Colorado Oil and Gas Conservation Commission

Monitoring Wells Summary Report December 2004

3M Project Monitoring Program La Plata County, Colorado

Colorado Oil and Gas Conservation Commission
Applied Hydrology International
Denver, Colorado

January 2005

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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 December 2004. The monitoring work was carried out by staff of the COGCC and Applied Hydrology International (AHI – formerly Applied Hydrology Associates, Inc.) 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 December 2004.

2.0 MONITORING ACTIVITIES AND DATA SUMMARY

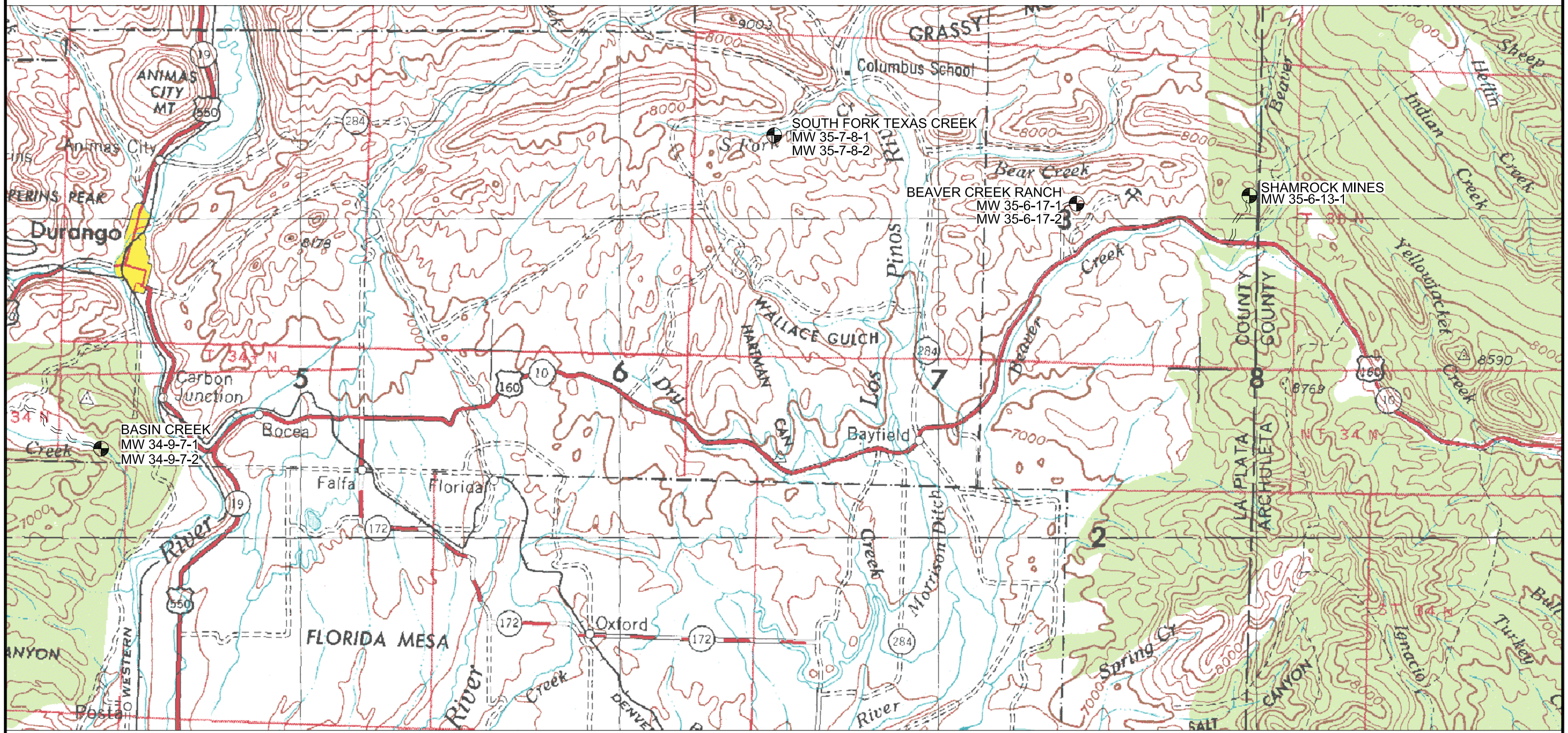
2.1 MONITORING SITE ACTIVITIES - FOURTH QUARTER 2004

No monitoring site maintenance or repair activities were performed during the fourth quarter of 2004. Remote downloading of well pressure measurements automatically recorded at each of the four monitoring sites was performed monthly by AHI in Denver via telemetry.

2.2 MONITORING WELL PRESSURE DATA SUMMARY

Well pressure is currently being measured and recorded twice daily (12-hour interval) at all sites. Well pressure and calculated well 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 only applicable when the water level in a well is below the upper transducer.

Well pressure data analyses 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.



MONITORING WELL SITE AND DESIGNATION

SOURCE
USGS 1° X 2° SERIES (TOPOGRAPHIC)
NJ 13-7
DURANGO, COLORADO

N

0 10,000 20,000
FEET
CONTOUR INTERVAL 200 FEET

Applied Hydrology Associates, Inc.

3M Project
La Plata County, CO

Figure 1
3M Site Map
Well Locations

DESIGN: NLH	DATE: 6/12/02	DRAWING NUMBER
DRAWN: JLS	SCALE: AS SHOWN	San Juan Dur-Bay.dwg
SCRIPT:		

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	1.65 ftags*	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**	PXD-461-1,000 psia	None**	PXD-461-1,000 psia
Shamrock Mines	MW 35-6-13-1	5	PXD-461-500 psia	500	PXD-461-1,000 psia

* 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
** MW 35-6-17-2 lower transducer raised from 1420 fbgs to 1415 fbgs August 22, 2003
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	November	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				
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			
		January	Feb - May	May	June	August	October	December	January- March	April	August	December
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	
	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	
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; power and data logger systems OK	~June 16: lower xd failed		Oct 8: Conduct well 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 fittings; gas sample	
	MW 35-7-8-2						Oct 8: Conduct 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	
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: conduct well pressure buildup tests				Aug 24: New data logger battery pack; vent well; Aug 25: gas sample	Remote site modem communication system failure after December 10
	MW 35-6-17-2		MW 35-6-17-2: Bushing leak	May 20: Location of wellhead threaded bushing leak identified; wellhead assembly to be redesigned		Aug 20: New flanged wellhead assembly installed; xd cable leak at swagelok fitting	Oct 8 & 21: well pressure buildup tests; wellhead leaks @ pressure >570 psia	Wellhead leaks @ 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	
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: Replace 12v Pb-acid battery, modem works; Oct 8: well pressure buildup tests; Oct 21: Replace solar panel				Aug 24: New data logger battery pack; vent well, no gas to sample	

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

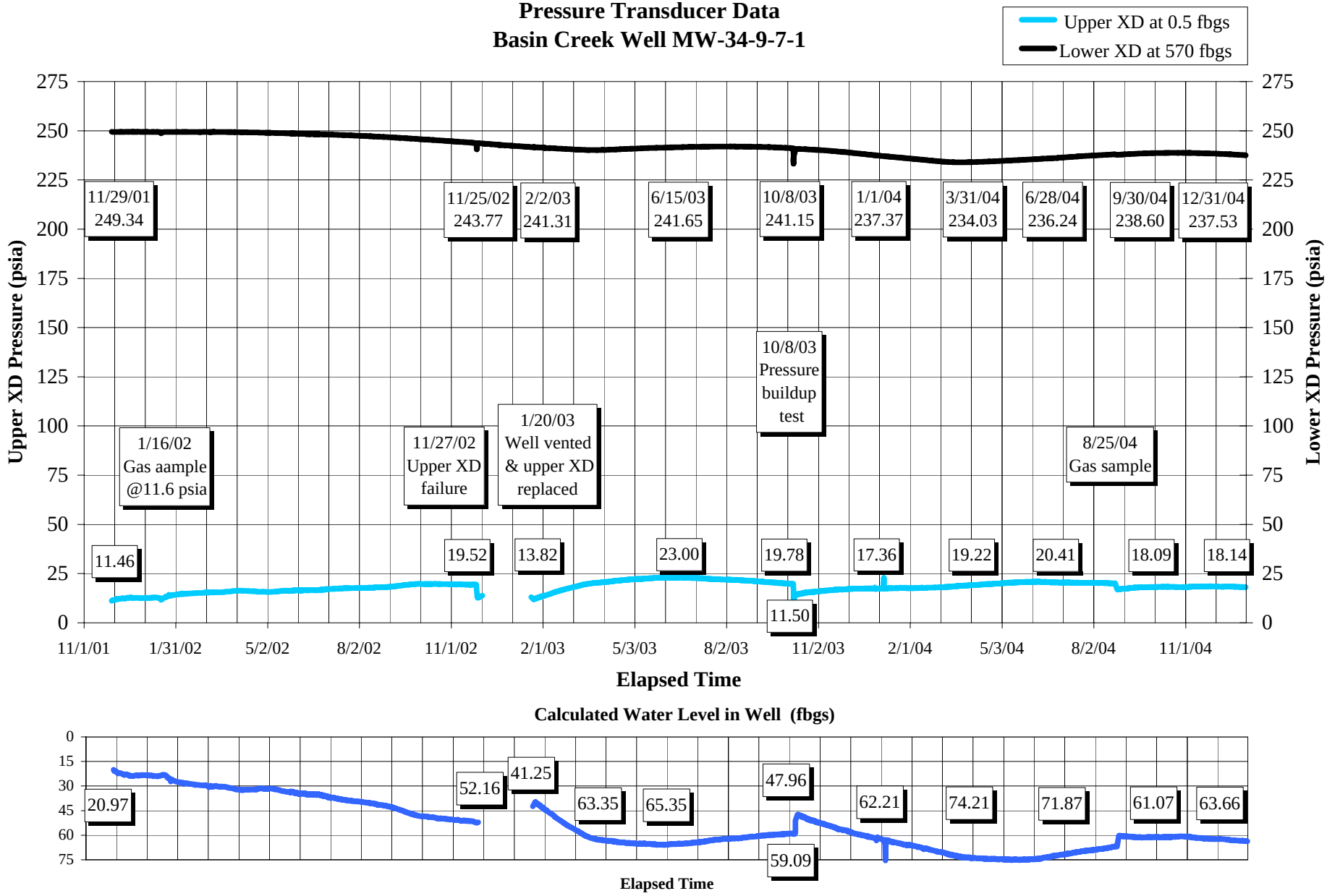
Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 34-9-7-1 Upper XD	11/29/01 to 12/31/04	11.46	18.14	6.68	20.97	63.66	-42.69
Lower XD		249.34	237.35	-11.99			
MW 34-9-7-2 Upper XD*	05/24/02 to 4/23/04	31.20	27.80*	-3.40	Well water level is above ground level; see discussion and Figures 3 and 3a for more details		
Upper XD**	4/23/04 To 8/25/04	25.73	26.13	0.40			
Upper XD***	8/26/04 To 12/31/04	Average 25.40	22.81	-2.59			
Lower XD	5/24/02 to 12/31/04	241.42	234.42	-5.93			

* MW 34-9-7-2 upper XD at 4.6 ft below ground level (under water)
** MW 34-9-7-2 upper XD at ground level (under water)
*** MW 34-9-7-2 upper XD at 1.65 ft above ground level

The upper transducer, lower transducer and calculated well water level charts (Figure 2) indicate a trend for 2004 of slight seasonal fluctuations in well pressure and the apparent water level in the well. In addition, Figure 2 and Table 2 show a gradually decreasing bottomhole pressure, increasing wellhead pressure, and a corresponding apparent decline in the well water level for the period of record.

The three short-term interruptions in the wellhead pressure and calculated well water level curves for the period of record are due to venting of the well to replace a transducer, conduct a pressure build up test, and to sample gas from the well. Bottomhole pressure rapidly returned to previous levels after each time the well was vented, while wellhead pressure and water level in the well gradually returned to previous levels.

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. As discussed below, the upper transducer was raised from 4.6 feet below ground level to ground level on April 23, 2004, and to 1.65 feet above ground level on August 25, 2004 to identify the shut-in water level in the well. The 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.

Figures 3 and 3a show a trend of gradually declining bottomhole pressure for the period of record. Figure 3a also shows slight seasonal fluctuations in 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 shut-in wellhead pressure at 4.6 fbgs was 27.8 psia verses 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 ft above ground surface (ftags), a difference of about 1 psia. In both cases, there was no corresponding difference in the bottomhole pressure (Figure 3a). Differential wellhead pressures between 4.6 fbgs and 1.65 ftags confirm the upper transducer is under water at 4.6 fbgs and at ground level. Thus, the apparent water level in well MW 34-9-7-2 is above ground level. An estimated well water level or equivalent water pressure cannot be determined because the method of calculation is valid only if the wellhead pressure transducer is above the water level in the well.

The 12-hour interval (3 am and 3 pm) pressure data shows well pressures at 4.6 fbgs and 485 fbgs are not subject to diurnal fluctuations (Figure 3a). In contrast, wellhead pressure at and above ground leve1 is subject to slight diurnal fluctuations. Wellhead pressure is consistently 0.4 psia to 0.5 psia higher at 3 pm than 3am at ground level, and about 0.3 to 1 psia higher at 1.65 ftags. These diurnal pressure fluctuations appear to occur in response to daily ambient air temperature fluctuations that warms and cools the 2.5-inch wellhead tubing above ground level.

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

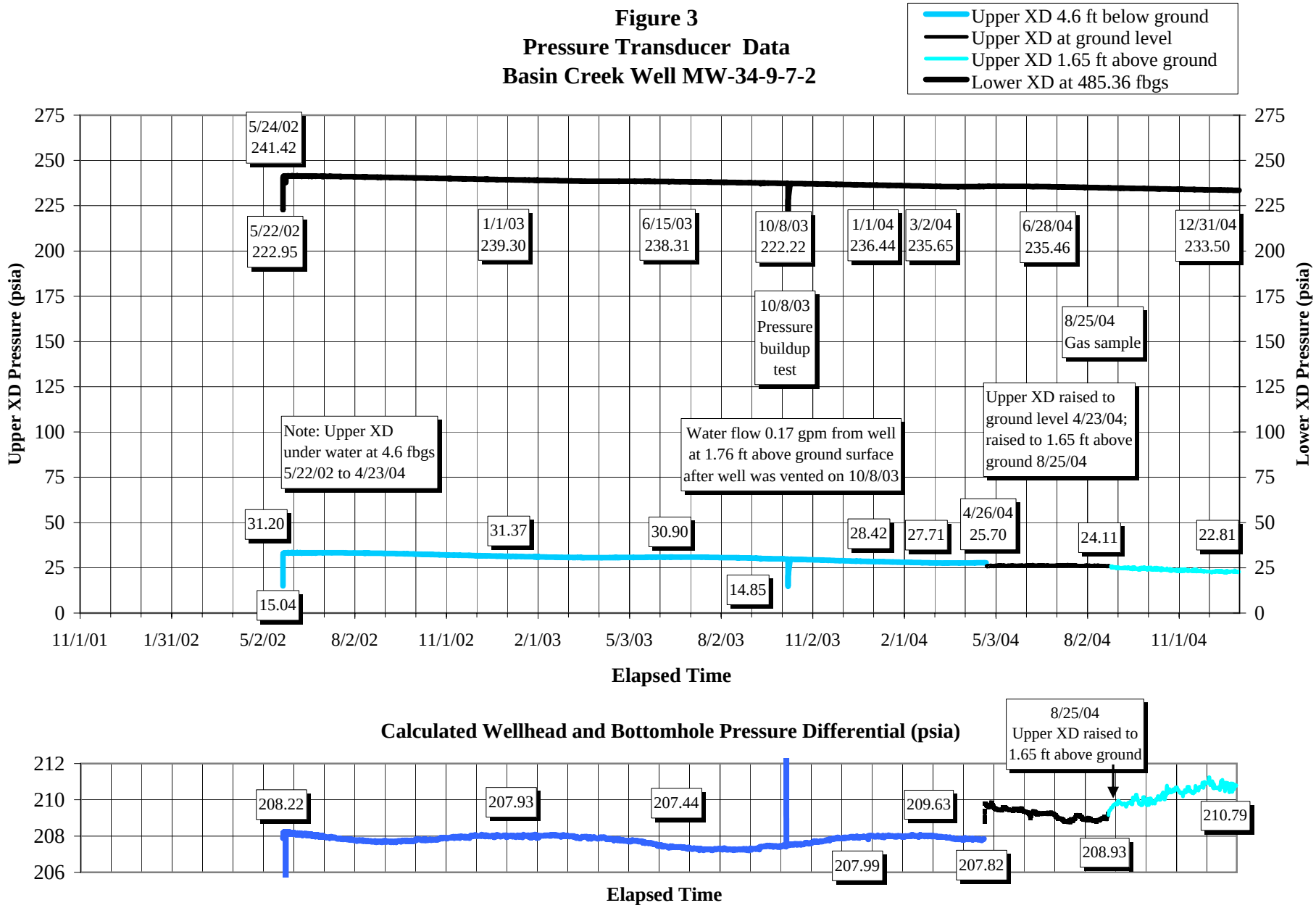
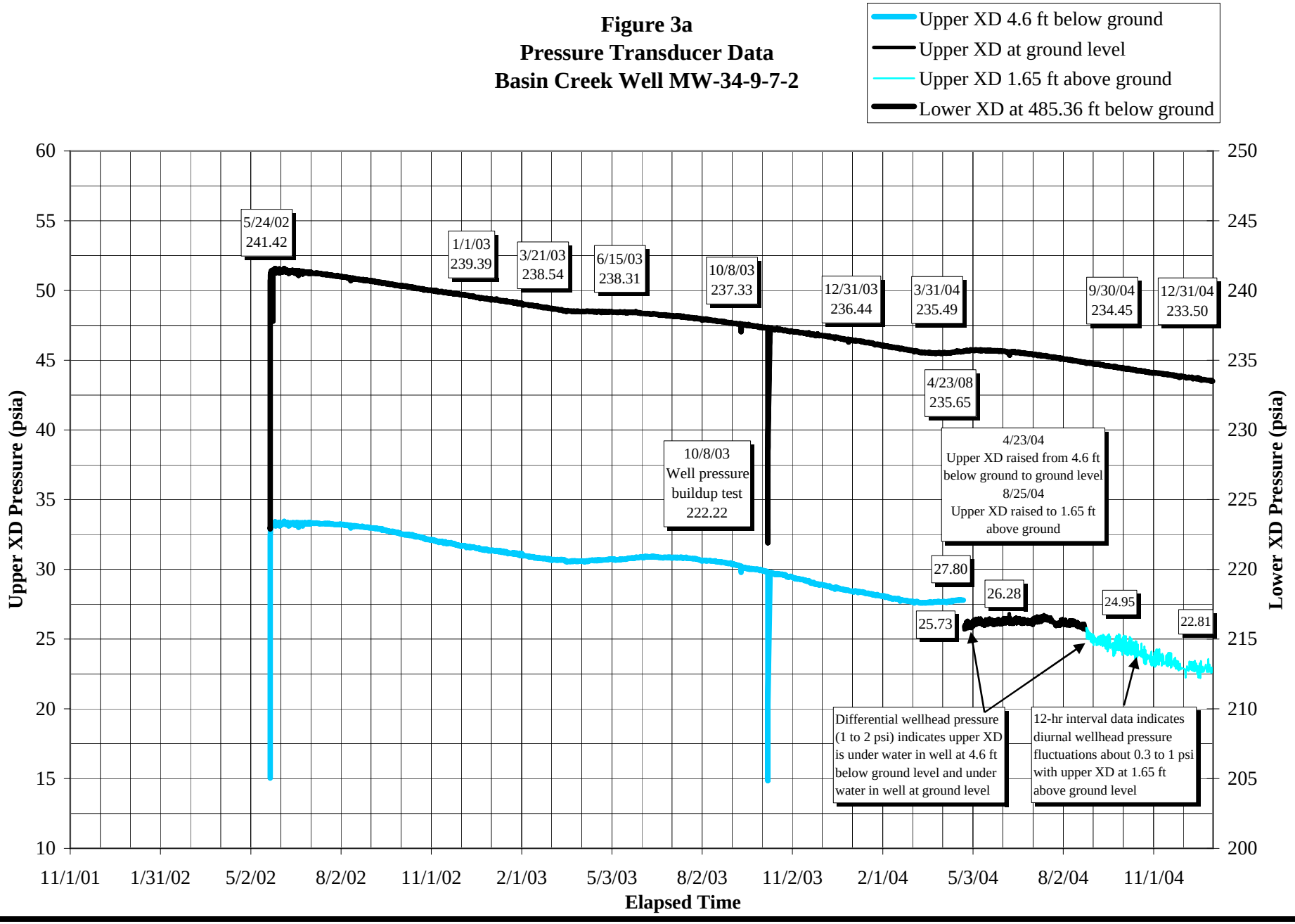


Figure 3a
Pressure Transducer Data
Basin Creek Well MW-34-9-7-2



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

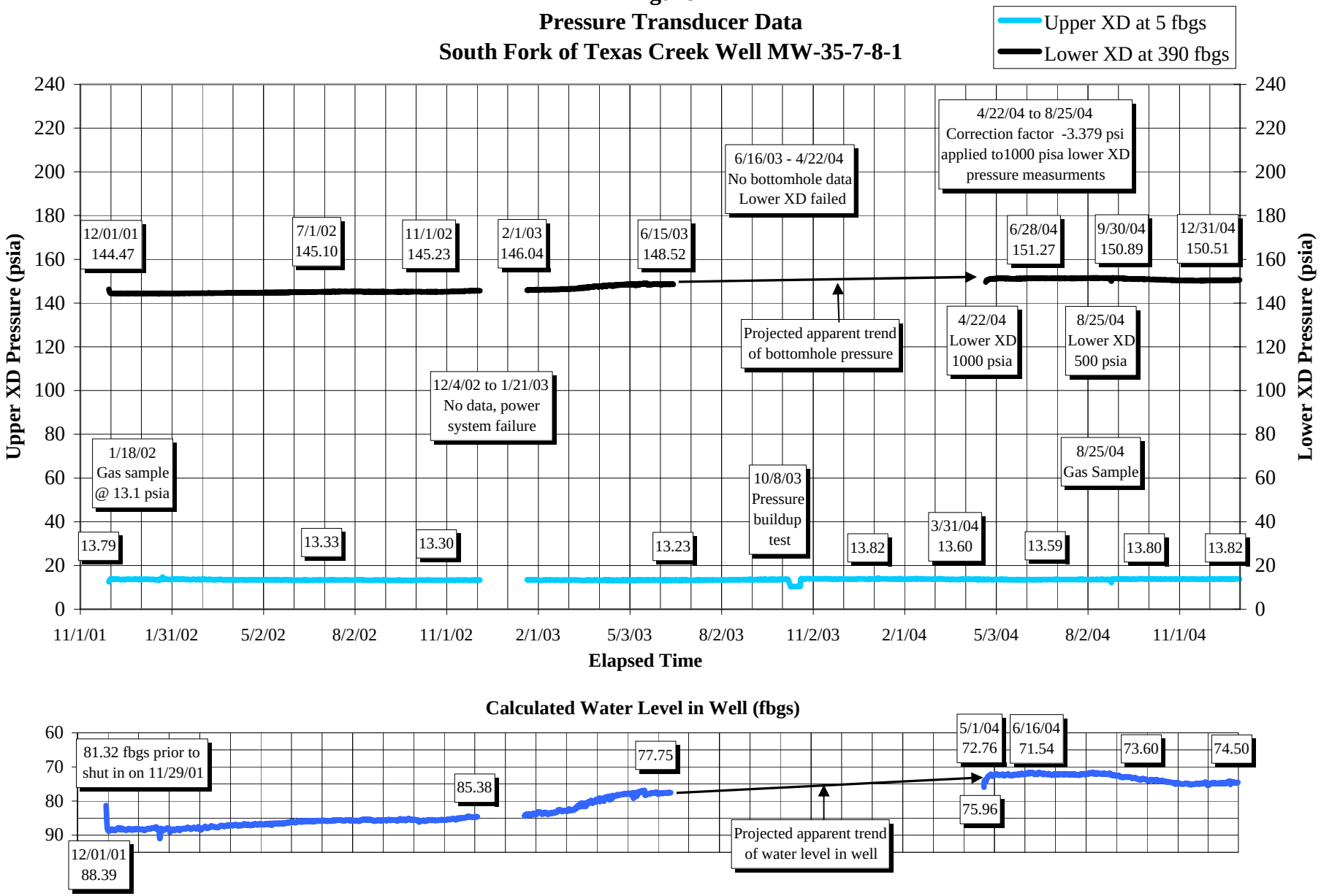
Data for MW 35-7-8-1 are charted in Figure 4 and summarized in Table 5. Upper transducer data recorded since January 1, 2002 indicate a relatively stable wellhead pressure, ranging between 13.1 psia and 13.8 psia, about 2 psia above atmospheric pressure. On December 31, 2004, the measured atmospheric pressure at this site was as about 11.11 psia. The 13 psia wellhead pressure in this well continues to be about seven times lower than the 88± psia wellhead pressure measured at well MW 35-7-8-2.

The calculated water level in the well on December 31, 2004 (74.5 fbgs) is about 3 feet higher than on June 15, 2003 (77.75 fbgs), prior to failure of the lower transducer. Figure 4 shows trend lines for an apparent increase in bottomhole pressure and water level rise for the period of missing bottomhole pressure measurements (June 15, 2003 to April 22, 2004). The calculated water level in the well between May 1, 2004 and December 31, 2004 fluctuated between a high of about 71.54 fbgs on June 16, 2004 to a low of 75.1 fbgs on December 24, 2004.

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 12/31/04	13.79	13.82	0.03	88.39	74.50	13.89
Lower XD		144.47	150.51	6.04			
MW 35-7-8-2 Upper XD	1/15/02 to 12/31/04	91.30	88.18	-3.12	Water level in well is >225 fbgs		
Lower XD		91.91	88.75	-3.16			

Figure 4
Pressure Transducer Data
South Fork of Texas Creek Well MW-35-7-8-1

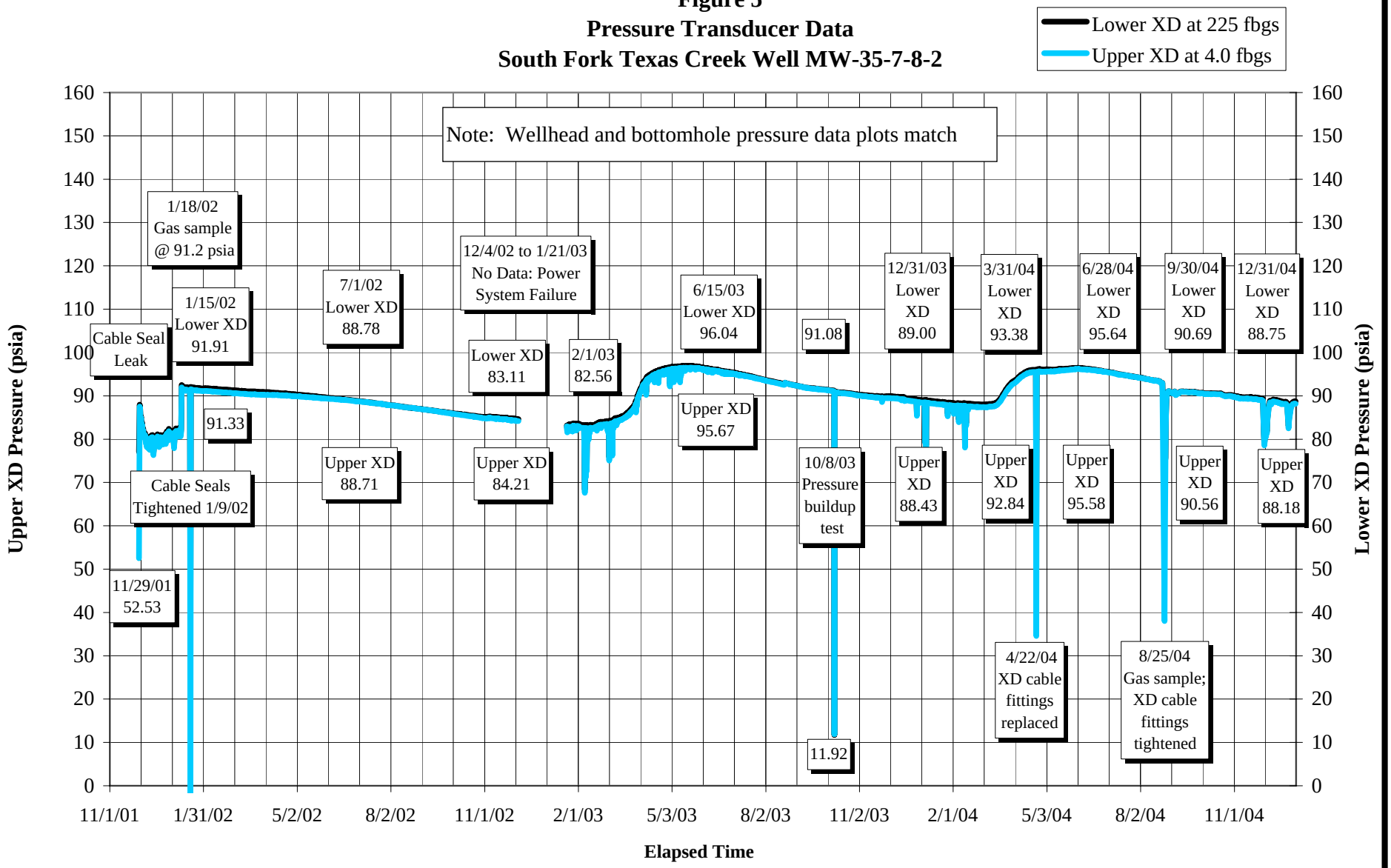


MW 35-7-8-2

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 and Table 5 continue to show equal wellhead and bottomhole pressures for the entire period of record. Thus, the water level in the well is deeper than 225 fbgs, which is the depth of the lower transducer.

Figure 5 shows that well pressure is subject to seasonal fluctuations ranging between 7 and 14 psia within an overall stable trend for the period of record. In general, well pressure for the period of record since January 2003 increases several psia in the spring (March through May) and then gradually declines until the following spring. The lowest seasonal well pressure of record, 82.5 psia, occurred on January 26, 2003, while the highest seasonal well pressure of record, 96.9 psia, occurred on May 14, 2003 and May 23, 2003. In 2004, well pressure fluctuated within a range of about 8 psia, from a low of about 88 psia between February 23, 2004 and March 2, 2004 and a high of 96.5 psia on June 2, 2004.

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



2.2.3 BEAVER CREEK RANCH

The most recent download of well pressure data for this site was completed on December 10, 2004. Attempts to download data since December 10, 2004 via telemetry have failed due to a cellular phone or power system malfunction.

MW 35-6-17-1

Monitoring data for well MW 35-6-27-1 are charted in Figure 6 and summarized in Table 6. 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 3, 2004, the wellhead pressure increased about 90.9 psi, from 14.36 psia to 105.24 psia. Between March 3, 2004 and September 30, 2004, wellhead pressure declined approximately 30 psia, from about 105 psia (March 3, 2004) to 74.78 psia (June 28, 2004), and then gradually increased to 87.4 psia as of December 10, 2004. These fluctuations may be seasonal.

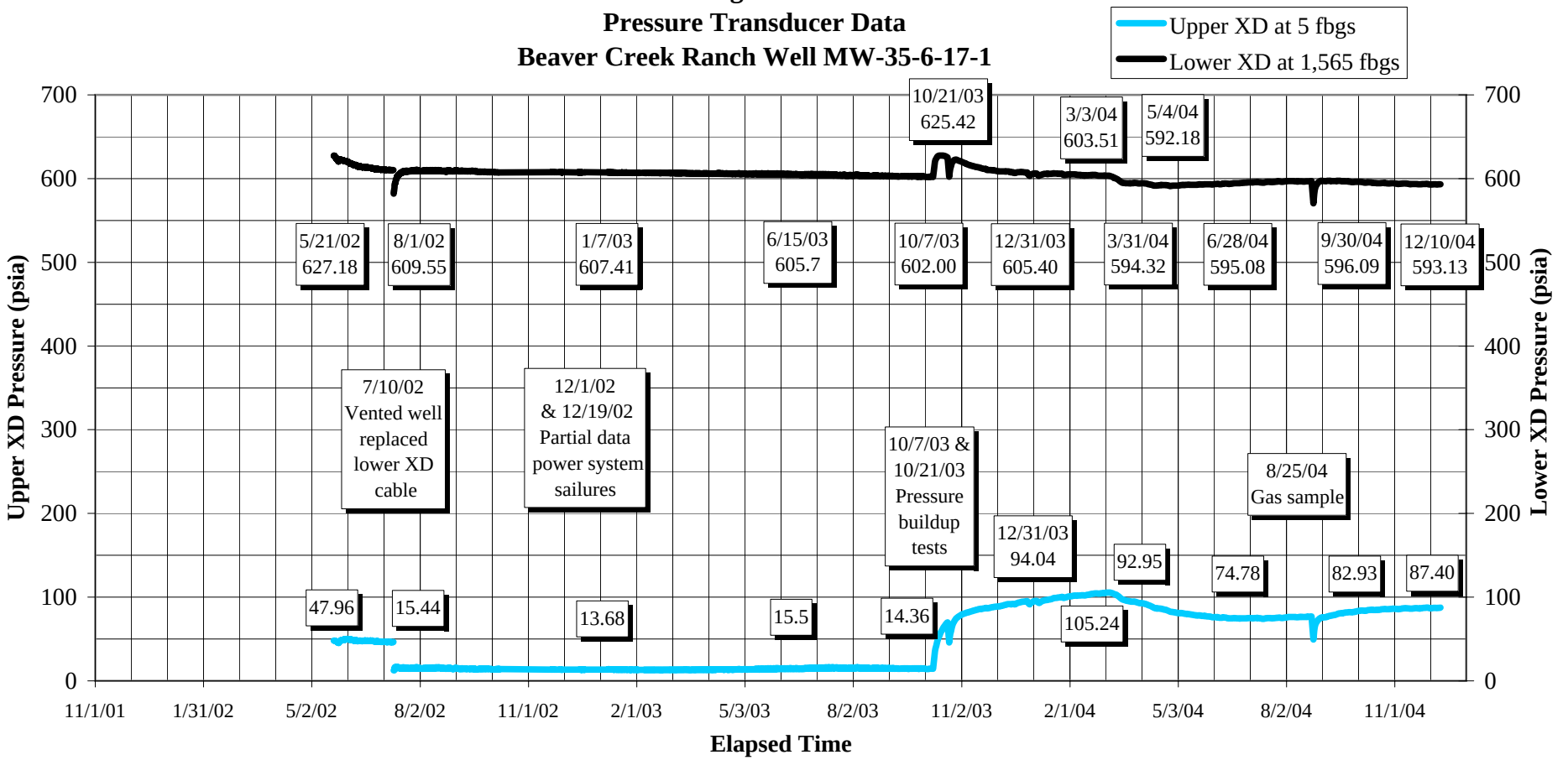
Just prior to the October 7, 2003 buildup test, Figure 6 shows a bottomhole pressure of about 602 psia. After the well was vented and shut in on October 7, 2003, there was a bottomhole pressure buildup of about 23 psi, from 602 psia to 625.42 psia (October 21, 2003). Between October 21, 2003 and December 10, 2004, bottomhole pressure measurements show a net decline of about 32.3 psi, from 625.42 psia to 593.13 psia.

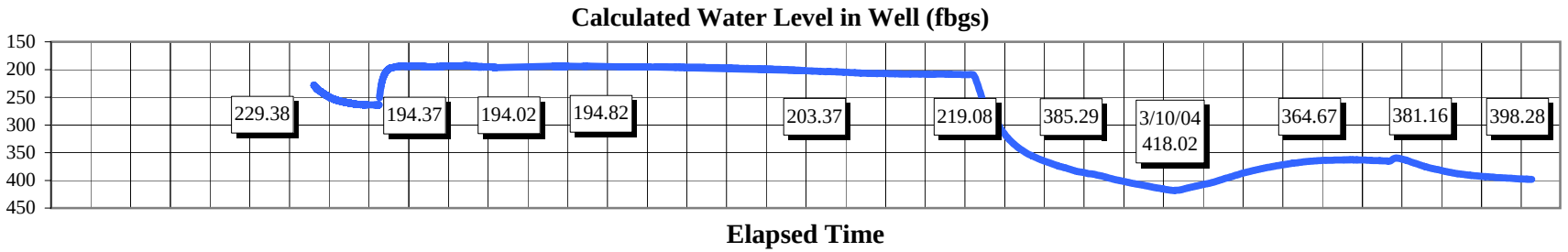
Figure 6 shows a decline about 200 feet in the well water level, from 219.08 fbgs on October 7, 2003 to 418.02 fbgs on March 10, 2004. Between March 10, 2004 and June 28, 2004, there was a rise of approximately 53 feet in the calculated well water level, from 418.02 fbgs to 364.67 fbgs. Figure 6 shows a decline of about 33.6 feet (364.67 to 398.28 fbgs) in the calculated well water level between June 28, 2004 and December 10, 2004. These fluctuations may be seasonal.

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 12/10/04	15.44	82.93	59.34	194.37	398.28	-203.91
Lower XD		609.55	593.13	-17.42			
MW 35-6-17-2 Upper XD	06/15/02 to 12/10/04	614.23	556.86	-54.80	1,378.64	No Data Lower XD removed	--
Lower XD		632.63	XD removed	--			

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. 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.

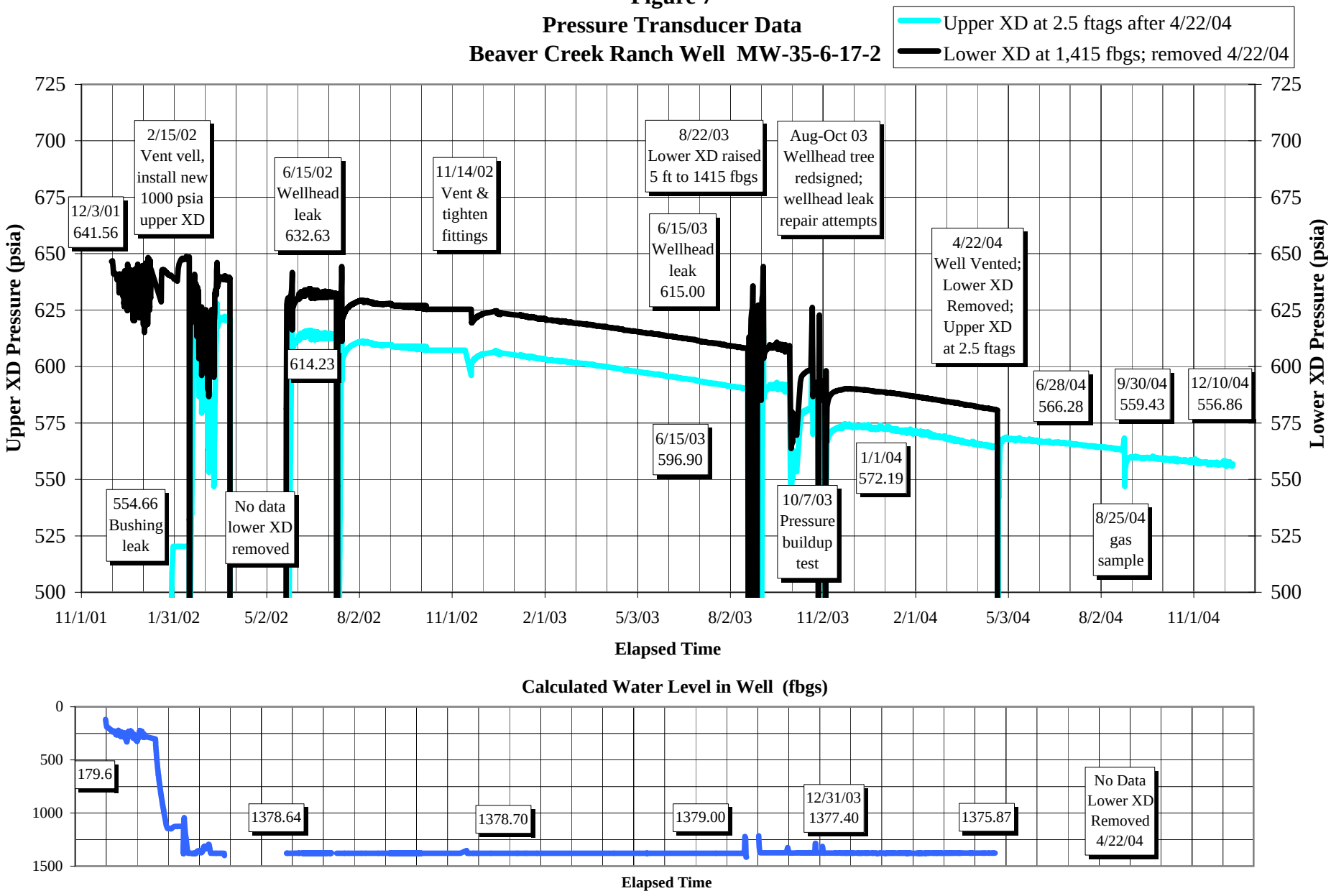
The wellhead pressure has been measured in excess of 600 psia, which is notably higher than in the other 3M monitoring wells. However, the wellhead was not completely shut in between February 2002 and mid-April 2004 because of a variety of wellhead fittings leaks. Consequently, the pressure data charted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

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.

Prior to venting the well on April 22, 2004, the wellhead pressure reading was 564.35 psia. On May 3, 2004, eleven days after the well was shut in again, the measured wellhead pressure buildup peaked at 568.23 psia. AHI inspected the wellhead assembly for leaks on May 13, 2004 and August 25, 2004. No leaks were detected during the inspections.

Figure 7 shows a trend of gradual wellhead pressure decline, about 15.3 psi, between January 1, 2004 (572.19 psia) and December 10, 2004 (556.86 psia). For the period record through December 10, 2004, Figure 7 shows a total decline of about 57.4 psi in wellhead pressure since the pressure was recorded at 614.23 psia on June 15, 2002.

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 Figure 8 and summarized in Table 7 for the entire period of record. This well has been monitored continuously since May 22, 2002.

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). The measured atmospheric pressure at this site (altitude 7717 feet) was about 11.0 psia on December 31, 2004.

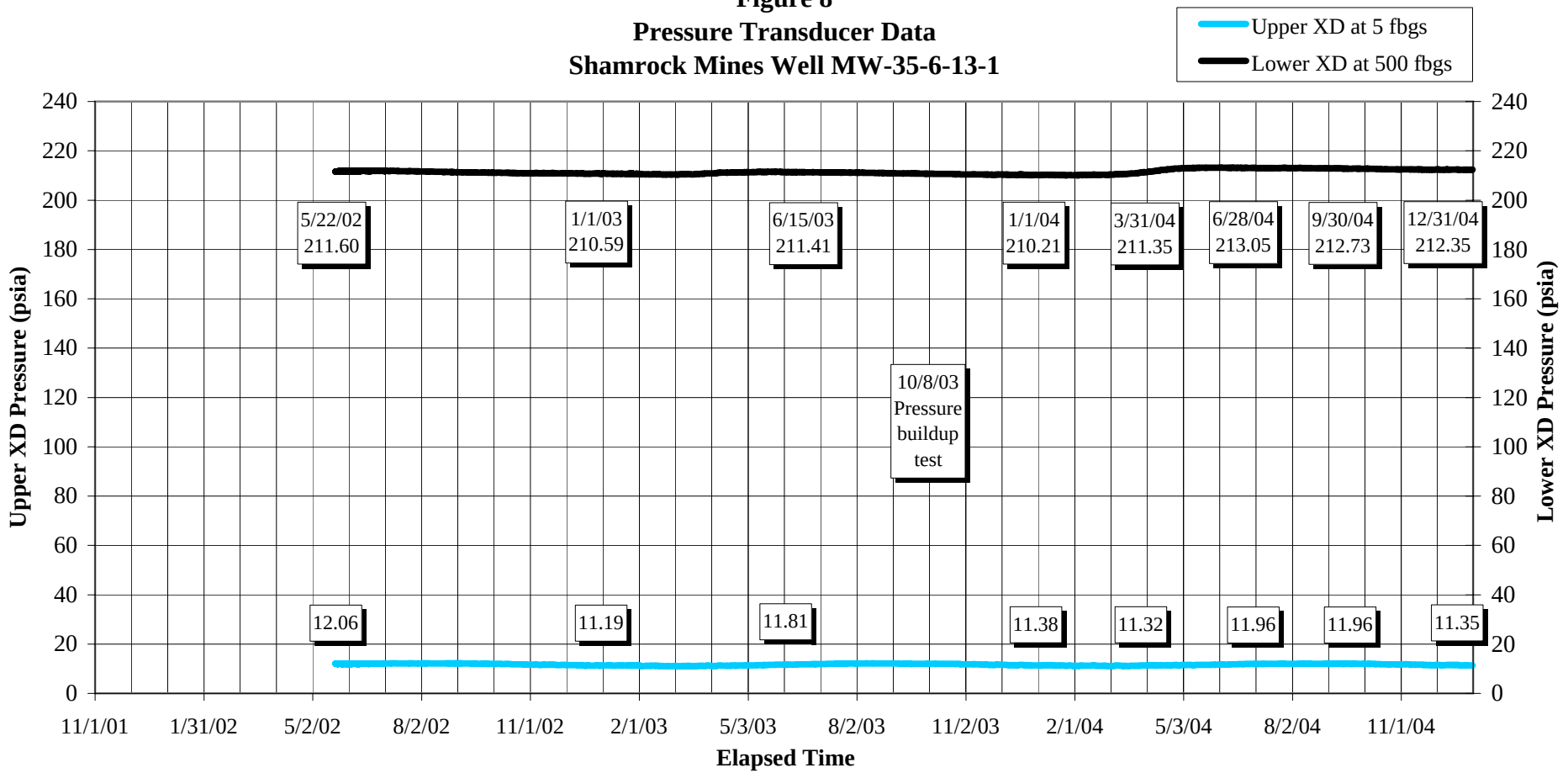
Both bottomhole pressure and calculated apparent water level in the well continue to exhibit a similar trend of seasonal fluctuation. Figure 8 shows slight seasonal fluctuations in bottomhole pressures within an overall increasing trend in 2004. Bottomhole pressure fluctuated between 210 psia and 211 psia, during the first quarter of 2004, and then between 211 psia and 213 psia during the remainder of the 2004.

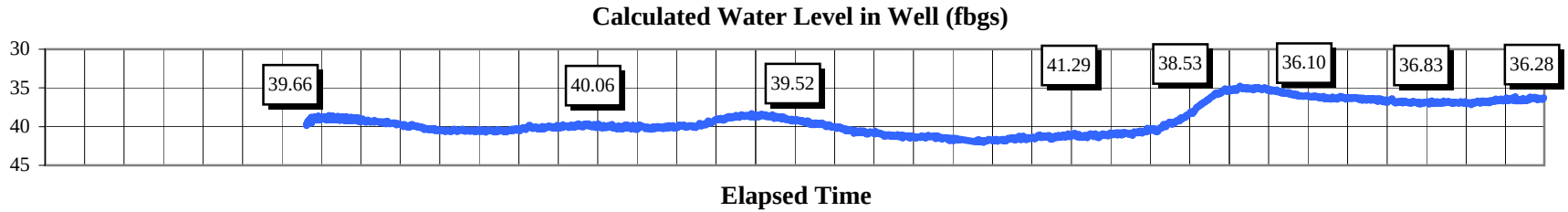
Figure 8 also shows a trend of increasing water level in the well during the last three quarters of 2004, which is consistent with a trend of increasing bottomhole pressure and stable wellhead pressure. The calculated well water level was about 36.3 fbgs on December 31, 2004, as compared to 41.3 fbgs on January 1, 2004 and 40.1 fbgs on January 1, 2003. For the period of record, the calculated water level in the well is subject to a seasonal fluctuation of about 7 feet. The highest water level in the well calculated to date, about 35 fbgs, occurred in May 2004 and the lowest water level calculated to date, about 41.7 fbgs, occurred in February 2004.

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	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 35-6-13-1 Upper XD	5/22/02 to 12/31/04	12.06	11.35	-0.71	39.66	36.28	3.38
Lower XD		211.60	212.35	0.75			

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





3.0 FUTURE WORK – FIRST QUARTER 2005

Routine work will continue to include periodic checks of each monitoring system and remote download of recorded pressure measurement data via telemetry. Specific operation and maintenance activities will be performed in the first quarter as needed, depending upon site accessibility under winter conditions. In particular, the Beaver Creek monitoring station needs to be inspected to remedy the loss of telemetry communications capability.