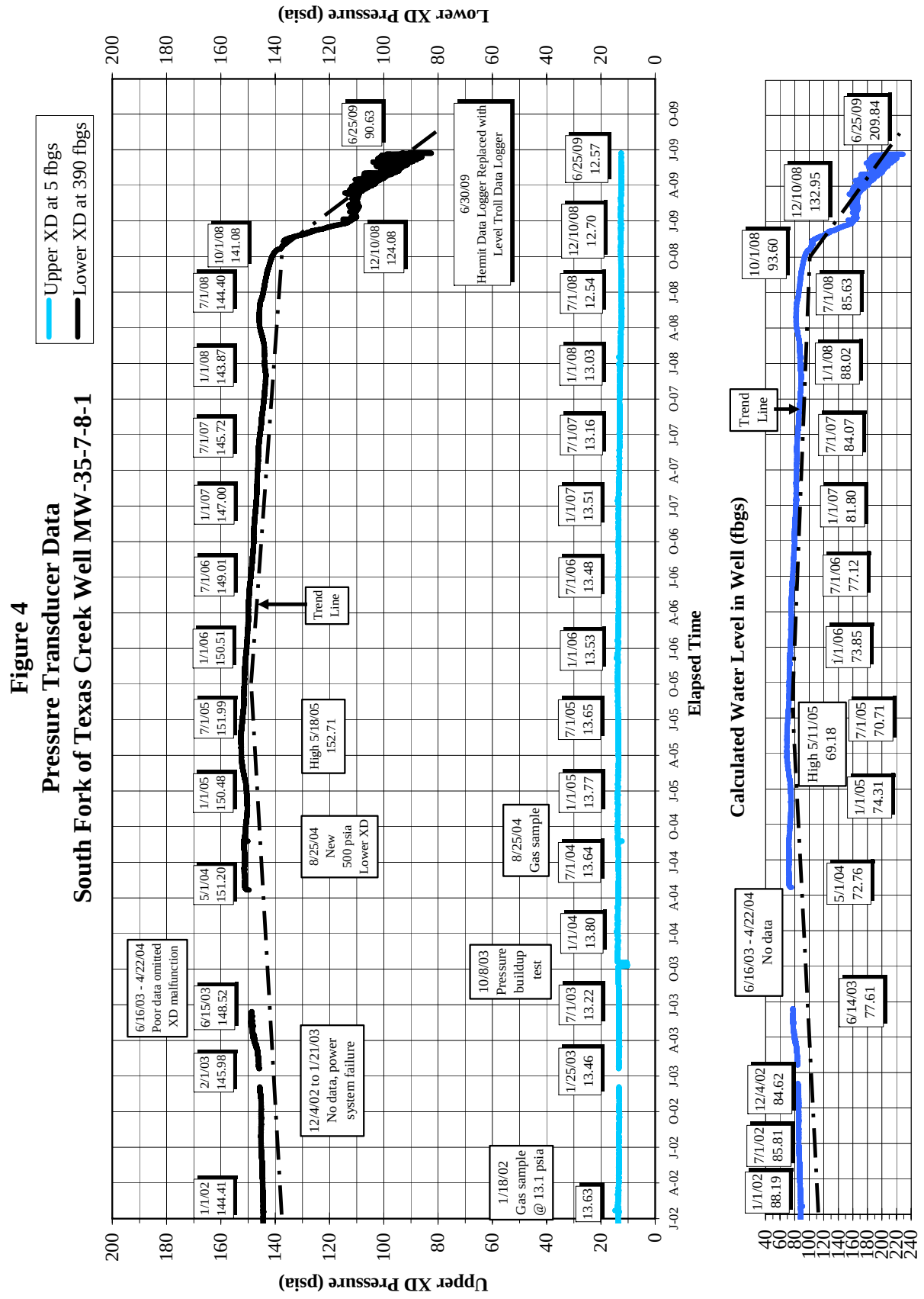


Figure 4
Pressure Transducer Data
South Fork of Texas Creek Well MW-35-7-8-1
Upper XD at 5 fbgs
Lower XD at 390 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
Calculated Water Level in Well (fbgs)
Trend Line
High 5/11/05 69.18
6/16/03 - 4/22/04 No data
6/16/03 - 4/22/04 Poor data omitted XD malfunction
12/4/02 to 1/21/03 No data, power system failure
10/8/03 Pressure buildup test
1/18/02 Gas sample @ 13.1 psia
8/25/04 Gas sample
8/25/04 New 500 psia Lower XD
High 5/18/05 152.71
6/30/09 Hermit Data Logger Replaced with Level Troll Data Logger

MW 35-7-8-2

Figure 5 charts the pressure data for well MW 35-7-8-2, which exhibits an entirely different pressure regime than the deeper monitoring well MW 35-7-8-1. Figure 5 shows nearly equal wellhead and bottomhole pressures for the period of record when the well is completely shut in. For example, wellhead and bottomhole pressures recorded on June 25, 2009 were 86.97 psia and 87.14 psia respectively under shut in conditions. As shown in Table 5, there has been a net well pressure change of about -4.5 psi for the period of record.

Leak-proof transducer cable seals required for complete well shut in have been difficult to maintain at the MW 35-7-8-2 wellhead since October 2005. The occurrences of leaky fittings resulting in incomplete wellhead shut in have provided the opportunity to observe that the well acts as a gas and water separator. The water in the well is gradually displaced by gas after the well is shut in and entirely displaced by gas once the wellhead pressure equals the bottomhole pressure. For example, the depth to water in the vented well on June 14, 2005 was calculated to be about 75 feet below ground surface based on the differential well pressures of 11.33 psia (wellhead) and 76.56 psia (bottomhole). The charts in Figure 5 show differential well pressures after the well was shut in on June 14, 2005 and until the wellhead pressure buildup equaled the bottomhole pressure of approximately 76 psia on July 2, 2005.

Figure 5 shows the wellhead pressure is erratic for the period of record between October 2005 and December 2007 and then again between November 2008 and March 2009. The cause of this erratic pattern is apparently related to leaky wellhead fittings rather than an erratic change in wellhead pressure since the bottomhole pressure curve does not show erratic pressure fluctuations for the same period of record. True pressures and trends cannot be measured until a complete shut in is accomplished. Past corrective action taken to achieve leak-proof seals has included tightening of fitting connections, installation of new connection fittings, replacement of the cable strain relief elastomer inserts with Swagelok tube fittings, and replacement of the thin-walled transducer cables with rugged polyethylene cable.

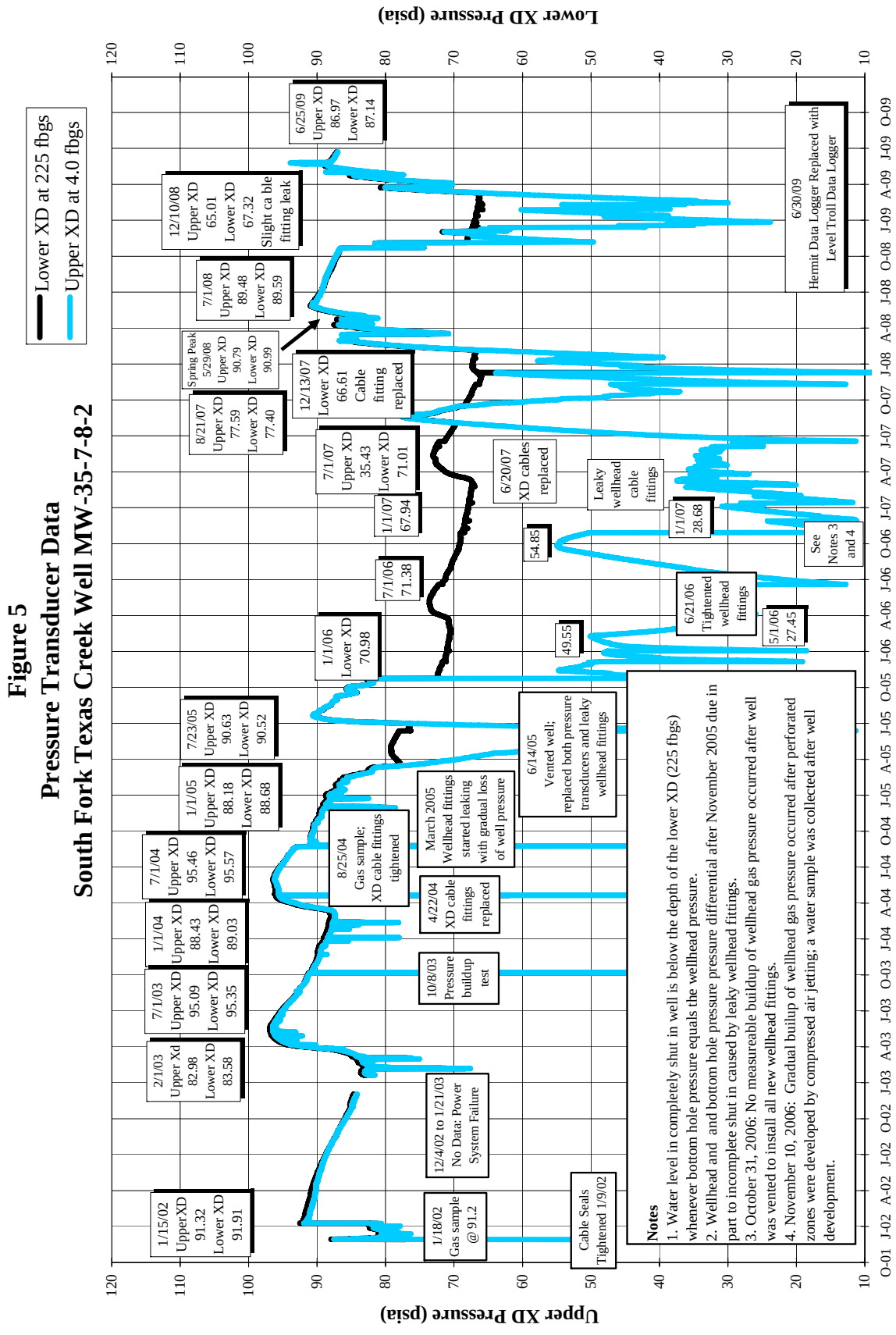


Figure 5
Pressure Transducer Data
South Fork Texas Creek Well MW-35-7-8-2
Lower XD at 225 fbgs
Upper XD at 4.0 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
1/15/02 Upper XD 91.32 Lower XD 91.91
2/1/03 Upper Xd 82.98 Lower XD 83.58
7/1/03 Upper XD 95.09 Lower XD 95.35
1/1/04 Upper XD 88.43 Lower XD 89.03
7/1/04 Upper XD 95.46 Lower XD 95.57
1/1/05 Upper XD 88.18 Lower XD 88.68
7/23/05 Upper XD 90.63 Lower XD 90.52
1/1/06 Lower XD 70.98
7/1/06 71.38
1/1/07 67.94
7/1/07 Upper XD 35.43 Lower XD 71.01
12/13/07 Lower XD 66.61 Cable fitting replaced
8/21/07 Upper XD 77.59 Lower XD 77.40
Spring Peak 5/29/08 Upper XD 90.79 Lower XD 90.99
7/1/08 Upper XD 89.48 Lower XD 89.59
12/10/08 Upper XD 65.01 Lower XD 67.32 Slight ca ble fitting leak
6/25/09 Upper XD 86.97 Lower XD 87.14
1/18/02 Gas sample @ 91.2
12/4/02 to 1/21/03 No Data: Power System Failure
10/8/03 Pressure buildup test
4/22/04 XD cable fittings replaced
8/25/04 Gas sample; XD cable fittings tightened
March 2005 Wellhead fittings started leaking with gradual loss of well pressure
6/14/05 Vented well; replaced both pressure transducers and leaky wellhead fittings
Cable Seals Tightened 1/9/02
49.55
54.85
6/20/07 XD cables replaced
Leaky wellhead cable fittings
1/1/07 28.68
6/21/06 Tightened wellhead fittings
5/1/06 27.45
See Notes 3 and 4
6/30/09 Hermit Data Logger Replaced with Level Troll Data Logger
Notes
1. Water level in completely shut in well is below the depth of the lower XD (225 fbgs) whenever bottom hole pressure equals the wellhead pressure.
2. Wellhead and and bottom hole pressure pressure differential after November 2005 due in part to incomplete shut in caused by leaky wellhead fittings.
3. October 31, 2006: No measureable buildup of wellhead gas pressure occurred after well was vented to install all new wellhead fittings.
4. November 10, 2006: Gradual builup of wellhead gas pressure occurred after perforated zones were developed by compressed air jetting; a water sample was collected after well development.

2.2.3 BEAVER CREEK RANCH

Well MW 35-6-17-1 has been monitored since May 21, 2002 and well MW 35-6-17-2 has been monitored since November 30, 2001. Initial and ending well pressures and calculated water levels in the monitor wells are summarized in Table 6 for the indicated period of record.

Table 6
Well Pressure Data Summary for Beaver Creek Ranch Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 35-6-17-1 Upper XD	08/01/02 to 6/25/09	15.44	70.90	55.46	194.37	450.36	-255.99
Lower XD		609.55	554.06	-55.49			
MW 35-6-17-2 Upper XD	06/15/02 to 6/25/09	614.23	474.51	-139.72	1,377.64	No Data Lower XD removed	--
Lower XD		632.63	XD removed	--			

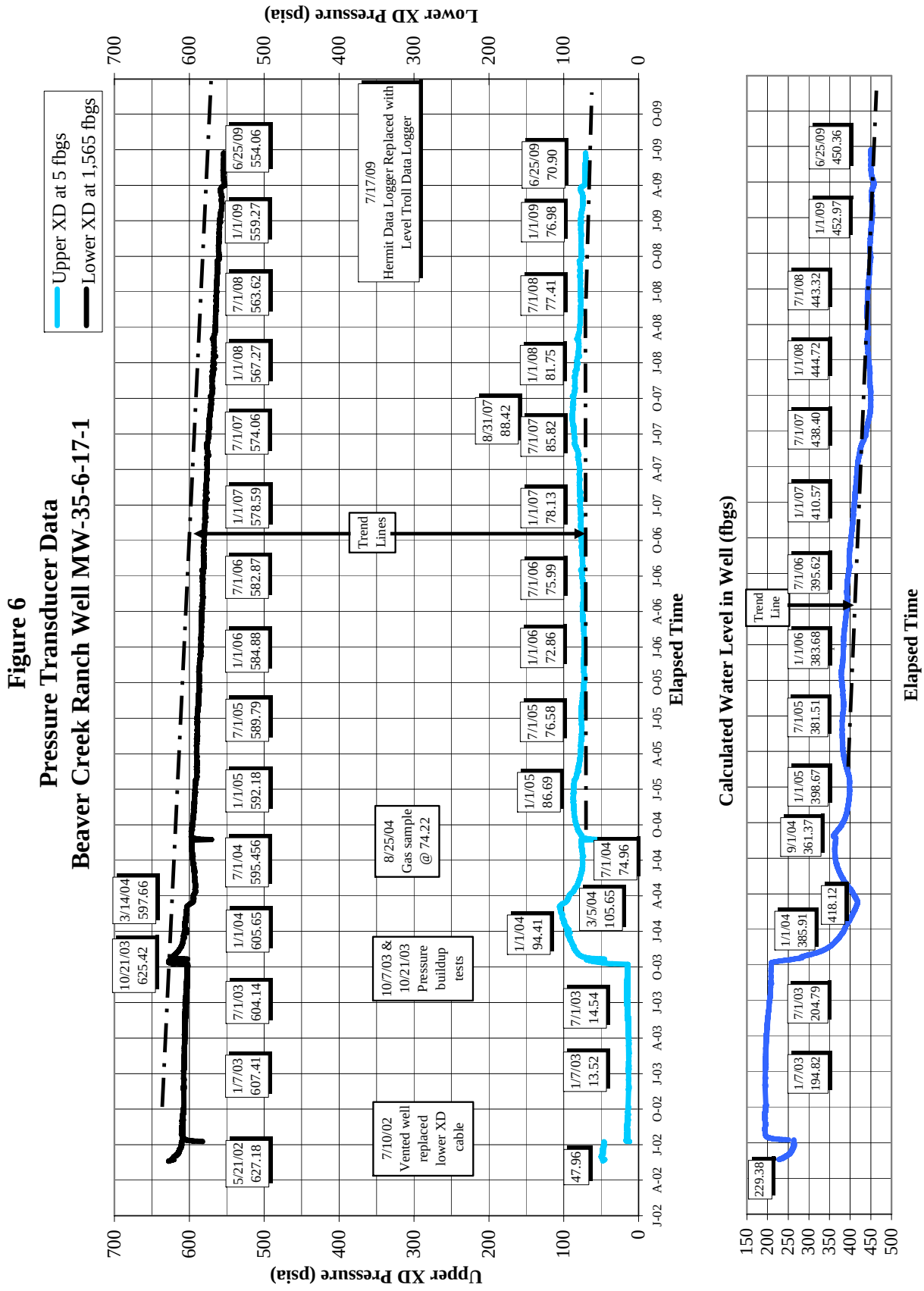
MW 35-6-17-1

Monitoring data for well MW 35-6-27-1 are charted in Figure 6. As described below, the pressure regime for this well is different than the regime exhibited by well MW 35-6-17-2.

Figure 6 shows a notable change in well pressure regime subsequent to two pressure buildup tests conducted on October 7, 2003 and October 21, 2003. Between October 7, 2003 and March 5, 2004, the wellhead pressure increased about 91.3 psi, from 14.36 psia to a recorded high of 105.65 psia. This pattern was followed by a gradual wellhead pressure decline until July 2004, a gradual increase in pressure through January 2005, and a gradual decrease to 72.1 psi on October 4, 2005. From October 2005 and to August 31, 2007 the wellhead pressure curve shows an increase of about 16 psi, from about 72.1 psia to about 86.4 psia. This pattern was followed by a gradual decline to 70.9 psia on June 25, 2009.

Figure 6 also shows changes in the water level regime since the October 7, 2003 buildup test. The calculated water level in the well declined almost 200 feet, from 219.08 fbgs on October 7, 2003 to 418.12 fbgs on March 10, 2004, and then rose to about 361.4 fbgs by September 1, 2004. Since September 1, 2004, Figure 6 shows slight seasonal fluctuations in the water level and corresponding bottom hole pressure curves within an overall declining trend. The net decline in the calculated water level during the 4.75-year period between September 1, 2004 (361.37 fbgs) and June 25, 2009 (450.36 fbgs) was about 89 feet, an average of about 18.7 feet per year.

Figure 6
Pressure Transducer Data
Beaver Creek Ranch Well MW-35-6-17-1



MW 35-6-17-2

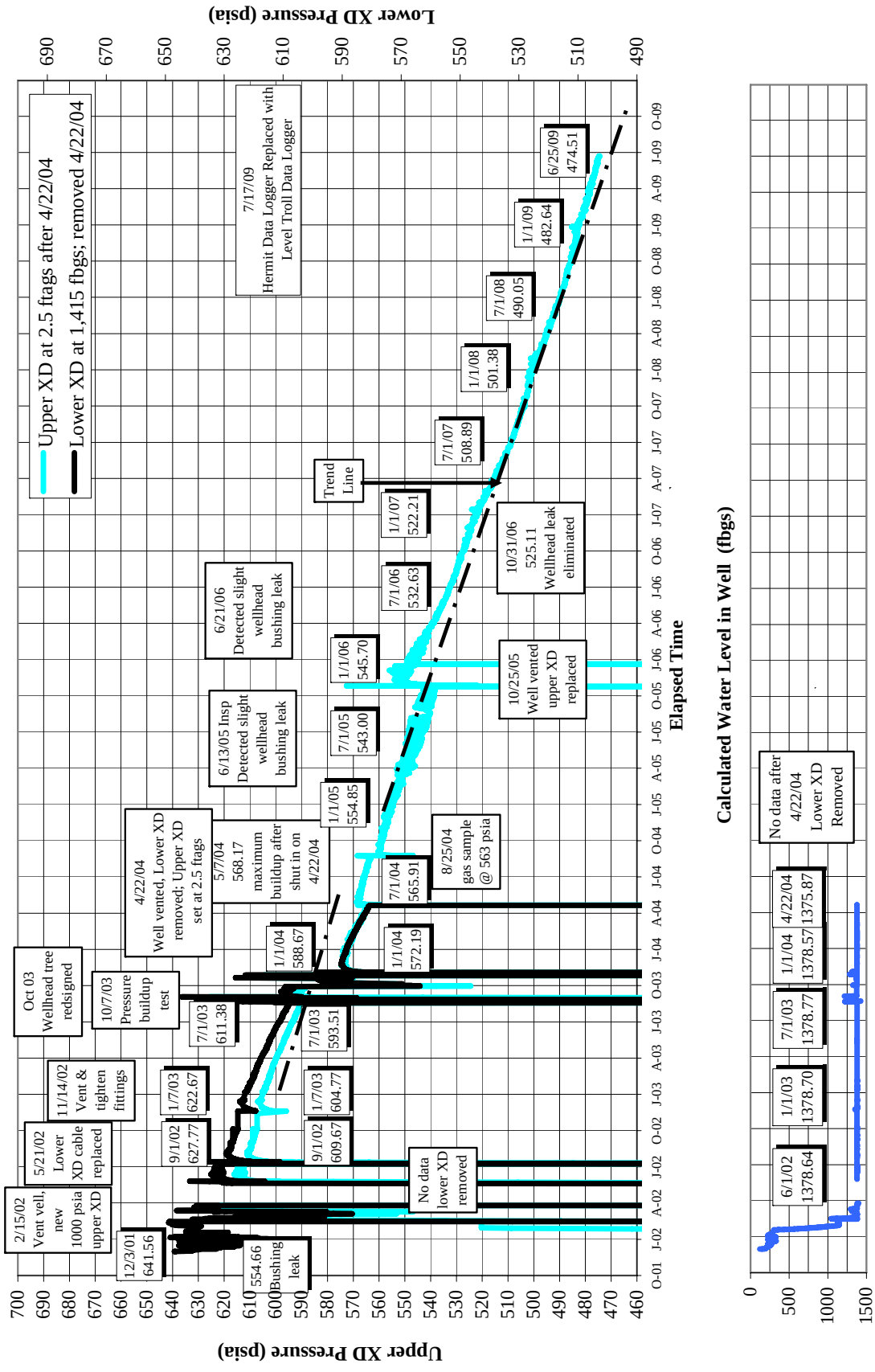
Wellhead pressure, bottomhole pressure, and calculated well water level data for well MW 35-6-17-2 are charted in Figure 7 and summarized in Table 6 for the period of record. Monitoring of bottomhole pressure was terminated after the lower transducer was removed from the well for the period of record between April 22, 2004 and June 25, 2009. Level Troll pressure monitoring loggers were installed in well MW 35-6-17-2 on July 17, 2009 to enable future monitoring of both wellhead and bottomhole pressure regimes.

The wellhead pressure has been measured in excess of 600 psia, which is notably higher than in the other 3M monitoring wells. However, the wellhead was not completely shut in between February 2002 and mid-April 2004 because of a variety of wellhead fittings leaks. Consequently, the pressure data charted in Figure 7 between February 15, 2002 and April 22, 2004 are only considered to be minimum values.

True pressures and trends could not be measured until a complete shut in was accomplished in April 2004 after the well was vented and both pressure transducer systems were removed from inside the well. One 1000 psia transducer was adapted to tap directly into the top of the flanged wellhead assembly. This external transducer adaptation makes it possible to measure wellhead pressure without passing flexible transducer cables through the wellhead assembly. Bottomhole pressure and water level data are not available without a lower pressure transducer set below the water level in the well.

After the well was shut in again on April 22, 2002, Figure 7 shows a relatively rapid build up in wellhead pressure to a maximum of 568.17 psia on May 7, 2004. Quarterly well inspections in 2005 and 2006 revealed a very slight leak from the pressure transducer bushing, which may have contributed to this gradual decline in pressure. The wellhead leak was eliminated on October 31, 2006 by permanently sealing the bushing to the flanged plate. True wellhead pressures charted after a complete shut in was accomplished on October 31, 2006 confirm a continuing trend of gradually declining well pressures. During the last 4.75 years of record, the wellhead pressure curve shows an overall steady decline to a record low of 474.51 psia on June 25, 2009.

Figure 7
Pressure Transducer Data
Beaver Creek Ranch Well MW-35-6-17-2



2.2.4 SHAMROCK MINES

Well MW 35-6-13-1 monitoring data are charted in Figures 8 and summarized in Table 7 for the entire 6.5-year period of record. Since there are no producing wells in close proximity to this area, this well is used to collect background data and has been monitored continuously since May 22, 2002.

Table 7
Well Pressure Data Summary for Shamrock Mines Monitoring Well

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia[1]	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs[1]	Net Water Level Change in Well ft
MW 35-6-13-1 Upper XD	5/22/02 to 6/25/09	12.06	11.84	Atmospheric Pressure	39.66	36.83	2.83
Lower XD		211.60	212.61	1.01			

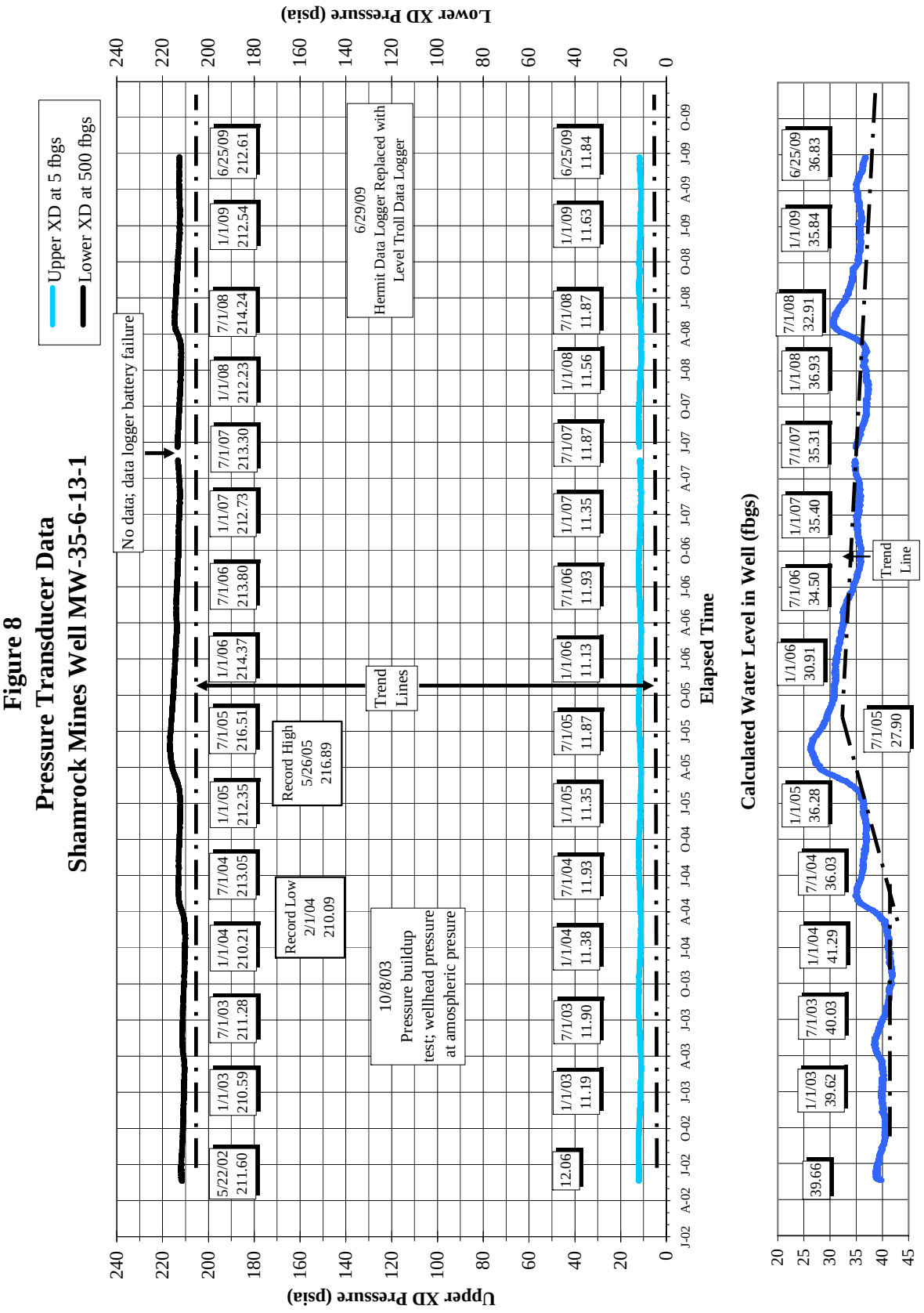
1 On May 26, 2005, the measured bottomhole pressure (216.89 psia) and calculated depth to water (26.53 ft) in well MW 35-6-13-1 were at their highest levels for the period of record.

Figures 8 shows the wellhead pressure regime continues to be stable at about atmospheric pressure and fluctuates within a range of 1 psi (between 11 psia and 12 psia). With wellhead pressure equal to atmospheric pressure, bottomhole pressure is equal to atmospheric pressure plus water pressure, which is a function of the water level in the well. Table 7 shows a measured bottomhole pressure of 212.61 psia when the water level in the well is 36.83 feet below ground surface. Figure 8 also shows the bottomhole pressure and calculated water level in the well continue to exhibit a similar trend of seasonal fluctuation. With wellhead pressure equal to atmospheric pressure, fluctuation of bottomhole pressure is attributable to the fluctuation of water pressure resulting from the fluctuation of the water level in the well.

Prior to February 2004, Figure 8 shows seasonal fluctuations in bottomhole pressure and water level curves within an overall slightly declining trend, followed by seasonal fluctuations of higher magnitude within an overall moderately increasing trend from February 2004 through May 2005. On May 26, 2005, the bottomhole pressure peaked at a record high of 216.89 psia and the water level in the well peaked at a record high of 26.53 feet below ground surface. The decline and subsequent increase in bottomhole pressure and the water level in the well during the 3-year period between May 2002 and June 2005 may be related to the return to more "normal" levels of precipitation in 2004 and 2005 after several years of "drought."

Since June 2005, Figure 8 shows slight seasonal fluctuations in the calculated water level and bottomhole pressure curves within an overall slightly declining trend from June 2005 through mid-February 2008. During the 16-month period between February 17, 2008 and June 25, 2009, Figure 8 shows a pattern of seasonal rise and decline in bottomhole pressure within a relatively narrow range of about 212 psia to 214.5 psia in response to a rise and decline in the water level.

Figure 8
Pressure Transducer Data
Shamrock Mines Well MW-35-6-13-1



3.0 FUTURE WORK

All well monitoring data loggers and telemetry systems were converted from analog technology to digital data logger and satellite communication systems in late June and early July 2009. Future routine work will consist of periodic field checks of each monitoring system and remote retrieval of recorded pressure measurement data using the In-Situ Inc. TROLL® Link telemetry system and ISI Data Center. Planned maintenance activities during the third quarter of 2009 may include inspection of all monitor wells.