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Incoming C0070041

OK

From: "Brad Price" <Bprice@rbgengineering.com>
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Date: 2/14/2007 11:42:17 AM
Subject: Grassy Trail Dam Seismic Update - Feb. 10, 2007

See attached pdf of seismic summary for February 10, 2007.
Brad

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RB&G ENGINEERING
Grassy Trail Dam, Seismic Summary for February 10, 2007.

For the period between January 13, and February 10, 2007 no MIS (Mining Induced Seismicity) earthquakes were recorded within the area near panel #7 by the UUSS. No MIS events were recorded on the Dam or Hillside instruments during the past month.

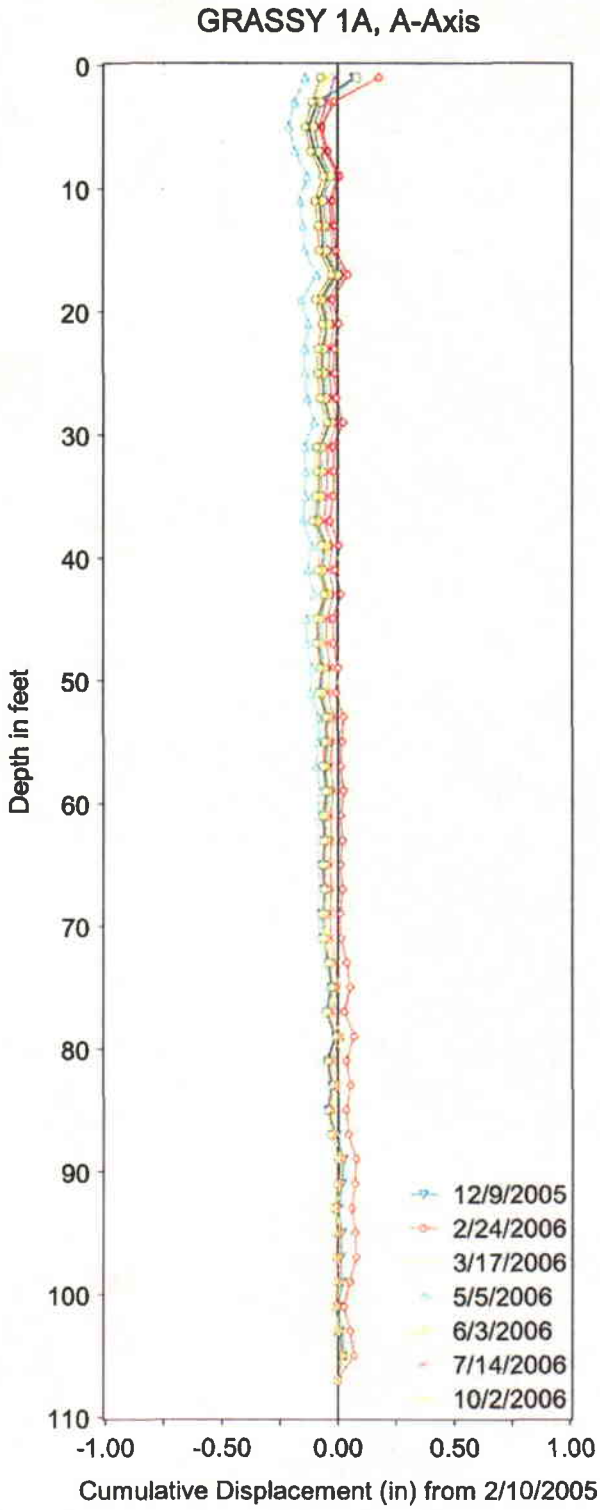
Since January 13, 2007 there have been 3 micro earthquakes (mag 1.2 to 1.6) reported by the UUSS which have taken place about 3-4miles West of the dam. This area is near Panel 9 where mining began after Panel 7 was completed at the end of September 2006. It is our understanding that mining in Panel 9 began in an area with about 300 feet of overburden. This relatively small amount of overburden has not generated very large rockbusrts and no reported earthquakes. During the past month the overburden has become thicker and a few earthquakes have been reported. None of these earthquakes were recorded on the Dam or Hillside seismic instruments.

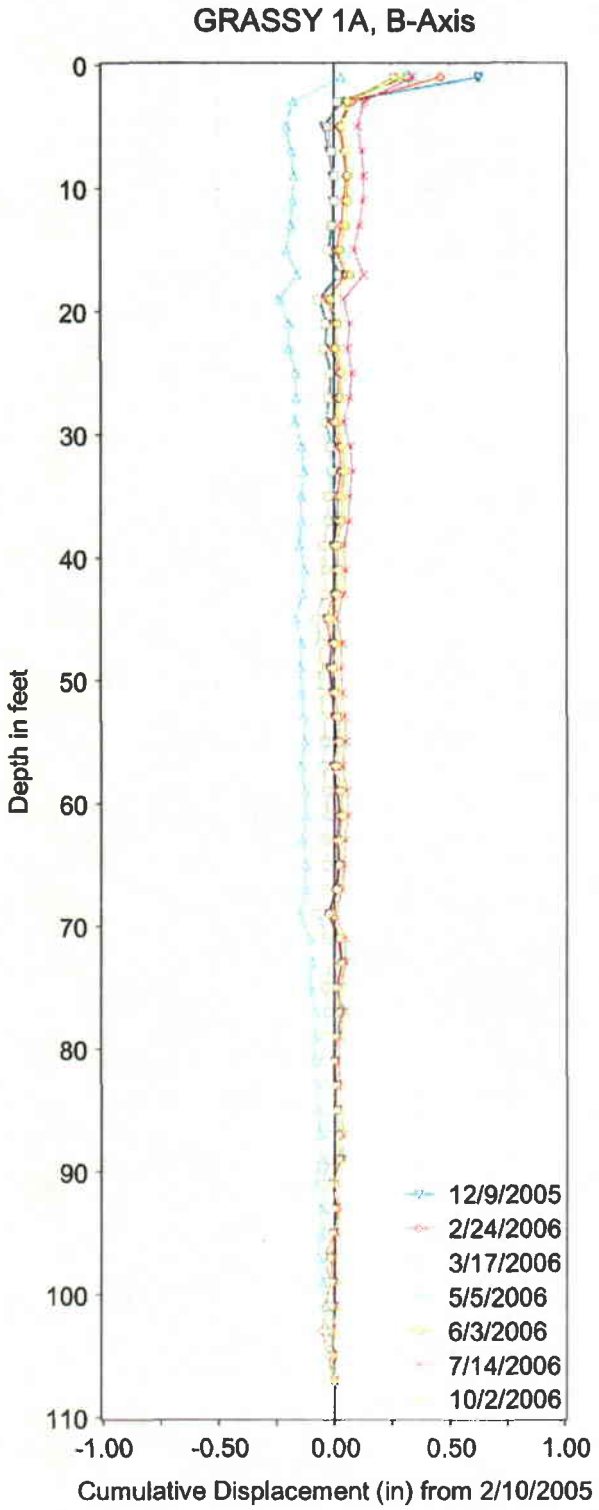
No significant movement has been detected in inclinometers 1 thur 4.

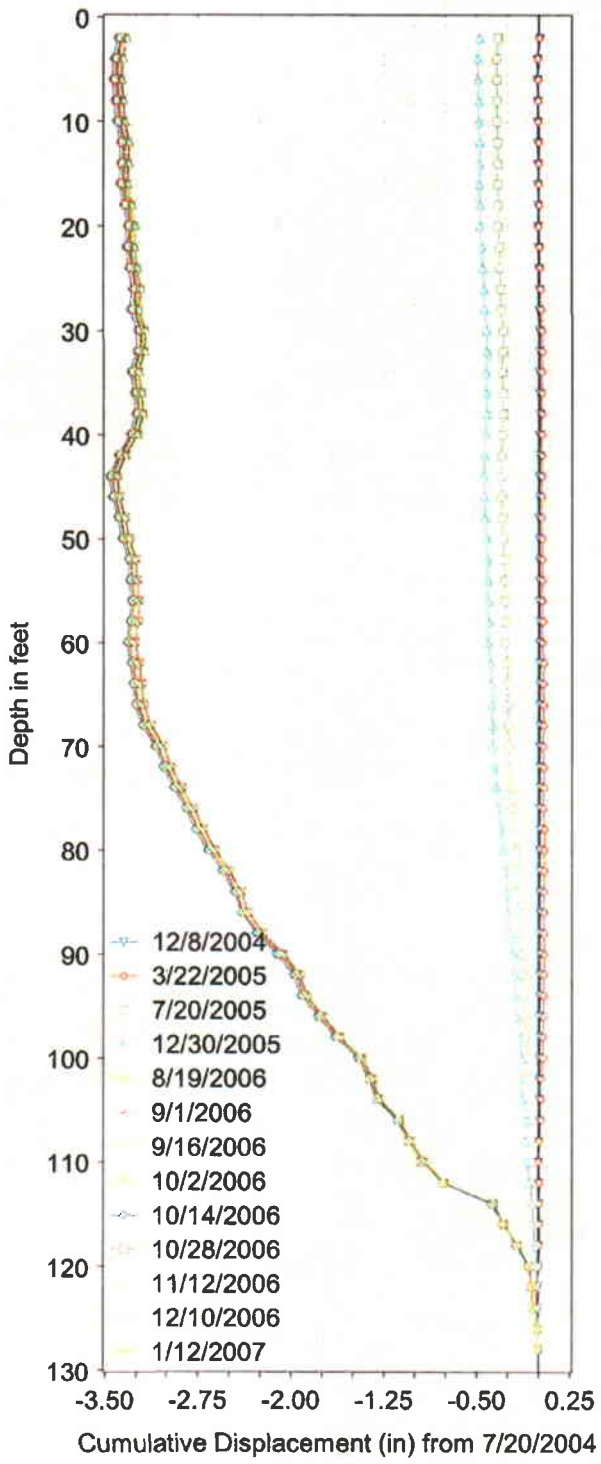
No unexpected changes in piezometer or seepage readings were observed during the past month. As reservoir levels have dropped so have the seepage readings on the Left Abutment, as well as most of the piezometer readings.

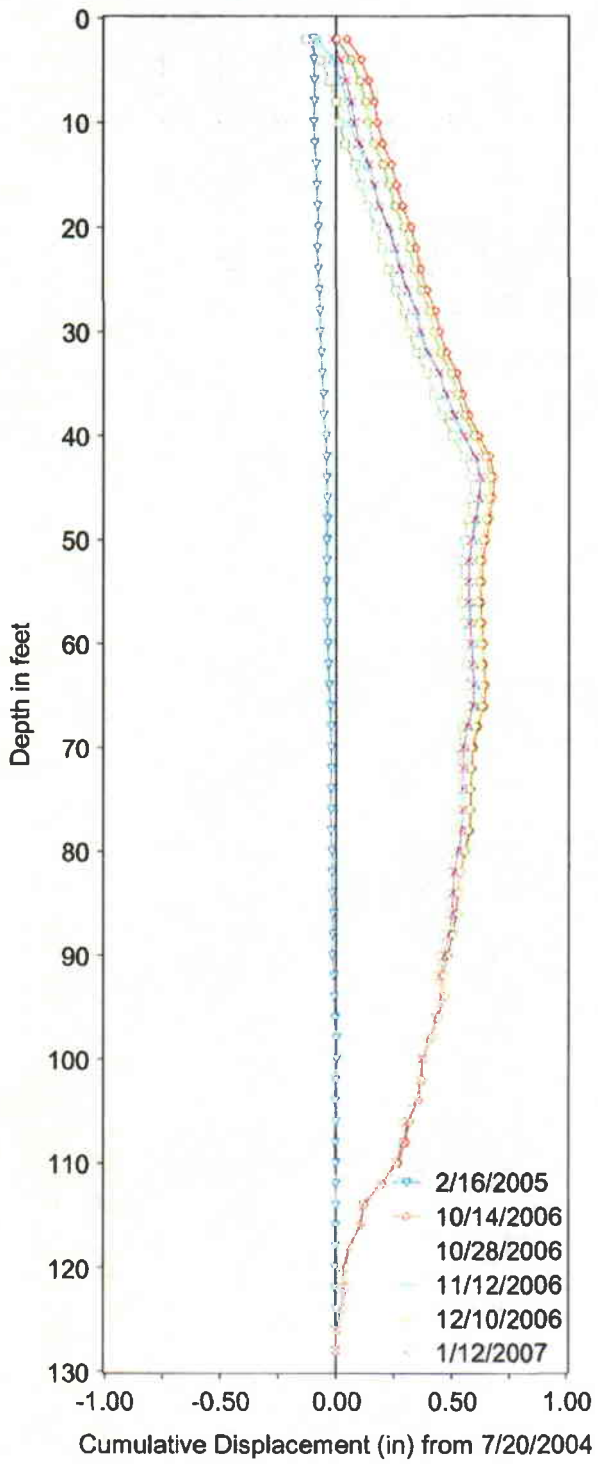
Other than a few freeze-thaw and desiccation cracks, no significant cracks or signs of movement were noted on the dam or abutments above the dam during the past month.

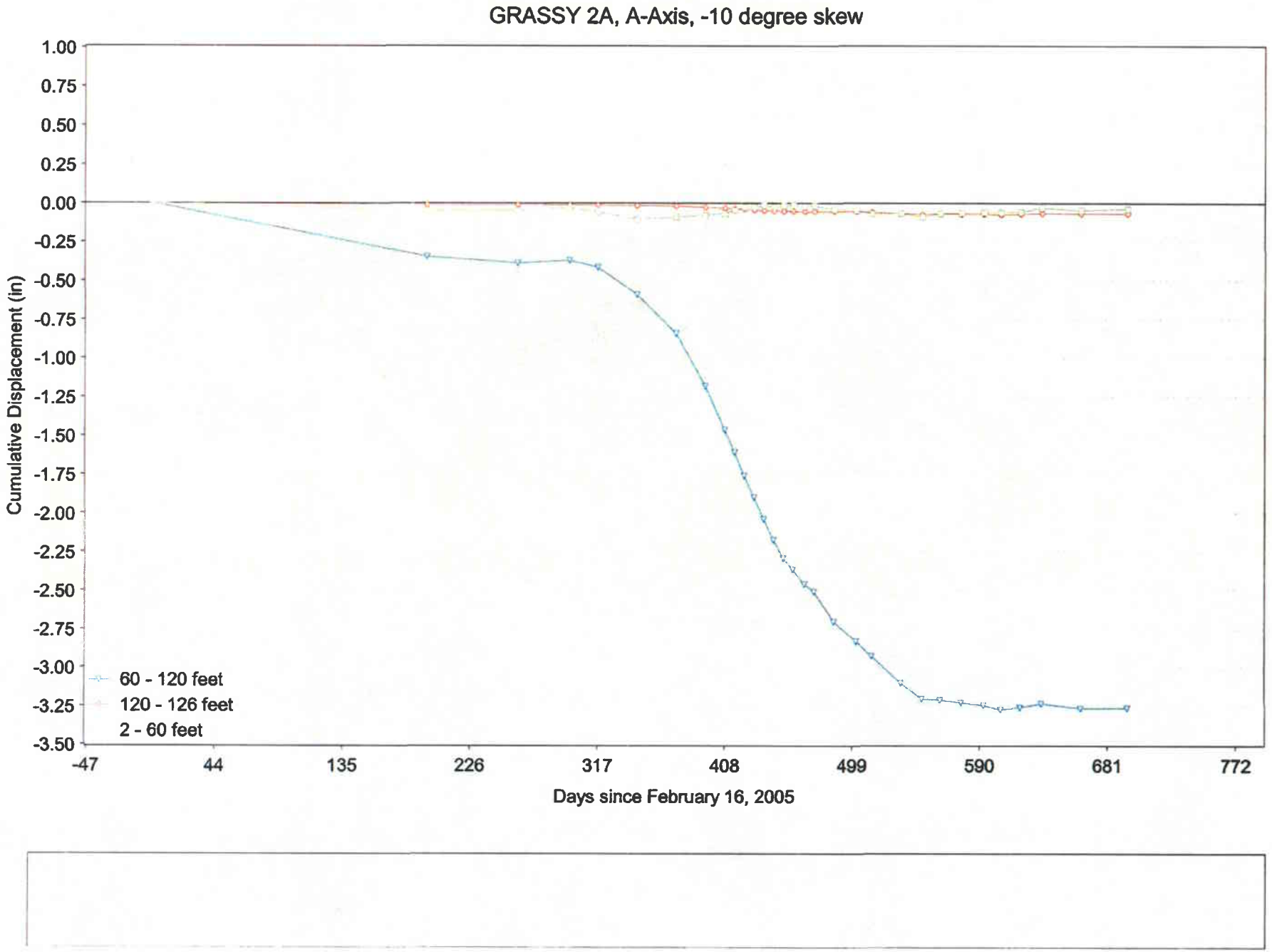
Michael Hansen
RB&G ENGINEERING

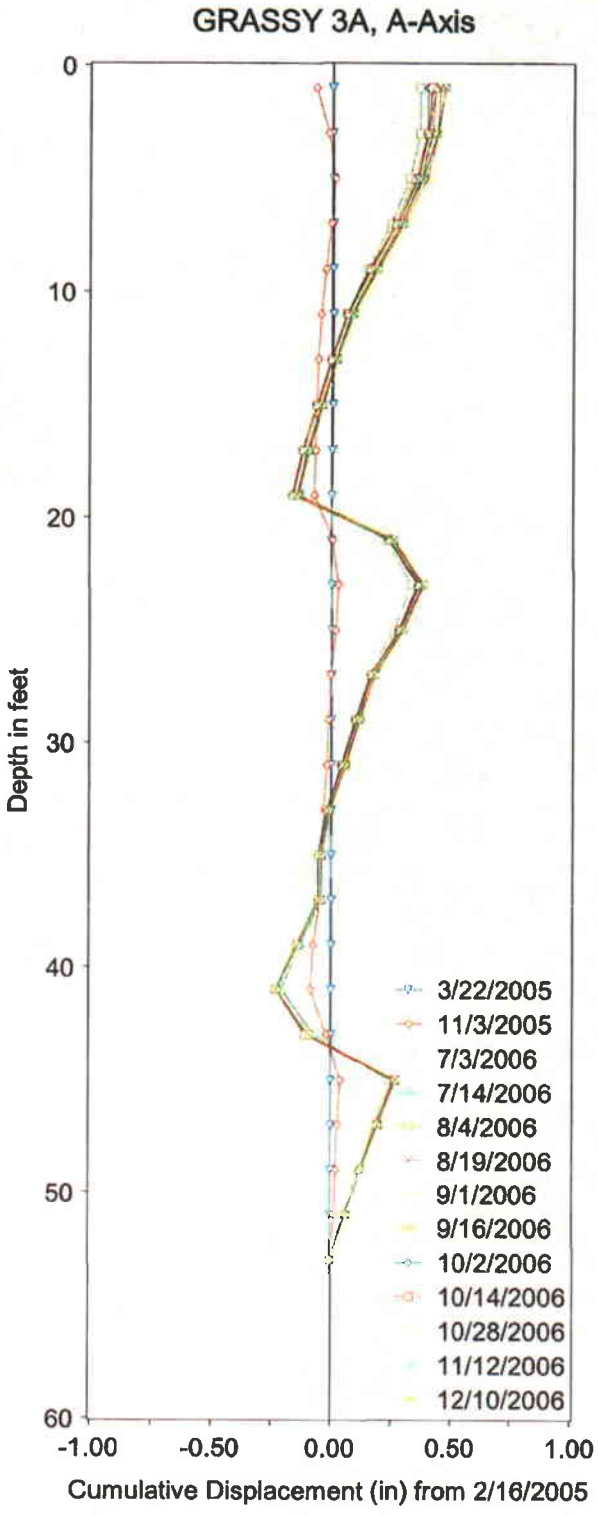

GRASSY 1A, A-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
-1.00
-0.50
0.00
0.50
1.00
Cumulative Displacement (in) from 2/10/2005
12/9/2005
2/24/2006
3/17/2006
5/5/2006
6/3/2006
7/14/2006
10/2/2006

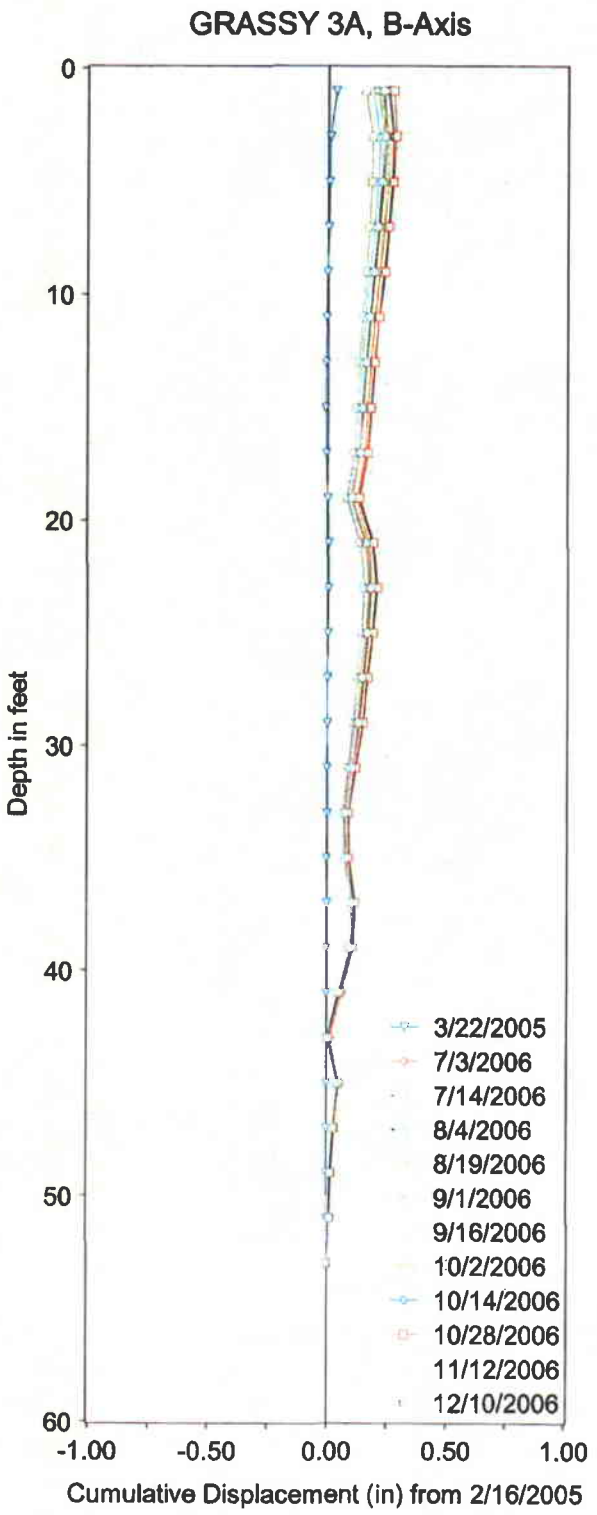

GRASSY 1A, B-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
-1.00
-0.50
0.00
0.50
1.00
Cumulative Displacement (in) from 2/10/2005
12/9/2005
2/24/2006
3/17/2006
5/5/2006
6/3/2006
7/14/2006
10/2/2006


GRASSY 2A, A-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
120
130
-3.50
-2.75
-2.00
-1.25
-0.50
0.25
Cumulative Displacement (in) from 7/20/2004
12/8/2004
3/22/2005
7/20/2005
12/30/2005
8/19/2006
9/1/2006
9/16/2006
10/2/2006
10/14/2006
10/28/2006
11/12/2006
12/10/2006
1/12/2007

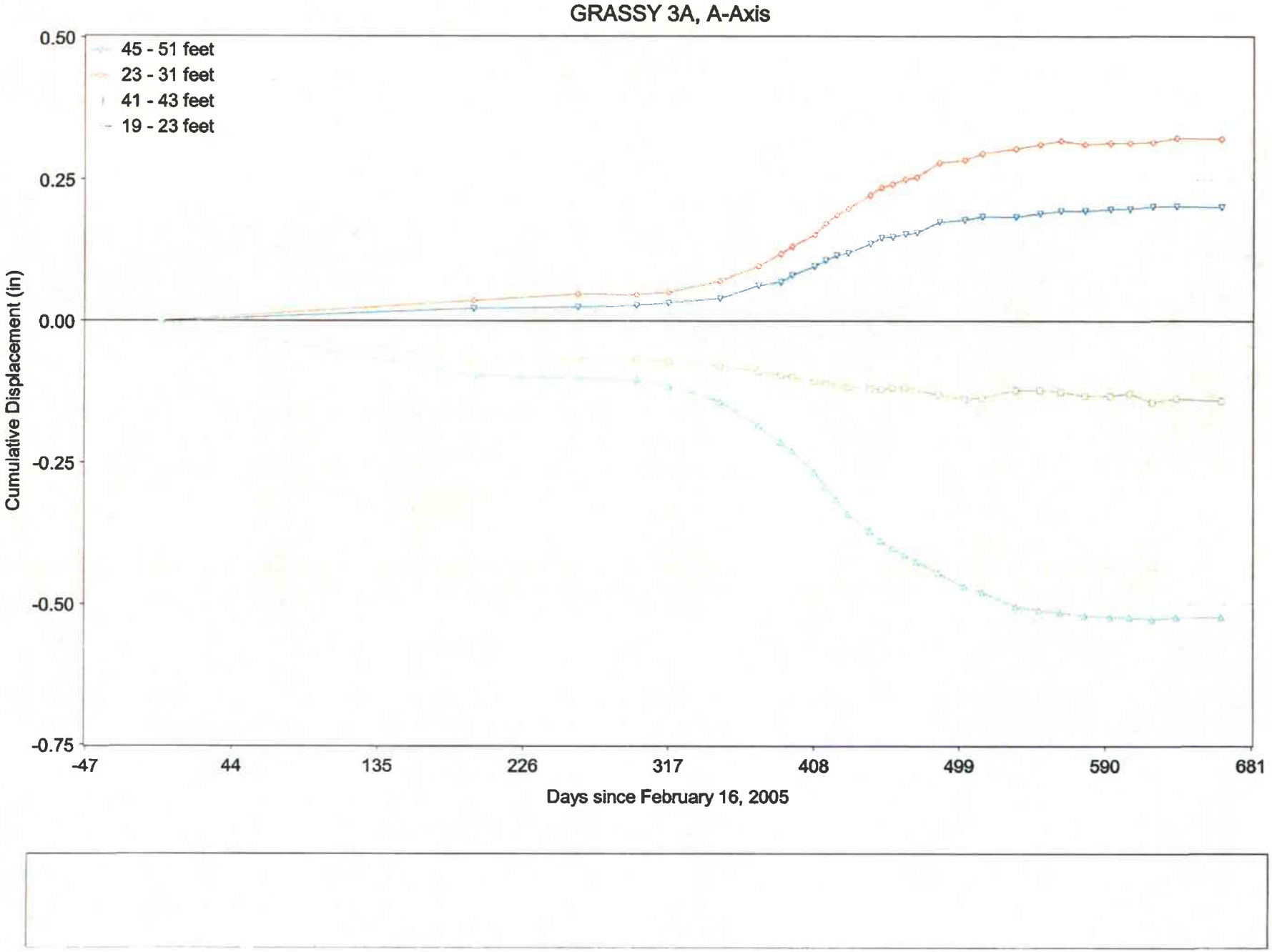

GRASSY 2A, B-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
120
130
-1.00
-0.50
0.00
0.50
1.00
Cumulative Displacement (in) from 7/20/2004
2/16/2005
10/14/2006
10/28/2006
11/12/2006
12/10/2006
1/12/2007

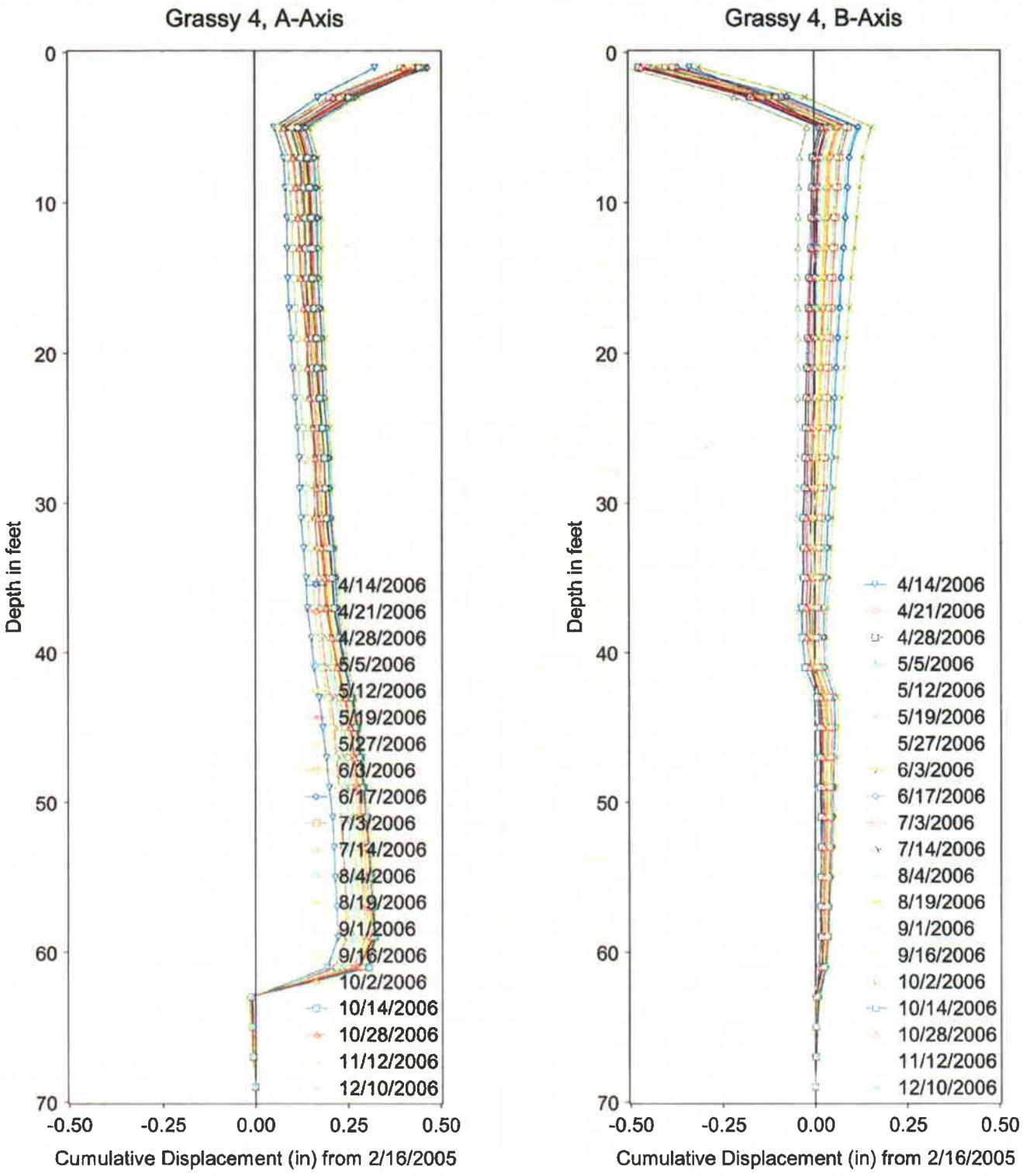

GRASSY 2A, A-Axis, -10 degree skew
Cumulative Displacement (in)
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
-1.25
-1.50
-1.75
-2.00
-2.25
-2.50
-2.75
-3.00
-3.25
-3.50
60 - 120 feet
120 - 126 feet
2 - 60 feet
-47
44
135
226
317
408
499
590
681
772
Days since February 16, 2005

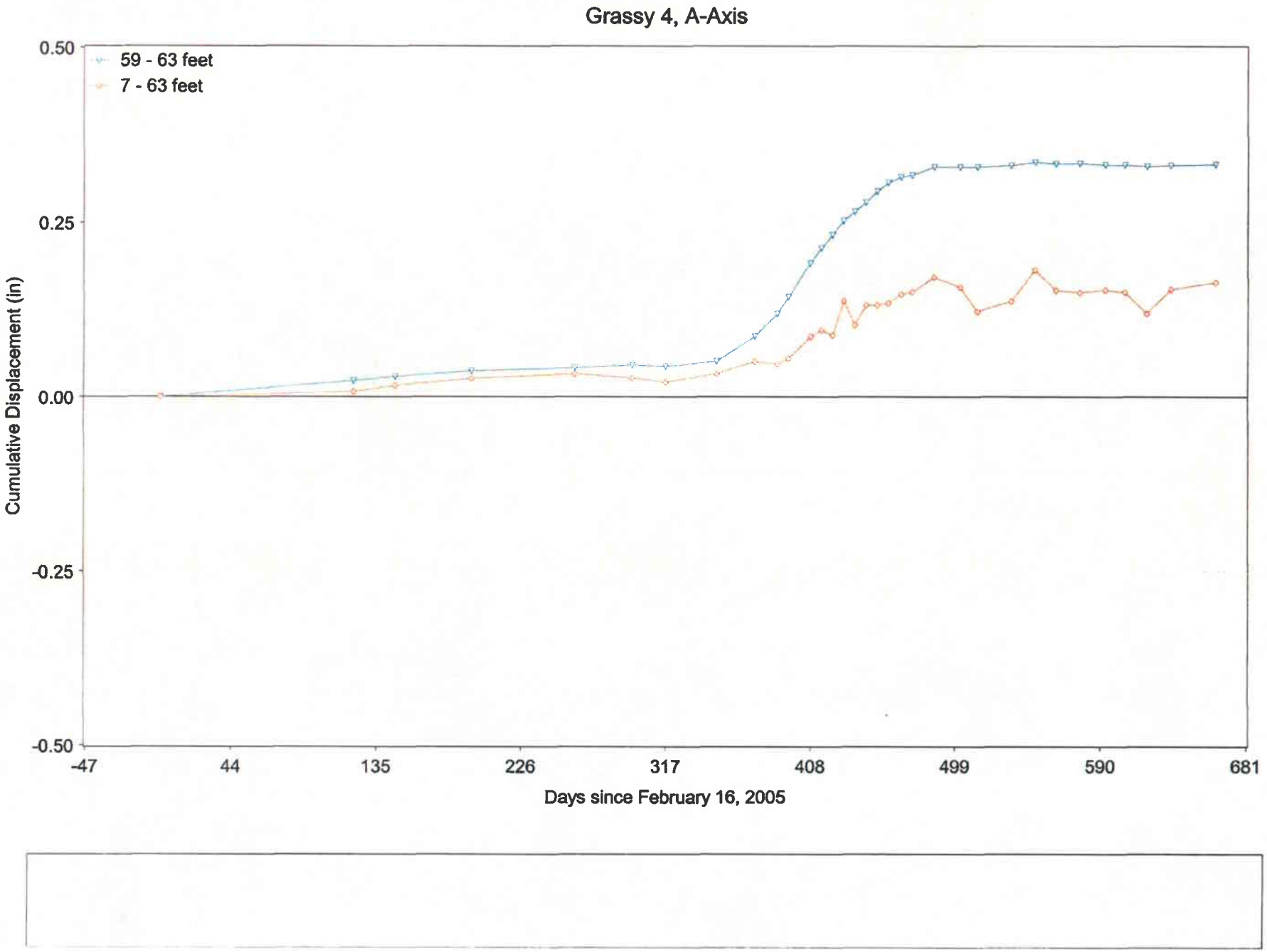




-30 degree skew


GRASSY 3A, A-Axis
45 - 51 feet
23 - 31 feet
41 - 43 feet
19 - 23 feet
0.50
0.25
0.00
-0.25
-0.50
-0.75
Cumulative Displacement (in)
-47
44
135
226
317
408
499
590
681
Days since February 16, 2005


Grassy 4, A-Axis
Grassy 4, B-Axis
Depth in feet
0
10
20
30
40
50
60
70
-0.50
-0.25
0.00
0.25
0.50
Cumulative Displacement (in) from 2/16/2005
4/14/2006
4/21/2006
4/28/2006
5/5/2006
5/12/2006
5/19/2006
5/27/2006
6/3/2006
6/17/2006
7/3/2006
7/14/2006
8/4/2006
8/19/2006
9/1/2006
9/16/2006
10/2/2006
10/14/2006
10/28/2006
11/12/2006
12/10/2006

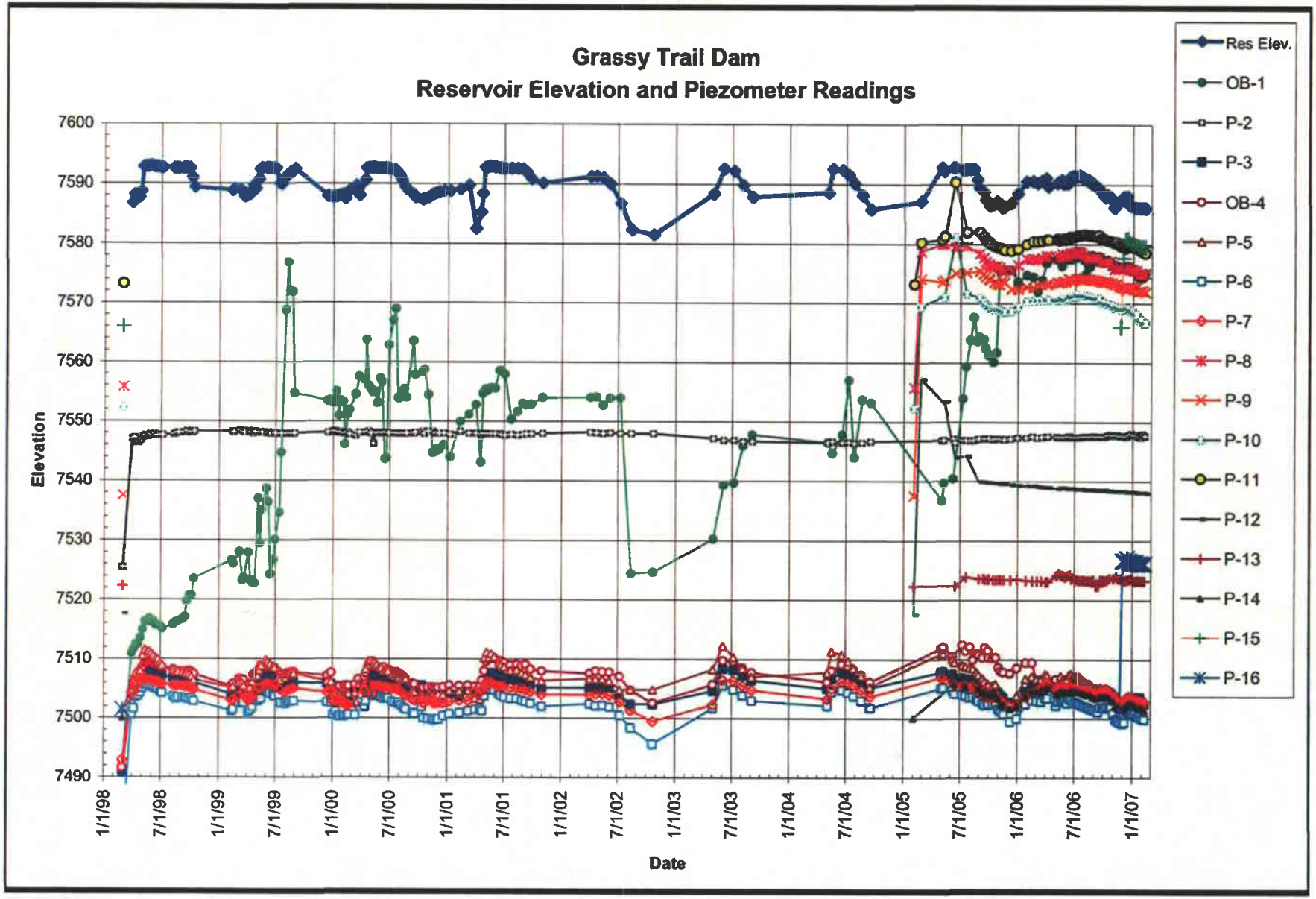

Grassy 4, A-Axis
59 - 63 feet
7 - 63 feet
0.50
0.25
0.00
-0.25
-0.50
Cumulative Displacement (in)
-47
44
135
226
317
408
499
590
681
Days since February 16, 2005

GRASSY TRAIL DAM PIEZOMETER & OBSERVATION WELL READINGS

TAKE READINGS AT RIM ELEV.

Dam Crest Elev. 7600.0
Spillway Elev. 7592.5
Rim Elev. (ft) 7601.5
Tip Elev. (ft) (actual)

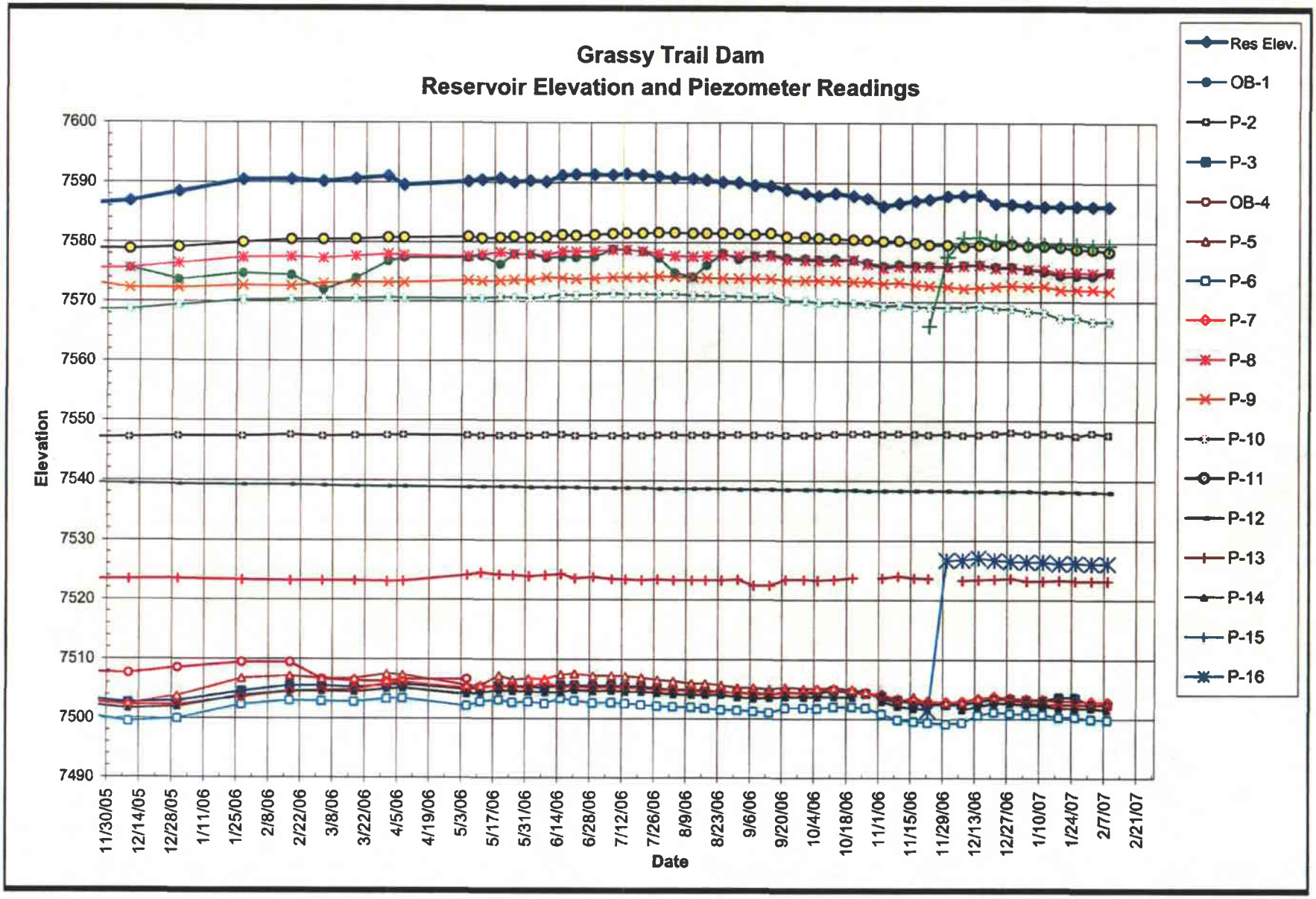
Date	Initials	Reservoir Elevation	05-2 5+62 PIEZ. 8	05-2 5+62 PIEZ. 9	79-4 5+15 O.W. 1	98-3 4+14 PIEZ. 2.0	98-3 4+14 PIEZ. 3	05-4 ~4+14 PIEZ. 13	05-4 ~4+14 PIEZ. 14	79-3 3+63 O.W. 4	05-3A 2+77 PIEZ 10	05-3 2+71 PIEZ 11	05-3 2+71 PIEZ 12	06-1 PIEZ 15	06-1 PIEZ 16	98-2 PIEZ 5	98-4 PIEZ 6	98-6 PIEZ 7
Piezometer Location:			CREST EMBANK.	CREST FOUND.	7601.6 CREST EMBANK/FOUND	7601.7 CREST EMBANK.	CREST FOUND.	7558.9 D.S. SLOPE EMBANK.	7558.9 D.S. SLOPE FOUND.	7601.7 CREST EMBANK/FOUND	7601.8 CREST EMBANK.	7601.7 CREST EMBANK.	7601.7 CREST FOUND.	7601.50 CREST FOUND.	7601.50 CREST BEDROCK	7528.8 TOE FOUND.	7512.0 TOE FOUND.	7519.5 TOE FOUND.
			7554.5	7535.1	7491.8	7525.4	7491.0	7521.0	7499.5	7491.7	7550.8	7572.0	7529.5	7566.00	7501.50	7601.5	7479.5	7493.0
			45.75' (47')	65' (66.4')	110'	76.2' (76.3')	110.7'	36.5' (37.9')	58.8' (59.4')	110'	49.5' (51')	28.5' (29.7')	84.0' (72.2')	34.00 35.50	98.50 100.00	27.3'	32.5'	26.5'
8/30/05	LW	-36"	23.2	26.2	37.4	54.5	95.6	35.2	53.8	90.9	30.8	19.6	61.7			21.3	9.0	14.6
9/12/05	LW	-44"	23.9	26.6	37.8	54.4	96.1	35.1	54.3	91.3	31.5	20.4	61.7			21.9	9.4	15.2
9/19/05	DC	-59"	24.6	27.1	39.3	54.5	96.4	35.3	54.5	89.7	32.1	21.0	61.8			22.4	9.7	14.5
9/28/05	LW	-65"	24.9	27.4	40.4	54.5	96.6	35.3	54.8	90.2	32.3	21.3	61.8			22.8	9.7	15.7
10/7/05	WD	-72"	25.2	27.6	40.5	54.4	96.6	35.2	54.8	91.3	32.5	21.6	61.8			23.0	9.5	15.8
10/14/05	LW	-69"	25.4	28.1	41.6	54.6	96.8	35.4	54.9	91.4	32.8	22.0	61.9			23.1	9.6	15.7
10/24/05	WD	-63"	25.2	28.3	40.0	54.5	96.7	35.4	54.8	91.3	32.8	22.2	61.8			22.9	9.3	15.7
11/2/05	WD	-68"	25.5	28.4	26.2	54.5	97.2	35.3	55.4	93.0	32.8	22.3	62.0			24.4	10.4	16.0
11/7/05	LW	-75"	26.0	27.7	26.7	54.5	97.7	35.4	56.6	93.6	33.0	22.4	62.0			25.2	10.8	16.2
11/18/05	WD	-73.5"	26.0	28.0	26.1	54.6	98.1	35.4	56.4	93.8	33.2	22.7	62.0			25.7	11.2	16.4
12/9/05	MKS	-66.5" ice	25.9	29.2	26.1	54.5	98.9	35.4	57.2	94.0	33.1	22.8	62.2			26.3	12.5	17.1
12/30/05	MKS	-48" ice	25.1	29.2	28.1	54.3	98.7	35.3	56.9	93.1	32.4	22.5	62.3			24.9	12.0	17.1
1/27/06	MKS	-24" ice	24.1	28.8	27.0	54.3	97.0	35.5	55.0	92.2	31.5	21.7	62.4			22.0	9.6	15.7
2/17/06	MNH	-23" ice	24.0	28.9	27.3	54.1	96.1	35.6	54.2	92.2	31.4	21.2	62.4			21.8	8.9	14.8
3/3/06	MNH	-27" ice	24.2	28.4	29.8	54.3	96.1	35.6	54.2	95.0	31.3	21.2	62.5			22.0	9.0	14.6
3/17/06	MNH	-22" ice	23.9	28.3	27.8	54.2	96.4	35.6	54.4	95.3	31.3	21.1	62.6			22.0	9.2	14.5
3/31/06	MNH	-17" ice	28.3	28.3	25.0	54.2	96.0	35.8	53.9	95.4	31.1	21.0	62.7			21.3	8.6	13.5
4/7/06	MNH	-34" ice	23.7	28.3	24.4	54.1	95.8	35.7	53.7	95.0	31.2	20.9	62.7			21.4	8.5	13.2
5/5/06	MNH	-27"	23.9	28.0	24.4	54.2	96.7	34.7	54.7	95.0	31.3	20.8	62.8			23.2	9.8	14.3
5/11/06	LW	-24"	23.6	28.1	24.1	54.2	96.4	34.3	54.5		31.2	21.0	62.7			23.2	9.1	14.0
5/19/06	LW	-20.5"	23.2	28.0	25.5	54.2	96.1	34.6	54.1		31.0	20.9	62.7			21.5	8.8	13.9
5/25/06	LW	-28"	23.5	27.8	23.7	54.2	96.1	34.7	54.2		31.1	20.7	62.7			22.2	9.2	14.0
6/1/06	LW	-25.5"	23.5	27.9	23.8	54.2	96.3	34.9	54.3		31.2	20.9	62.8			22.0	9.1	14.1
6/8/06	GK	-27.7"	23.7	27.4	24.4	54.1	96.4	34.7	54.4		31.0	20.7	62.8			22.1	9.4	13.3
6/15/06	LW	-15"	23.0	27.5	24.2	54.0	96.0	34.5	54.4		30.6	20.4	62.8			21.3	8.5	14.0
6/21/06	LW	-13"	23.1	27.7	24.3	54.2	96.0	35.2	54.0		30.7	20.5	62.8			21.2	8.9	13.9
6/29/06	LW	-13"	23.0	27.6	24.2	54.2	96.1	35.0	54.2		30.6	20.4	62.9			21.5	9.3	14.1
7/7/06	LW	-14"	22.8	27.4	22.9	54.2	96.0	35.3	54.1		30.4	20.2	62.9			21.5	9.2	14.0
7/13/06	LW	-12"	22.8	27.4	23.0	54.2	96.2	35.4	54.3		30.5	20.1	62.9			21.6	9.4	14.1
7/20/06	LW	-14"	23.0	27.4	23.3	54.2	96.2	35.5	54.3		30.5	20.1	62.9			21.8	9.6	14.2
7/27/06	LW	-16.75"	23.4	27.2	24.4	54.1	96.5	35.4	54.5		30.5	20	63			22.2	9.8	14.4
8/3/06	LW	-19.5"	23.8	27.3	26.9	54.1	96.7	35.5	54.7		30.5	20	63			22.4	9.9	14.5
8/11/06	GK	-21"	23.9	27.4	27.6	54.1	96.7	35.5	54.8		30.7	20.1	63.0			22.8	10	14.6
8/17/06	LW	-24"	23.8	27.5	25.6	54.1	96.9	35.5	54.8		30.8	20.1	63.0			22.8	10.2	14.8
8/24/06	LW	-28"	23.7	27.6	23.6	54.1	97.0	35.5	54.8		30.8	20.1	63.0			23.1	10.4	14.9
8/31/06	LW	-29"	23.8	27.6	24.6	54.0	97.2	35.4	55.2		30.9	20.2	63.1			23.5	10.5	14.9
9/7/06	LW	-34"	23.9	27.6	24	54.1	97.3	36.4	55.4		31.0	20.3	63.1			23.5	10.7	15.1
9/14/06	LW	-36"	23.8	27.7	23.8	54.1	97.4	36.4	55.3		30.9	20.1	63.1			23.7	10.9	15.2
9/21/06	LW	-43"	24.4	27.9	24.3	54.1	97.1	35.4	55.1		31.6	20.7	63.1			23.4	10.1	14.9
9/29/06	LW	-50"	24.5	27.9	24.4	54.1	97.2	35.4	55.2		31.6	20.7	63.1			23.6	10.1	15
10/5/06	GK	-55"	24.6	27.9	24.6	54.1	97.2	35.5	55.1		31.9	20.9	63.1			23.6	10.2	14.5
10/12/06	LW	-50"	24.6	27.9	24.4	53.9	96.8	35.4	55.1		31.8	21.0	63.2			23.5	9.9	14.4
10/20/06	LW	-59"	24.4	28.1	24.7	53.8	97.1	35.1	55.2		32.0	21.1	63.2			23.8	9.9	14.7
10/26/06	LW	-60"	25.1	28.1	25.1	53.8	97.3	na	na		32.1	21.2	63.3			24.1	10.1	15
11/2/06	LW	-76"	25.8	28.4	25.7	53.9	97.7	35.1	55.9		32.5	21.4	63.3			25.3	11.1	15.2
11/9/06	LW	-70	25.5	28.2	25.4	53.8	98.4	34.8	56.7		32.3	21.3	63.3			25.9	12.1	16
11/16/06	LW	-65	25.6	28.6	25.6	53.9	98.9	35.1	57.1		32.6	21.7	63.3			25	12.4	16.3
11/22/06	LW	-62	25.6	28.8	25.6	54.0	99.1	35.2	57.2		32.7	22.0	63.3			26.1	12.6	16.4
11/30/06	LW	-55	25.6	28.9	25.8	53.9	99.2	na	na		32.7	22.0	63.3	23.85	74.72	26	12.8	16.5
12/7/06	LW	-54	25.4	29.2	25.5	54.1	99.2	35.5	57.3		32.7	22.3	63.4	20.6	74.7	25.9	12.6	16.4
12/14/06	LW	-53	25.3	29.1	25.4	54.0	98.6	35.4	56.7	nm	32.5	22.1	63.4	20.5	74.3	25.2	11.3	15.9
12/21/06	LW	-71	25.8	28.9	25.8	53.8	98.2	35.3	56.2		32.9	22	63.4	21.1	74.7	25.1	10.8	15.6
12/28/06	LW	-72	25.8	28.7	25.8	53.6	98.2	35.2	56.2		32.9	21.9	63.4	21.4	74.9	25.5	11	15.8
1/4/07	LW	-73	26	28.9	26.3	53.8	98.4	35.6	56.5		33.4	22.2	63.4	21.6	75	25.9	11.2	16
1/11/07	LW	-76.5	26	28.8	26.6	53.8	98.5	35.6	56.6		33.6	22.2	63.5	21.7	75	26.30	11.2	16.1



RB&G ENGINEERING INC.
Provo, Utah

Figure Reservoir Elevation and Piezometer Readings
March 1998 to February 8, 2007

Grassy Trail Dam and Reservoir



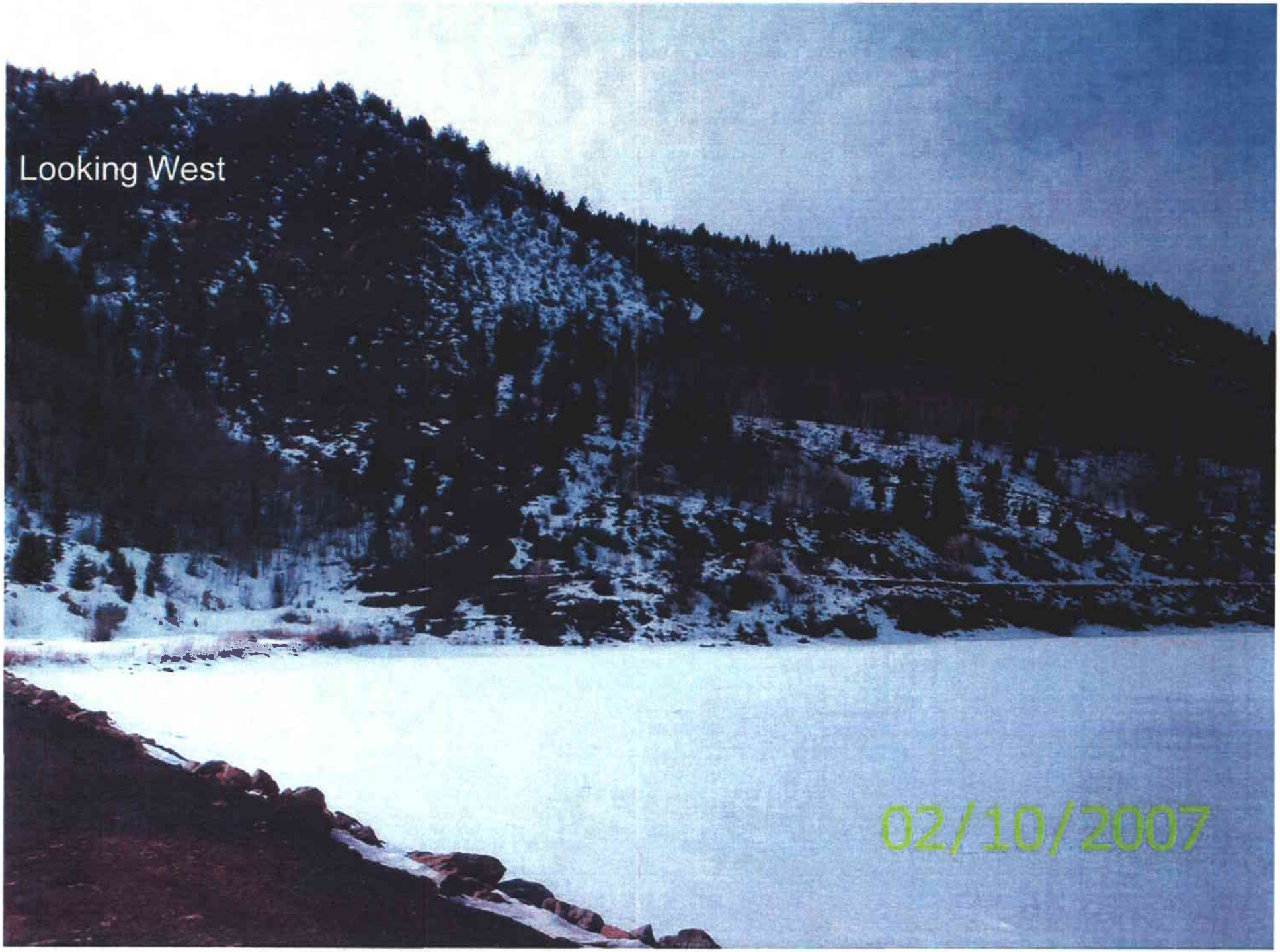
RB&G ENGINEERING INC.
Provo, Utah

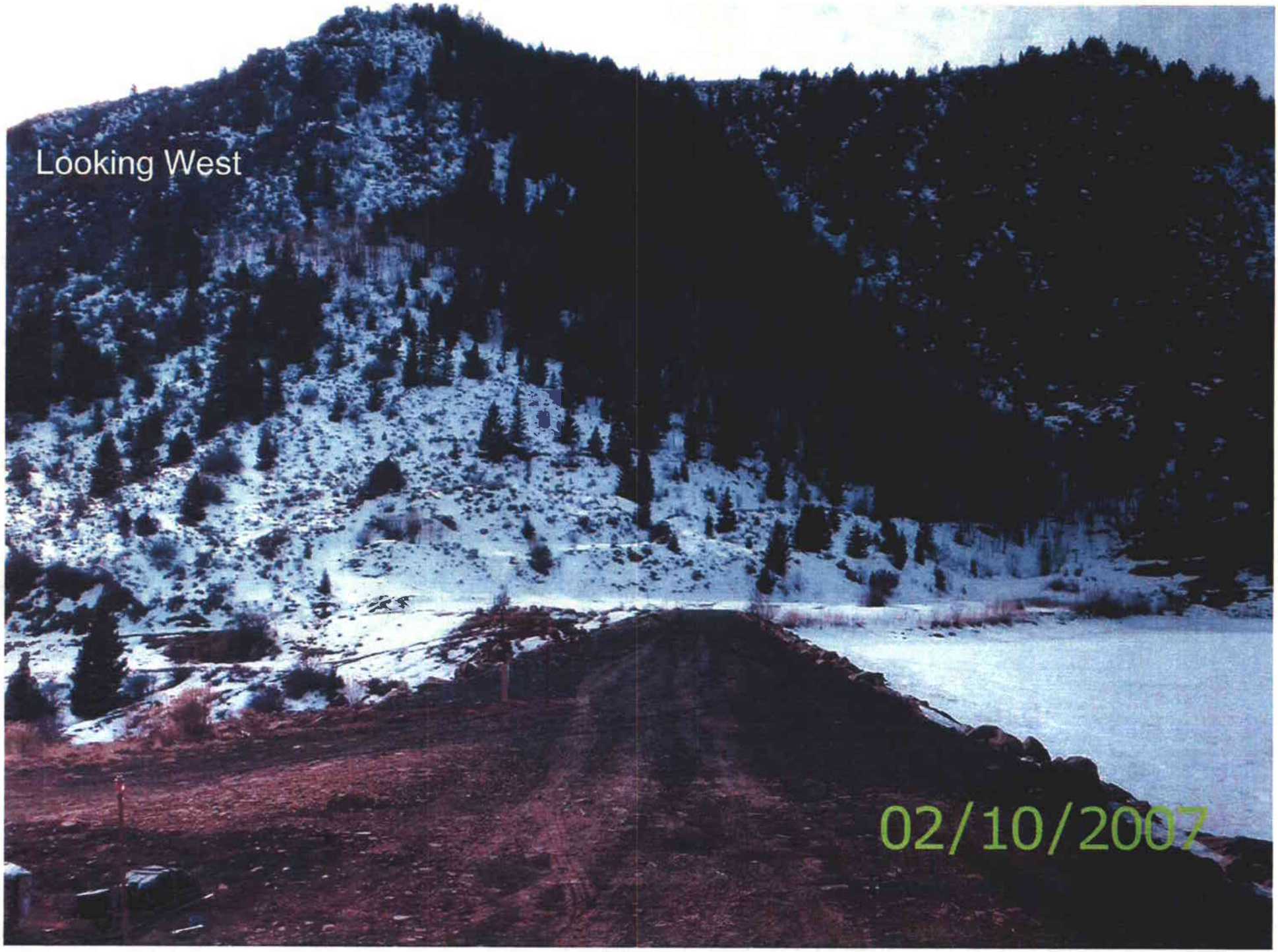
Figure Reservoir Elevation and Piezometer Readings
November 2005 to February 8 2007

Grassy Trail Dam and Reservoir

GRASSY TRAIL DAM SEEPAGE READINGS

Dam Crest Elev(ft) 7600.0 Spillway Elev. (ft) 7592.5 Seep Location:			Seep1:Toe Drain			Seep 2: Left Abutment (East Seep)		Seep 3: Right Abutment (West Seep)			
Date	Initials	Reservoir Elev.	Reservoir Characteristics	GAL/MIN	Water Characteristics	GAL/MIN	Water Characteristics	GAL/MIN	Water Characteristics	Weather Conditions	Temperature (F)
8/19/06	MNH	7590.4		dry		16.7	Clear	0.45	Clear	Sunny	82
8/25/06	MNH	7590.2		1.1	muddy storm run off	15.8	Clear	0.77	Clear	heavy rain/hail	52
9/1/06	MNH	7590.1		dry		15.0	Clear	0.44	Clear	Sunny	83
9/8/06	MNH	7589.6		dry		15.0	Clear	0.44	Clear	Rain	65
9/16/06	MNH	7589.5		dry		15.0	Clear	0.44	Clear	P Cldy trace snow	45
9/22/06	MNH	7588.9		wet, no flow	Clear	15.0	Clear	0.42	Clear	P Cldy to snowy	46 drop to 37
10/2/06	MNH	7587.9		dry		14.0	Clear	0.42	Clear	Overcast/PC	61
10/7/06	MNH	7588.1		5.5	Clear, Storm runoff	15.0	Clear	0.41	Clear	PC	47
10/14/06	MNH	7588.2		0.1	Clear, Storm runoff	13.6	Clear	0.39	Clear	Rain	50
10/22/06	MNH	7587.8	Trace ice	wet drip	Clear, runoff	13.2	Clear	0.36	Clear	clear	22 (8:00AM)
10/28/06	MNH	7586.9		dry		12.5	Clear	0.37	Clear	Sunny	56
11/4/06	MNH	7586.2		dry		11.5	Clear	0.38	Clear	PC trace snow	47
11/12/06	MNH	7586.9		dry		11.7	Clear	Ice		Sunny	31 to 35
11/17/06	MNH	7587.1		dry		11.6	Clear	0.26	Partially frozen	Sunny	45
11/27/06	MNH	7587.7	Trace ice	dry		12.5	Clear	Ice	frozen	Snow windy	29
12/10/06	MNH	7588.0	Frozen	dry		12.8	Clear	Ice	frozen	Snow windy	32
1/4/07	LW	7586.3	Frozen	dry		11.5	Clear	Ice	frozen		
1/11/07	LW	7586.1	Frozen	dry		10.7	Clear	Ice	frozen		
2/8/07	LW	7586.1	Frozen	dry		10.7	Clear	Ice	frozen		


Looking West
02/10/2007


Looking West
02/10/2007

Looking West
02/10/2007

Looking East
02/10/2007

Looking East
02/10/2007

Looking East
02/10/2007

West Abutment
02/10/2007

Down stream face
02/10/2007

East Abutment
02/10/2007