

20 January, 2004
KX04398



City of Quesnel
410 Kinchant Street
Quesnel, BC V2J 7J5

Attention: Mr. Jack Marsh, Director of Public Works

**RE: ON-GOING MONITORING
WEST QUESNEL LAND STABILITY STUDY**

1.0 INTRODUCTION

This purpose of this letter is to provide the City of Quesnel (CoQ) with an update of the on-going monitoring of slope inclinometer (SI) measurements, water level measurements, precipitation data and BC Gas GPS survey hubs for the West Quesnel Area.

2.0 SI READING SCHEDULE

Since installation and initial survey of the seven SI installations in the late fall of 2000, AMEC has conducted 12 subsequent readings (except SI 5 where 13 sets of readings have been conducted) of the remaining functional installations, SI-1, SI-2, SI-5 and the upper slip surface of SI-7. The latest set of readings was conducted on 2 December, 2003.

Table 1 summarizes the SI reading schedule to date:

Table 1: SI Monitoring Schedule

SI	SI-1	SI-2	SI-3	SI-4	SI-5	SI-6	SI-7
Location	Avery Lane	Avery Lane	Abbott Drive	Voyager School	Abbott Drive	Dixon Street	Pierce Crescent
Depth SI Read to (feet/m)	142 ft 43 m	244 ft 74 m	334 ft 102 m	504 ft 154 m	474 ft 144 m	502 ft 153 m	410 ft 125 m
Spiral Reading	11 Jun. 2001	11 Jun. 2001	12 Jun. 2001	11 Jun. 2001	12 Jun. 2001	11 Jun. 2001	12 Jun. 2001
Initial Reading Date	21 Nov. 2000	21 Nov. 2000	21 Nov. 2000	3 Nov. 2000	28 Oct. 2000	22 Nov. 2000	22 Nov. 2000
Reading 1	7 Dec. 2000	7 Dec. 2000	6 Dec. 2000	24 Nov. 2000	24 Nov. 2000	6 Dec. 2000	7 Dec. 2000
Reading 2	12 Jan. 2001	11 Jan. 2001	12 Jan. 2001	6 Dec. 2000	6 Dec. 2000	11 Jan. 2001	12 Jan. 2001
Reading 3	5 Mar. 2001	5 Mar. 2001	6 Mar. 2001	11 Jan. 2001	12 Jan. 2001	5 Mar. 2001	6 Mar. 2001
Reading 4	2 Apr. 2001	2 Apr. 2001	3 Apr. 2001	5 Mar. 2001	6 Mar. 2001	2 Apr. 2001	3 Apr. 2001
Reading 5	28 Apr. 2001	28 Apr. 2001	28 Apr. 2001	2 Apr. 2001	3 Apr. 2001	28 Apr. 2001	29 Apr. 2001
Reading 6	18 Jun. 2001	13 Jun. 2001	14 Jun. 2001	28 Apr. 2001	29 Apr. 2001	13 Jun. 2001	14 Jun. 2001
Reading 7	4 Oct. 2001	4 Oct. 2001	4 Oct. 2001	14 Jun. 2001	14 Jun. 2001	26 Sep. 2001	4 Oct. 2001
Reading 8	20 Nov. 2001	19 Nov. 2001	19 Nov. 2001	4 Oct. 2001	4 Oct. 2001	19 Nov. 2001	20 Nov. 2001
Reading 9	6 May 2002	6 May 2002	6 May 2002	19 Nov. 2001	19 Nov. 2001	blocked	6 May 2002
Reading 10	19 Nov. 2002	19 Nov. 2002	blocked	6 May 2002	6 May 2002	blocked	19 Nov 2002*
Reading 11	15 Aug. 2003	15 Aug. 2003	blocked	blocked	19 Nov 2002	blocked	15 Aug. 2003
Reading 12	2 Dec. 2003	2 Dec. 2003	blocked	blocked	15 Aug. 2003	blocked	2 Dec. 2003
Reading 13	blocked	blocked	blocked	blocked	2 Dec. 2003	blocked	blocked

* The SI casing was blocked at a depth of 68 m, continue to measure the upper slip surface above 68 m.

3.0 SI READING RESULTS

Attached in Appendix A are the results of the SI readings to date. The SI readings are generally presented in incremental and cumulative plots with a 50 mm and 100 mm horizontal displacement scale versus depth. The incremental plots show the individual changes in inclination of the casing at each reading depth. The cumulative plots are constructed by adding together the incremental changes starting from the bottom of the installation and show the overall apparent lateral movement of the SI casing at each depth relative to the lateral position of the bottom of the casing.

Two channels (directions) of readings are presented: A and B. The A channel is oriented to be "down slope" whereas the B channel is "across slope". The actual orientation of each of the casings is shown on previously supplied mapping. Positive movements on the cumulative plots are down slope on Channel A and across the slope to the right when looking downhill for Channel B.

Table 2 presents AMEC's observations based on the data gathered to date. Figure 1 shows the locations of the slope inclinometers, along with their displacements as of December 2003.

Table 2: Slope Inclinometer Casing Displacement - Dec. 2000 to Dec. 2003					
Installation No.	Location	Casing Displacement (mm)		Interpretation	Notes
		(A) Max Down Slope	(B) Max Across Slope		
SI 1	Avery Lane	24	20	sliding at 26 and 40 m depths	
SI 2	Avery Lane	93	8	sliding at 42 and 60 m depths	
SI 3	Abbott & Bettcher	62*	10*	sliding at 39 m	Casing blocked at 39 m between May 2002 and Nov 2002
SI 4	Voyageur School	60*	8*	sliding at 51 m	Casing blocked at 51 m between May 2002 and Nov 2002
SI 5	Abbott Drive	105	35	sliding at 37 m	Casing compression, 37 to 92 m
SI 6	Dixon Street	60*	3*	sliding at 28 m	Casing blocked at 51 m between Nov 2001 and May 2002
SI 7	Lewis & Pierce	77*	25*	sliding at 27 m and 68 m depths	Casing blocked at 68 m between May 2002 and Nov 2002, will continue reading casing above 68 m depth to monitor slip surface at 27 m depth

* Displacements are reported until last reading prior to the SI being blocked

Included in Appendix B are horizontal displacement versus time (velocity) plots. Velocity plots are given in the downhill A channel direction (positive displacements indicate movement toward the east, and negative toward the west) and in the cross slope B channel direction (positive displacements indicate movement toward the south and negative displacements toward the north). Review the velocity plots included in Appendix B indicate that SI movements appear to have slowed over 2003.

The following notes should be read while reviewing the SI data presented in Appendix A:

- A second set of plots for SI-5 has been included with the readings previous to 3 April 2001 omitted to eliminate the wave like profile (casing compression) observed in the raw data. This plot may present a clearer representation of how much of the SI deformation may be attributable to lateral ground movement, as opposed to vertical compression of the casing.
- A second set of plots has been included for SI-7 for the portion of the borehole above 68 m which can be still monitored, but these plots do not reflect movements that are likely occurring below 68 m depth.

3.0 PIEZOMETER INSTALLATION AND MONITORING

Table 3 summarizes the previous standpipe and vibrating wire piezometer installation details for the study area.

Table 3: Standpipe and Vibrating Wire Piezometer Installation Details						
BH	BH-2A	BH-3A	BH-4A	BH-4A	BH-6A1	BH-6A2
Location	Avery Lane	Abbott Drive	Voyager School		Dixon Street	
Installation Type	Standpipe	Vibrating Wire Piezometer	Standpipe	Vibrating Wire Piezometer	Standpipe	
Date of Completion	2 November, 2001	15 November, 2001	6 December, 2001		18 December, 2001	
Screen Depth/Tip Depth*	54.2 m to 60.2 m	38.0 m	39.6 to 39.9 m	49.0 m	44.0 to 45.2 m	26.4 to 27.8 m
Type of Casing Protector	Stick-up	Stick-up	Stick-up	Stick-up	Flush-Mount	
Casing Stick-up	800 mm	N/A	860 mm	N/A	N/A	

* Depths are measured from ground surface. Screen depth is for standpipes, depth to tip is for vibrating wire piezometers.

The standpipes were monitored during routine visits to Quesnel. The standpipe monitoring schedule is shown in Table 4:

Table 4: Standpipe Piezometer Monitoring				
BH	BH-2A	BH-4A	BH-6A1	BH-6A2
Location	Avery Lane	Voyager School	Dixon Street	Dixon Street
Initial Reading	9 Nov. 2001	12 Dec. 2001	19 Dec. 2002	19 Dec. 2002
Reading 1	15 Nov. 2001	13 Dec. 2001	28 Jan. 2002	28 Jan. 2002
Reading 2	20 Nov. 2001	14 Dec. 2001	20 Mar. 2002	20 Mar. 2002
Reading 3	23 Nov. 2001	18 Dec. 2001	11 Apr. 2002	11 Apr. 2002
Reading 4	29 Nov. 2001	28 Jan. 2002	25 Jun. 2002	25 Jun. 2002
Reading 5	4 Dec. 2001	28 Mar. 2002	17 Aug. 2002	17 Aug. 2002
Reading 6	12 Dec. 2001	11 Apr. 2002	31 Oct. 2002	31 Oct. 2002
Reading 7	18 Dec. 2001	6 May. 2002	18 Nov. 2002	18 Nov. 2002
Reading 8	28 Jan. 2002	8 Jun. 2002	19 Jun. 2003	19 Jun. 2003
Reading 9	28 Mar. 2002	25 Jun. 2002	No measurement was obtained for Nov. 2003 due to ice and snow cover of the flush-mount	
Reading 10	11 Apr. 2002	17 Aug. 2002		
Reading 11	08 Jun. 2002	31 Oct. 2002		

Table 4: Standpipe Piezometer Monitoring

BH	BH-2A	BH-4A	BH-6A1	BH-6A2
Reading 12	25 Jun. 2002	18 Nov. 2002		
Reading 13	17 Aug. 2002	19 Jun. 2003		
Reading 14	31 Oct. 2002	25 Nov. 2003		
Reading 15	18 Nov. 2002			
Reading 16	19 Jun. 2003			
Reading 17	25 Nov. 2003			

The vibrating wire (VW) piezometers were sealed in the boreholes and an electronic minilogger monitored the pore-water pressures. The VW miniloggers were programmed to take daily pore water pressure readings from the date of completion. Refer to Appendix C for graphs displaying the water levels from the standpipes (2A and 6A) and VW piezometers (3A and 4A) recorded to date. There appears to have been a small decrease in the water elevations (less than a 100 mm) in VW 3A since AMEC has begun pump tests for the pilot dewatering program during the fall of 2003, while VW 4A has shown no change.

Additional wells were installed as part of pump testing for the pilot dewatering program. Data collected from these additional well will be reported on separately.

4.0 PRECIPITATION

The monthly total precipitation data was obtained from Environment Canada for the Quesnel Airport. Plots of the recorded data through 1975 to 2003 are shown in Appendix D along with historical data and the cumulative difference. The historical data is based on a 30 year moving mean, where an average over 30 years was calculated for each month beginning with 1975. To calculate the thirty year moving mean for 1975, data was taken back to 1946 and all the monthly values were averaged over that 30 year interval. The cumulative difference is the sum of difference between the recorded data and the historical mean beginning with January 1975 and ending December 2003. This plot shows the trend of the recorded precipitation whether it is increasing or decreasing (i.e. wetter or drier trends) compared to the historical mean.

The precipitation data indicates that the period from 1975 through the spring of 1988 was close to or slightly below average. From the spring of 1988 through the end of 1996, conditions tended to be much drier than normal, with 1991 being close to average. From the spring of 1996 to the fall of 1997, conditions tended to be must wetter then normal. From 1998 to the summer of 2002 conditions have appeared to be close to average. Over 2003 the conditions appeared to have been slightly drier then average. The drier tend in 2003 is likely the cause for the slower SI movements recorded over the last year.

5.0 MOVEMENT HUBS

BC Gas provided AMEC with survey data from ongoing semi-annual monitoring of GPS Movement Hubs, which were installed in September of 1998 in the study area. Data was also provided from additional movement hubs installed during December of 2001. Figure 1 shows the locations of the BC Gas movement hubs and the associated horizontal displacement vectors over three periods:

1. From September 1998 to November 2003.

- From December 2000 to November 2003 (this period roughly corresponds to the period AMEC has been monitoring the SI's)
- From December 2001 to November 2003 (monitoring of additional hubs installed during December 2001)

These three periods were chosen so that movements over time periods similar to when the slope inclinometers were in place could be compared.

Table 5 below summarizes the movement hub data collected to date. Appendix E contains the BC Gas movement hub data over the monitoring periods.

Table 5: BC Gas Movement Hub Data to November 2003

Movement Hub	Date Installed	Horizontal Displacement	
		Magnitude (mm)	Vector (°)
2	September 1998	252	101
4	September 1998	208	57
5	September 1998	222	91
6	September 1998	267	45
7	September 1998	219	64
8	September 1998	206	66
9	September 1998	276	92
14	September 1998	259	95
15	September 1998	196	77
16	September 1998	140	77
17	September 1998	300	99
18	September 1998	259	99
19	September 1998	235	106
20	September 1998	223	107
21	September 1998	128	111
22	September 1998	32	108
23	September 1998	20	87
30	December 2001	61	107
31	December 2001	86	91
32	December 2001	17	193
33	December 2001	44	108
34	December 2001	62	111
35	December 2001	21	161
36	December 2001	10	53
37	December 2001	68	101
39	December 2001	42	135
40	December 2001	35	92

Displacement vectors displaying the movements to the most recent survey provided by BC Gas of November 2003 have been included on Figure 1, in addition to the SI displacements. Refer to Appendix E for Chart E1 of the survey hub cumulative displacements over the total monitoring period. Generally the survey hub movements appear to have slowed over the last monitoring period from October 2002 to November 2003.

5.0 FUTURE WORK

Given the nature of the movements observed to date, AMEC recommends continued monitoring of the operable SI installations, with the next set of readings being conducted in the early spring of 2004. Given that the majority of SI's have been sheared in the Uplands Area, AMEC suggests that an additional SI installation be installed either at Voyageur School or in the central portion of the study area. Note that any new SI should be installed to a depth of at least 10 m past the previously recorded lowest slip surface, rather than the full depth of the original installation. This installation would replace one of the 6 new installations recommended in AMEC's final report of 25 October, 2002.

5.0 CLOSURE

Thank you for the opportunity to provide assistance in this matter. Please do not hesitate to contact the undersigned at 1-250-564-3243 should you have any questions or require further information.

Respectfully submitted,

AMEC Earth & Environmental Limited



Shiloh Jorgensen, E.I.T.
Geotechnical Engineer

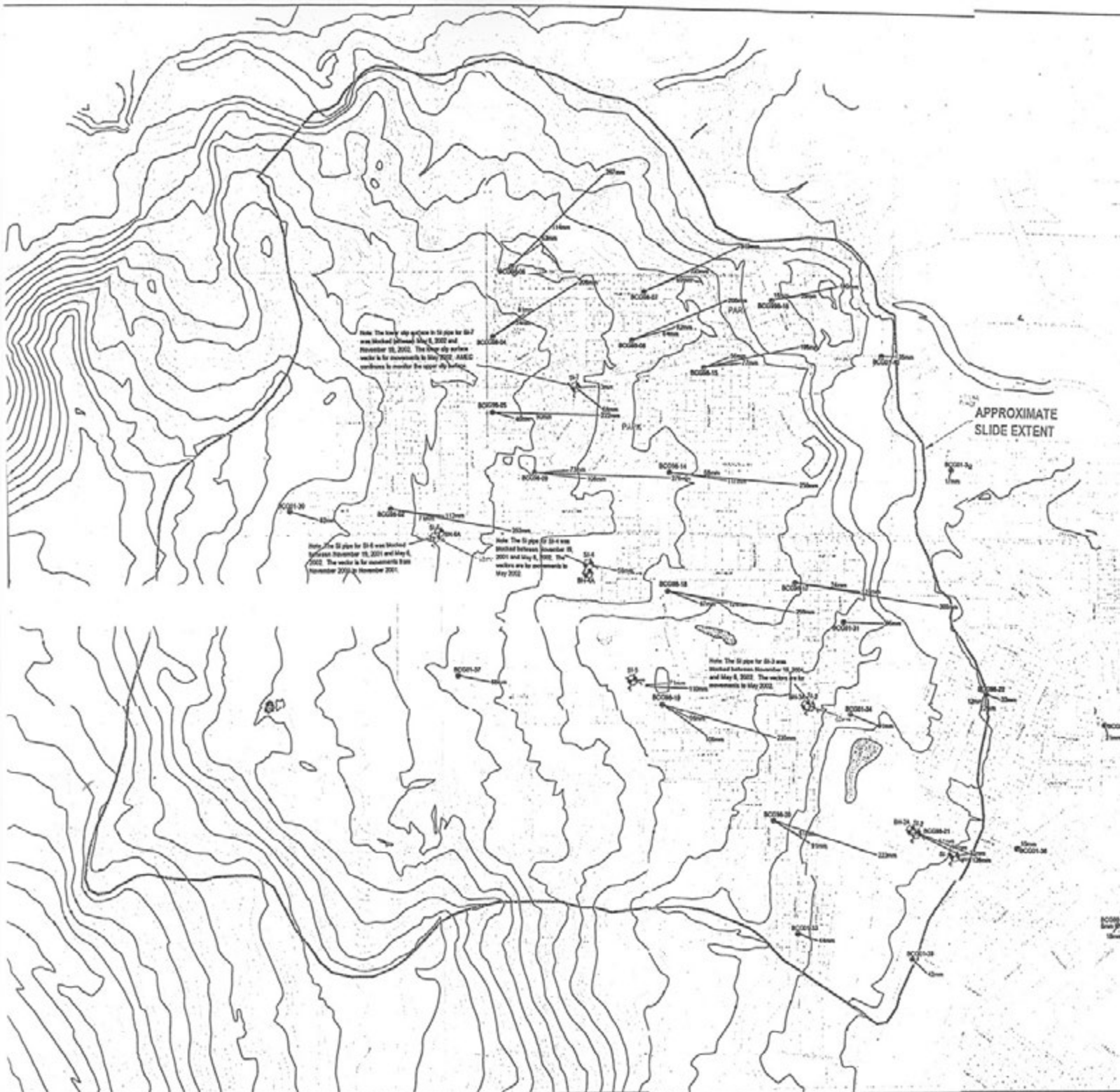
Reviewed by:



Nick Polysou, P.Eng.
Senior Geotechnical Engineer
Regional Manager

SJ /mm
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Attachments: Figure 1 SI and BC Gas Movement Hubs Displacement Vectors
Appendix A: SI Reading Results
Appendix B: SI Velocity Plots
Appendix C: Piezometric Data
Appendix D: Precipitation Data
Appendix E: BC Gas Movement Hubs



100' 0"

GPS VECTOR - SEPT 1996 TO NOV 2000
GPS VECTOR - DEC 2000 TO NOV 2002
GPS VECTOR - DEC 2001 TO NOV 2000

1000 BC GAS GPS SURVEY HUB
2001 BC GAS GPS SURVEY HUB
AMEC SLOPE INDICATOR
AMEC BOREHOLE LOCATION

NOTE: ORIGINAL SIZE AND PROPORTIONS OF THIS PROJECTED BY MEASUREMENTS OF THE SURVEYED LINES AND DISPLACEMENTS, WITH PROPORTION BY MEASUREMENTS OF THE

amec

AMEC Earth & Environmental Limited
610 Portman Road
Portman, B.C.
V6C 4L1
Tel: 604-261-1111
Fax: 604-261-1112

CLIENT: **CITY OF QUESNEL**

TITLE: **SI AND BC GAS GPS MOVEMENT HUBS
DISPLACEMENT VECTORS**

PROJECT: **WEST QUESNEL LAND
STABILITY STUDY
QUESNEL, BC**

DATE: **JANUARY 2004**

JOB #: **KX04398**

DRAWN BY: **SANDE**

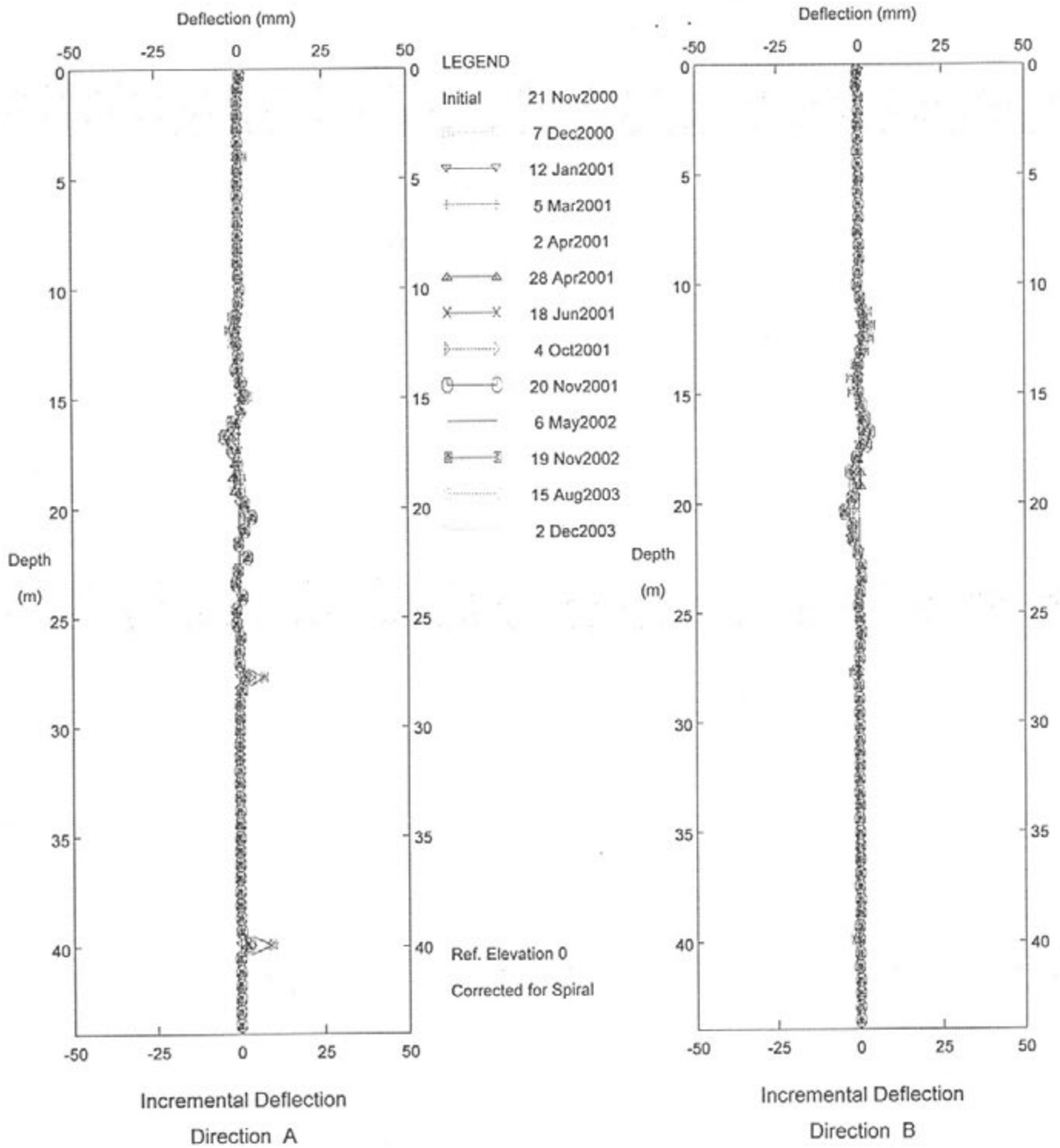
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FIGURE #: **FIGURE 1**

APPENDIX A

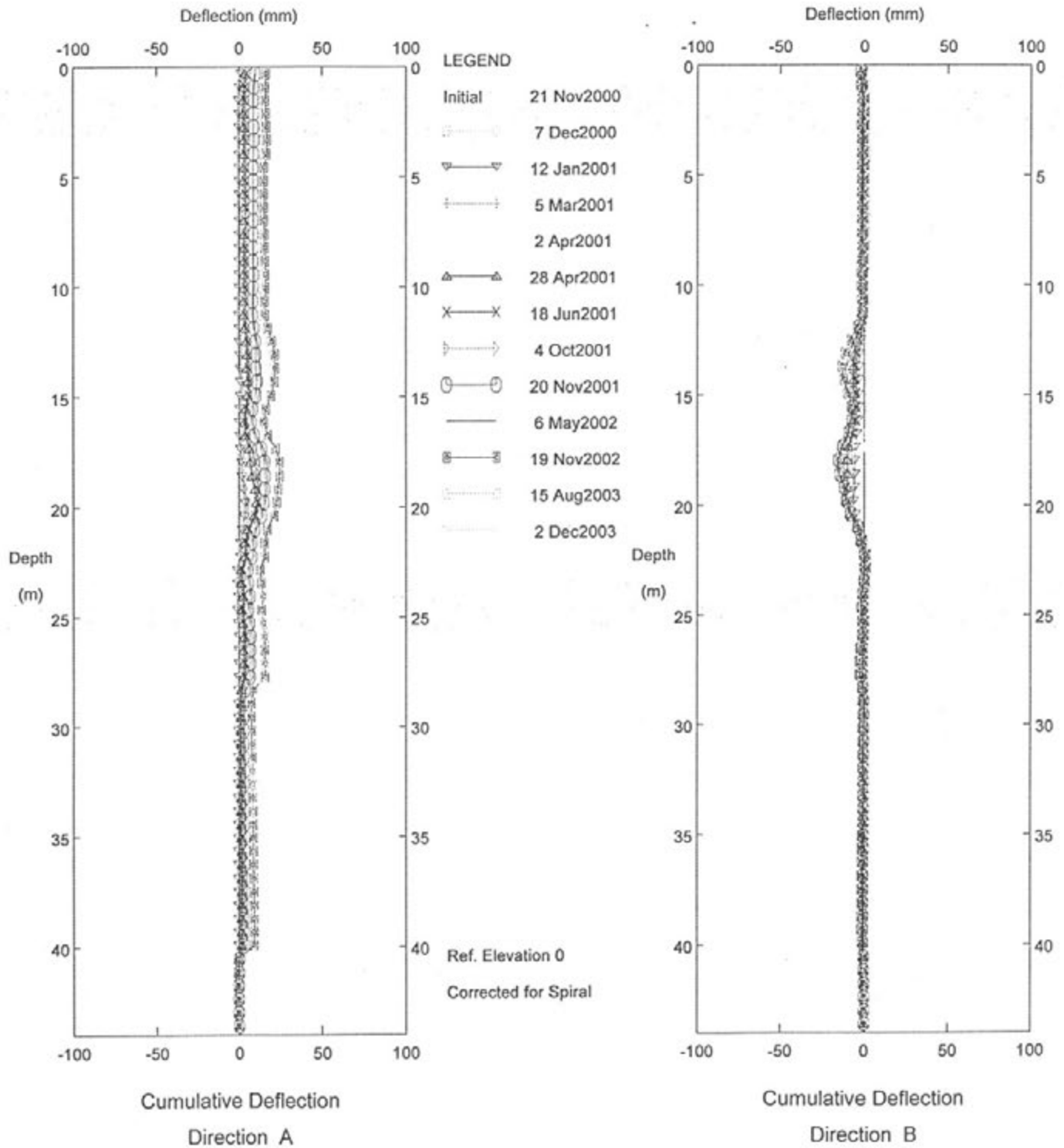
SI READING RESULTS

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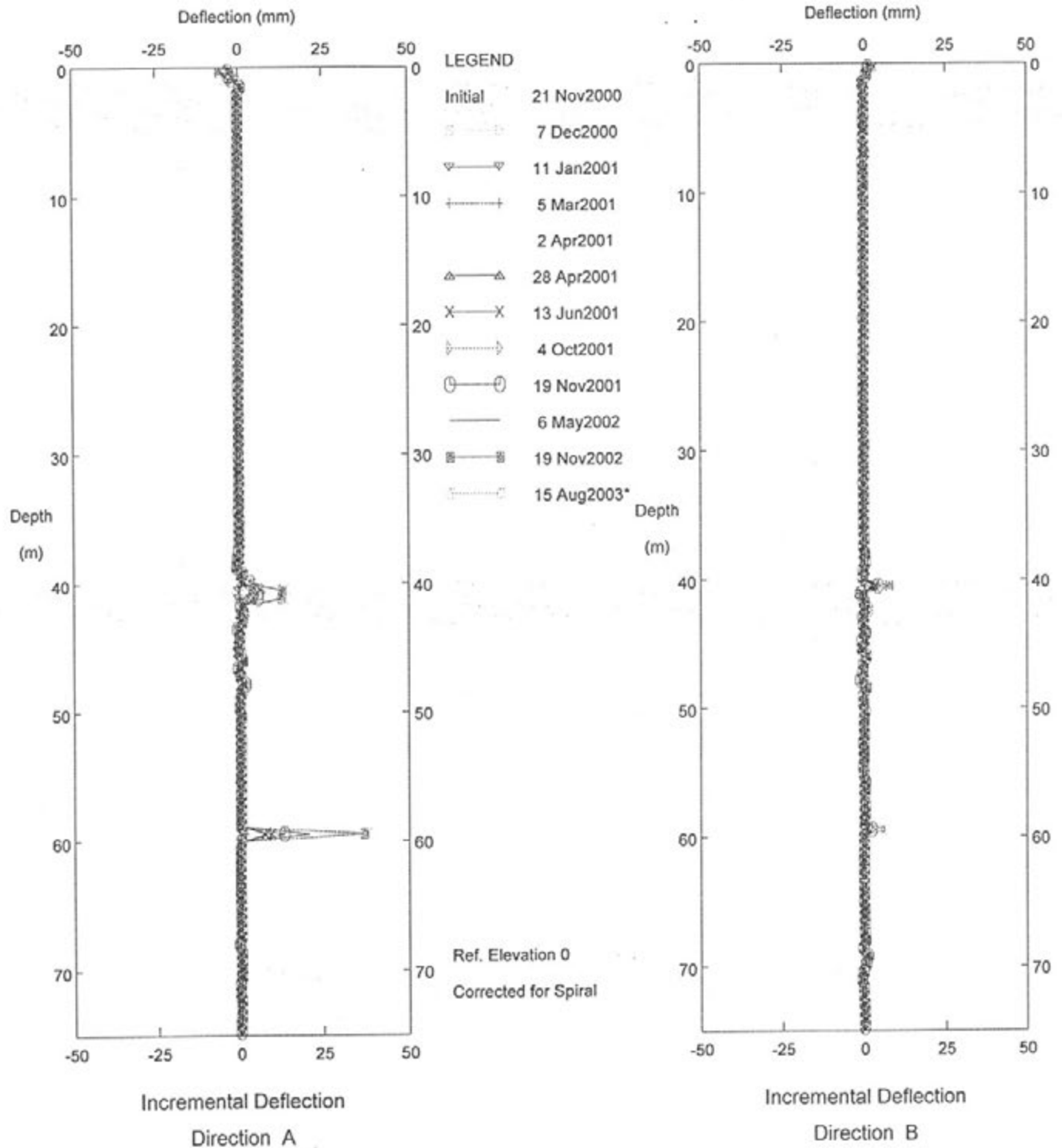
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Lower Avery Lane



KX03904 W. Quesnel Stability Study, Inclinator SI-1 Corr.

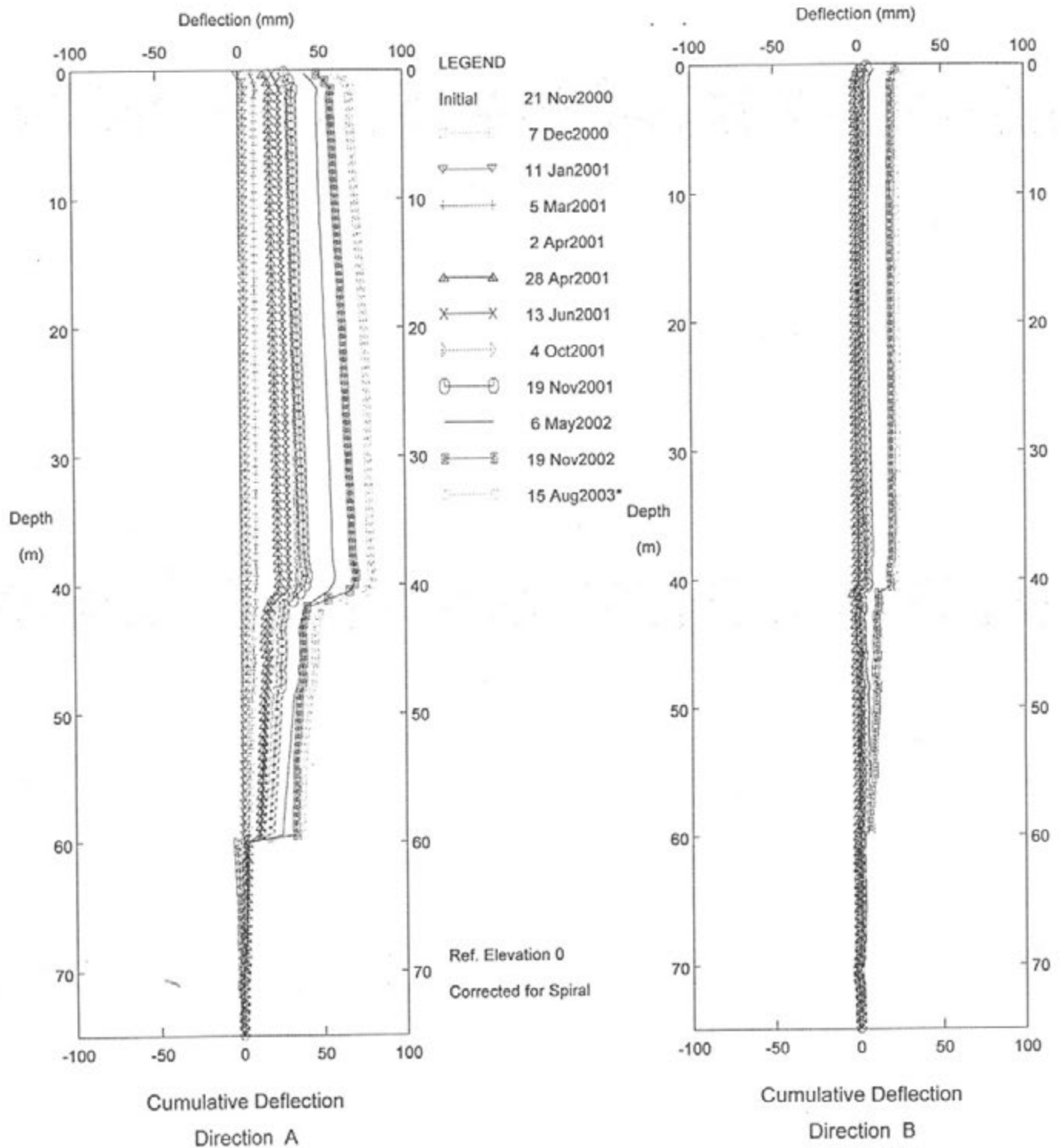
Lower Avery Lane



KX03904 W. Quesnel Stability Study, Inclinator SI-2 Corr.

Upper Avery Lane

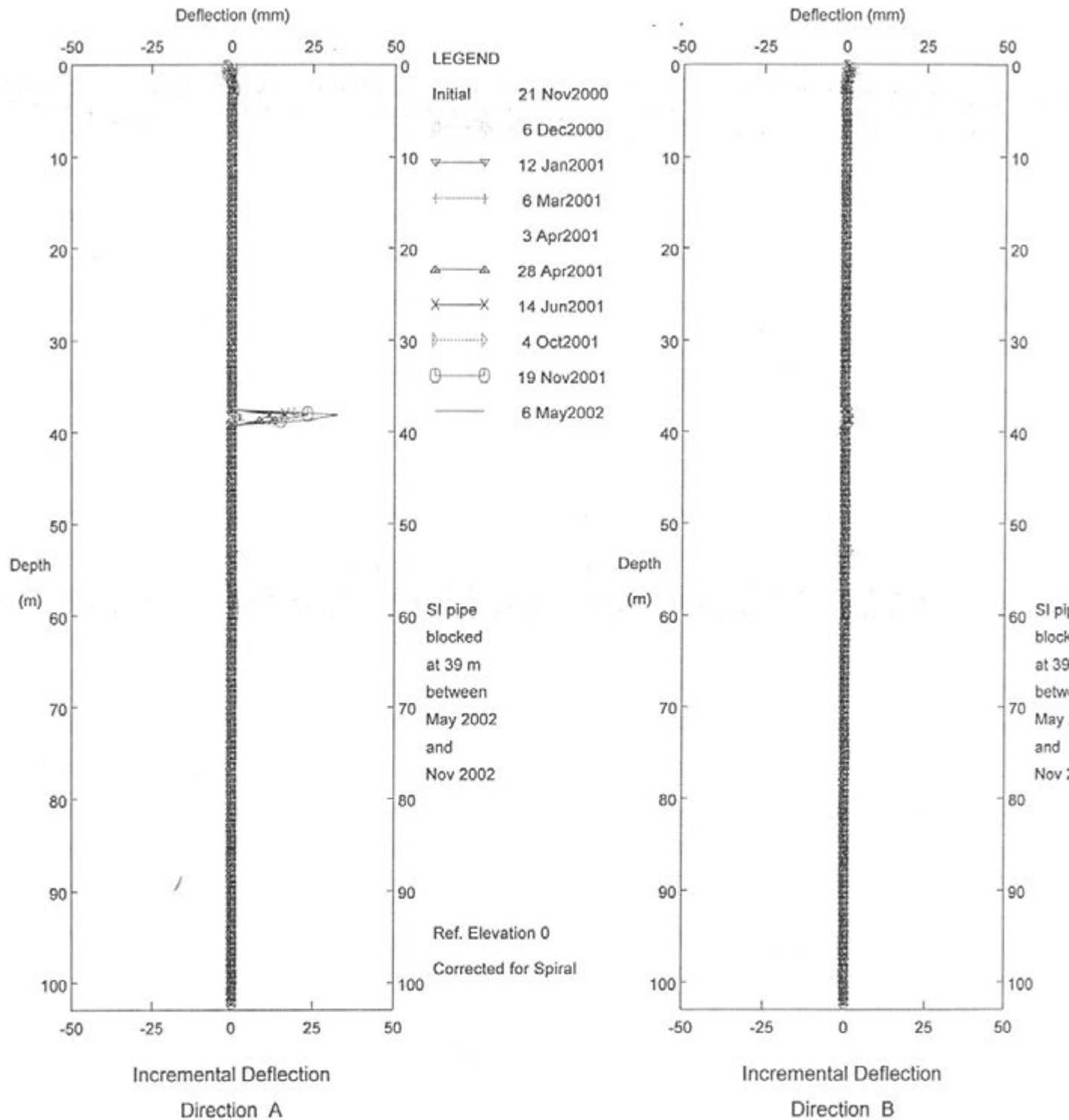
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Upper Avery Lane

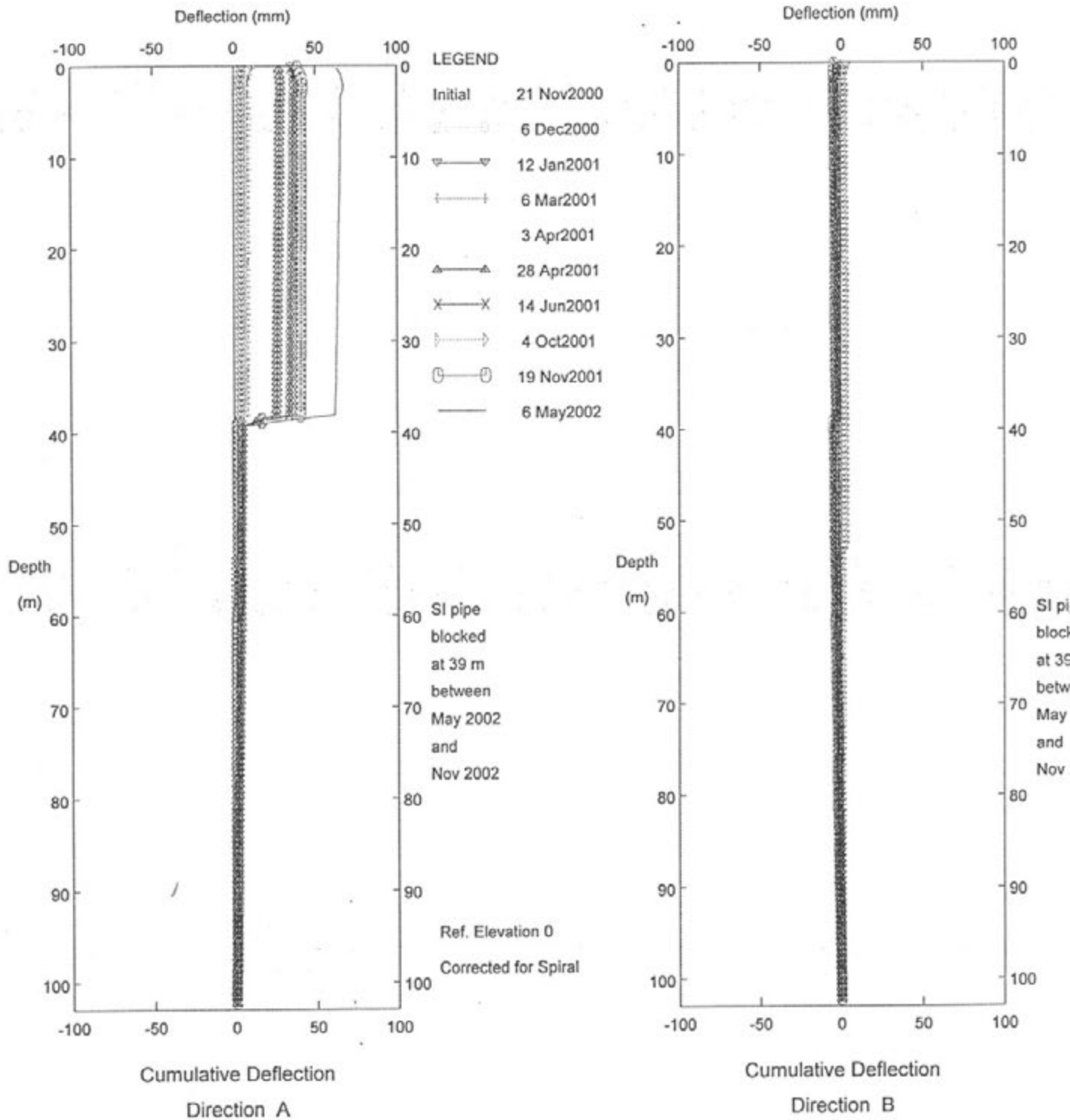
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Abbott Drive near Bettcher

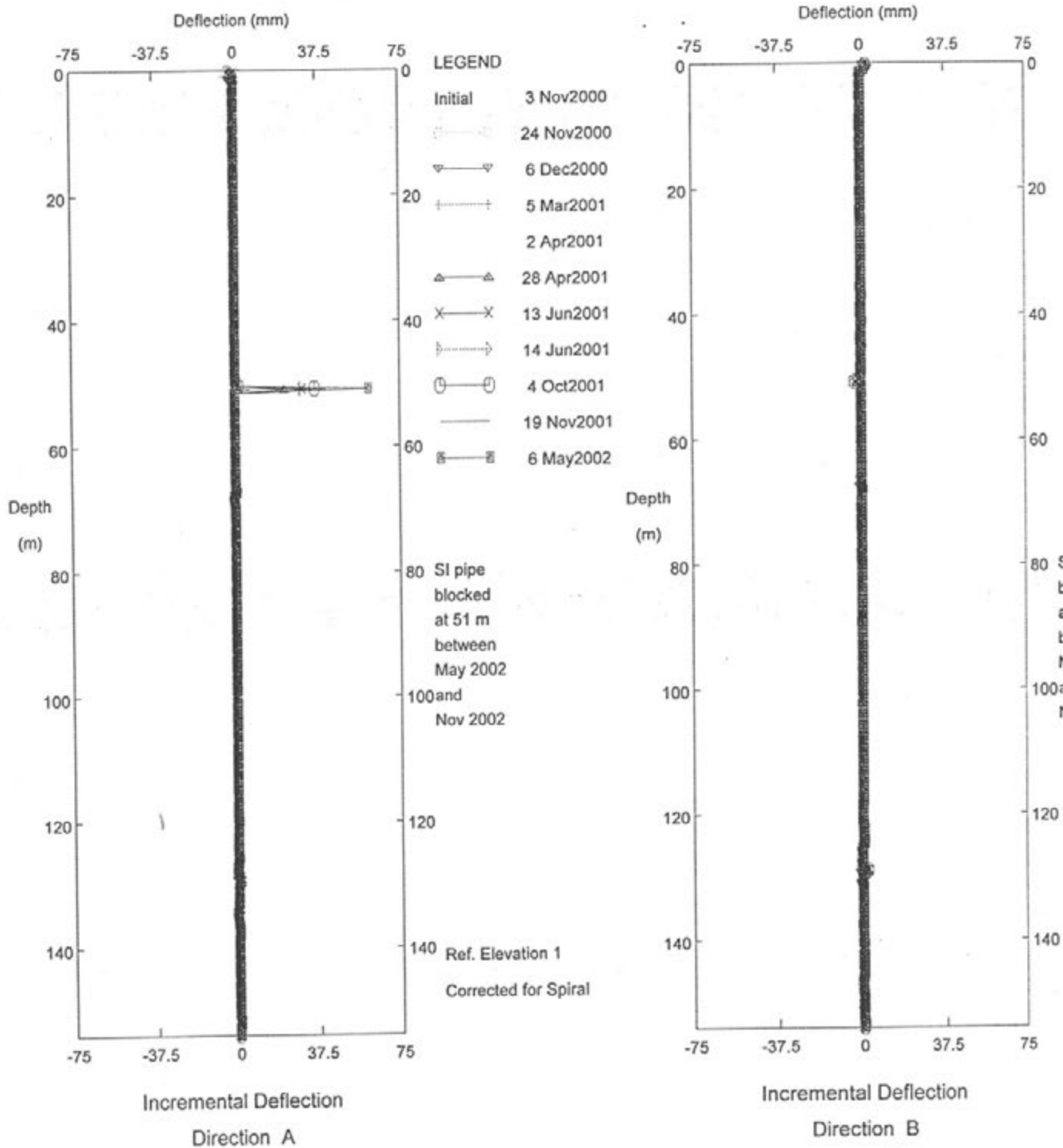
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Abbott Drive near Bettcher

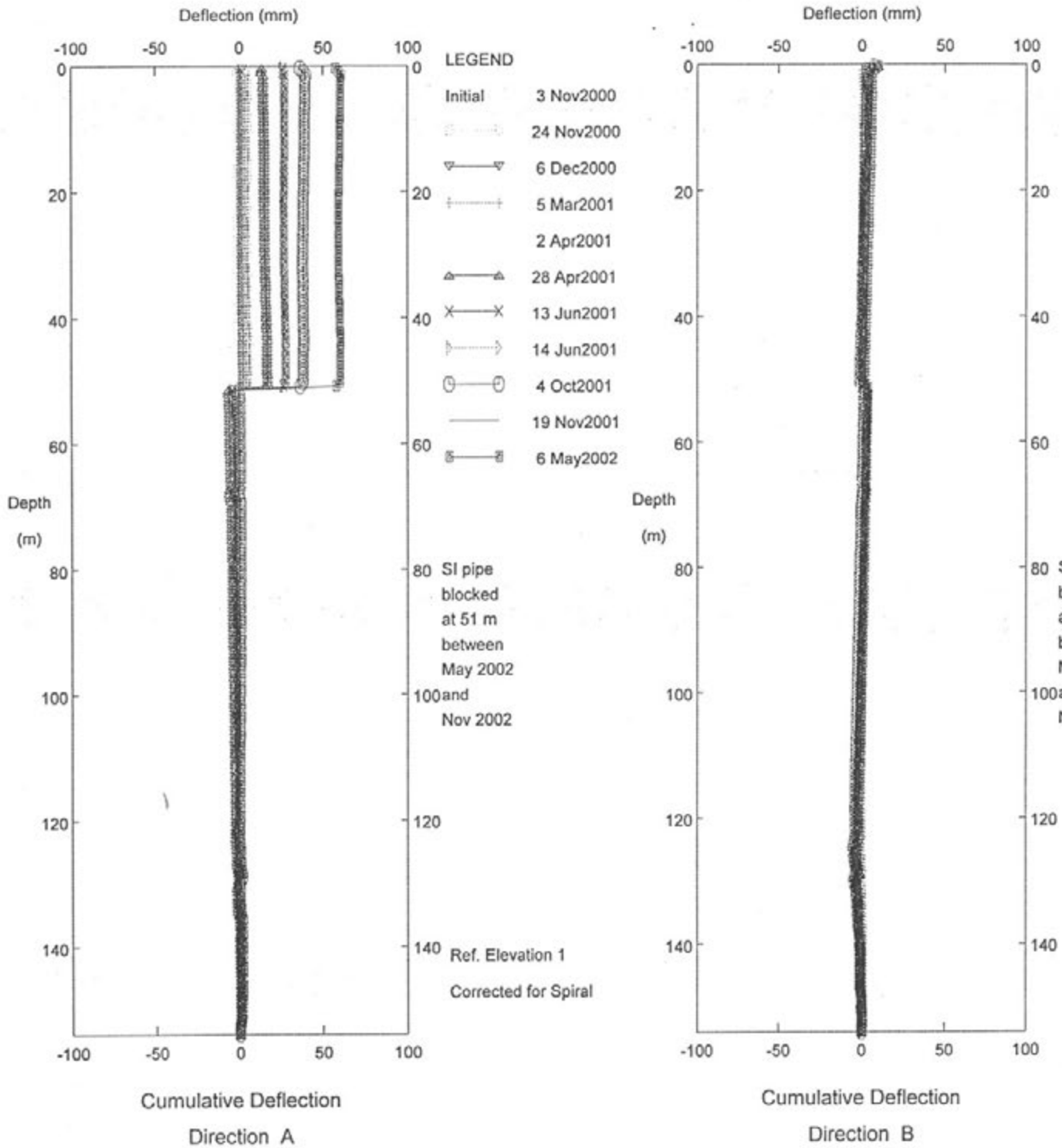
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Voyageur School

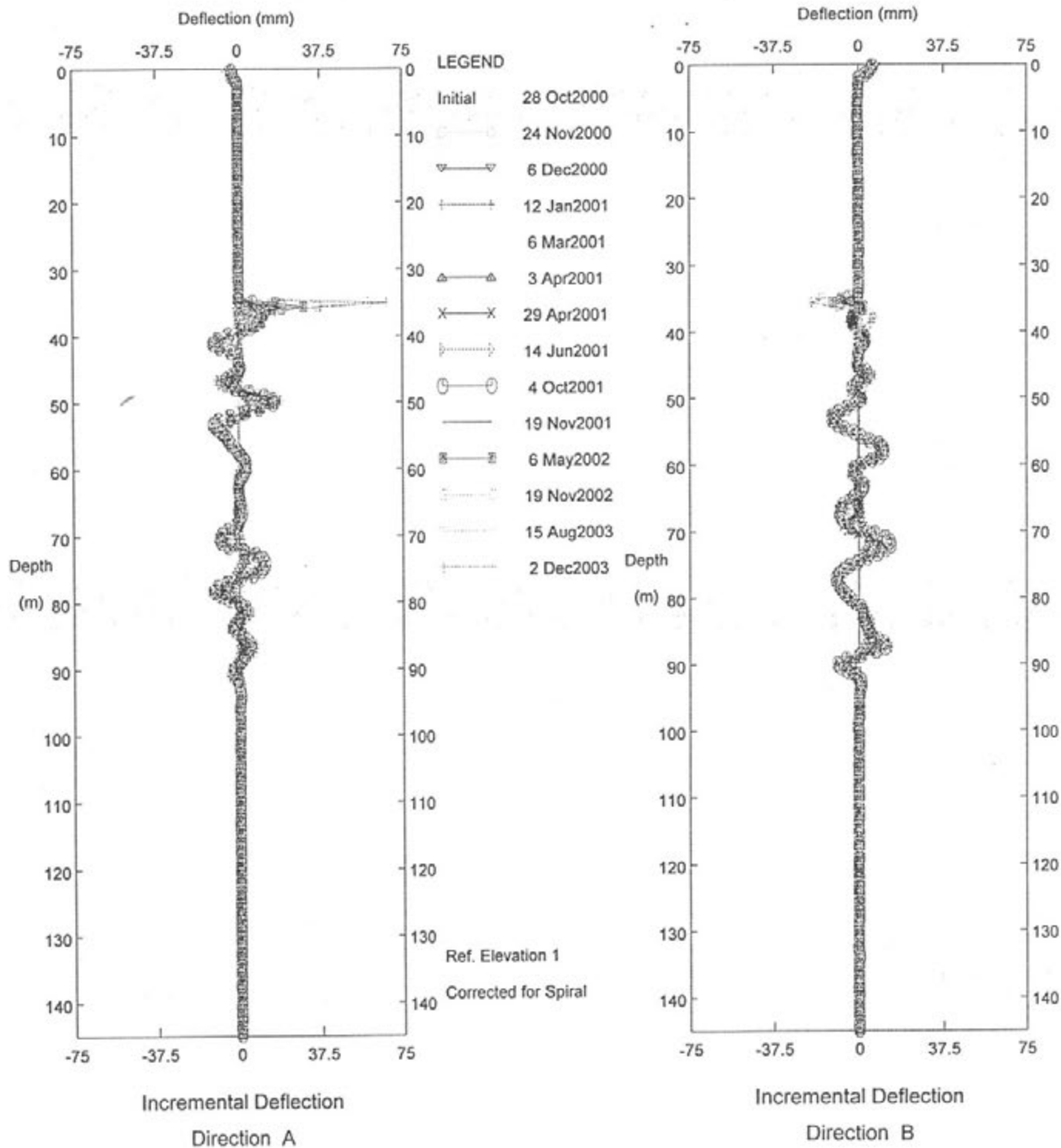
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Voyageur School

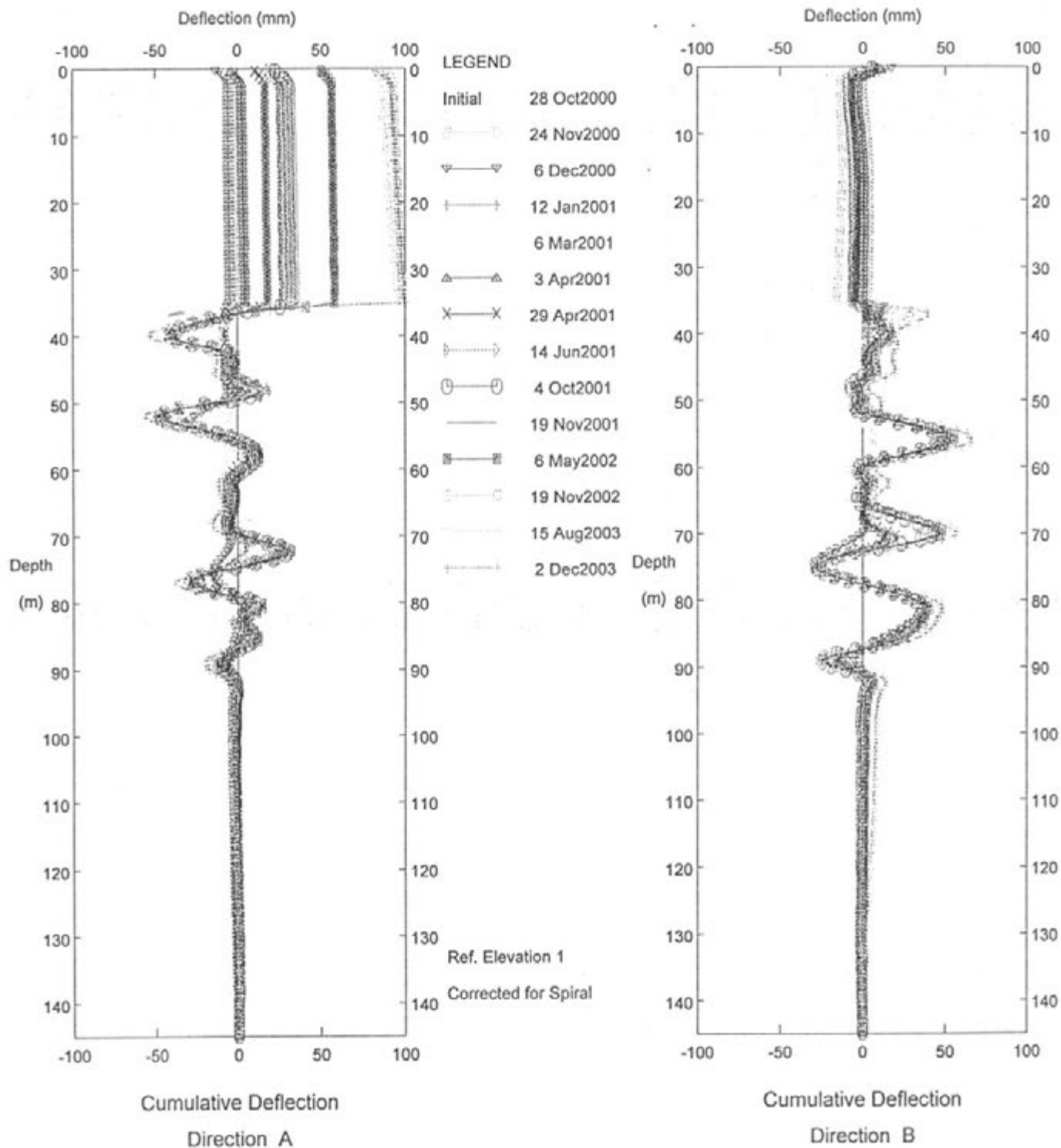
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Abbott Drive

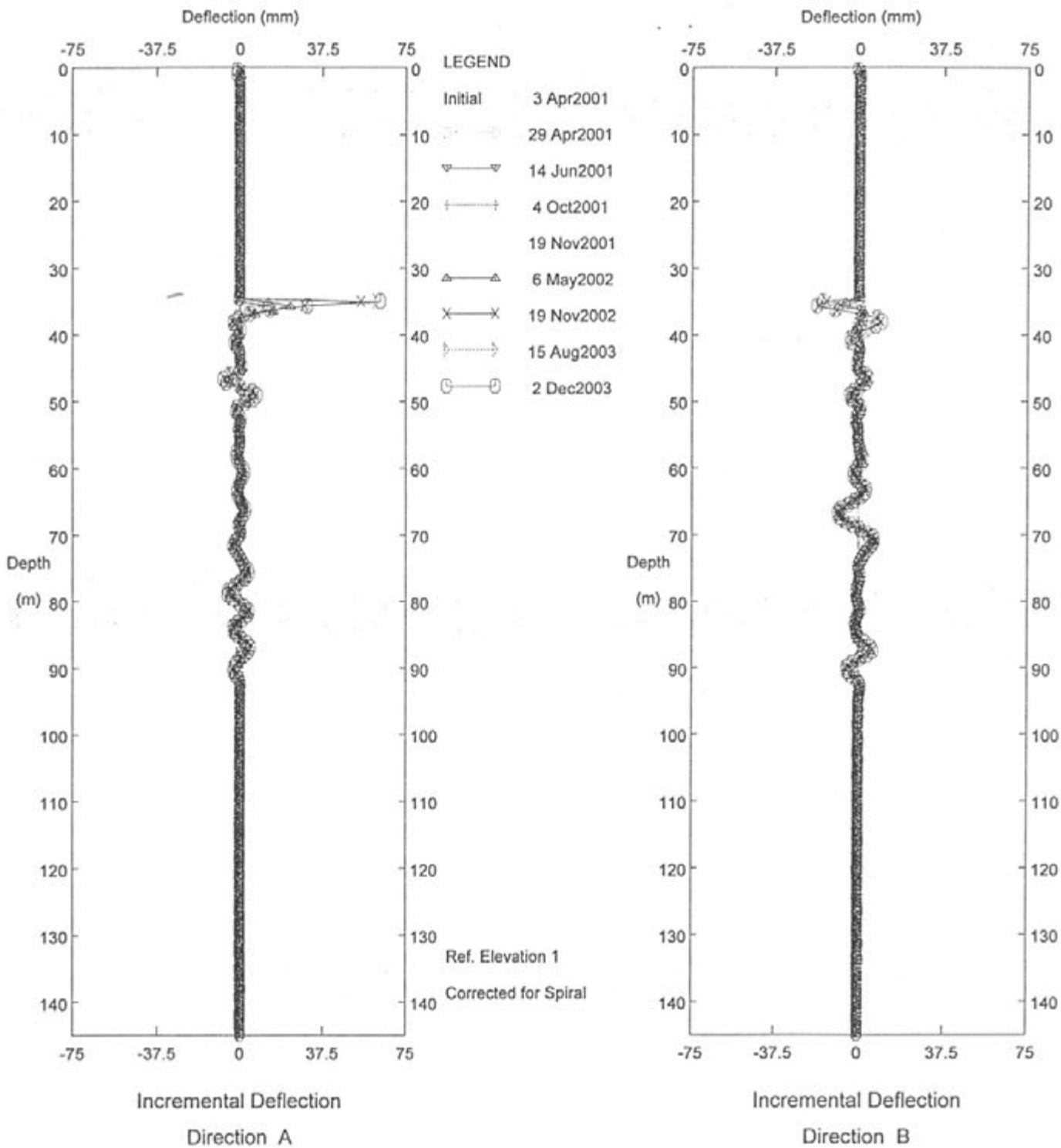
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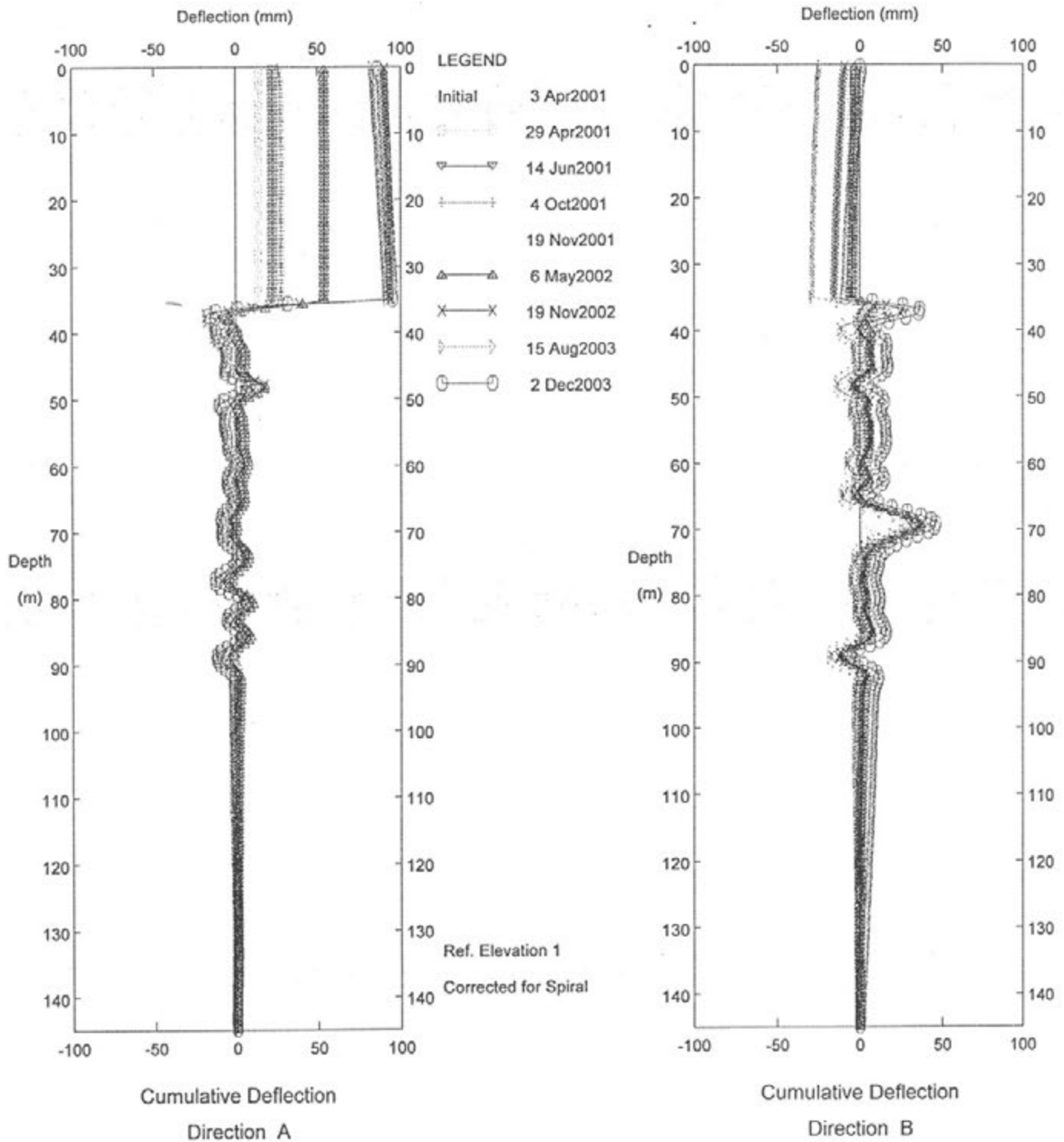
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Abbott Drive

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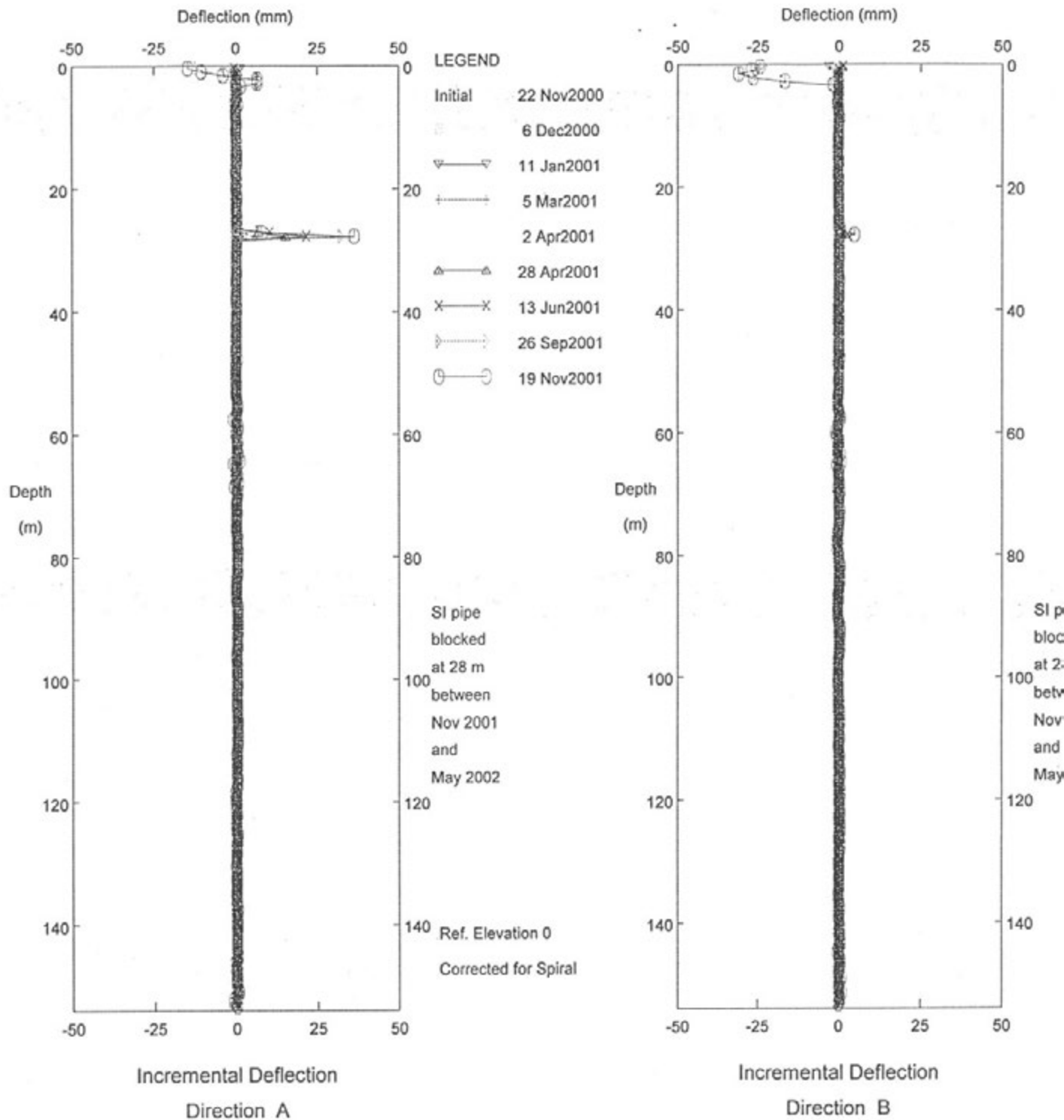


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Abbott Drive

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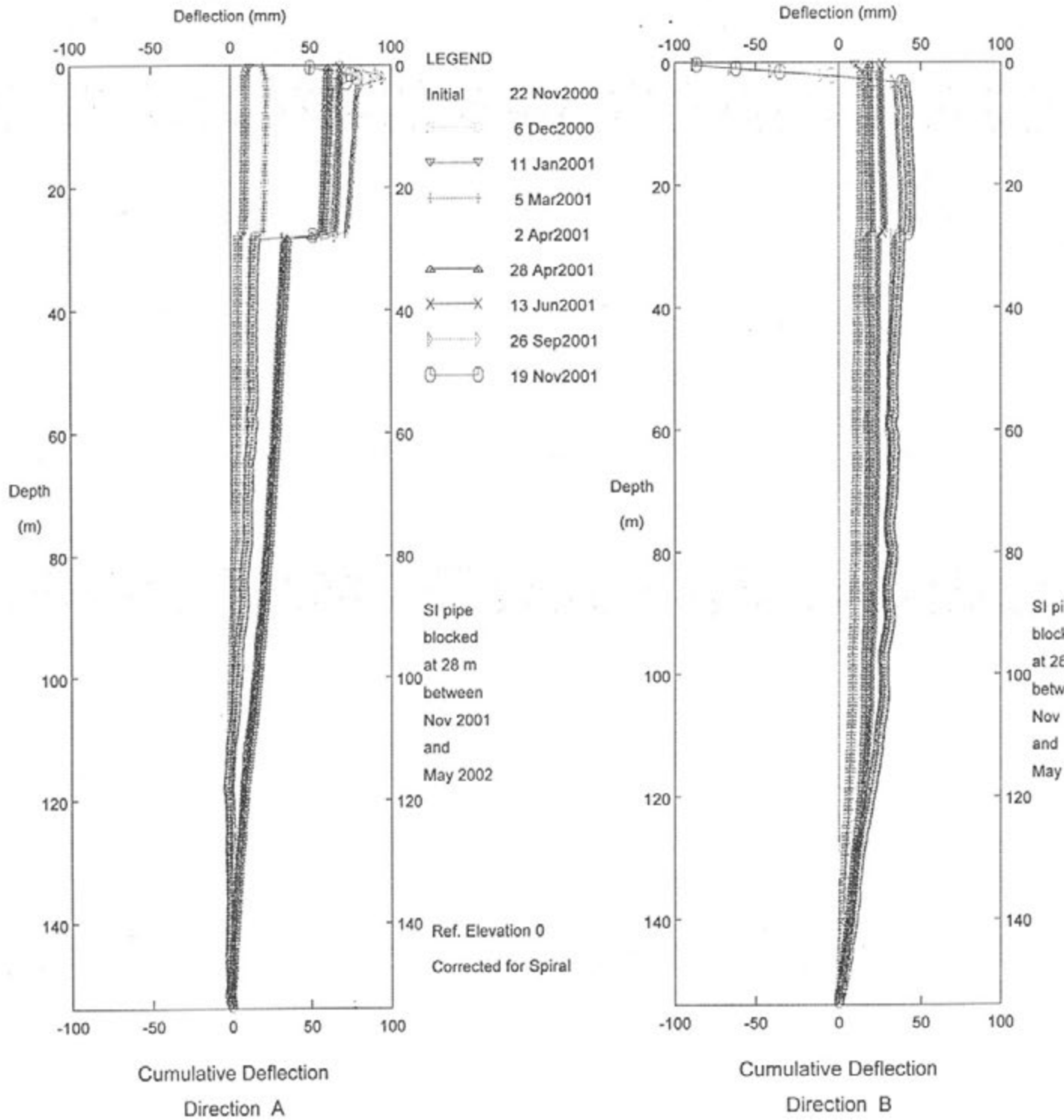
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End of Dixon Street

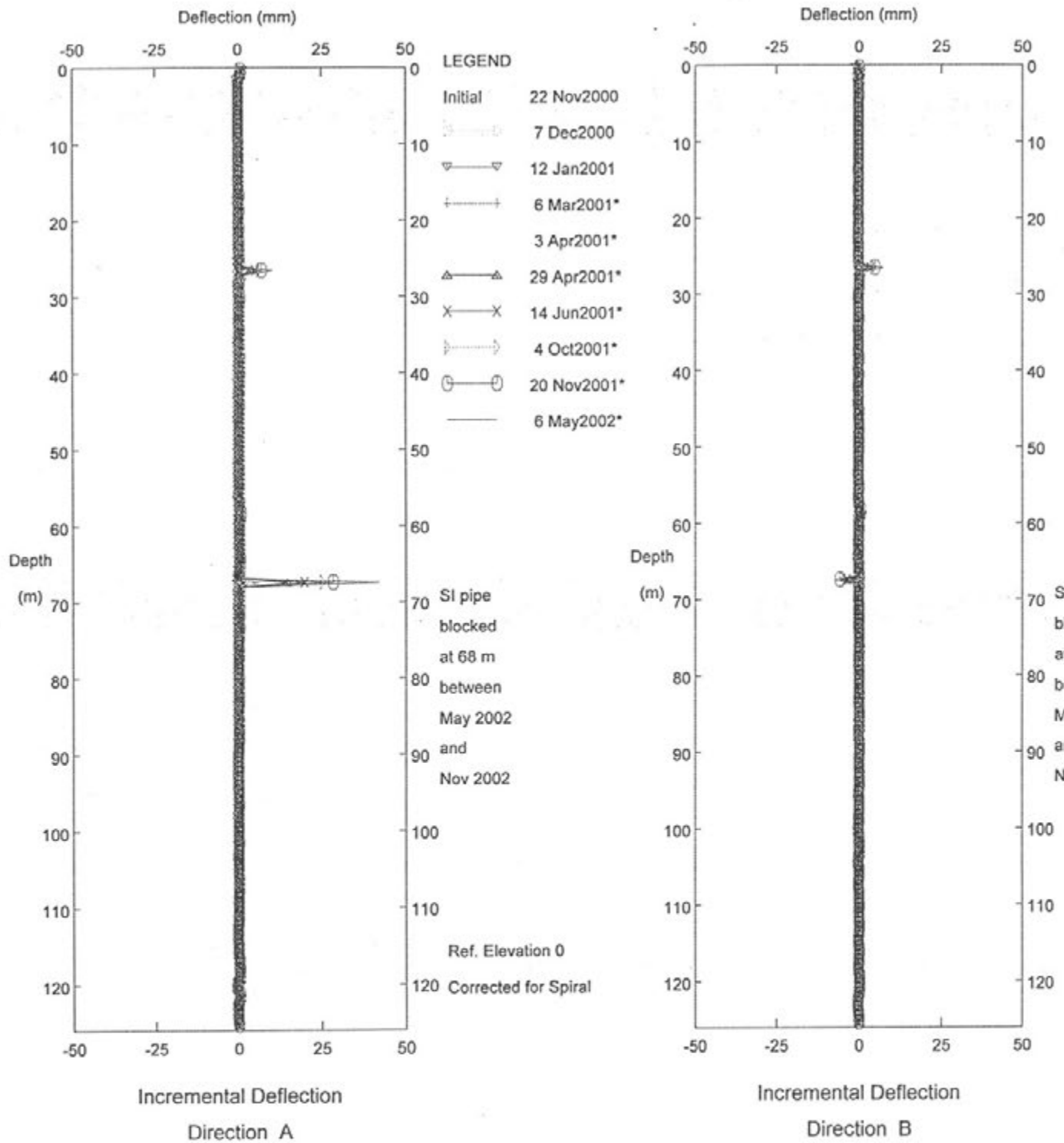
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End of Dixon Street

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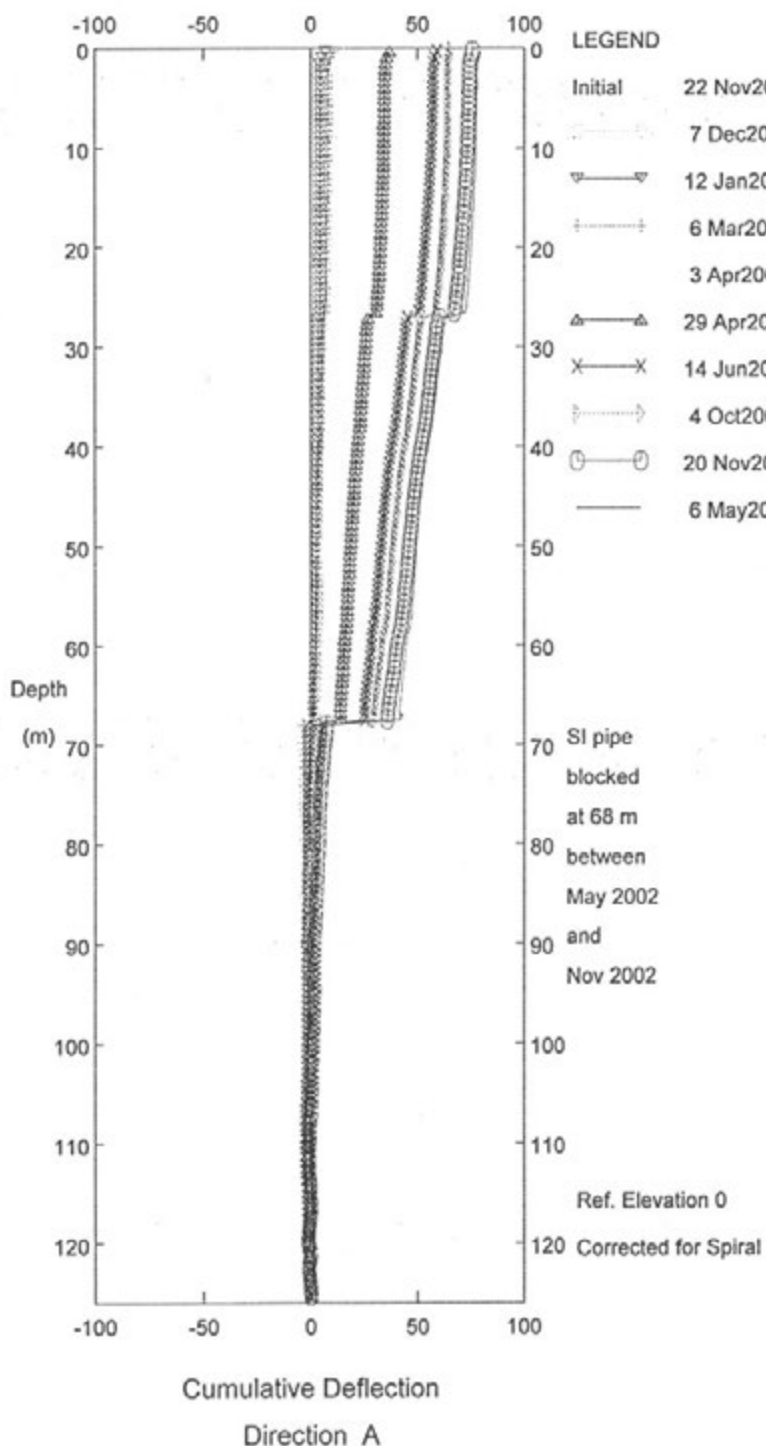
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Pierce Crescent & Lewis Drive

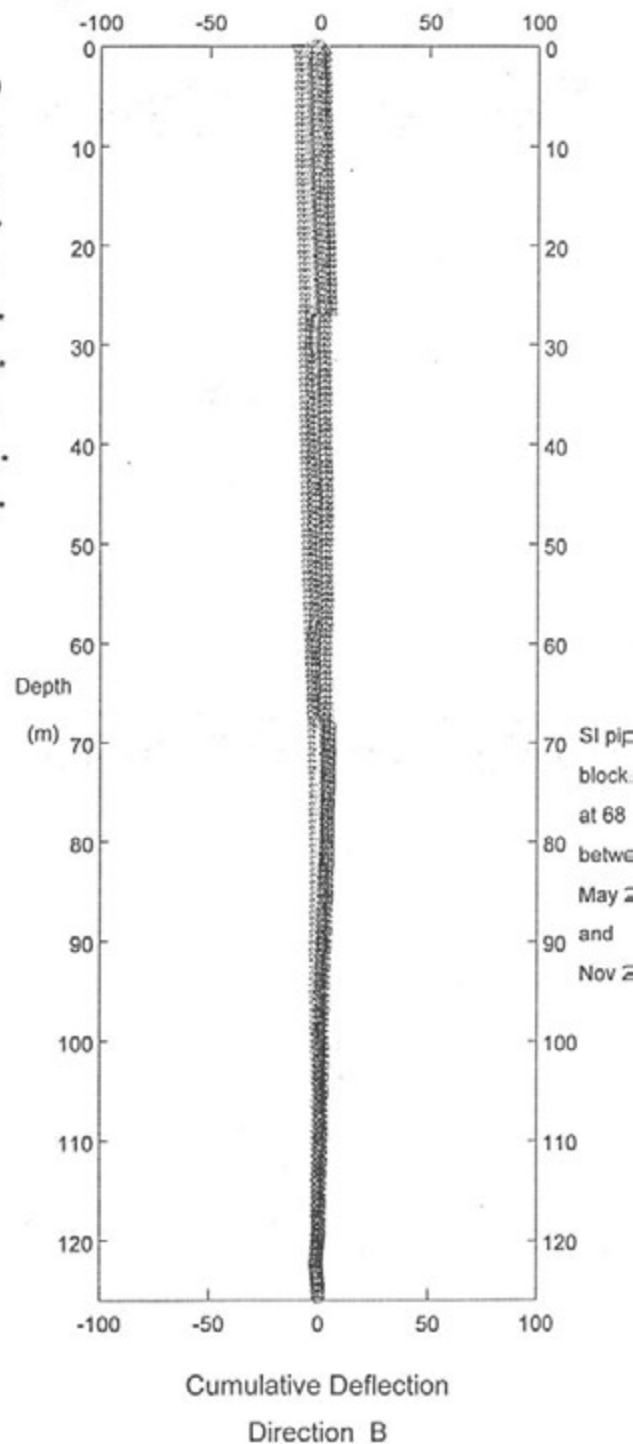
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Deflection (mm)



Deflection (mm)



KX03904 W. Quesnel Stability Study, Inclinator SI-7 Corr.

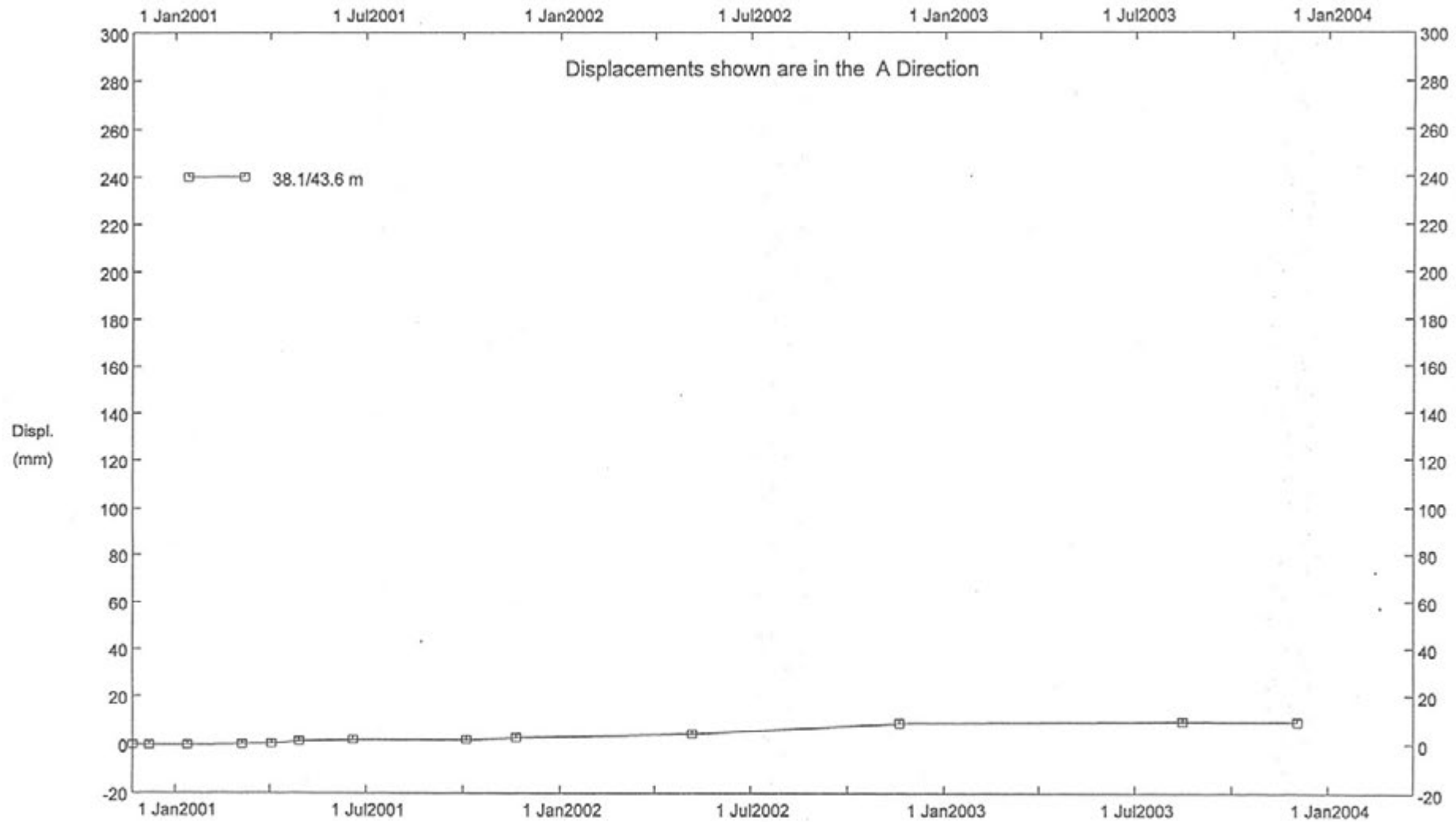
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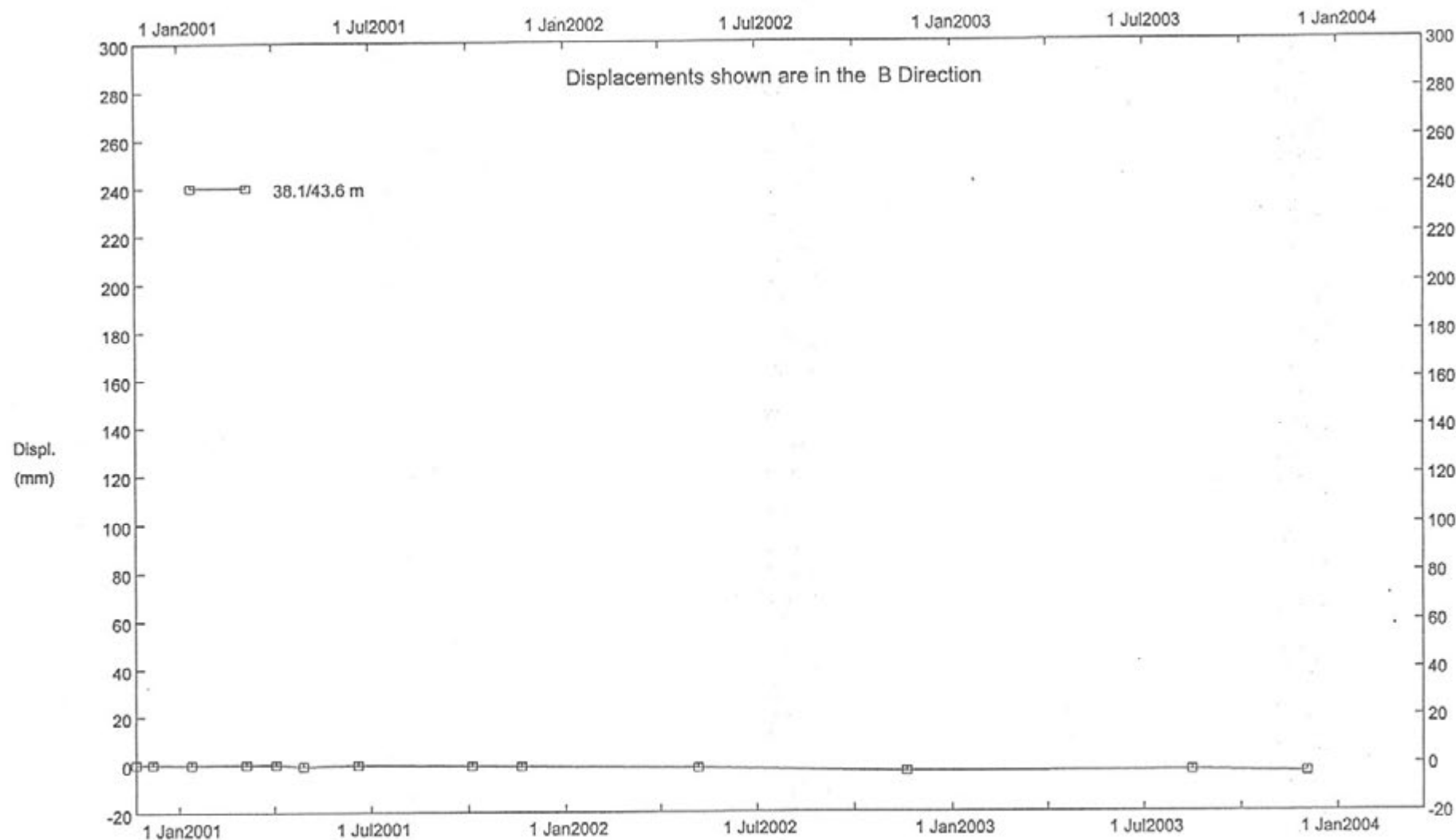
APPENDIX B

VELOCITY PLOTS



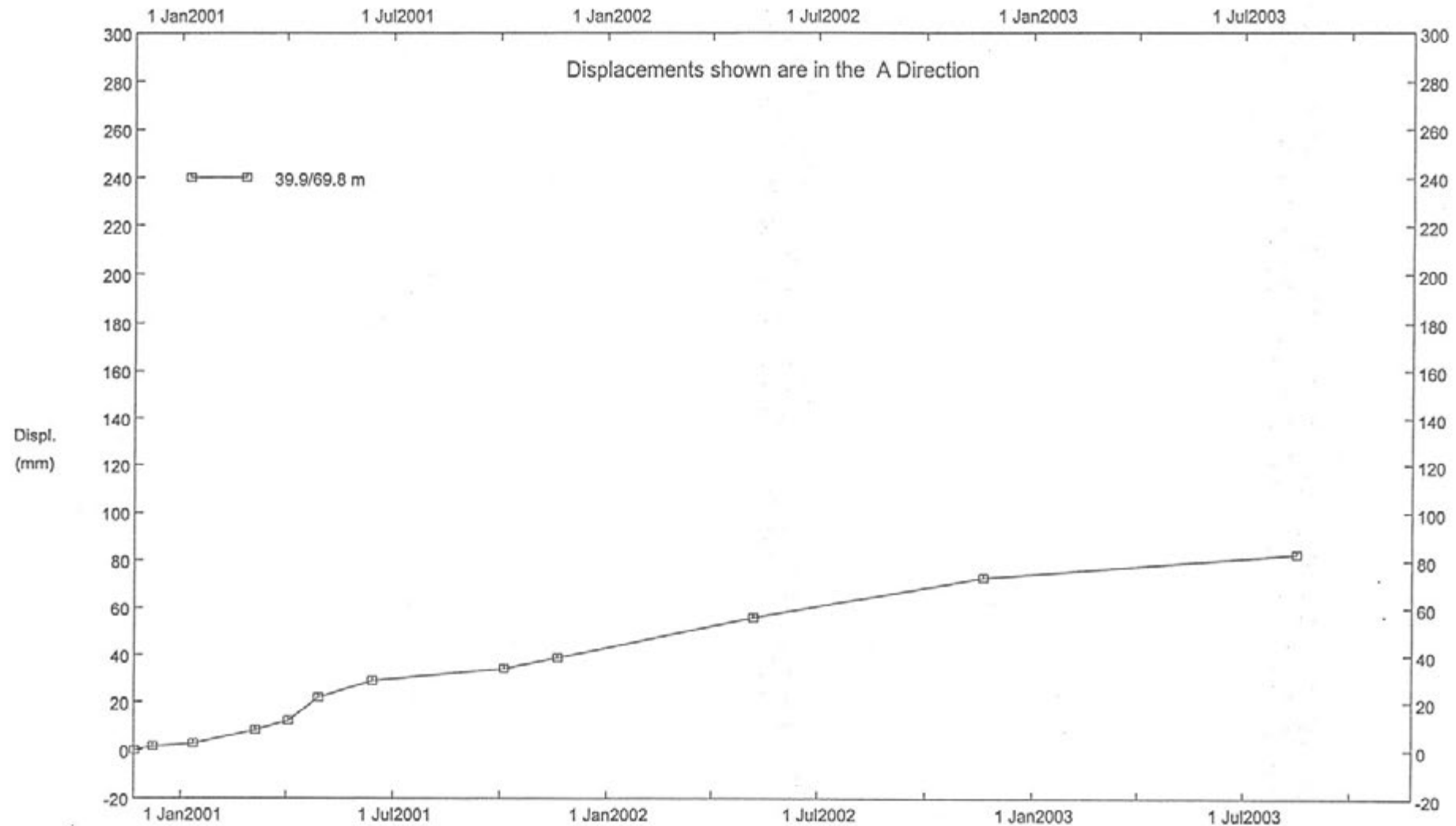
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Lower Avery Lane



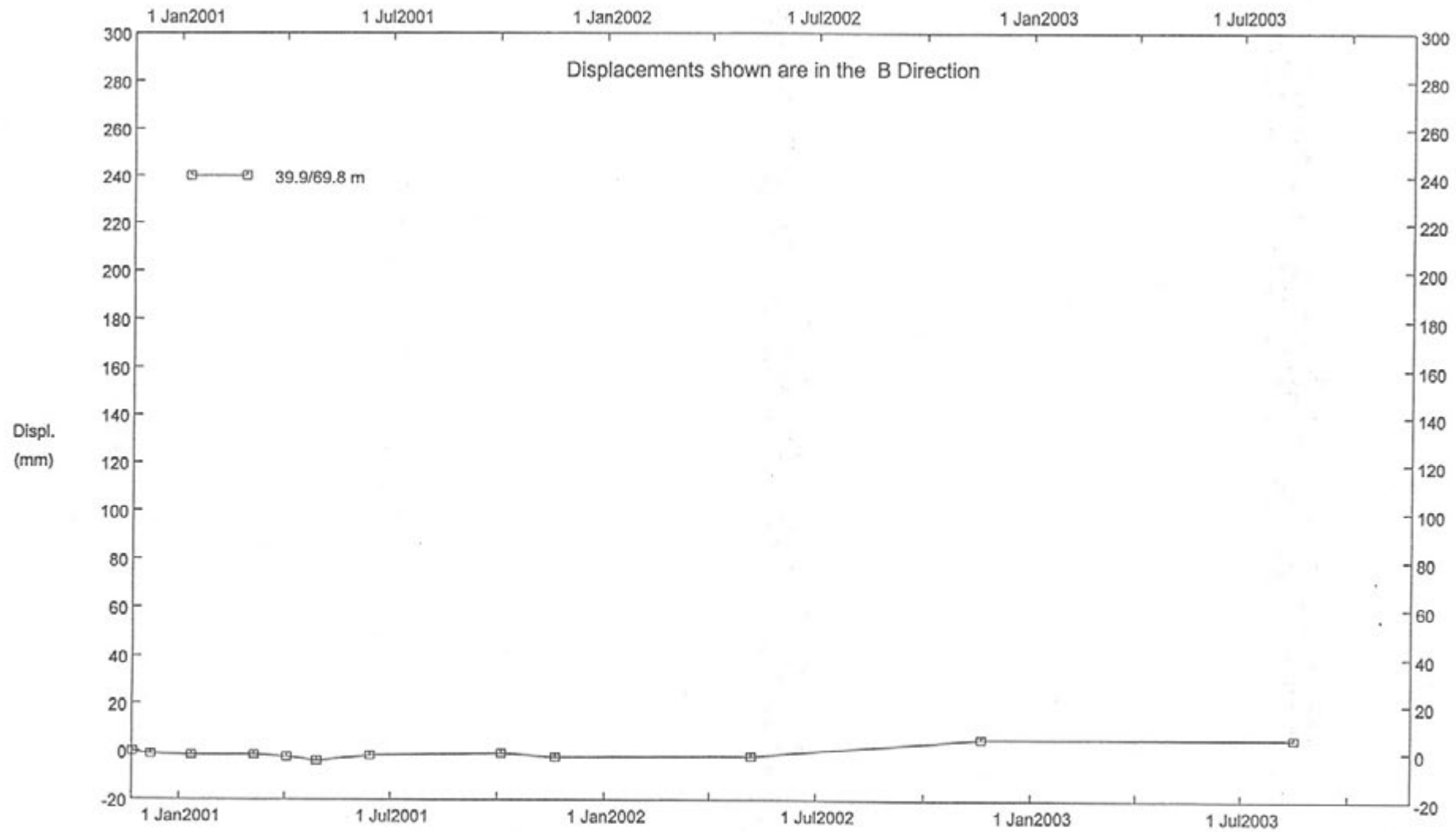
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Lower Avery Lane



KX03904 W. Quesnel Stability Study, Inclinator SI-2 Corr.

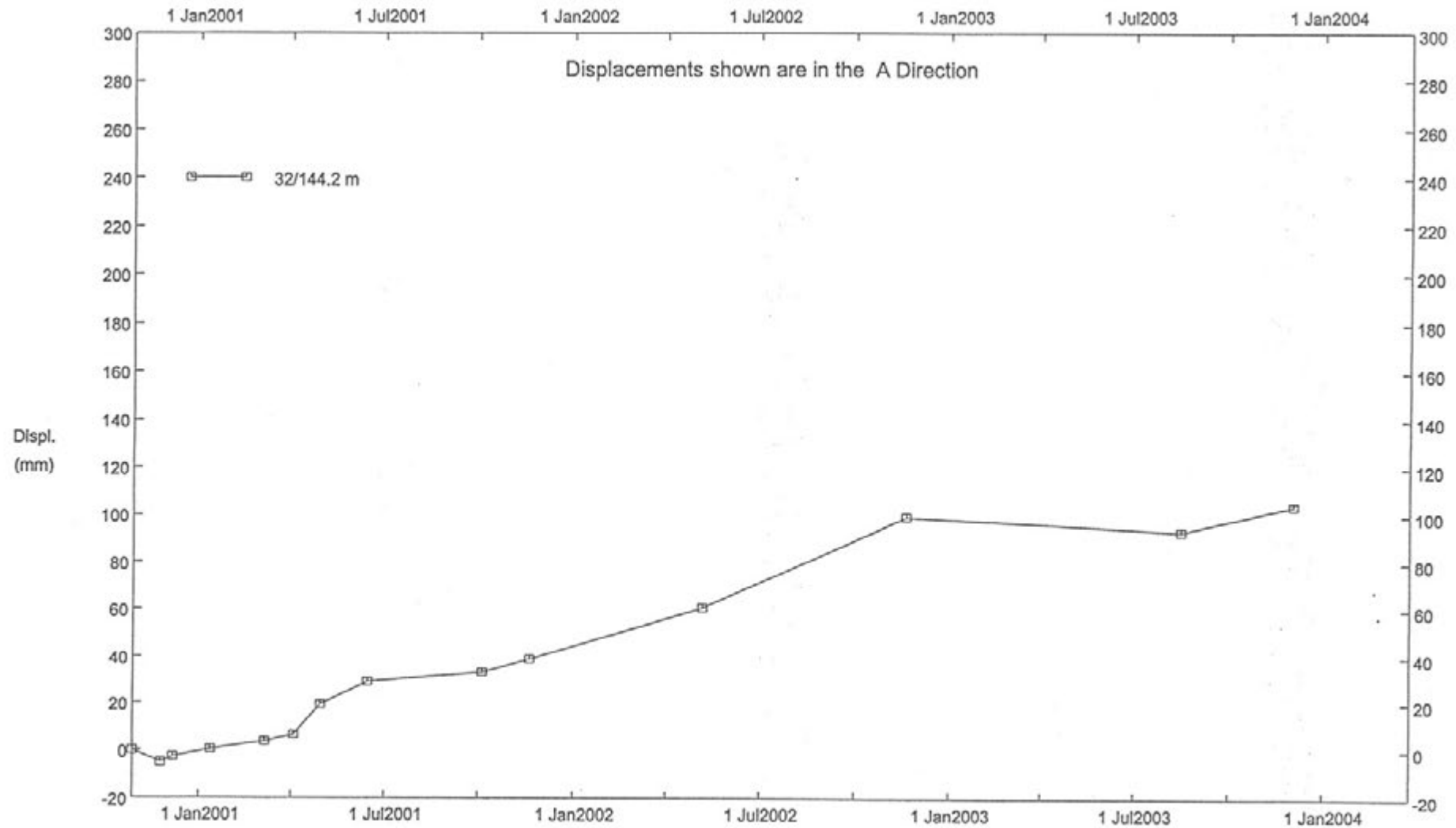
Upper Avery Lane



KX03904 W. Quesnel Stability Study, Inclinator SI-2 Corr.

Upper Avery Lane

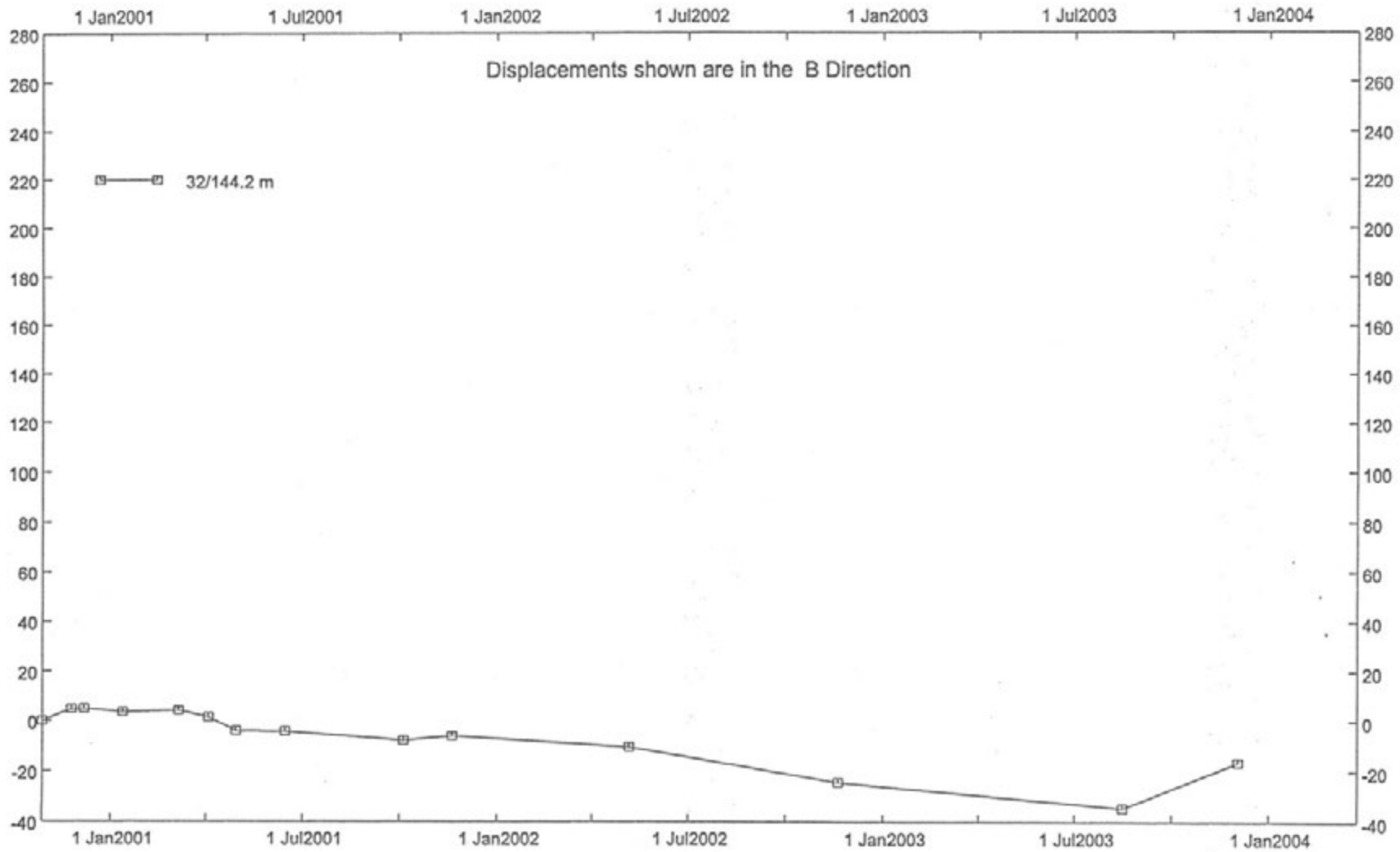
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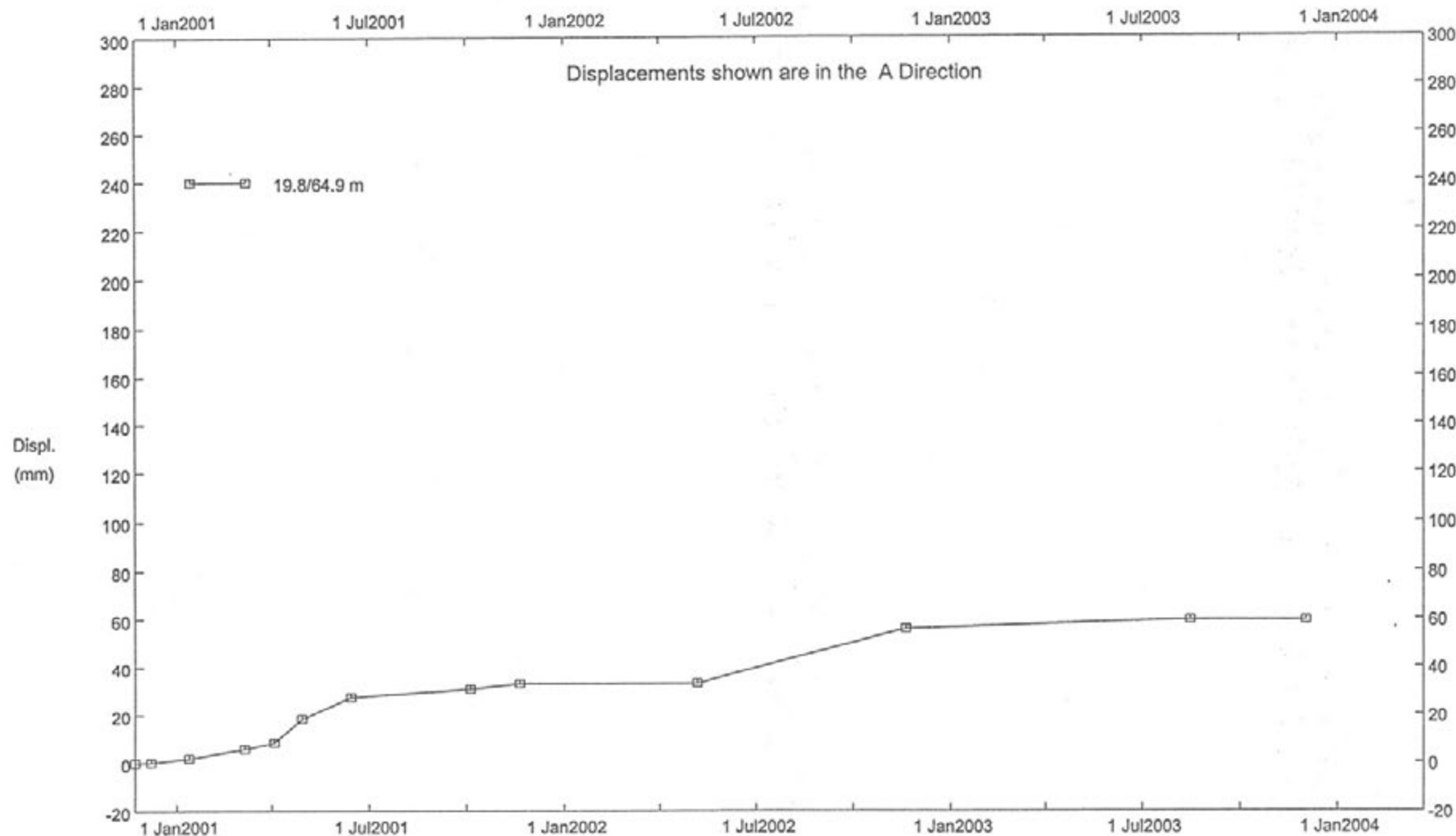
Abbott Drive

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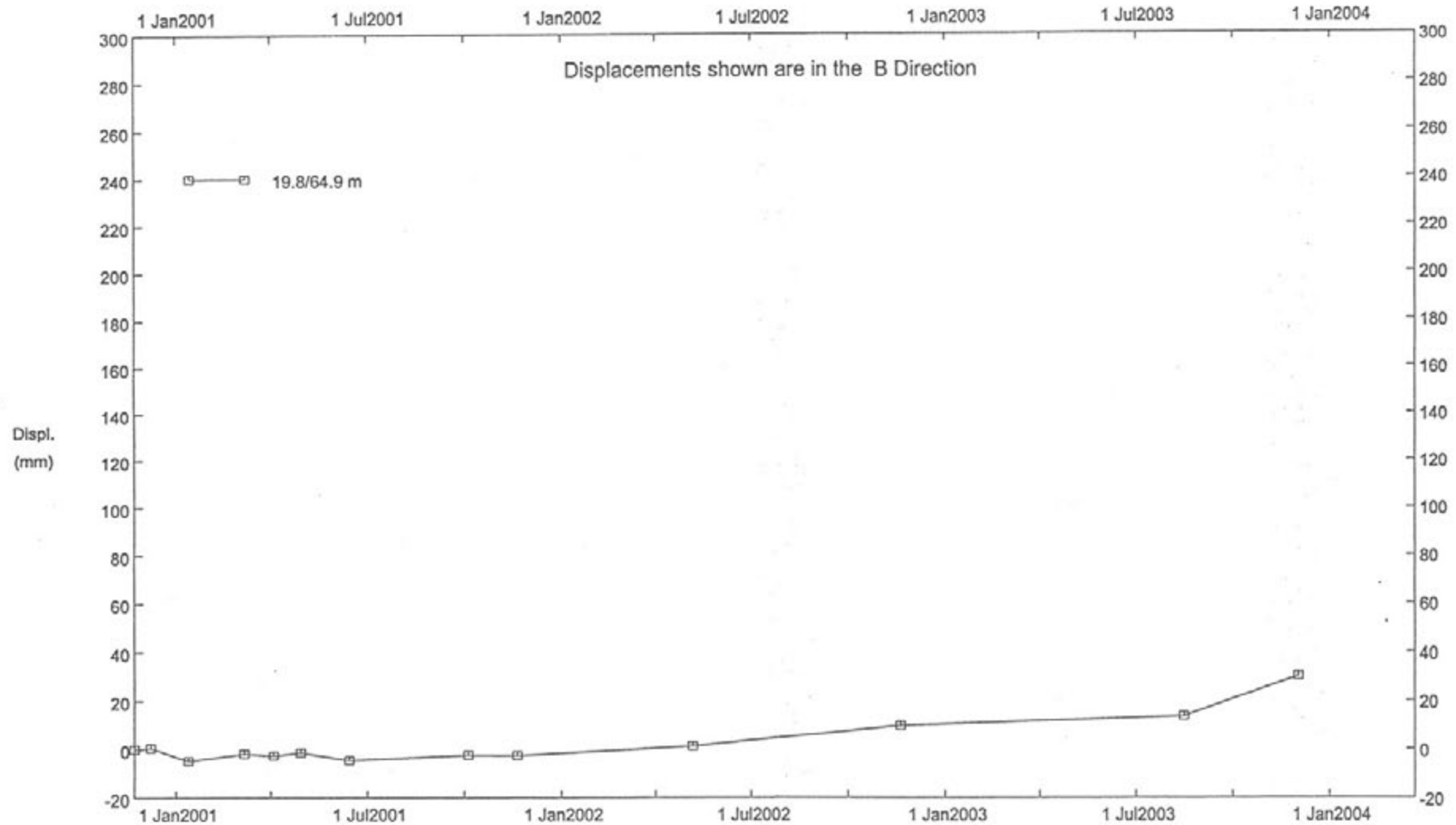
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Abbott Drive



KX03904 W. Quesnel Stability Study, Inclinator SI-7 Corr.

Pierce Crescent & Lewis Drive



KX03904 W. Quesnel Stability Study, Inclinator SI-7 Corr.

Pierce Crescent & Lewis Drive



APPENDIX C
WATER LEVEL DATA

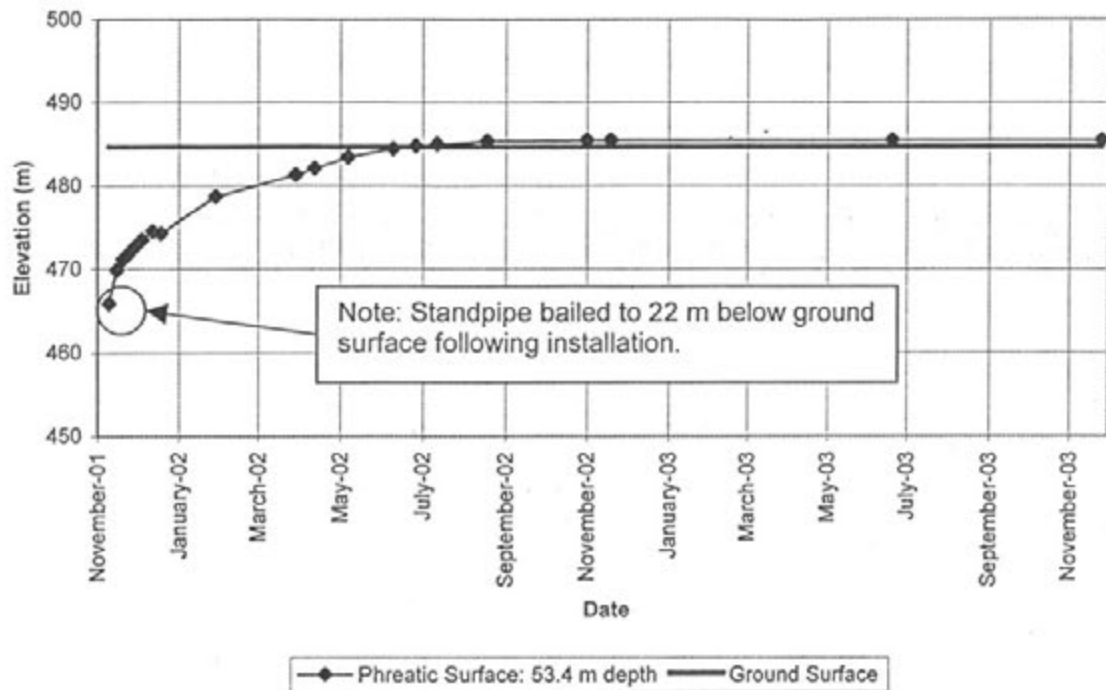


Chart 1: Piezometric data from BH-2A.

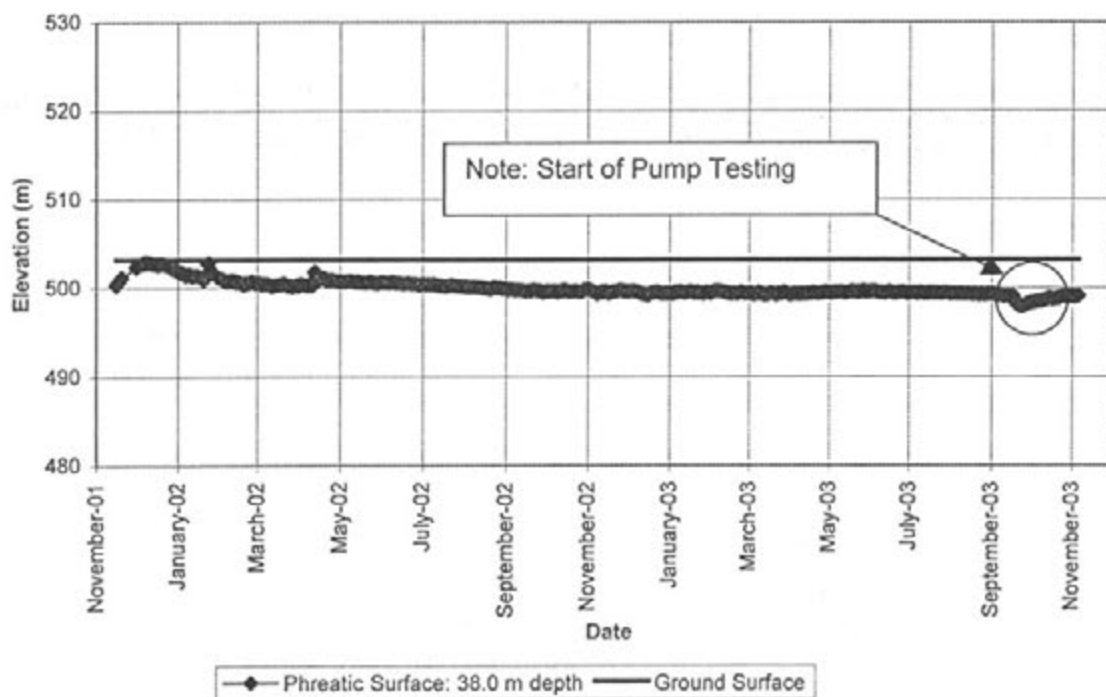


Chart 2: Piezometric data from BH-3A.

amec
Earth & Environmental

City of Quesnel
West Quesnel Land Stability Study
Quesnel, BC

Charts C1 and C2

DATE:
Jan 2004

SCALE:
NTS

DRAWN BY:
SJ

PROJECT No: KX04398

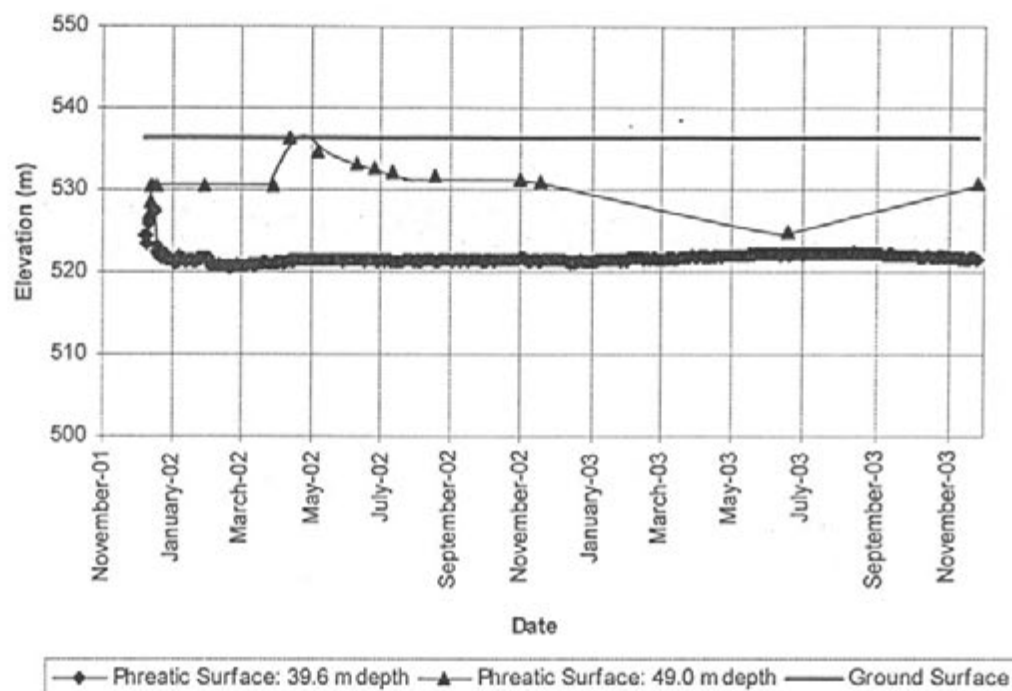


Chart 3: Piezometric data from BH-4A.

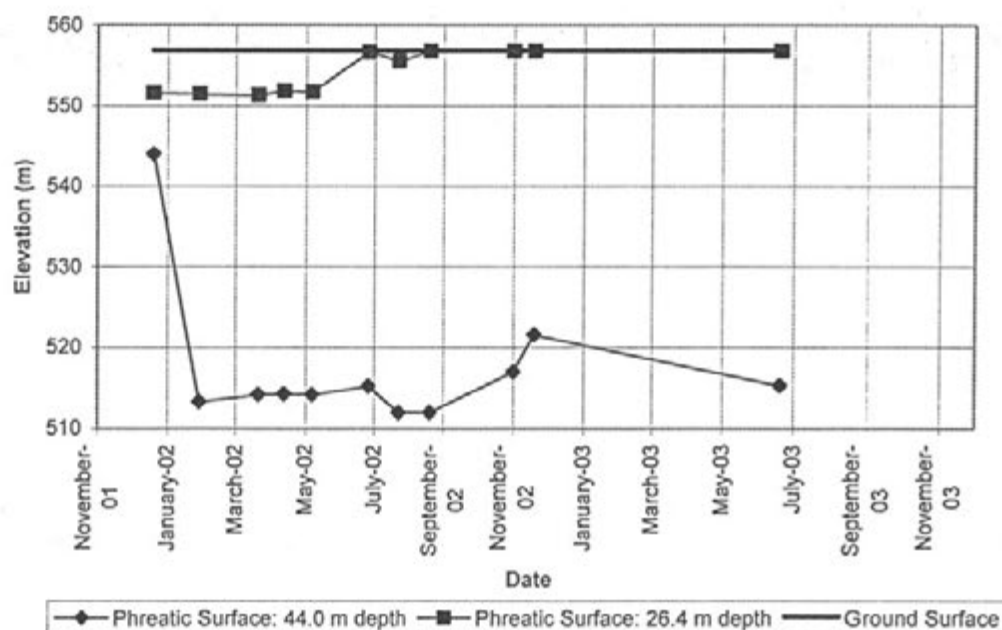


Chart 4: Piezometric data from BH-6A.

amec
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City of Quesnel
West Quesnel Land Stability Study
Quesnel, BC

Charts C3 and C4

DATE:
Jan 2004

SCALE:
NTS

DRAWN BY:
SJ

PROJECT No: KX04398



APPENDIX D
PRECIPITATION DATA

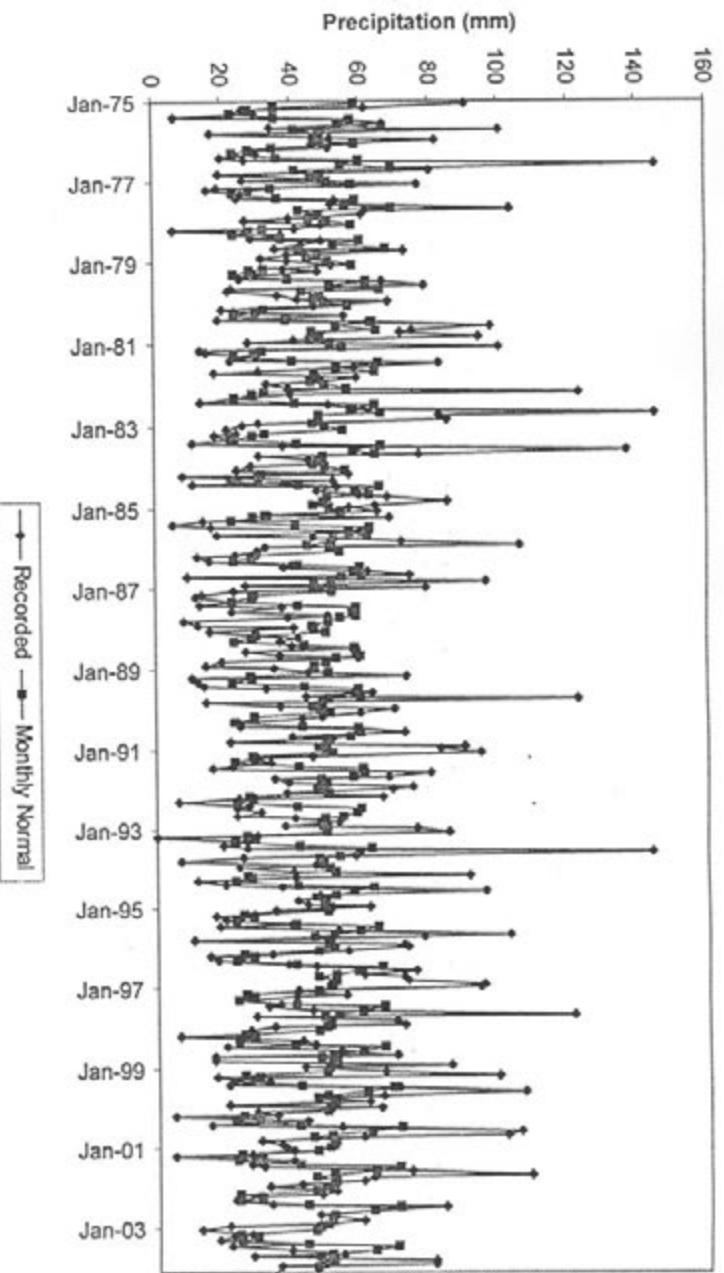


Chart 1: Monthly Precipitation from 1975 to 2003

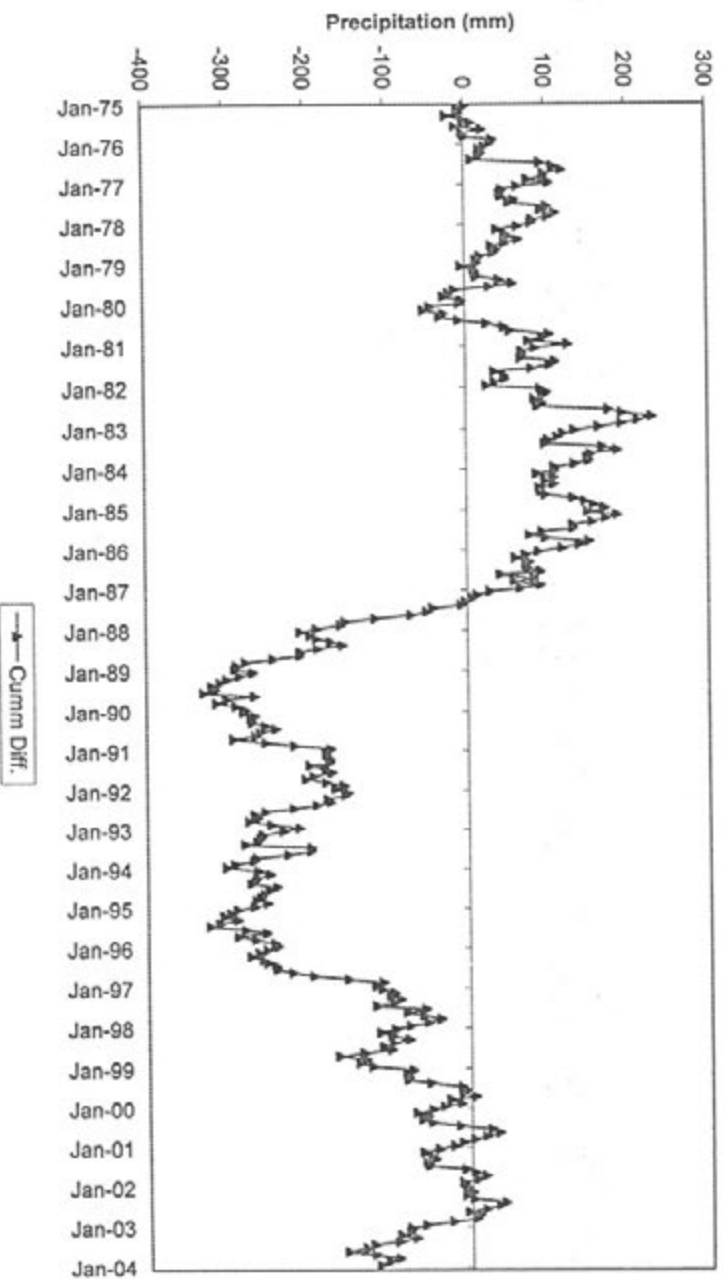


Chart 2: Cumulative Difference from 1975 to 2003

APPENDIX E
BC GAS MOVEMENT HUBS

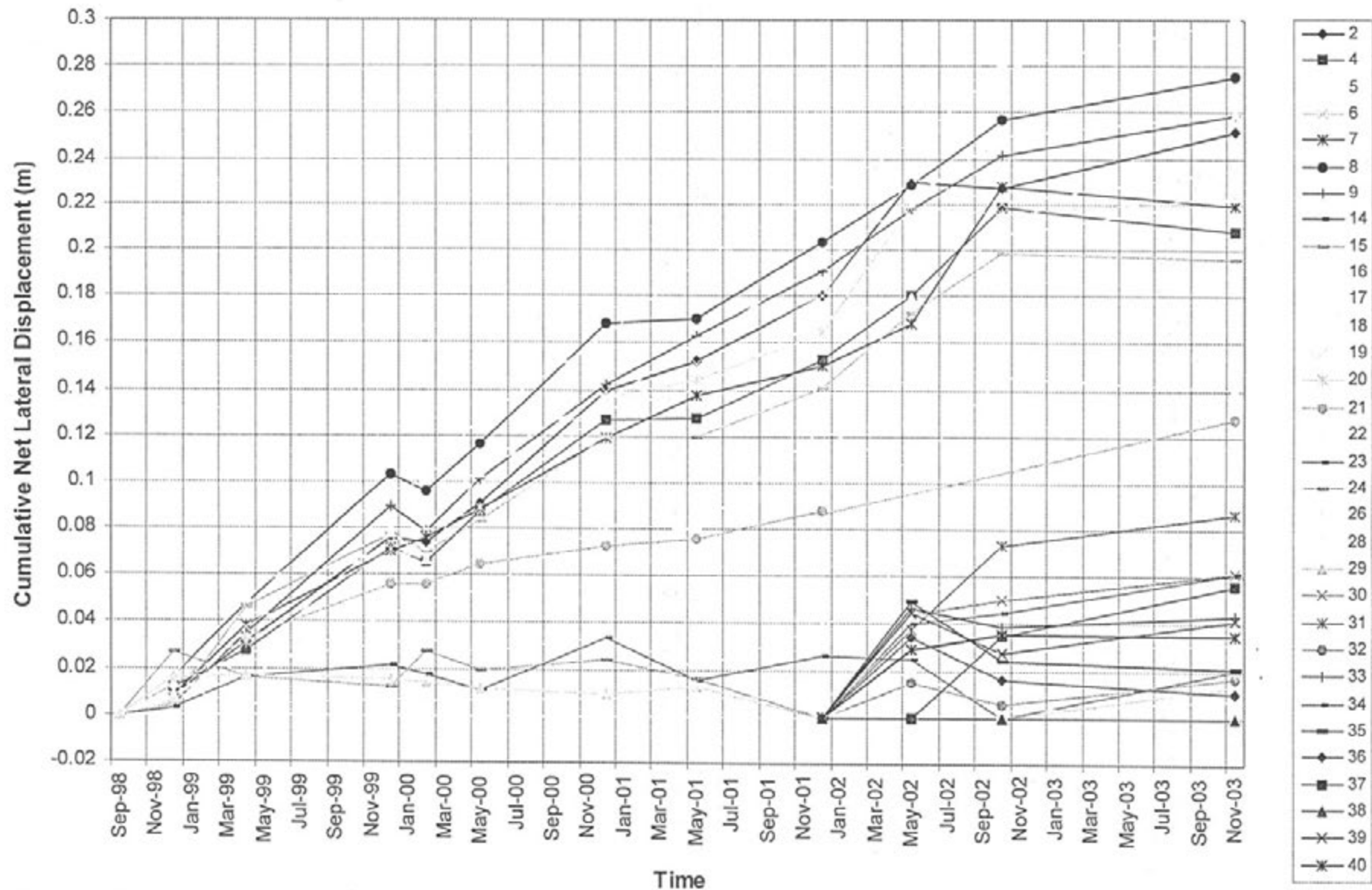


Chart F1

City of Quesnel

West Quesnel Land Stability Study
Quesnel, BC

Chart 1: Cumulative net lateral displacement
versus time from BC Gas movement hubs
(September 1998 to November 2003)

DATE:

Jan 2004

SCALE:

MTS

DRAWN BY:

S.I.

PROJECT No: KX04398

Table 1: Summary of Monitoring Data from September 1998 to December 1998

Station Number	Location (Landmark, Road)	September, 1998			December, 1998			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.871	531420.907	563.014	-0.007	0.005	-0.007	0.009
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870331.961	531626.828	557.163	0.012	-0.001	-0.008	0.012
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.445	531627.216	551.965	0.003	0.007	-0.013	0.008
6	Paley West	5870474.774	531664.168	539.628	5870474.771	531664.179	539.615	-0.003	0.011	-0.013	0.011
7	Paley East	5870427.297	531932.241	533.473	5870427.299	531932.249	533.467	0.002	0.008	-0.006	0.008
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.580	531909.287	536.905	0.000	-0.008	-0.038	0.008
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.588	531714.875	549.766	-0.011	0.012	-0.019	0.016
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.435	531986.023	531.210	-0.002	-0.004	-0.014	0.004
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.892	532052.515	524.393	0.004	0.002	0.008	0.004
16	Healy Road	5870413.504	532184.864	509.104	5870413.499	532184.859	509.086	-0.005	-0.005	-0.018	0.007
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.634	532237.872	519.599	-0.013	0.010	-0.011	0.016
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.929	531984.611	524.132	0.006	-0.006	-0.015	0.008
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.534	531978.063	517.219	0.002	0.002	-0.006	0.003
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.263	532199.109	504.333	0.004	0.004	-0.023	0.006
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869343.005	532493.492	485.459	0.009	0.009	-0.015	0.013
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.968	532631.095	478.920	0.000	0.009	0.000	0.009
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.061	532888.608	475.357	-0.003	0.001	-0.027	0.003
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.373	531399.217	589.567	-0.026	0.007	-0.042	0.027
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.622	533765.361	545.406	-0.012	0.000	-0.023	0.012
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.893	536304.135	575.004	0.006	0.015	-0.010	0.016
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.947				

Statistics for stations 2 to 22

Average =	0.000062	0.003438	-0.012375	0.008956
Standard Deviation =	0.006767	0.006542	0.010204	0.003954
2 x Standard Deviation =	0.013535	0.013084	0.020408	0.007909

* Net Horizontal Displacement

Table 2: Summary of Monitoring Data from September 1998 to April 1999

Station Number	Location (Landmark, Road)	September, 1998			April, 1999			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total *
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.867	531420.931	563.007	-0.011	0.029	-0.014	0.031
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870331.956	531626.856	557.150	0.007	0.027	-0.021	0.028
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.438	531627.250	551.951	-0.004	0.041	-0.027	0.041
6	Paley West	5870474.774	531664.168	539.628	5870474.788	531664.208	539.613	0.014	0.040	-0.015	0.042
7	Paley East	5870427.297	531932.241	533.473	5870427.300	531932.279	533.462	0.003	0.038	-0.011	0.038
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.581	531909.314	536.909	0.001	0.019	-0.034	0.019
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.593	531714.910	549.753	-0.006	0.047	-0.032	0.047
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.428	531986.061	531.205	-0.009	0.034	-0.019	0.035
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.902	532052.557	524.361	0.014	0.044	-0.024	0.046
16	Healy Road	5870413.504	532184.864	509.104	5870413.501	532184.880	509.054	-0.003	0.016	-0.050	0.016
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.634	532237.910	519.610	-0.013	0.048	0.000	0.050
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.930	531984.639	524.126	0.007	0.022	-0.021	0.023
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.525	531978.098	517.218	-0.007	0.037	-0.007	0.038
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.256	532199.136	504.327	-0.003	0.031	-0.029	0.031
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.998	532493.516	485.473	0.002	0.033	-0.001	0.033
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.972	532631.109	478.920	0.004	0.023	0.000	0.023
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.068	532888.623	475.365	0.004	0.016	-0.019	0.016
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.391	531399.224	589.587	-0.008	0.014	-0.022	0.016
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.631	533765.364	545.407	-0.003	0.003	-0.022	0.004
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.898	536304.133	574.998	0.011	0.013	-0.016	0.017
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.947				

Statistics for stations 2 to 22

Average =	-0.000250	0.033063	-0.019063	0.033916
Standard Deviation =	0.008202	0.009862	0.013777	0.010180
2 x Standard Deviation =	0.016403	0.019724	0.027553	0.020359

* Net Horizontal Displacement

Table 3: Summary of Monitoring Data from September 1998 to December 1999

Station Number	Location (Landmark, Road)	September, 1998			December, 1999			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.879	531420.978	563.027	0.001	0.076	0.006	0.076
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870331.993	531626.885	557.160	0.044	0.056	-0.011	0.071
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.448	531627.288	551.953	0.006	0.079	-0.025	0.079
6	Paley West	5870474.774	531664.168	539.628	5870474.805	531664.239	539.608	0.031	0.071	-0.020	0.077
7	Paley East	5870427.297	531932.241	533.473	5870427.321	531932.307	533.461	0.024	0.066	-0.012	0.070
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.609	531909.354	536.909	0.029	0.059	-0.034	0.066
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.614	531714.965	549.774	0.015	0.102	-0.011	0.103
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.441	531986.116	531.199	0.004	0.089	-0.025	0.089
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.903	532052.589	524.376	0.015	0.076	-0.009	0.077
16	Healy Road	5870413.504	532184.864	509.104	5870413.509	532184.907	509.068	0.005	0.043	-0.036	0.043
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.644	532237.958	519.608	-0.003	0.096	-0.002	0.096
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.923	531984.695	524.127	0.000	0.078	-0.020	0.078
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.519	531978.134	517.213	-0.013	0.073	-0.012	0.074
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.259	532199.176	504.353	0.000	0.071	-0.003	0.071
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.998	532493.539	485.478	0.002	0.056	0.004	0.056
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.969	532631.117	478.922	0.001	0.031	0.002	0.031
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.069	532888.628	475.374	0.005	0.021	-0.010	0.022
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.393	531399.221	589.596	-0.006	0.011	-0.013	0.013
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.630	533765.367	545.409	-0.004	0.006	-0.020	0.007
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.896	536304.133	575.002	0.009	0.013	-0.012	0.016
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.947				

Statistics for stations 2 to 22

Average =	0.010062	0.070125	-0.013000	0.072443
Standard Deviation =	0.015066	0.018381	0.012853	0.017899
2 x Standard Deviation =	0.030133	0.036761	0.025706	0.035798

* Net Horizontal Displacement

Table 4: Summary of Monitoring Data from September 1998 to February 2000

Station Number	Location (Landmark, Road)	September, 1998			February, 2000			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.874	531420.976	563.006	-0.004	0.074	-0.015	0.074
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870331.985	531626.884	557.159	0.036	0.055	-0.012	0.066
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.447	531627.289	551.948	0.005	0.080	-0.030	0.080
6	Paley West	5870474.774	531664.168	539.628	5870474.829	531664.236	539.608	0.055	0.068	-0.020	0.087
7	Paley East	5870427.297	531932.241	533.473	5870427.327	531932.311	533.457	0.030	0.070	-0.016	0.076
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.601	531909.349	536.907	0.021	0.054	-0.036	0.058
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.597	531714.959	549.773	-0.002	0.096	-0.012	0.096
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.437	531986.106	531.221	0.000	0.079	-0.003	0.079
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.906	532052.581	524.364	0.018	0.068	-0.021	0.070
16	Healy Road	5870413.504	532184.864	509.104	5870413.515	532184.912	509.064	0.011	0.048	-0.040	0.049
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.634	532237.962	519.603	-0.013	0.100	-0.007	0.101
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.919	531984.684	524.127	-0.004	0.067	-0.020	0.067
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.525	531978.140	517.238	-0.007	0.079	0.013	0.079
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.255	532199.171	504.340	-0.004	0.066	-0.016	0.066
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.994	532493.539	485.472	-0.002	0.056	-0.002	0.056
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.979	532631.117	478.918	0.011	0.031	-0.002	0.033
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.068	532888.624	475.373	0.004	0.017	-0.011	0.017
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.378	531399.228	589.599	-0.021	0.018	-0.010	0.028
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.631	533765.367	545.417	-0.003	0.006	-0.012	0.007
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.896	536304.131	575.008	0.009	0.011	-0.006	0.014
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				

Statistics for stations 2 to 22

Average =	0.009437	0.068188	-0.014938	0.071155
Standard Deviation =	0.018443	0.017352	0.013483	0.017180
2 x Standard Deviation =	0.036885	0.034704	0.026966	0.034359

* Net Horizontal Displacement

Table 5: Summary of Monitoring Data from September 1998 to May 2000

Station Number	Location (Landmark, Road)	September, 1998			May, 2000			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.860	531420.991	563.009	-0.018	0.089	-0.012	0.091
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.002	531626.898	557.136	0.053	0.069	-0.035	0.087
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.448	531627.297	551.936	0.006	0.088	-0.042	0.088
6	Paley West	5870474.774	531664.168	539.628	5870474.840	531664.240	539.586	0.066	0.072	-0.042	0.098
7	Paley East	5870427.297	531932.241	533.473	5870427.334	531932.321	533.449	0.037	0.080	-0.024	0.088
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.607	531909.363	536.886	0.027	0.068	-0.057	0.073
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.593	531714.979	549.763	-0.006	0.116	-0.022	0.116
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.432	531986.128	531.198	-0.005	0.101	-0.026	0.101
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.909	532052.594	524.343	0.021	0.081	-0.042	0.084
16	Healy Road	5870413.504	532184.864	509.104	5870413.516	532184.916	509.071	0.012	0.052	-0.033	0.053
17	Beltcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.626	532237.988	519.593	-0.021	0.126	-0.017	0.128
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.903	531984.719	524.125	-0.020	0.102	-0.022	0.104
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.502	531978.164	517.224	-0.030	0.103	-0.001	0.107
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.247	532199.193	504.330	-0.012	0.088	-0.026	0.089
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.985	532493.547	485.486	-0.011	0.064	0.012	0.065
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.964	532631.113	478.913	-0.004	0.027	-0.007	0.027
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.069	532888.617	475.376	0.005	0.010	-0.008	0.011
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.380	531399.216	589.577	-0.019	0.006	-0.032	0.020
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.633	533765.368	545.406	-0.001	0.007	-0.023	0.007
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.892	536304.131	574.995	0.005	0.011	-0.019	0.012
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				
Statistics for stations 2 to 22 Average = 0.005938 0.082875 -0.024750 0.087458 Standard Deviation = 0.027961 0.024660 0.017468 0.024391 2 x Standard Deviation = 0.055921 0.049320 0.034936 0.048781											

* Net Horizontal Displacement

Table 6: Summary of Monitoring Data from September 1998 to December 2000

Station Number	Location (Landmark, Road)	September, 1998			December, 2000			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.847	531421.038	562.998	-0.031	0.136	-0.023	0.139
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.013	531626.939	557.146	0.064	0.110	-0.025	0.127
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.441	531627.341	551.947	-0.001	0.132	-0.031	0.132
6	Paley West	5870474.774	531664.168	539.628	5870474.883	531664.276	539.588	0.109	0.108	-0.040	0.153
7	Paley East	5870427.297	531932.241	533.473	5870427.348	531932.349	533.436	0.051	0.108	-0.037	0.119
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.636	531909.396	536.885	0.056	0.101	-0.058	0.115
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.603	531715.031	549.752	0.004	0.168	-0.033	0.168
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.429	531986.169	531.198	-0.008	0.142	-0.026	0.142
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.922	532052.628	524.353	0.034	0.115	-0.032	0.120
16	Healy Road	5870413.504	532184.864	509.104	5870413.524	532184.943	509.062	0.020	0.079	-0.042	0.081
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.618	532238.022	519.580	-0.029	0.160	-0.030	0.163
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.907	531984.751	524.107	-0.016	0.134	-0.040	0.135
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.531	531978.200	517.202	-0.001	0.139	-0.023	0.139
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.240	532199.240	504.315	-0.019	0.135	-0.041	0.136
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869343.007	532493.555	485.488	0.011	0.072	0.014	0.073
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.980	532631.118	478.908	0.012	0.032	-0.012	0.034
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.081	532888.636	475.383	0.017	0.029	-0.001	0.034
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.379	531399.224	589.591	-0.020	0.014	-0.018	0.024
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.631	533765.368	545.412	-0.003	0.007	-0.017	0.008
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.890	536304.129	575.002	0.003	0.009	-0.012	0.009
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				

Statistics for stations 2 to 22

Average =	0.016000	0.116937	-0.029938	0.123669
Standard Deviation =	0.038245	0.034567	0.015729	0.034682
2 x Standard Deviation =	0.076490	0.069134	0.031458	0.069364

* Net Horizontal Displacement

Table 7: Summary of Monitoring Data from September 1998 to May 2001

Station Number	Location (Landmark, Road)	September, 1998			May, 2001			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.846	531421.051	562.986	-0.032	0.149	-0.035	0.152
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.019	531626.936	557.100	0.070	0.107	-0.071	0.128
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.438	531627.349	551.923	-0.004	0.140	-0.055	0.140
6	Paley West	5870474.774	531664.168	539.628	5870474.886	531664.285	539.551	0.112	0.117	-0.077	0.162
7	Paley East	5870427.297	531932.241	533.473	5870427.359	531932.364	533.417	0.062	0.123	-0.056	0.138
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.636	531909.408	536.872	0.056	0.113	-0.071	0.126
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.598	531715.033	549.740	-0.001	0.170	-0.045	0.170
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.422	531986.189	531.193	-0.015	0.162	-0.031	0.163
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.914	532052.630	524.335	0.026	0.117	-0.050	0.120
16	Healy Road	5870413.504	532184.864	509.104	5870413.522	532184.942	509.052	0.018	0.078	-0.052	0.080
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.619	532238.054	519.581	-0.028	0.192	-0.029	0.194
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.892	531984.774	524.104	-0.031	0.157	-0.043	0.160
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.487	531978.205	517.207	-0.045	0.144	-0.018	0.151
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.221	532199.244	504.315	-0.038	0.139	-0.041	0.144
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.971	532493.555	485.475	-0.025	0.072	0.001	0.076
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.962	532631.106	478.908	-0.006	0.020	-0.012	0.021
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.053	532888.618	475.346	-0.011	0.011	-0.038	0.016
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.388	531399.222	589.575	-0.011	0.012	-0.034	0.016
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.631	533765.369	545.407	-0.003	0.008	-0.022	0.009
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.884	536304.133	574.998	-0.003	0.013	-0.016	0.013
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				

Statistics for stations 2 to 22

Average =	0.007437	0.125000	-0.042812	0.132804
Standard Deviation =	0.045956	0.042354	0.021757	0.042647
2 x Standard Deviation =	0.091913	0.084708	0.043514	0.085294

* Net Horizontal Displacement

Table 7: Summary of Monitoring Data from September 1998 to May 2001

Station Number	Location (Landmark, Road)	September, 1998			May, 2001			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.846	531421.051	562.986	-0.032	0.149	-0.035	0.152
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.019	531626.936	557.100	0.070	0.107	-0.071	0.128
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.438	531627.349	551.923	-0.004	0.140	-0.055	0.140
6	Paley West	5870474.774	531664.168	539.628	5870474.886	531664.285	539.551	0.112	0.117	-0.077	0.162
7	Paley East	5870427.297	531932.241	533.473	5870427.359	531932.364	533.417	0.062	0.123	-0.056	0.138
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.636	531909.408	536.872	0.056	0.113	-0.071	0.126
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.598	531715.033	549.740	-0.001	0.170	-0.045	0.170
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.422	531986.189	531.193	-0.015	0.162	-0.031	0.163
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.914	532052.630	524.335	0.026	0.117	-0.050	0.120
16	Healy Road	5870413.504	532184.864	509.104	5870413.522	532184.942	509.052	0.018	0.078	-0.052	0.080
17	Beltcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.619	532238.054	519.581	-0.028	0.192	-0.029	0.194
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.892	531984.774	524.104	-0.031	0.157	-0.043	0.160
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.487	531978.205	517.207	-0.045	0.144	-0.018	0.151
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.221	532199.244	504.315	-0.038	0.139	-0.041	0.144
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.971	532493.555	485.475	-0.025	0.072	0.001	0.076
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.962	532631.106	478.908	-0.006	0.020	-0.012	0.021
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.053	532888.618	475.346	-0.011	0.011	-0.038	0.016
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609	5878341.388	531399.222	589.575	-0.011	0.012	-0.034	0.016
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.631	533765.369	545.407	-0.003	0.008	-0.022	0.009
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773	5870190.608	537039.418	595.773	0.000	0.000	0.000	0.000
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.884	536304.133	574.998	-0.003	0.013	-0.016	0.013
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				
Statistics for stations 2 to 22 Average = 0.007437 0.125000 -0.042812 0.132804 Standard Deviation = 0.045956 0.042354 0.021757 0.042647 2 x Standard Deviation = 0.091913 0.084708 0.043514 0.085294											

* Net Horizontal Displacement

Table 8: Summary of Monitoring Data from September 1998 to December 2001

Station Number	Location (Landmark, Road)	September, 1998			December, 2001			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.844	531421.079	562.988	-0.034	0.177	-0.033	0.180
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.030	531626.959	557.116	0.081	0.130	-0.055	0.153
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.449	531627.379	551.943	0.007	0.170	-0.035	0.170
6	Paley West	5870474.774	531664.168	539.628	5870474.904	531664.298	539.564	0.130	0.130	-0.064	0.184
7	Paley East	5870427.297	531932.241	533.473	5870427.363	531932.376	533.430	0.066	0.135	-0.043	0.150
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.645	531909.423	536.882	0.065	0.128	-0.061	0.144
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.587	531715.066	549.752	-0.012	0.203	-0.033	0.203
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.419	531986.217	531.202	-0.018	0.190	-0.022	0.191
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.910	532052.652	524.336	0.022	0.139	-0.049	0.141
16	Healy Road	5870413.504	532184.864	509.104	5870413.530	532184.984	509.054	0.026	0.120	-0.050	0.123
17	Beltcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.610	532238.084	519.605	-0.037	0.222	-0.005	0.225
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.906	531984.810	524.129	-0.017	0.193	-0.018	0.194
19	Abbott/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.493	531978.237	517.234	-0.039	0.176	0.009	0.180
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.223	532199.265	504.332	-0.036	0.160	-0.024	0.164
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.958	532493.562	485.490	-0.038	0.079	0.016	0.088
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.967	532631.124	478.927	-0.001	0.038	0.007	0.038
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.066	532888.633	475.373	0.002	0.026	-0.011	0.026
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609							
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.635	533765.370	545.327	0.001	0.009	-0.102	0.009
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773							
29	Quesnel Hill	5870484.887	536304.120	575.014							
30	West End of Dodds Avenue at Finley Road				5869989.266	531217.807	575.401				
31	Blair Street				5869768.124	532338.411	508.144				
32	Lewis Drive/Beabien Avenue				5870079.631	532553.538	481.549				
33	South End of Allard Street				5869124.379	532245.960	495.342				
34	Abbott Road and Blair Street				5869581.862	532354.652	494.462				
35	Lewis Drive North of Couldwell Street				5869572.261	532863.710	473.090				
36	Anderson Drive at Abbott Drive				5869315.625	532692.784	476.837				
37	Dawson Street at Abbott Drive				5869644.821	531567.709	545.684				
38	Quesnel No. 1 Station - BM				5870193.015	537018.228	596.514				
39	Anderson Avenue at Wade Avenue				5869071.953	532473.937	476.875				
40	Lewis Drive East of Healy Street				5870303.346	532408.207	493.536				
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				

Statistics for stations 2 to 22

Average = 0.010313 0.149375 -0.028750 0.157981

Standard Deviation = 0.051051 0.047227 0.025252 0.046136

2 x Standard Deviation = 0.102102 0.094454 0.050504 0.092271

* Net Horizontal Displacement

Table 9: Summary of Monitoring Data from September 1998 to May 2002

Station Number	Location (Landmark, Road)	September, 1998			May, 2002			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.824	531421.125	562.983	-0.054	0.223	-0.038	0.229
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.033	531626.988	557.090	0.084	0.159	-0.081	0.180
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.432	531627.388	551.910	-0.010	0.179	-0.068	0.179
6	Paley West	5870474.774	531664.168	539.628	5870474.892	531664.320	539.554	0.118	0.152	-0.074	0.192
7	Paley East	5870427.297	531932.241	533.473	5870427.379	531932.388	533.422	0.082	0.147	-0.051	0.168
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.645	531909.462	536.866	0.065	0.167	-0.077	0.179
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.581	531715.091	549.755	-0.018	0.228	-0.030	0.229
14	Pentland/Fleming Intersection	5870067.437	531986.027	531.224	5870067.410	531986.243	531.190	-0.027	0.216	-0.034	0.218
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.924	532052.682	524.322	0.036	0.169	-0.063	0.173
16	Healy Road	5870413.504	532184.864	509.104	5870413.517	532184.970	509.027	0.013	0.106	-0.077	0.107
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.602	532238.105	519.573	-0.045	0.243	-0.037	0.247
18	Lark/Fleming Intersection	5869826.923	531984.617	524.147	5869826.867	531984.832	524.097	-0.056	0.215	-0.050	0.222
19	Abbott/Fleming Intersection	5869596.532	531978.061	517.225	5869596.463	531978.282	517.216	-0.069	0.221	-0.009	0.232
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.206	532199.318	504.309	-0.053	0.213	-0.047	0.219
21	Lane between Avery/Allison	5869342.996	532493.483	485.474							
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.946	532631.150	478.912	-0.022	0.064	-0.008	0.068
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.071	532888.631	475.342	0.007	0.024	-0.042	0.025
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609							
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.615	533765.366	545.325	-0.019	0.005	-0.104	0.020
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773							
29	Quesnel Hill	5870484.887	536304.120	575.014							
30	West End of Dodds Avenue at Finley Road				5869989.252	531217.849	575.435				
31	Blair Street				5869768.142	532338.444	508.116				
32	Lewis Drive/Beabien Avenue				5870079.618	532553.546	481.519				
33	South End of Allard Street				5869124.352	532245.998	495.329				
34	Abbott Road and Blair Street				5869581.832	532354.679	494.423				
35	Lewis Drive North of Couldwell Street				5869572.217	532863.733	473.093				
36	Anderson Drive at Abbott Drive				5869315.619	532692.818	476.814				
37	Dawson Street at Abbott Drive				5869644.805	531567.740	545.706				
38	Quesnel No. 1 Station - BM										
39	Anderson Avenue at Wade Avenue				5869071.931	532473.976	476.838				
40	Lewis Drive East of Healy Street				5870303.321	532408.222	493.526				
82C256	Government Benchmark at Airport										
Statistics for stations 2 to 22 Average = 0.002933 0.180133 -0.049600 0.189498 Standard Deviation = 0.060089 0.049964 0.023769 0.049065 2 x Standard Deviation = 0.120177 0.099928 0.047538 0.098130											

* Net Horizontal Displacement

Table 10: Summary of Monitoring Data from September 1998 to October 2002

Station Number	Location (Landmark, Road)	September, 1998			October, 2002			Change			Total *
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.849	531421.127	562.960	-0.029	0.225	-0.061	0.227
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.088	531626.998	557.052	0.139	0.169	-0.119	0.219
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.456	531627.415	551.896	0.014	0.206	-0.082	0.206
6	Paley West	5870474.774	531664.168	539.628	5870474.971	531664.345	539.518	0.197	0.177	-0.110	0.265
7	Paley East	5870427.297	531932.241	533.473	5870427.421	531932.432	533.390	0.124	0.191	-0.083	0.228
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.687	531909.479	536.828	0.107	0.184	-0.115	0.213
9	Lane between Patchett/Pierce	5870063.599	531714.863	549.785	5870063.593	531715.120	549.734	-0.006	0.257	-0.051	0.257
14	Pentland/Fleming Intersection	5870067.437	531986.027	531.224	5870067.409	531986.267	531.172	-0.028	0.240	-0.052	0.242
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.960	532052.698	542.298	0.072	0.185	17.913	0.199
16	Healy Road	5870413.504	532184.864	509.104	5870413.570	532184.994	509.024	0.066	0.130	-0.080	0.146
17	Beltcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.616	532238.139	519.552	-0.031	0.277	-0.058	0.279
18	Lark/Fleming Intersection	5869826.923	531984.617	524.147	5869826.897	531984.865	524.084	-0.026	0.248	-0.063	0.249
19	Abbott/Fleming Intersection	5869596.532	531978.061	517.225	5869596.484	531978.276	517.200	-0.048	0.215	-0.025	0.220
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.218	532199.317	545.313	-0.041	0.212	40.957	0.216
21	Lane between Avery/Allison	5869342.996	532493.483	485.474							
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.966	532631.114	504.299	-0.002	0.028	25.379	0.028
23	Doherty Dr. - BM	5869134.064	532888.607	475.384							
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609							
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.633	533765.364	545.313	-0.001	0.003	-0.116	0.003
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773							
29	Quesnel Hill	5870484.887	536304.120	575.014							
30	West End of Dodds Avenue at Finley Road				5869989.264	531217.857	478.894				
31	Blair Street				5869768.143	532338.482	575.398				
32	Lewis Drive/Beabien Avenue				5870079.634	532553.543	508.117				
33	South End of Allard Street				5869124.378	532245.999	481.512				
34	Abbott Road and Blair Street				5869581.848	532354.695	495.304				
35	Lewis Drive North of Couldwell Street				5869572.284	532863.719	494.407				
36	Anderson Drive at Abbott Drive				5869315.641	532692.787	473.019				
37	Dawson Street at Abbott Drive				5869644.819	531567.765	476.793				
38	Quesnel No. 1 Station - BM										
39	Anderson Avenue at Wade Avenue				5869071.948	532473.964	76.827				
40	Lewis Drive East of Healy Street				5870303.370	532408.233	493.514				
82C256	Government Benchmark at Airport										
Statistics for stations 2 to 22 Average = 0.033867 0.196267 5.556667 0.212864 Standard Deviation = 0.077816 0.060023 12.476759 0.060097 2 x Standard Deviation = 0.155631 0.120046 24.953519 0.120194											

* Net Horizontal Displacement

Table 11: Summary of Monitoring Data from September 1998 to November 2003

Station Number	Location (Landmark, Road)	September, 1998			November, 2003			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.878	531420.902	563.021	5869992.830	531421.149	562.984	-0.048	0.247	-0.037	0.251
4	Picard Place (Lane)	5870331.949	531626.829	557.171	5870332.061	531627.004	557.107	0.112	0.175	-0.064	0.208
5	East of Dawson/Lewis Intersection	5870180.442	531627.209	551.978	5870180.438	531627.431	551.910	-0.004	0.222	-0.068	0.222
6	Paley West	5870474.774	531664.168	539.628	5870474.963	531664.357	539.530	0.189	0.189	-0.098	0.267
7	Paley East	5870427.297	531932.241	533.473	5870427.392	531932.439	533.408	0.095	0.198	-0.065	0.219
8	Picard Avenue	5870328.580	531909.295	536.943	5870328.664	531909.484	536.879	0.084	0.189	-0.064	0.206
9	Lane between Patchett/Pierce	5870063.599	531714.883	549.785	5870063.592	531715.139	549.745	-0.007	0.276	-0.040	0.276
14	Pentland/Flamingo Intersection	5870067.437	531986.027	531.224	5870067.414	531986.285	531.172	-0.023	0.258	-0.052	0.259
15	Palmer/Lewis Intersection	5870275.888	532052.513	524.385	5870275.932	532052.704	524.314	0.044	0.191	-0.071	0.196
16	Healy Road	5870413.504	532184.864	509.104	5870413.535	532185.001	509.048	0.031	0.137	-0.056	0.140
17	Bettcher/Lark Intersection	5869847.647	532237.862	519.610	5869847.601	532238.158	519.575	-0.046	0.296	-0.035	0.300
18	Lark/Flamingo Intersection	5869826.923	531984.617	524.147	5869826.883	531984.873	524.079	-0.040	0.256	-0.068	0.259
19	Abbot/Flamingo Intersection	5869596.532	531978.061	517.225	5869596.467	531978.287	517.212	-0.065	0.226	-0.013	0.235
20	Hawk Street @ Crane Ave.	5869364.259	532199.105	504.356	5869364.193	532199.318	504.319	-0.066	0.213	-0.037	0.223
21	Lane between Avery/Allison	5869342.996	532493.483	485.474	5869342.951	532493.603	485.500	-0.045	0.120	0.026	0.128
22	Lane between Beath/Bouchie	5869628.968	532631.086	478.920	5869628.958	532631.116	478.922	-0.010	0.030	0.002	0.032
23	Doherty Dr. - BM	5869134.064	532888.607	475.384	5869134.065	532888.627	475.369	0.001	0.020	-0.015	0.020
24	Salton Road (Hixon Road)	5878341.399	531399.210	589.609							
26	Benchmark by Airport - BM	5873887.634	533765.361	545.429	5873887.630	533765.368	545.325	-0.004	0.007	-0.104	0.008
28	Red Bluff Pump Station - BM	5870190.608	537039.418	595.773							
29	Quesnel Hill	5870484.887	536304.120	575.014	5870484.879	536304.132	574.983	-0.008	0.012	-0.031	0.014
30	West End of Dodds Avenue at Finley Road				5869989.248	531217.866	575.425				
31	Blair Street				5869768.122	532338.497	508.122				
32	Lewis Drive/Beabien Avenue				5870079.614	532553.534	481.561				
33	South End of Allard Street				5869124.365	532246.002	495.322				
34	Abbott Road and Blair Street				5869581.840	532354.709	494.425				
35	Lewis Drive North of Couldwell Street				5869572.241	532863.717	473.076				
36	Anderson Drive at Abbott Drive				5869315.631	532692.792	476.822				
37	Dawson Street at Abbott Drive				5869644.808	531567.776	545.704				
38	Quesnel No. 1 Station - BM										
39	Anderson Avenue at Wade Avenue				5869071.923	532473.967	476.852				
40	Lewis Drive East of Healy Street				5870303.345	532408.242	493.575				
82C256	Government Benchmark at Airport				5875411.453	533109.702	542.946				
Statistics for stations 2 to 22											
Average =								0.012582	0.201406	-0.046392	0.213894
Standard Deviation =								0.073823	0.065954	0.030969	0.066607
2 x Standard Deviation =								0.147647	0.131908	0.061939	0.133214

* Net Horizontal Displacement

Table 12: Summary of Monitoring Data from December 2001 to May 2002

Station Number	Location (Landmark, Road)	December, 2001			May, 2002			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.844	531421.079	562.988	5869992.824	531421.125	562.983	-0.020	0.046	-0.005	0.050
4	Picard Place (Lane)	5870332.030	531626.959	557.116	5870332.033	531626.988	557.090	0.003	0.029	-0.026	0.029
5	East of Dawson/Lewis Intersection	5870180.449	531627.379	551.943	5870180.432	531627.388	551.910	-0.017	0.009	-0.033	0.019
6	Paley West	5870474.904	531664.298	539.564	5870474.892	531664.320	539.554	-0.012	0.022	-0.010	0.025
7	Paley East	5870427.363	531932.376	533.430	5870427.379	531932.388	533.422	0.016	0.012	-0.008	0.020
8	Picard Avenue	5870328.645	531909.423	536.882	5870328.645	531909.462	536.866	0.000	0.039	-0.016	0.039
9	Lane between Patchett/Pierce	5870063.587	531715.066	549.752	5870063.581	531715.091	549.755	-0.006	0.025	0.003	0.026
14	Pentland/Flamingo Intersection	5870067.419	531986.217	531.202	5870067.410	531986.243	531.190	-0.009	0.026	-0.012	0.028
15	Palmer/Lewis Intersection	5870275.910	532052.652	524.336	5870275.924	532052.682	524.322	0.014	0.030	-0.014	0.033
16	Healy Road	5870413.530	532184.984	509.054	5870413.517	532184.970	509.027	-0.013	-0.014	-0.027	0.019
17	Bettcher/Lark Intersection	5869847.610	532238.084	519.605	5869847.602	532238.105	519.573	-0.008	0.021	-0.032	0.022
18	Lark/Flamingo Intersection	5869826.906	531984.810	524.129	5869826.867	531984.832	524.097	-0.039	0.022	-0.032	0.045
19	Abbott/Flamingo Intersection	5869596.493	531978.237	517.234	5869596.463	531978.282	517.216	-0.030	0.045	-0.018	0.054
20	Hawk Street @ Crane Ave.	5869364.223	532199.265	504.332	5869364.208	532199.318	504.309	-0.017	0.053	-0.023	0.056
21	Lane between Avery/Allison	5869342.958	532493.562	485.490							
22	Lane between Beath/Bouchie	5869628.967	532631.124	478.927	5869628.946	532631.150	478.912	-0.021	0.026	-0.015	0.033
23	Doherty Dr. - BM	5889134.066	532888.633	475.373	5869134.071	532888.631	475.342	0.005	-0.002	-0.031	0.005
24	Sallon Road (Hixon Road)										
26	Benchmark by Airport - BM	5873887.635	533765.370	545.327	5873887.615	533765.366	545.325	-0.020	-0.004	-0.002	0.020
28	Red Bluff Pump Station - BM										
29	Quesnel Hill										
30	West End of Dodds Avenue at Finley Road	5869989.266	531217.807	575.401	5869989.252	531217.849	575.435	-0.014	0.042	0.034	0.044
31	Blair Street	5869768.124	532338.411	508.144	5869768.142	532338.444	508.116	0.018	0.033	-0.028	0.038
32	Lewis Drive/Beabien Avenue	5870079.631	532553.538	481.549	5870079.618	532553.546	481.519	-0.013	0.008	-0.030	0.015
33	South End of Allard Street	5869124.379	532245.960	495.342	5869124.352	532245.998	495.329	-0.027	0.038	-0.013	0.047
34	Abbott Road and Blair Street	5869581.862	532354.652	494.462	5869581.832	532354.679	494.423	-0.030	0.027	-0.039	0.040
35	Lewis Drive North of Couldwell Street	5869572.261	532863.710	473.090	5869572.217	532863.733	473.093	-0.044	0.023	0.003	0.050
36	Anderson Drive at Abbott Drive	5869315.625	532692.784	476.837	5869315.619	532692.818	476.814	-0.006	0.034	-0.023	0.035
37	Dawson Street at Abbott Drive	5869644.821	531567.709	545.684	5869644.805	531567.740	545.706	-0.016	0.031	0.022	0.035
38	Quesnel No. 1 Station - BM	5870193.015	537018.228	596.514							
39	Anderson Avenue at Wade Avenue	5869071.953	532473.937	476.875	5869071.931	532473.976	476.838	-0.022	0.039	-0.037	0.045
40	Lewis Drive East of Healy Street	5870303.346	532408.207	493.536	5870303.321	532408.222	493.526	-0.025	0.015	-0.010	0.029
82C256	Government Benchmark at Airport	5875411.453	533109.702	542.946							

Statistics for stations 2 to 22

Average =	-0.010600	0.026067	-0.017867	0.033231
Standard Deviation =	0.014903	0.016533	0.010776	0.012677
2 x Standard Deviation =	0.029807	0.033067	0.021552	0.025354

* Net Horizontal Displacement

Table 13: Summary of Monitoring Data from December 2001 to October 2002

Station Number	Location (Landmark, Road)	December, 2001			October, 2002			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.844	531421.079	562.988	5869992.849	531421.127	562.960	0.005	0.048	-0.028	0.048
4	Picard Place (Lane)	5870332.030	531626.959	557.116	5870332.088	531626.998	557.052	0.058	0.039	-0.064	0.070
5	East of Dawson/Lewis Intersection	5870180.449	531627.379	551.943	5870180.456	531627.415	551.896	0.007	0.036	-0.047	0.037
6	Paley West	5870474.904	531664.298	539.564	5870474.971	531664.345	539.518	0.067	0.047	-0.046	0.082
7	Paley East	5870427.363	531932.376	533.430	5870427.421	531932.432	533.390	0.058	0.056	-0.040	0.081
8	Picard Avenue	5870328.645	531909.423	536.882	5870328.687	531909.479	536.828	0.042	0.056	-0.054	0.070
9	Lane between Patchett/Pierce	5870063.587	531715.066	549.752	5870063.593	531715.120	549.734	0.006	0.054	-0.018	0.054
14	Pentland/Flamingo Intersection	5870067.419	531986.217	531.202	5870067.409	531986.267	531.172	-0.010	0.050	-0.030	0.051
15	Palmer/Lewis Intersection	5870275.910	532052.652	524.336	5870275.960	532052.698	542.298	0.050	0.046	17.962	0.068
16	Healy Road	5870413.530	532184.984	509.054	5870413.570	532184.994	509.024	0.040	0.010	-0.030	0.041
17	Bettcher/Lark Intersection	5869847.610	532238.084	519.605	5869847.616	532238.139	519.552	0.006	0.055	-0.053	0.055
18	Lark/Flamingo Intersection	5869826.906	531984.810	524.129	5869826.897	531984.865	524.084	-0.009	0.055	-0.045	0.056
19	Abbott/Flamingo Intersection	5869596.493	531978.237	517.234	5869596.484	531978.276	517.200	-0.009	0.039	-0.034	0.040
20	Hawk Street @ Crane Ave.	5869364.223	532199.265	504.332	5869364.218	532199.317	545.313	-0.005	0.052	40.981	0.052
21	Lane between Avery/Allison	5869342.958	532493.562	485.490							
22	Lane between Beath/Bouchie	5869628.967	532631.124	478.927	5869628.966	532631.114	504.299	-0.001	-0.010	25.372	0.010
23	Doherty Dr. - BM	5869134.066	532888.633	475.373							
24	Salton Road (Hixon Road)										
26	Benchmark by Airport - BM	5873887.635	533765.370	545.327	5873887.633	533765.364	545.313	-0.002	-0.006	-0.014	0.006
28	Red Bluff Pump Station - BM										
29	Quesnel Hill										
30	West End of Dodds Avenue at Finley Road	5869989.266	531217.807	575.401	5869989.264	531217.857	478.894	-0.002	0.050	-96.507	0.050
31	Blair Street	5869768.124	532338.411	508.144	5869768.143	532338.482	575.398	0.019	0.071	67.254	0.073
32	Lewis Drive/Beabien Avenue	5870079.631	532553.538	481.549	5870079.634	532553.543	508.117	0.003	0.005	26.568	0.006
33	South End of Allard Street	5869124.379	532245.960	495.342	5869124.378	532245.999	481.512	-0.001	0.039	-13.830	0.039
34	Abbott Road and Blair Street	5869581.862	532354.652	494.462	5869581.848	532354.695	495.304	-0.014	0.043	0.842	0.045
35	Lewis Drive North of Coudwell Street	5869572.261	532863.710	473.090	5869572.284	532863.719	494.407	0.023	0.009	21.317	0.025
36	Anderson Drive at Abbott Drive	5869315.625	532692.784	476.837	5869315.641	532692.787	473.019	0.016	0.003	-3.818	0.016
37	Dawson Street at Abbott Drive	5869644.821	531567.709	545.684	5869644.819	531567.765	476.793	-0.002	0.056	-68.891	0.056
38	Quesnel No. 1 Station - BM	5870193.015	537018.228	596.514							
39	Anderson Avenue at Wade Avenue	5869071.953	532473.937	476.875	5869071.948	532473.964	76.827	-0.005	0.027	-400.048	0.027
40	Lewis Drive East of Healy Street	5870303.346	532408.207	493.536	5870303.370	532408.233	493.514	0.024	0.026	-0.022	0.035
82C256	Government Benchmark at Airport	5875411.453	533109.702	542.946							

Statistics for stations 2 to 22

Average = 0.018938 0.039187 5.238250 0.051343
 Standard Deviation = 0.028025 0.021717 12.129325 0.021582
 2 x Standard Deviation = 0.056050 0.043434 24.258651 0.043165

* Net Horizontal Displacement

Table 14: Summary of Monitoring Data from December 2001 to November 2003

Station Number	Location (Landmark, Road)	December, 2001			November, 2003			Change			
		Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Northing (m)	Easting (m)	Elevation (m ASL)	Total * (m)
2	Donnelly/Dodds Intersection	5869992.844	531421.079	562.988	5869992.830	531421.149	562.984	-0.014	0.070	-0.004	0.071
4	Picard Place (Lane)	5870332.030	531626.959	557.116	5870332.061	531627.004	557.107	0.031	0.045	-0.009	0.055
5	East of Dawson/Lewis Intersection	5870180.449	531627.379	551.943	5870180.438	531627.431	551.910	-0.011	0.052	-0.033	0.053
6	Paley West	5870474.904	531664.298	539.564	5870474.963	531664.357	539.530	0.059	0.059	-0.034	0.083
7	Paley East	5870427.363	531932.376	533.430	5870427.392	531932.439	533.408	0.029	0.063	-0.022	0.069
8	Picard Avenue	5870328.645	531909.423	536.882	5870328.664	531909.484	536.879	0.019	0.061	-0.003	0.064
9	Lane between Patchett/Pierce	5870063.587	531715.066	549.752	5870063.592	531715.139	549.745	0.005	0.073	-0.007	0.073
14	Pentland/Flamingo Intersection	5870067.419	531986.217	531.202	5870067.414	531986.285	531.172	-0.005	0.068	-0.030	0.068
15	Palmer/Lewis Intersection	5870275.910	532052.652	524.336	5870275.932	532052.704	524.314	0.022	0.052	-0.022	0.056
16	Healy Road	5870413.530	532184.984	509.054	5870413.535	532185.001	509.048	0.005	0.017	-0.006	0.017
17	Beltcher/Lark Intersection	5869847.610	532238.084	519.605	5869847.601	532238.158	519.575	-0.009	0.074	-0.030	0.075
18	Lark/Flamingo Intersection	5869826.906	531984.810	524.129	5869826.883	531984.873	524.079	-0.023	0.063	-0.050	0.067
19	Abbott/Flamingo Intersection	5869596.493	531978.237	517.234	5869596.467	531978.287	517.212	-0.026	0.050	-0.022	0.057
20	Hawk Street @ Crane Ave.	5869364.223	532199.265	504.332	5869364.193	532199.318	504.319	-0.030	0.053	-0.013	0.061
21	Lane between Avery/Allison	5869342.958	532493.562	485.490	5869342.951	532493.603	485.500				
22	Lane between Beath/Bouchie	5869628.967	532631.124	478.927	5869628.958	532631.116	478.922	-0.009	-0.008	-0.005	0.012
23	Doherty Dr. - BM	5869134.066	532888.633	475.373	5869134.085	532888.627	475.369				
24	Salton Road (Hixon Road)										
26	Benchmark by Airport - BM	5873887.635	533765.370	545.327	5873887.630	533765.368	545.325	-0.005	-0.002	-0.002	0.006
28	Red Bluff Pump Station - BM										
29	Quesnel Hill				5870484.879	536304.132	574.983				
30	West End of Dodds Avenue at Finley Road	5869989.266	531217.807	575.401	5869989.248	531217.866	575.425	-0.018	0.059	0.024	0.061
31	Blair Street	5869768.124	532338.411	508.144	5869768.122	532338.497	508.122	-0.002	0.086	-0.022	0.086
32	Lewis Drive/Beabien Avenue	5870079.631	532553.538	481.549	5870079.614	532553.534	481.561	-0.017	-0.004	0.012	0.017
33	South End of Allard Street	5869124.379	532245.960	495.342	5869124.365	532246.002	495.322	-0.014	0.042	-0.020	0.044
34	Abbott Road and Blair Street	5869581.862	532354.652	494.462	5869581.840	532354.709	494.425	-0.022	0.057	-0.037	0.061
35	Lewis Drive North of Couldwell Street	5869572.261	532863.710	473.090	5869572.241	532863.717	473.076	-0.020	0.007	-0.014	0.021
36	Anderson Drive at Abbott Drive	5869315.625	532692.784	476.837	5869315.631	532692.792	476.822	0.006	0.008	-0.015	0.010
37	Dawson Street at Abbott Drive	5869644.821	531567.709	545.684	5869644.808	531567.776	545.704	-0.013	0.067	0.020	0.068
38	Quesnel No. 1 Station - BM	5870193.015	537018.228	596.514							
39	Anderson Avenue at Wade Avenue	5869071.953	532473.937	476.875	5869071.923	532473.967	476.852	-0.030	0.030	-0.023	0.042
40	Lewis Drive East of Healy Street	5870303.346	532408.207	493.536	5870303.345	532408.242	493.575	-0.001	0.035	0.039	0.035
82C256	Government Benchmark at Airport	5875411.453	533109.702	542.946	5875411.453	533109.702	542.946	0.000	0.000	0.000	0.000

Statistics for stations 2 to 22

Average =	0.002404	0.049358	-0.018421	0.055385
Standard Deviation =	0.023963	0.025207	0.014237	0.023288
2 x Standard Deviation =	0.047925	0.050414	0.028474	0.046575

* Net Horizontal Displacement