Colorado Oil and Gas Conservation Commission

Monitor Wells Summary Report
November 2006

3M Project Monitoring Program
La Plata County, Colorado

Fruitland Formation West of Basin Creek Monitoring Well Site MW-34-9-7

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December 18, 2006

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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 November 30, 2006. 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 November 2006.

2.0 MONITORING ACTIVITIES AND DATA SUMMARY

2.1 MONITORING ACTIVITIES – JUNE - NOVEMBER 2006

Remote downloading of well pressure measurements automatically recorded at each of the four monitoring sites was continued on a weekly basis by Norwest in Denver via telemetry. Monitoring site maintenance activities performed during the second and fourth quarters of 2006 included the following:

- June 21, 2006: Inspection of all four monitoring sites and tightening of South Fork Texas Creek MW 35 -7-8-2 wellhead fittings.
- October 31, 2006: Replacement of South Fork Texas Creek MW 35 -7-8-2 wellhead fittings and sealing of Beaver Creek Ranch MW-35-6-17-2 wellhead bushing.
- November 10, 2006: Development of South Fork Texas Creek monitoring well MW 35 -7-8-2 by compressed air-lifting and air-jetting, and collection of a water sample.

2.2 MONITORING WELL PRESSURE DATA SUMMARY

Well pressure continues to be measured and recorded twice daily (12-hour interval) at all sites. 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 monitoring well are summarized below. Well pressure measurements recorded by the data logger at each monitoring well site are available upon request to all interested parties.

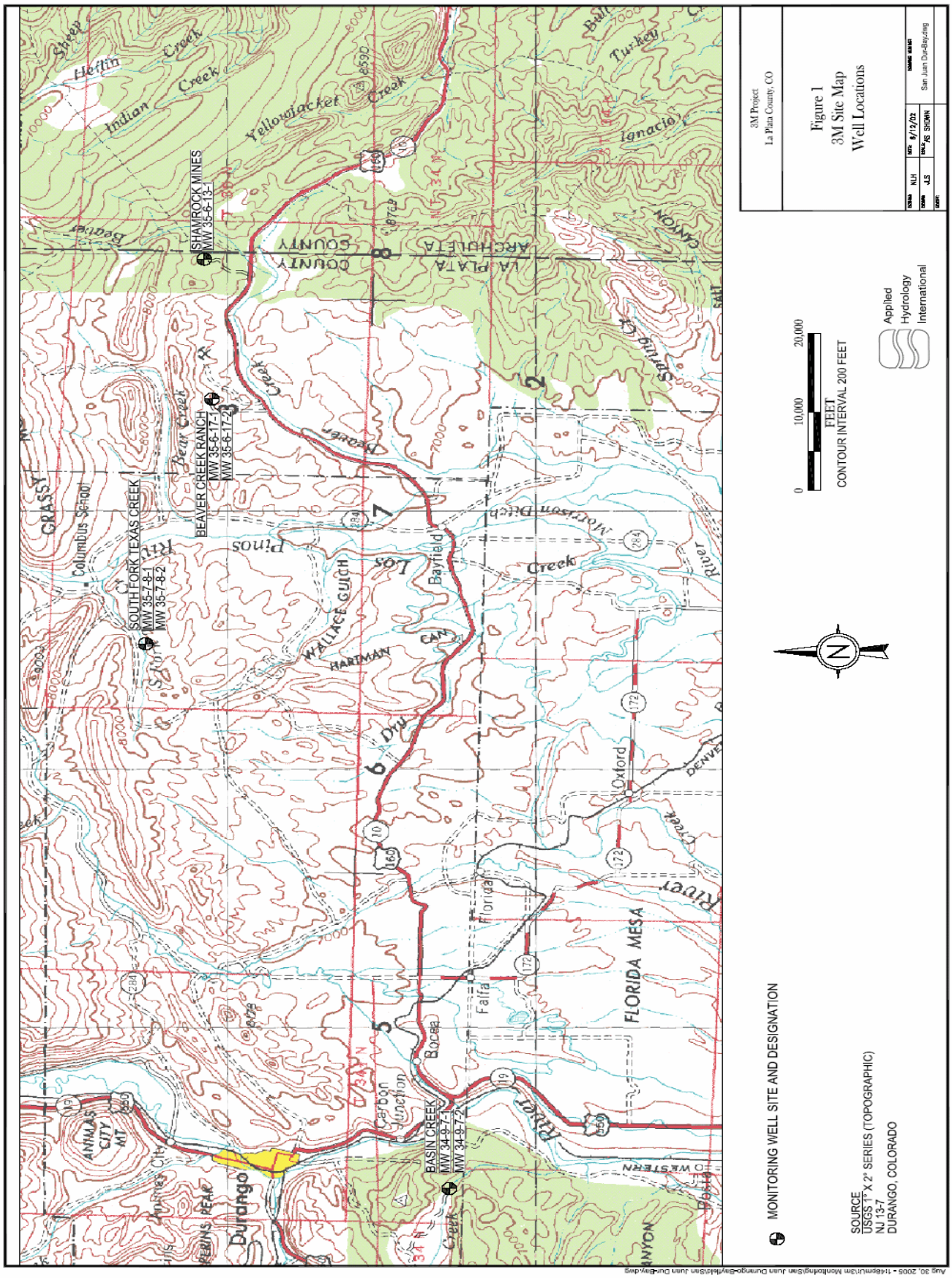

3M Project
La Plata County, CO
Figure 1
3M Site Map
Well Locations
San Juan Dur-Bay.dwg
8/12/02
SHOWN
NJH
JLS
SHAMROCK MINES
MW 35-6-13-1
BEAVER CREEK RANCH
MW 35-6-17-1
MW 35-6-17-2
SOUTH FORK TEXAS CREEK
MW 35-7-8-1
MW 35-7-8-2
BASIN CREEK
MW 34-9-7-1
MW 34-9-7-2
LA PLATA COUNTY
ARCHULETA COUNTY
FLORIDA MESA
Durango
Oxford
Bayfield
Florida
Yellowjacket Creek
Indian Creek
Wallace Gulch
Hartman Draw
Morrison Ditch
Los Pinos River
Grass Creek
Bear Creek
Spring Creek
Turkey Canyon
Carbon Junction
Animas City Mt.
Perins Peak
0
10,000
20,000
FEET
CONTOUR INTERVAL 200 FEET
N
Applied Hydrology International
MONITORING WELL SITE AND DESIGNATION
SOURCE
USGS 1° X 2° SERIES (TOPOGRAPHIC)
NJ 13-7
DURANGO, COLORADO

Table 1
3M Project Monitoring 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 Monitoring 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 Monitoring Well Chronology

Location	Well	2001				2002								
		January	September	November	December	January	February	March	April	May	June	July	January	December
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	Surveyed	Jan. 18:Tighten wellhead fittings; rewire telemetry system	Install new batteries in telemetry unit with In-Situ assistance							Lost telemetry communitcation with data logger
	MW 34-9-7-2								April 24-25: Drill & install well	May 5: Perforate well May 9: Fish out cable May 22: Install xds	Surveyed			
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	Surveyed	Jan. 18: Tighten wellhead fittings; rewire telemetry unit	Install new batteries in telemetry unit with In-Situ assistance			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
	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	Surveyed	Jan. 18: Tighten wellhead fittings				May 21: Ck for leaks		Oct 25: Vent well; replaced strain relief fittings Dec 7: Tightened wellhead fittings	Jan 3: Tightened wellhead fittings	
Beaver Creek Ranch	MW 35-6-17-1						Install new batteries in telemetry unit with In-Situ assistance	Mar. 5-Apr 4: Drill & install well		May 2: Perforate well; May 20-21: Install xds	Surveyed	July 10: Replace lower xd cable with unvented cable		Dec 13: Insp by Raymond Const.- no wellhead gas leak; solar pwr @14.8 v; data logger batt pack @ 0% capacity; modem pwr off (auto pwr-up disabled or modem memory prob); Dec. 19: Data lost through end of year due to bad data logger bkup battery
	MW 35-6-17-2		Sept. 22-Oct. 4: Drill/install well	Nov. 26: Perforate well Nov. 27: Set up telemetry unit	Surveyed	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		Gas leak @ top bushing; July 10: Vent well & ck bushing galls; July 11: Shutinl well	Nov. 14: Vent well; replace valve and reseal all connections	
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	Surveyed			Lost telmetry communitcation with data logger

Table 3
3M Project Monitoring Well Chronology

Location	Well	2003					2004			2005			2006	
		January	Feb - May	May - June	August	Oct - Dec	Jan - Mar	April	August	March	June	Oct - Dec	January	June - Nov
Basin Creek	MW 34-9-7-1	Jan 20: New well 34-9-7-1 upper xd (30 psig, sn 7201); move data logger ext pwr + lead to + pole on batt charger regul.; replace data logger bkup batt; re-flash modem memory; enable modem auto pwr-up; start new data logger test	Telemetry system malfunction; data logger & power OK	May 20: Replace modem and cell phone; power and data logger systems OK	Aug 21: Vent both wells and tighten wellhead xd cable strain relief fittings	Oct 8: Conduct rapid blowdown & shutin test			Aug 25: New data logger battery pack; vent well; gas sample		June 14: Inspection			June 21: Inspection
	MW 34-9-7-2				Aug 21: Vent both wells and tighten wellhead xd cable strain relief fittings	Oct 8: Conduct rapid blowdown & shutin test		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			June 21: Inspection
South Fork Texas Creek	MW 35-7-8-1	Jan 20: Move dataloger ext pwr + lead to + pole on batt charger regul.; replace data logger bkup batt; re-flash modem memory; enable modem auto pwr-up; start new data logger test	Telemetry system malfunction; data logger & power OK	May 20: Replace modem and cell phone; June 16: lower xd failed		Oct 8: kWell pressure buildup test	No data reported for 6/16/03 to 4/22/04 -lower xd failed	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
	MW 35-7-8-2					Oct 8: Well pressure buildup test	Well pressure data suggest that wellhead xd cable strain relief fittings leak intermittently in winter	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
Beaver Creek Ranch	MW 35-6-17-1	Jan 7 & Jan 21: No wellhead gas leak @ MW35-6-17-2; Jan 21: Move data logger, modem & solar panel pwr common leads to charger regul. common poles; replace data logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up; start new data logger test	Telemetry system malfunction; data logger & power OK	May 20: Replace modem and cell phone; power and data logger systems OK		Oct 7 & 21: Well pressure buildup test			Aug 24: New data logger battery pack; vent well; Aug 25: gas sample		June 13: Inspection			June 21: Inspection
	MW 35-6-17-2		MW 35-6-17-2: 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; Dec:Wellhead leak @ pressure >570 psia	Wellhead leaks @ pressure >570 psia	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	Jan 21: Move solar pwr common lead to common pole on charger regul.; replace data logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up; start new data logger test	Telemetry system malfunction; data logger & power OK	May 20: Replace modem and cell phone; power and data logger systems OK	Aug 20: Modem not powering up; replaced 12v battery - works	Oct 7: Replaced 12v external battery pack; Oct 8: well pressure buildup tests; Oct 21: Replace solar panel			Aug 24: New data logger battery pack; vent well, no gas to sample		June 13: Inspection			June 21: Inspection

2.2.1 BASIN CREEK

MW 34-9-7-1

Figure 2 charts the upper and lower pressure transducer data and the calculated water level in the well for the period of record. Initial and ending monitoring well pressures and calculated water levels in the well are summarized in Table 4 for the period of record. This well has been monitored continuously since November 29, 2001.

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 11/30/06	11.46	21.23	9.77	20.97	123.38[2]	-102.41
Lower XD		249.34	214.74[2]	-34.60			
MW 34-9-7-2 Upper XD[1]	5/24/02 to 11/30/06	31.20[1]	22.07[1]	-9.13[1]	Well water level is above ground level; see discussion and Figures 3 and 3a for more details		
Lower XD		241.42	229.54	-11.88			

1 MW 34-9-7-2 upper XD at 4.6 ft below ground level is under water.
2 Measured bottomhole pressure and calculated depth to water in well MW 34-9-7-1 on September 30, 2006 were at their lowest levels for the period of record.

Figure 2 shows a gradually increasing wellhead pressure, declining bottomhole pressure, and a corresponding apparent decline in the well water level for the period from November 29, 2001 to about November 1, 2003. From November 1, 2003 to about January 1, 2006, Figure 2 shows the slight seasonal fluctuations in wellhead pressure, bottomhole pressure and well water level occur within an overall flat trend.

Since January 1, 2006, Figure 2 shows an apparent departure from the trend of seasonal fluctuations that occurred between November 1, 2003 and January 1, 2006. During the previous two years (2004 and 2005), both bottomhole pressure and the well water level declined during the first quarter (January through March), stabilized in April and May and then gradually increased during the summer months of June, July and August. However, the seasonal decline in bottomhole pressure and calculated well water level during the first quarter of 2006 continued into the fourth quarter. As of November 30, 2006, both the bottomhole pressure (214.74 psia) and calculated depth to water in the well (123.38ft) have declined to their lowest levels for the period of record. In contrast, Figure 2 shows a 5.5 psia increase in wellhead pressure from 17.48 psia on May 1, 2006 to a recorded high of 22.99 psia on September 30, 2006, followed by a gradual decline to 21.23 psia as of November 30, 2006.

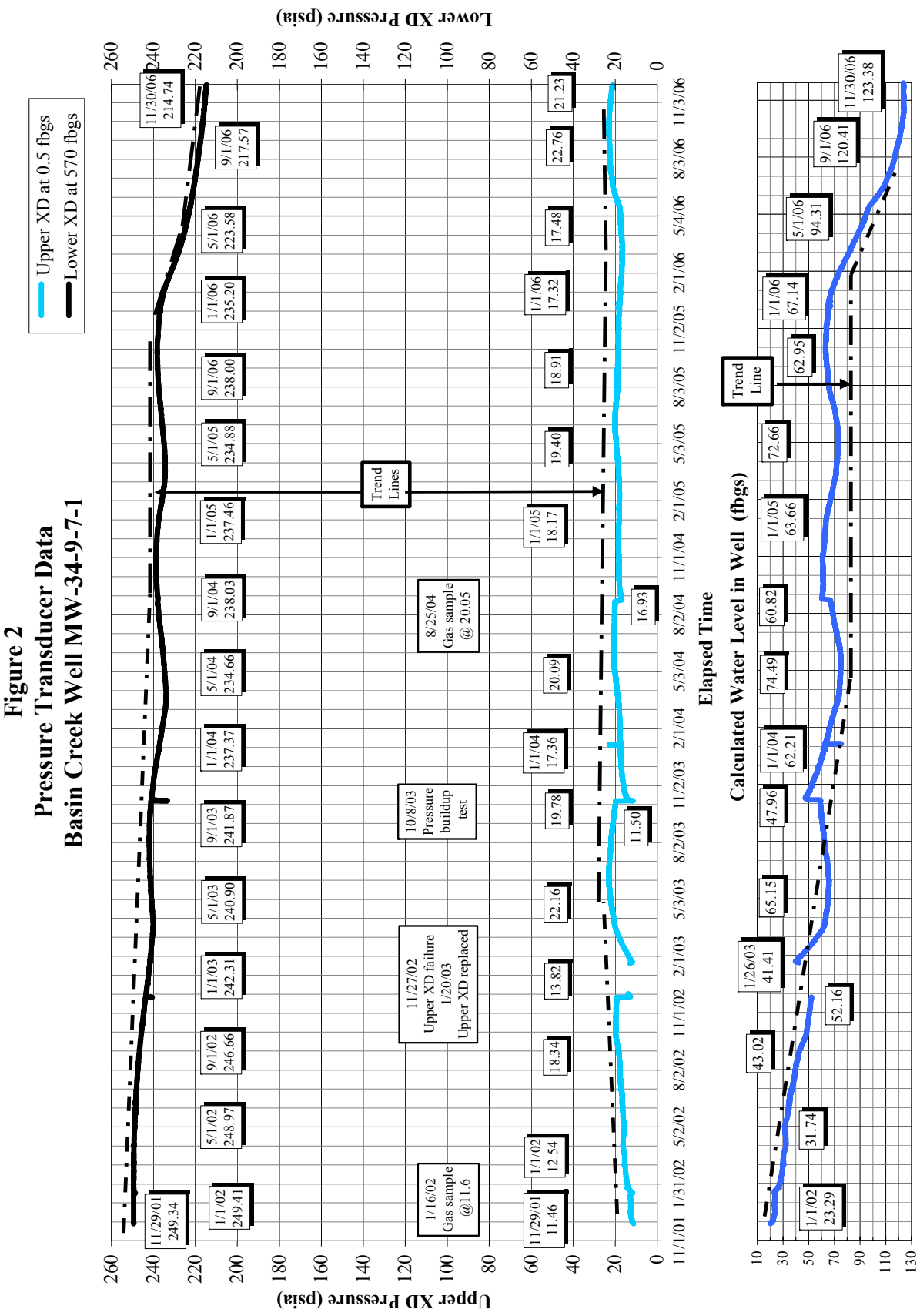


Figure 2
Pressure Transducer Data
Basin Creek Well MW-34-9-7-1

MW 34-9-7-2

Well MW 34-9-7-2 has been monitored continuously since May 24, 2002. Recorded pressure data for well MW-34-9-7-2 are charted on Figures 3 and 3a. Figure 3 also charts the calculated bottomhole and wellhead differential pressure in the well for the period of record. 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) and the bottomhole transducer set at about 485 fbgs.

Figures 3 and 3a continue to show a trend of gradually declining well pressure for the period of record. Figure 3a also shows slight seasonal fluctuations in wellhead and bottomhole pressures within the overall declining trend for the period of record.

Figures 3 and 3a show a notable difference in wellhead pressure relative to the location of the upper transducer. On April 23, 2004 (Figure 3a), the wellhead shut-in pressure at 4.6 fbgs was 27.8 psia versus 25.73 psia at ground level, a difference of about 2 psia. On August 25, 2004, the shut-in pressure at ground level was 26.13 psia verses 25.08 psia at 1.65 feet above ground surface (ftags), a difference of about 1 psia. In both cases, there was no corresponding measurable difference in the bottomhole pressure (Figure 3a). Differential wellhead shut-in pressures between 4.6 fbgs and 1.65 ftags confirm the upper transducer is under water at 4.6 fbgs and the apparent water level in well MW 34-9-7-2 is above ground level when the well is 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 since May 2002. Figure 3 shows slight seasonal variations in calculated differential well pressures, between about 206.8 psia and 208.1 psia, for the period of record with the upper transducer set at 4.6 fbgs.

Figure 3a shows a variation in the magnitude of seasonal fluctuations in well pressure occurred within the overall declining trend in 2005. In 2003 and 2004, the bottomhole pressure was relatively stable during the months of April and May. In 2005, the bottomhole pressure started to gradually increase in mid-January and reached a seasonal peak of about 235 psia in late June through July. Since July 2005, Figure 3a shows a trend of gradually declining wellhead and bottomhole pressures.

Figure 3a also shows a higher pressure spike of about 1 psia in the bottomhole pressure curve occurred on November 25, 2005. The cause of this spike may be bottomhole pressure transducer performance related rather than an abrupt change in bottomhole pressure since the wellhead pressure curve does not show a pressure spike for the same period of record.

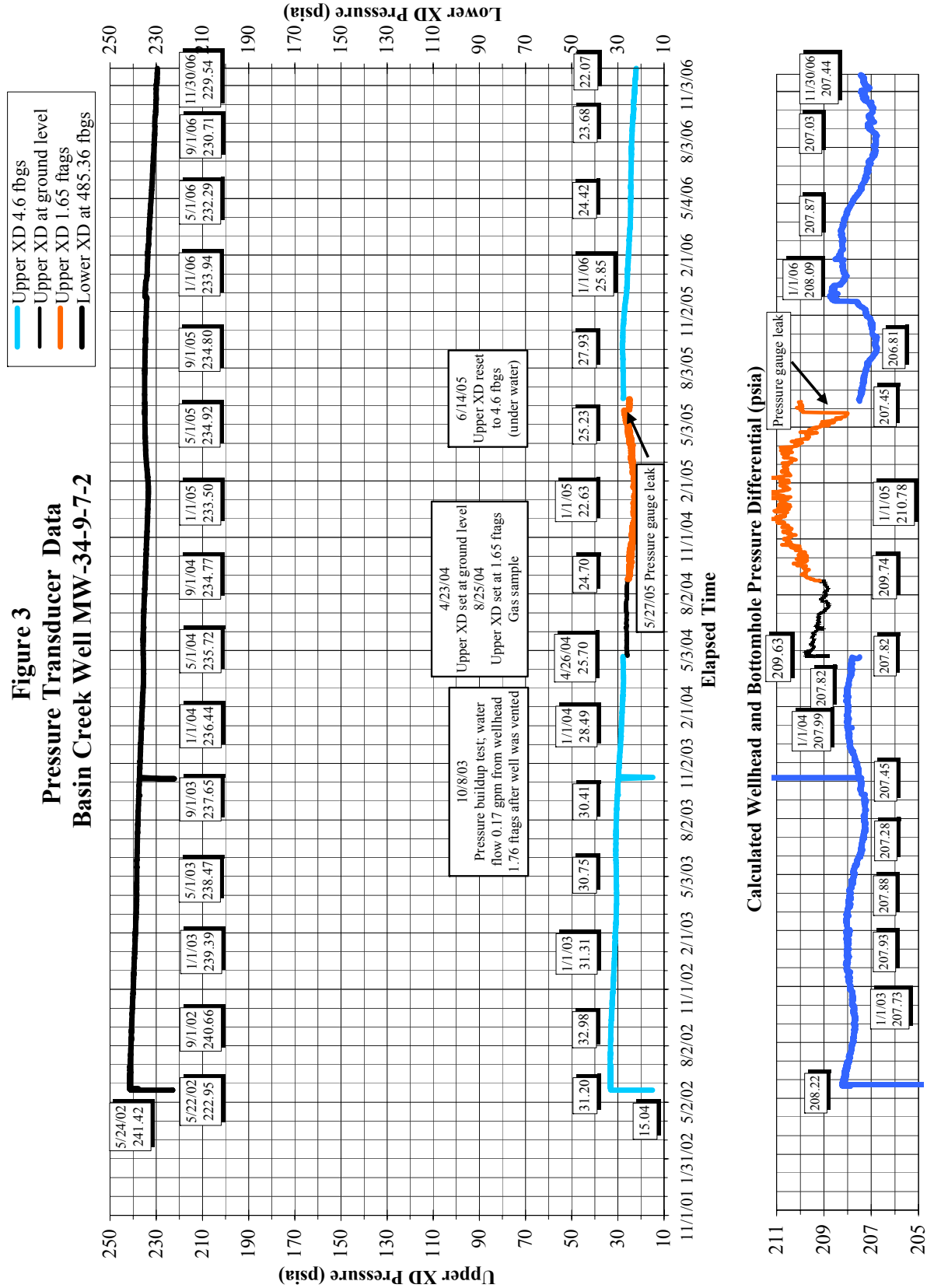


Figure 3
Pressure Transducer Data
Basin Creek Well MW-34-9-7-2
Upper XD 4.6 fbgs
Upper XD at ground level
Upper XD 1.65 ftags
Lower XD at 485.36 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
10/8/03
Pressure buildup test; water flow 0.17 gpm from wellhead
1.76 ftags after well was vented
4/23/04
Upper XD set at ground level
8/25/04
Upper XD set at 1.65 ftags
Gas sample
6/14/05
Upper XD reset to 4.6 ftgs (under water)
5/27/05 Pressure gauge leak
Calculated Wellhead and Bottomhole Pressure Differential (psia)
Pressure gauge leak

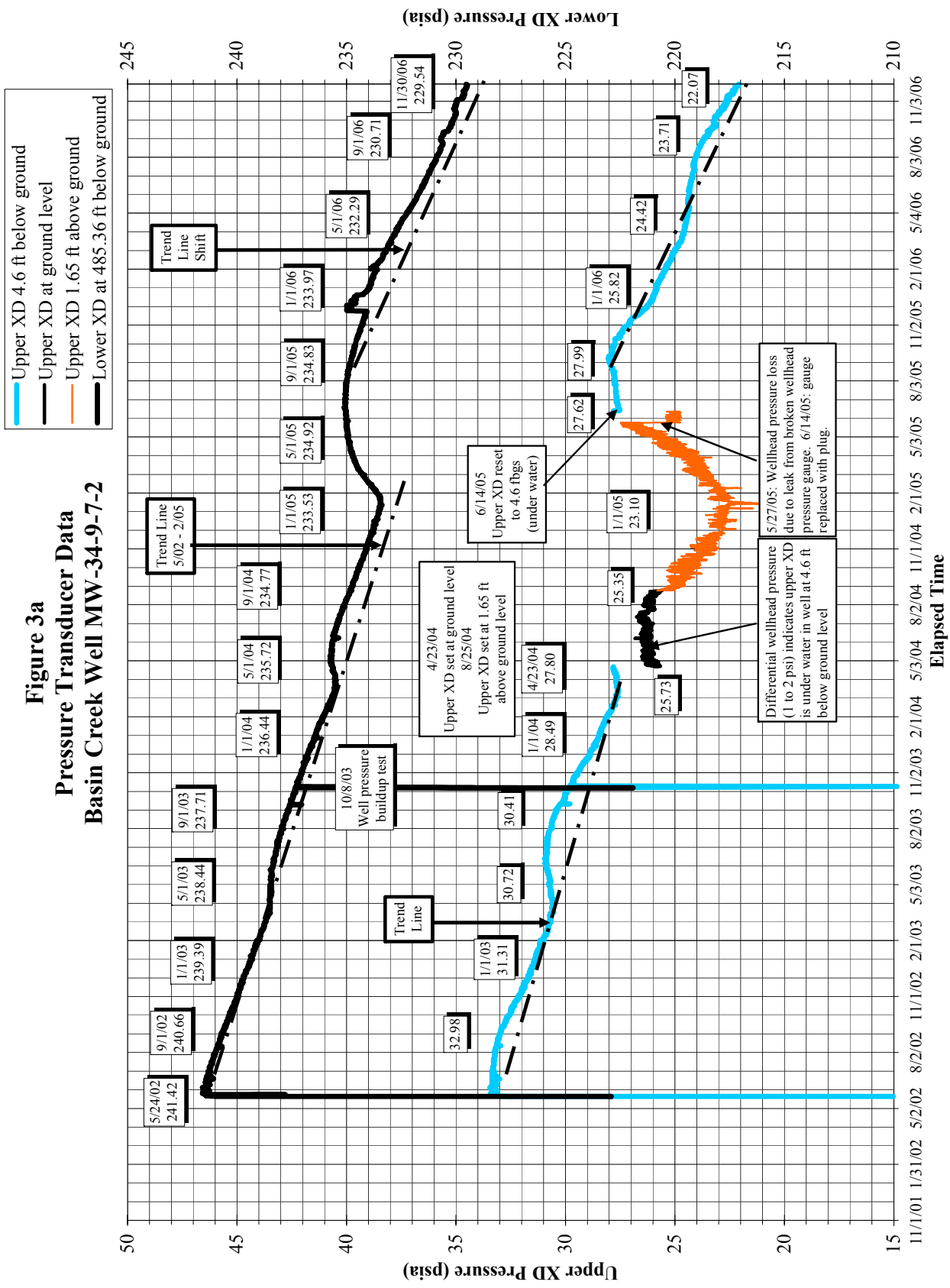


Figure 3a
Pressure Transducer Data
Basin Creek Well MW-34-9-7-2

2.2.2 SOUTH FORK TEXAS CREEK

Both monitoring wells have been monitored continuously since November 29, 2001, except for the period of monitoring system power failure between December 4, 2002 and January 20, 2003.

MW 35-7-8-1

Data for MW 35-7-8-1 are charted in Figure 4 and summarized in Table 5. Upper transducer data recorded since January 1, 2002 indicate a relatively stable wellhead pressure, consistently ranging between 13.1 psia and 13.8 psia, about 2 psi above atmospheric pressure. On November 30, 2006, the measured atmospheric pressure at this site was about 11.2 psi.

Figure 4 shows a trend of gradually increasing bottomhole pressure and rising water level in the well for the period of record between November 2001 and May 2005. Overall, the recorded bottomhole pressure increased about 8.3 psi, from 144.41 psia on November 1, 2001 to a high of 152.71 psia on May 18, 2005, which is nearly equivalent to the calculated 19.2 feet of water level rise in the well for the same period of record. (1 psi equals about 2.31 feet of water.) Since May 2005, Figure 4 shows a trend of gradually declining water level in the well and corresponding decline in bottomhole pressure.

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 within the overall declining trend since May 2005.

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 11/30/06	13.79	13.54	-0.25	88.39	80.66	7.73
Lower XD		144.47	147.57	3.10			
MW 35-7-8-2 Upper XD	1/15/02 to 11/30/06	91.32	24.22[1]	-67.10	Water level in well is >225 fbgs with complete shut-in; calculated water level in well is about 192 fbgs at 69.18 psia bottomhole pressure and wellhead pressure at 54.81 psia		
Lower XD		91.91	68.32[1]	-23.59			

1 Both bottomhole and wellhead pressure are typically the same in MW 35-7-8-2 with complete shut in; periods of differential well pressures shown in Figure 5 since March 2005 represent an incomplete shut in condition due to wellhead fitting leaks.

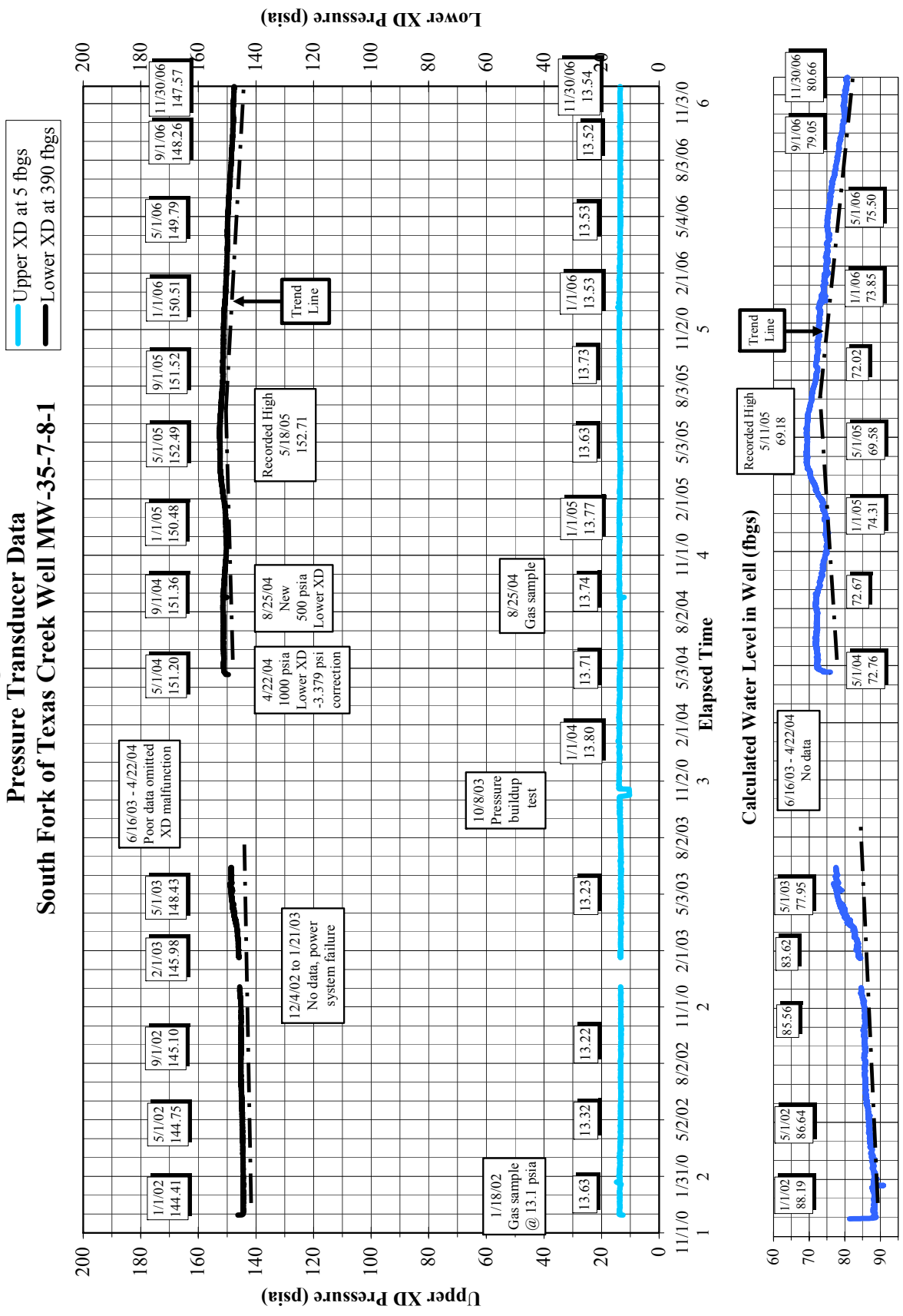


Figure 4
Pressure Transducer Data
South Fork of Texas Creek Well MW-35-7-8-1
Upper XD at 5 fbgs
Lower XD at 390 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
Calculated Water Level in Well (fbgs)
Trend Line
Recorded High 5/11/05 69.18
6/16/03 - 4/22/04 Poor data omitted XD malfunction
12/4/02 to 1/21/03 No data, power system failure
4/22/04 1000 psia Lower XD -3.379 psi correction
8/25/04 New 500 psia Lower XD
Recorded High 5/18/05 152.71
8/25/04 Gas sample
10/8/03 Pressure buildup test
1/18/02 Gas sample @ 13.1 psia
6/16/03 - 4/22/04 No data

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 (page 15) shows equal wellhead and bottomhole pressures for the period of record when the well is completely shut in. For example, wellhead and bottomhole recorded on October 1, 2005 were essentially the same (85.38 psia and 85.43 psia respectively).

After about March 1, 2005, both upper and lower transducer charts show a differential drop in well pressure caused by leaks from several wellhead fittings. After the leaky fittings were replaced on June 14, 2005, well pressures gradually returned to previous levels with complete wellhead shut in.

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.

Leaky wellhead conditions developed again in late October 2005, resulting in incomplete wellhead shut in and subsequent development of a measurable wellhead pressure and bottomhole pressure differential. Three attempts to reseal the wellhead fittings in October and December 2005 and January 2006 did not achieve complete wellhead shut in. The well was vented and wellhead fittings were tightened again on June 21, 2006. After the well was shut in on June 21, 2006, there was a gradual buildup of wellhead pressure to 54.94 psia on September 28, 2006, followed by a gradual decline to 50.4 psia on October 30, 2006.

MW 35-7-8-2 was vented on October 31, 2006 and all wellhead fittings were replaced with new fittings to address the possibility that the decline in wellhead pressure was associated with leaky wellhead fittings. Prior to venting the well, the wellhead pressure was measured at 49.99 psia and the bottom-hole pressure was measured at 69.09 psia. However, there was no measurable wellhead pressure buildup after the wellhead was shut in again October 31, 2006. Two potential reasons for the absence of wellhead pressure buildup include clogging of well tubing perforations and a decline in formation gas production.

With the approval of the COGCC, Norwest Applied Hydrology subcontracted the services of a water well services company on November 10, 2006 to develop the three perforated intervals (235-241 fbgs, 254-258 fbgs and 264-274 fbgs) in MW 35-7-8-2 by air jetting and air lifting with compressed air (100 psi). Figures 6 and 7 show the set up used for the air-lift method of well development. The method included the following steps:

Step 1. Removed the pressure transducers and wellhead assembly.
Step 2. Measured the depth to the water level in the well at 93 fbgs.
Step 3. Measured the depth of the bottom of the well at 416 fbgs, which confirmed that the tubing was not filled with debris opposite the perforated intervals. (Original depth 420 fbgs.)

Step 4. One-inch diameter, Schedule 80 PVC tubing string was installed as an air line equipped with a six-nozzle high-pressure jetting tool. The jetting tool was initially lowered inside the two-inch well tubing to 233 fbgs, two feet above the top of the upper perforated interval, and the air was turned on to pump the well at the maximum rate obtainable in a normal airlift manner at 100 psi pressure to induce water flow into the well by lowering the water level in the well.

Step 5. Proceeded by working the jetting tool from the top perforated interval down, and applying the horizontal jet stream from the six-nozzle jetting tool to dislodge fine materials from the perforations and bring them into the well for removal by air lifting. The jetting tool was rotated constantly while it was raised and lowered in very small increments to expose all the perforations to the jet stream. Each of the three perforated intervals was worked in this manner in two passes. The material in the water discharged by air lifting was predominantly coal fines.

Step 6. Upon completion of jetting all three intervals, injection air was turned off, and the well was allowed to recover for 15 to 30 minutes. Then injection air was turned on to pump all the water out and check the water discharge for dislodged material. This procedure was repeated three times to confirm free flow of water through the perforations and the discharge was free of coal fines. A sample of the discharge water was collected during the third air lift procedure.

Step 6. Removed the air line, and measured the depth that the water level had recovered in the well at 172 fbgs, about 35 minutes after injection air was turned off.

Step 7. Reinstalled the wellhead assembly and pressure transducers, shut in the wellhead, and monitored wellhead pressure buildup.

Development of MW 35-7-8-2 by the air jetting method on November 10, 2006 restored gas flow to the well. As Figure 5 shows, the wellhead pressure gradually increased after the wellhead was shut in on November 10, 2006 to a measured pressure of 24.22 psia on November 30, 2006.

The water sample collected on November 10, 2006 was analyzed by Green Analytical Laboratories, Inc. for general water quality and Safe Drinking Water Act inorganic chemistry parameters. The analytical results listed in Table 6 indicate water of generally good quality and low trace metal concentrations.

Table 6
Water Analysis Summary for South Fork Texas Creek Monitoring Well MW 35-7-8-2

General Water Quality	
Alkalinity as CaCO3	490 mg/L
Calcium	7.5 mg/L
Chloride	<10 mg/L
Conductivity	922 uS/cm
Fluoride	1.2 mg/L
Hardness	22 mg/L
Magnesium	0.7 mg/L
pH	8.49 SU
Potassium	2.1 mg/L
Sodium	208 mg/L
Sulfate	<10 mg/L
TDS	610 mg/L

Trace Metals	
Antimony	0.0030 mg/L
Arsenic	0.0005 mg/L
Barium	0.2261 mg/L
Beryllium	<0.0005 mg/L
Cadmium	<0.00005 mg/L
Chromium	0.001 mg/L
Copper	0.0149 mg/L
Iron	0.17 mg/L
Lead	0.0412 mg/L
Mercury	<0.0002 mg/L
Nickel	0.0025 mg/L
Selenium	<0.001 mg/L
Thallium	<0.00005 mg/

Figure 5
Pressure Transducer Data
South Fork Texas Creek Well MW-35-7-8-2

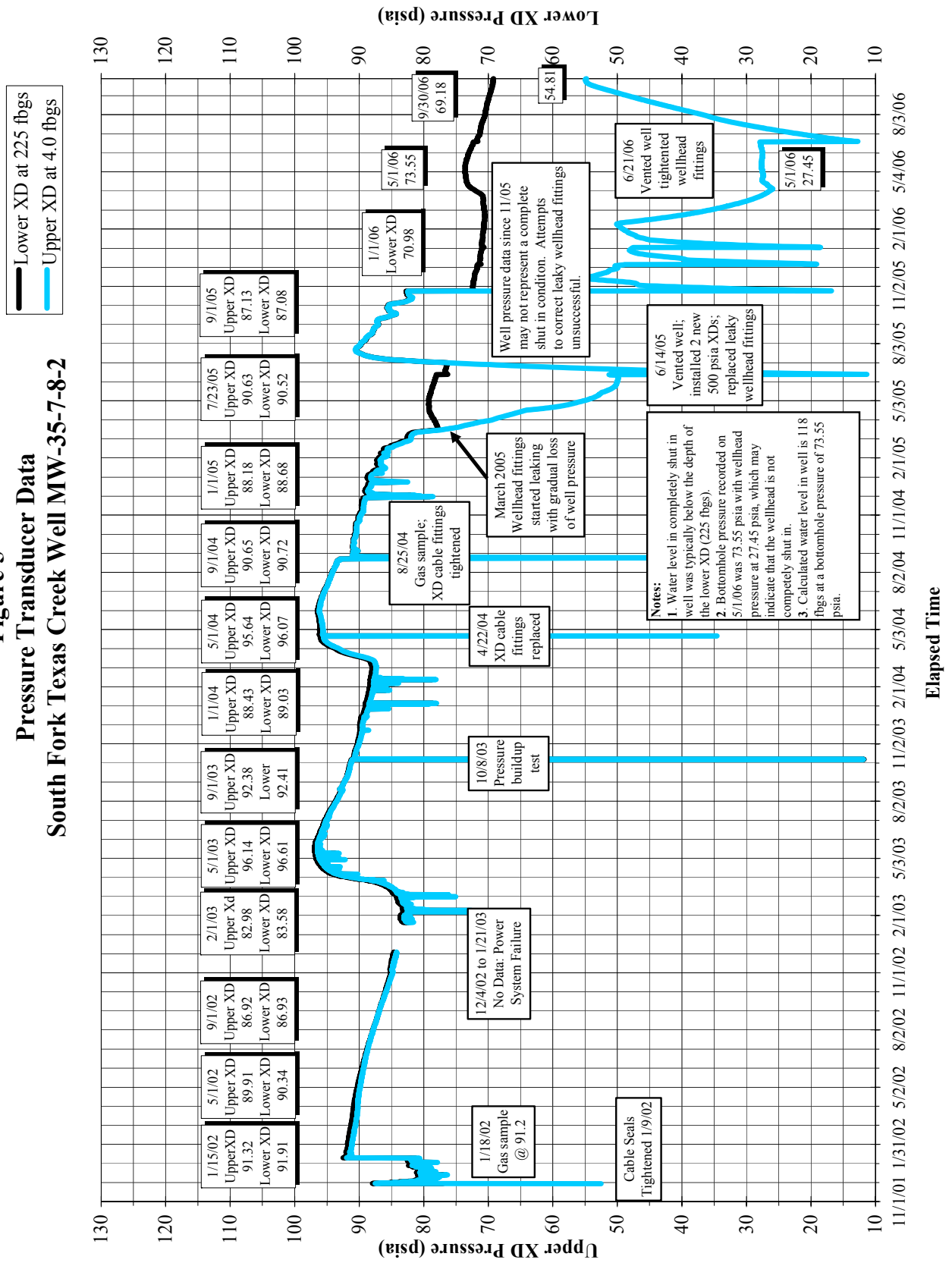


Figure 6. Air-lift apparatus used to development of MW 35-7-8-2.

Figure 7. Air-lift discharge from MW 35-7-8-2 diverted into containment pit.

2.2.3 BEAVER CREEK RANCH

MW 35-6-17-1

Monitoring data for well MW 35-6-27-1 are charted in Figure 8 and summarized in Table 7. This well has been monitored almost continuously since May 21, 2002. As described below, the pressure regime for this well is different than the regime exhibited by well MW 35-6-17-2.

Pressure buildup tests were conducted on October 7, 2003 and October 21, 2003. Figure 6 shows a notably different well pressure regime since the pressure buildup tests in October 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 2005, followed by a gradual increase in pressure through January 2005. Wellhead pressure gradually declined from about 87 psia in January 2005 to about 72.9 psia on January 1, 2006. Between January 1, 2006 and November 30, 2006, the wellhead pressure gradually increased from about 72.9 psia to about 76.92 psia.

Just prior to the October 7, 2003 buildup test, Figure 8 shows a bottomhole pressure of about 602 psia. After the well was vented and shut in on October 7, 2003, there was a bottomhole pressure buildup of about 23 psi, from 602 psia to 625.42 psia (October 21, 2003). Between October 21, 2003 and November 30, 2006, bottomhole pressure measurements show a net decline of about 47 psi, from 625.42 psia to 578.53 psia.

Figure 8 shows a decline of about 200 feet in the well water level, from 219.08 fbgs on October 7, 2003 to 418.02 fbgs on March 10, 2004. Between March 10, 2004 and July 26, 2004, there was a rise of about 55 feet in the calculated well water level, from 418.02 fbgs to 362.83 fbgs. Figure 8 shows a decline of about 35 feet (362.83 to 398.28 fbgs) in the calculated well water level between July 26, 2004 and December 10, 2004. In 2005, Figures 6 shows slight seasonal fluctuations in the well water level within an overall rising trend, followed by an overall declining trend in 2006. Figure 8 shows a decline of about 24 feet in the calculated well water level between January 1, 2006 (383.68 fbgs) and November 30, 2006 (407.78 fbgs).

Table 7
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 11/30/06	15.44	76.92	61.48	194.37	407.78	-213.41
Lower XD		609.55	578.53	-31.02			
MW 35-6-17-2 Upper XD	06/15/02 to 11/30/06	614.23	525.74	-88.49	1,377.64	No Data Lower XD removed	--
Lower XD		632.63	XD removed	--			

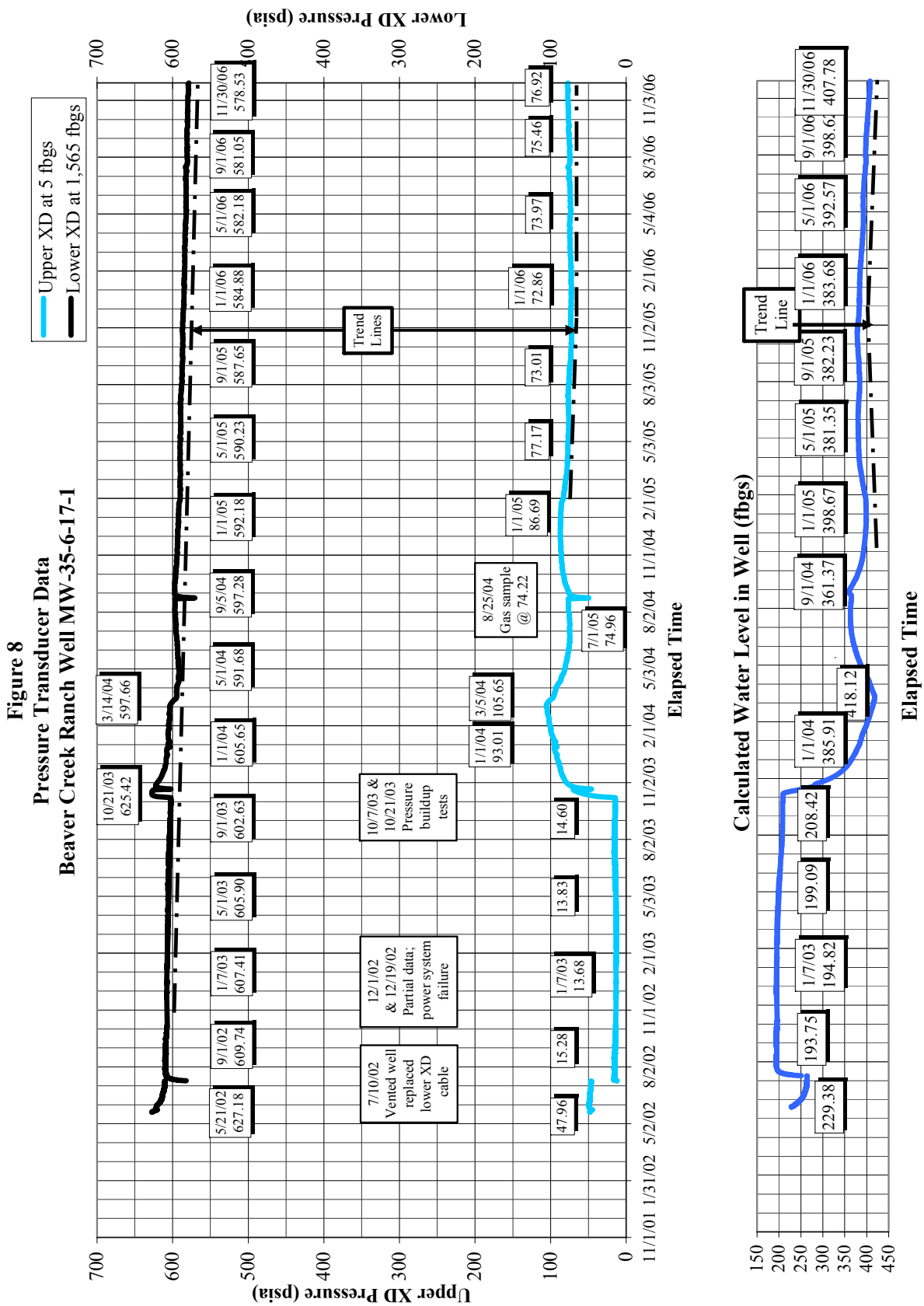


Figure 8
Pressure Transducer Data
Beaver Creek Ranch Well MW-35-6-17-1
Upper XD at 5 fbgs
Lower XD at 1,565 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
Trend Lines
10/21/03 625.42
3/14/04 597.66
5/21/02 627.18
9/1/02 609.74
1/7/03 607.41
5/1/03 605.90
9/1/03 602.63
1/1/04 605.65
5/1/04 591.68
9/5/04 597.28
1/1/05 592.18
5/1/05 590.23
9/1/05 587.65
1/1/06 584.88
5/1/06 582.18
9/1/06 581.05
11/30/06 578.53
47.96
15.28
1/7/03 13.68
13.83
14.60
1/1/04 93.01
3/5/04 105.65
8/25/04 Gas sample @ 74.22
7/1/05 74.96
1/1/05 86.69
77.17
73.01
1/1/06 72.86
73.97
75.46
76.92
7/10/02 Vented well replaced lower XD cable
12/1/02 & 12/19/02 Partial data; power system failure
10/7/03 & 10/21/03 Pressure buildup tests
Calculated Water Level in Well (fbgs)
Trend Line
229.38
193.75
1/7/03 194.82
199.09
208.42
1/1/04 385.91
418.12
9/1/04 361.37
1/1/05 398.67
5/1/05 381.35
9/1/05 382.23
1/1/06 383.68
5/1/06 392.57
9/1/06 398.6
11/30/06 407.78

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 9 and summarized in Table 7 for the period of record. This well has been monitored since December 3, 2001. Data were not collected between April 8, 2002 and May 20, 2002 due to a damaged lower transducer cable. There are no data for the periods December 1, 2002 to December 13, 2002 and December 19, 2002 to January 7, 2003 due to power system failure. Monitoring of bottomhole pressure ended after the lower transducer was removed from the well on April 22, 2004.

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 9 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.

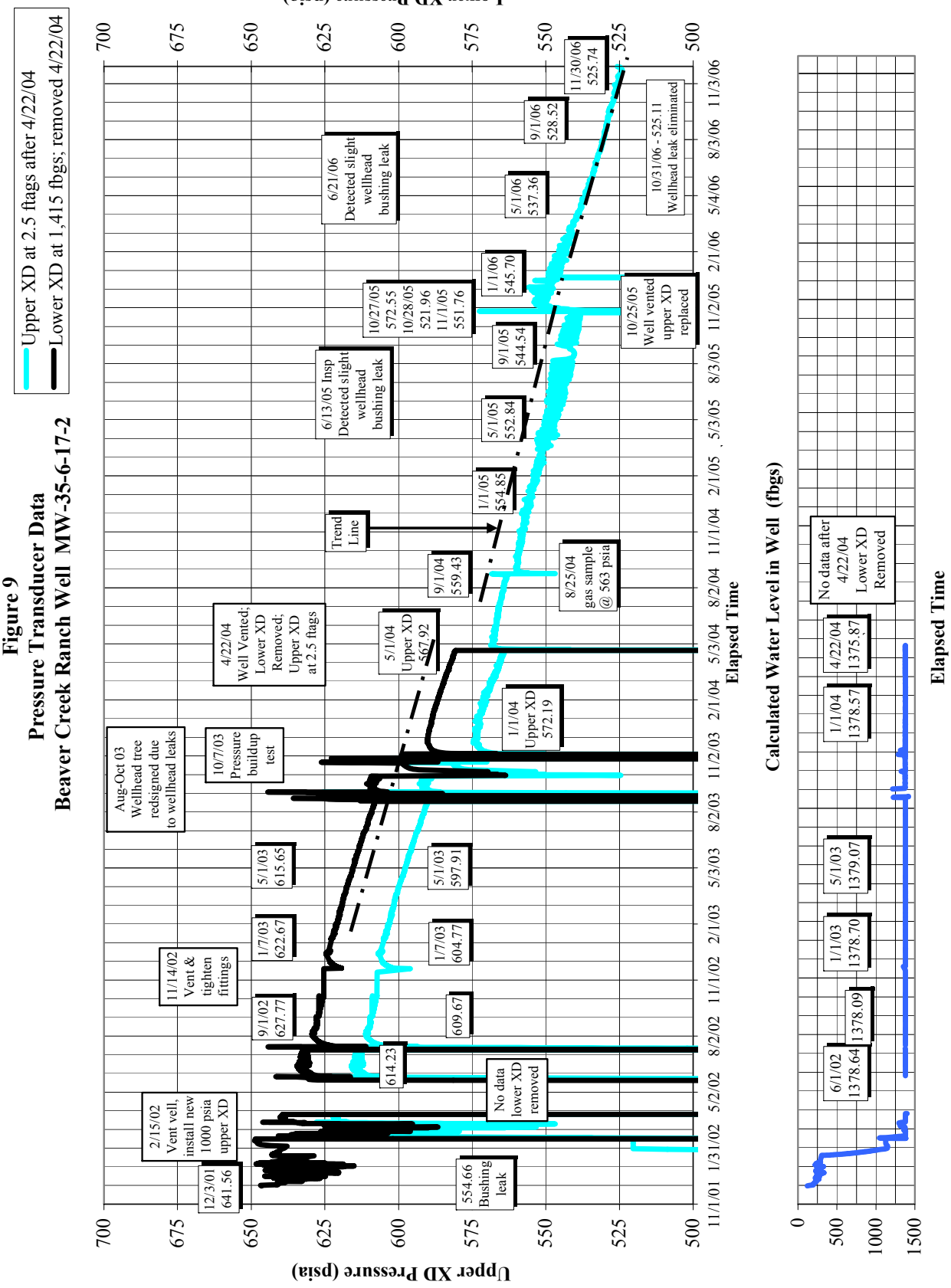
On April 22, 2004, the well was vented and both pressure transducer systems were removed from inside the well. One 1000 psia transducer was adapted to tap directly into the top of the flanged wellhead assembly. This external transducer adaptation makes it possible to measure wellhead pressure without passing flexible transducer cables through the wellhead assembly. Bottomhole pressure and water level data are not available without a lower transducer.

Figure 9 shows a trend of gradual wellhead pressure decline, about 27.5 psi, between January 1, 2004 (572.19 psia) and October 1, 2005 (544.73 psia). For the period record from June 15, 2002 (614.23 psia) to October 25, 2005 (538.14 psia), Figure 9 shows a total decline of about 76 psi in wellhead pressure. The June 13, 2005 and October 25, 2005 wellhead inspections revealed a very slight leak from the pressure transducer bushing, which may have contributed to this gradual decline in pressure.

In response to irregular pressure transducer measurements recorded for second and third quarters of 2005, the 1000 psia wellhead transducer was replaced on October 25, 2005. After the well was shut in on October 26, 2005, Figure 9 shows a relatively rapid pressure build up to a measured peak wellhead pressure of 572.55 psia on October 27, 2005, followed by a drop off to about 521.96 psia on October 28, 2005. A second period of wellhead pressure build up, to about 551.76 psia, occurred between October 28, 2005 and November 1, 2005.

After the well wellhead transducer was replaced on October 25, 2005, Figure 9 also shows irregular pressure measurements and a trend of gradually declining wellhead pressure. Between January 1, 2006 and September 30, 2006, wellhead pressure declined about 17.6 psi, from 545.7 psia to 528.08 psia, possibly in response to the continuing slight leak from around the pressure transducer bushing detected during the wellhead inspections on June 21, 2006 and October 31, 2006. The wellhead leak was eliminated on October 31, 2006 by permanently sealing the bushing to the flanged plate.

Figure 9
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 10 and 10a and summarized in Table 8 for the entire 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 8
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 11/30/06	12.06	11.56	Atmospheric Pressure	39.66	35.18	4.48
Lower XD		211.60	213.05	1.45			

1 On May 26, 2005, the measured bottomhole pressure (216.89 psia) and calculated depth to water (26.38 ft) in well MW 35-6-13-1 were at their highest levels for the period of record.

Figures 10 and 10a show 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 10 shows a measured bottomhole pressure of about 213 psia when the water level in the well is about 35 feet below ground surface.

Figures 10 and 10a show 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 in the well that occurs whenever the water level fluctuates. Seasonal fluctuations in bottomhole pressure occur within an overall slightly declining trend prior to February 2004. The bottomhole pressure and water level curves show seasonal fluctuations of higher magnitude occurred within an overall increasing pressure trend after February 2004. The decline and subsequent increase in bottomhole pressure and the water level in the well may be related to the return to more "normal" levels of precipitation in 2004 and 2005 after several years of "drought."

Bottomhole pressure fluctuated between 210 psia and 211 psia, during the first quarter of 2004, and then between 211 psia and 213 psia during the remainder of the 2004. During the first five months of 2005, bottomhole pressure increased from a low of 212.12 psia to a new recorded seasonal high of 216.89 psia on May 26, 2005. Likewise, the calculated well water level reached a new high of about 26.38 fbgs on May 26, 2005. Since May 2005, Figure 10a shows an apparent shift in the seasonality of the bottomhole pressure curve. In previous years, Figure 8a shows seasonal highs in May and lows in January or February. After the seasonal high in May 2005, however, the decline in bottomhole pressure continued through mid-March 2006. The seasonal rise in bottomhole pressure that typically began in February in previous years did not begin until mid-April in 2006 and peaked at about 214.12 psia in May 2006. Additional monitoring data is needed to further clarify this apparent shift in seasonal water level fluctuations within an overall decreasing trend in bottomhole since September 2005.

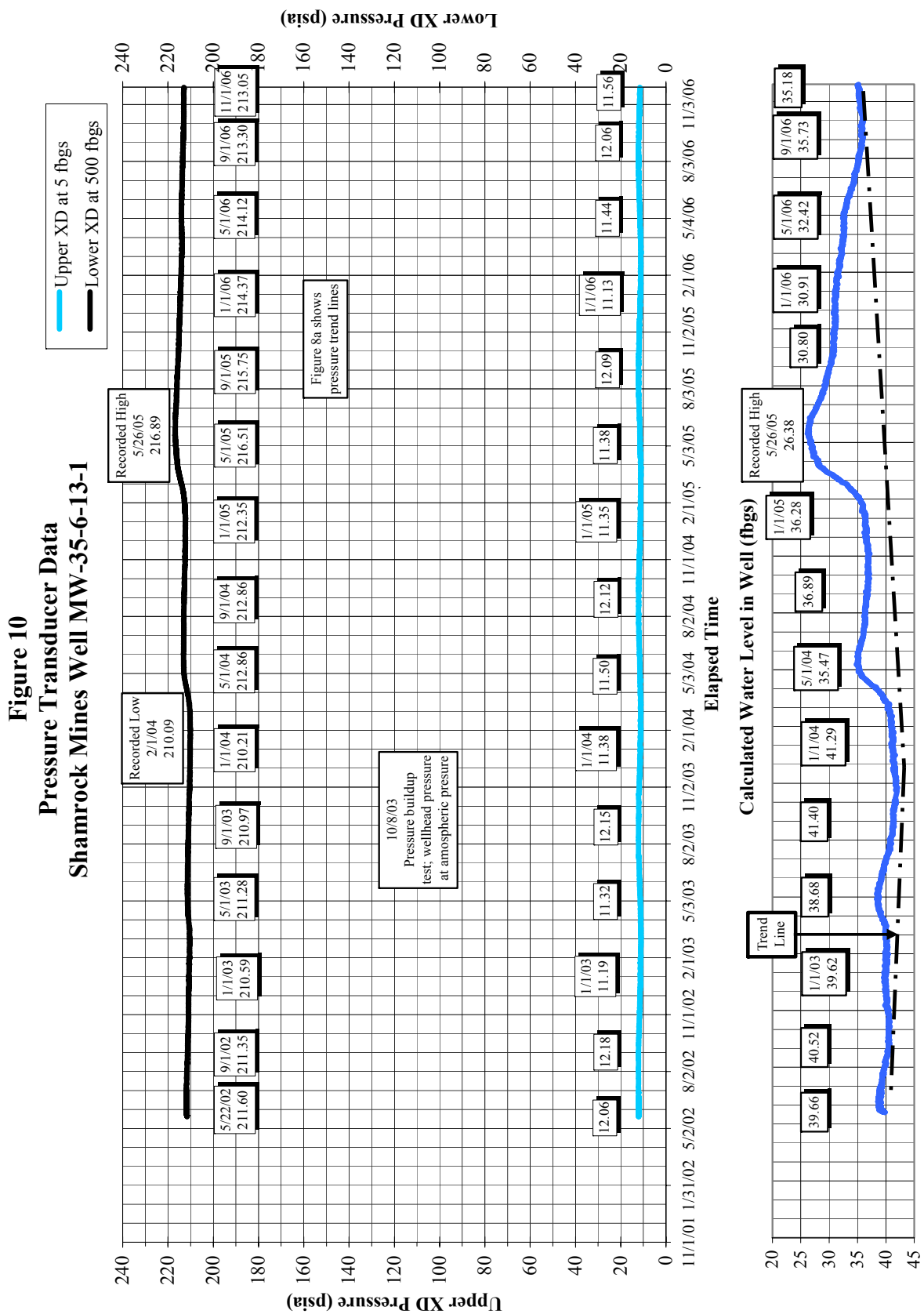


Figure 10
Pressure Transducer Data
Shamrock Mines Well MW-35-6-13-1
Upper XD at 5 fbgs
Lower XD at 500 fbgs
Recorded High
5/26/05
216.89
Recorded Low
2/1/04
210.09
Figure 8a shows
pressure trend lines
10/8/03
Pressure buildup
test; wellhead pressure
at amospheric presure
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
Calculated Water Level in Well (fbgs)
Recorded High
5/26/05
26.38
Trend
Line

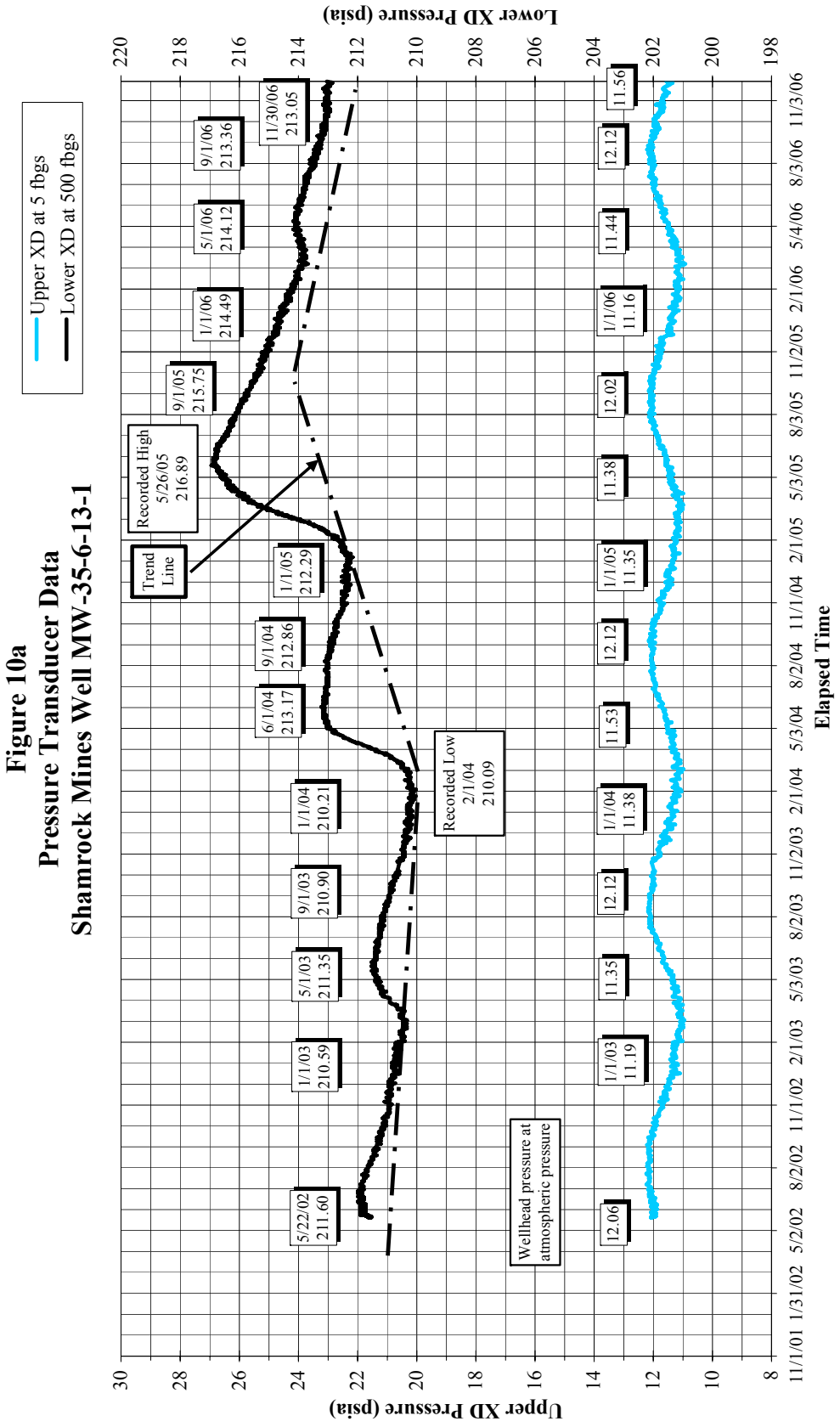


Figure 10a
Pressure Transducer Data
Shamrock Mines Well MW-35-6-13-1

3.0 FUTURE WORK – FIRST QUARTER 2007

Routine work will continue to include periodic checks of each monitoring system and remote download of recorded pressure measurement data via telemetry. No specific operation and maintenance activities are planned for the first quarter of 2007 due to winter conditions.