



Countywide Recycling & Disposal Facility

Division of Republic Waste Services of Ohio
3619 Gracemont Street S.W.
East Sparta, Ohio 44626
Phone: 330-874-3855
Fax: 330-874-2426

January 16, 2008

Mr. Ed Gortner
Ohio Environmental Protection Agency
PO Box 1049
Columbus, OH 43216-1049

RE: REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
COUNTYWIDE RECYCLING AND DISPOSAL FACILITY

Dear Mr. Gortner:

On August 17, 2007, at the request of the Ohio Environmental Protection Agency (OEPA), Countywide began monitoring the West Slope of the landfill for evidence of unusual movement or instability. Countywide did not concur that there was any evidence or suggestion that the West Slope was, or could become, unstable; but instituted a rigorous monitoring program.

Since that time, the monitoring has consisted of the following:

- Survey on 6 station lines, 3 times per week, using GPS technique, with one of the station lines surveyed once per week using total stationing (higher resolution than GPS);
- Monitoring the spread of (currently 6) cracks at the top of the bowl area 3 times per week; and
- Measurement of deformation and in situ temperature at four inclinometers once per week.

A drawing showing the location of these monitoring points is attached.

The results of over four months of monitoring are presented in a memorandum in Attachment A. In summary:

- Survey of the 6 station lines shows normal settlement and slope consolidation, survey at the base of the slope indicated no movement at all;
- The maximum tension crack spread has been 3 inches and appear to be linked to the settlement features to the east of the cracks and not to west slope movement (see Attachment B for a table of results);
- Monitoring of inclinometers has shown normal internal deformation of municipal waste and stable temperatures.

Recognizing that the results of monitoring done to date should assuage OEPA's sense of urgency, Countywide would like to propose that monitoring continue, but be decreased in frequency as such:

- Continue to monitor the six station lines, but reduce frequency to weekly with one-half of the lines done one week, and the other (alternating) half done the following week. The measurements would be done using GPS technique while continuing to monitor one of the lines with total stationing;
- Eliminate the crack monitoring;
- Eliminate inclinometer monitoring, but continue with in situ weekly temperature measurements at the inclinometer locations.

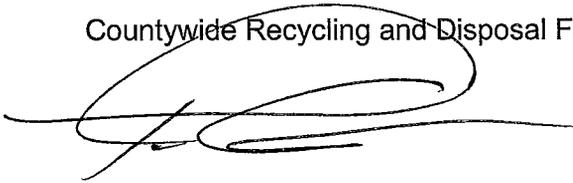
Countywide will continue to report to you the results of the monitoring, and if the data shows movement above normal MSW slope deformation, we will resume monitoring at a mutually-agreed frequency.

Additionally, we would like you to understand that snow cover may affect the timing and/or frequency of measurements. Reasonable efforts will be made to obtain measurements every Wednesday.

If you have questions or comments, please do not hesitate to contact me at (330) 874-3855.

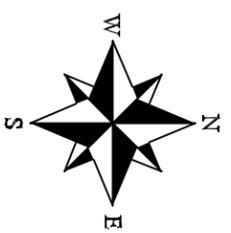
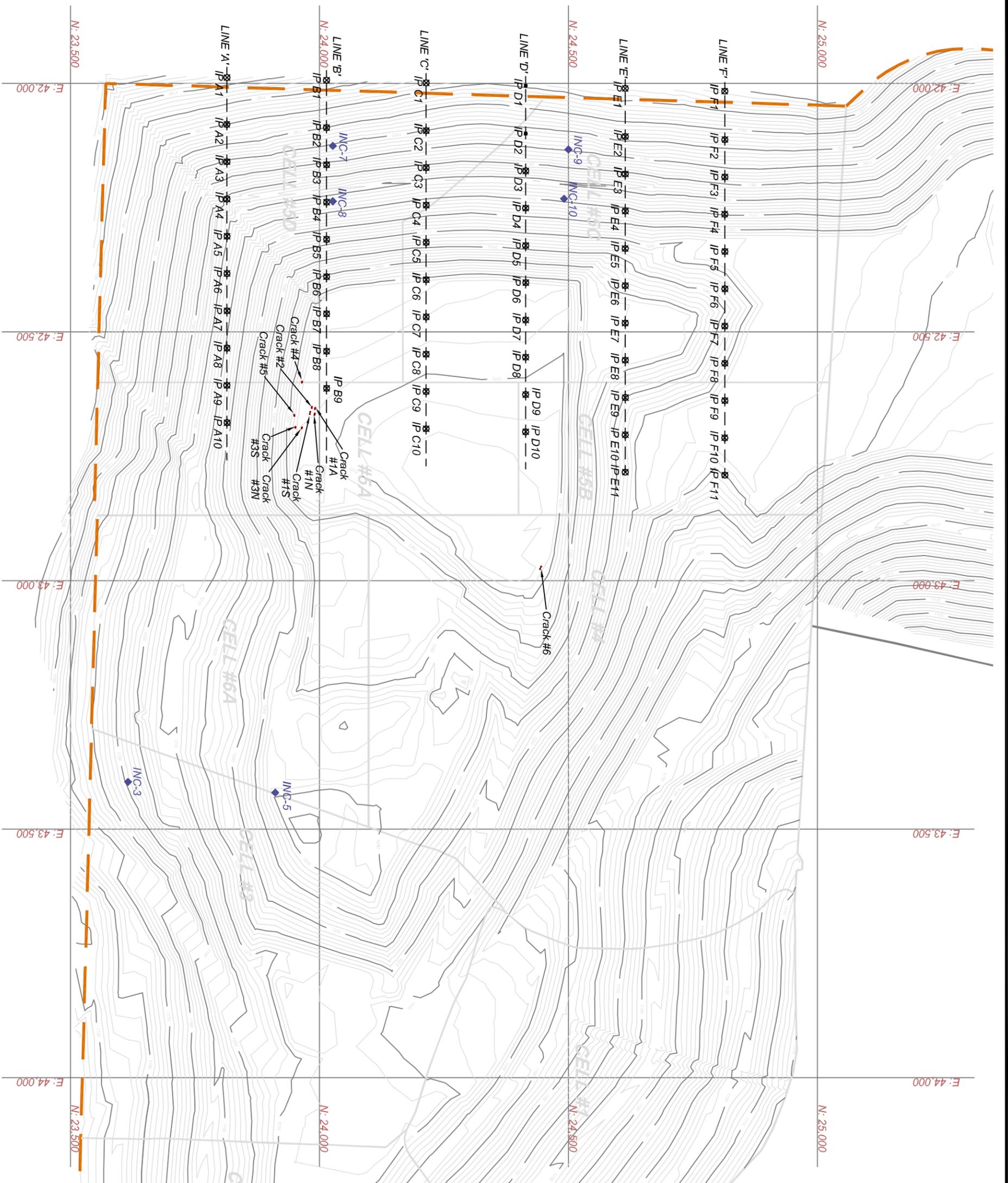
Sincerely,

Countywide Recycling and Disposal Facility

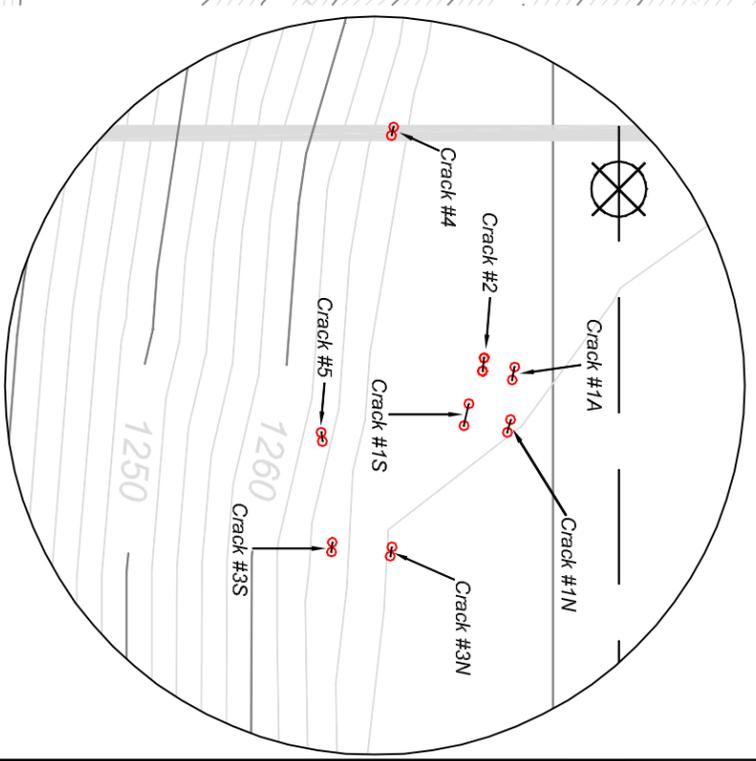
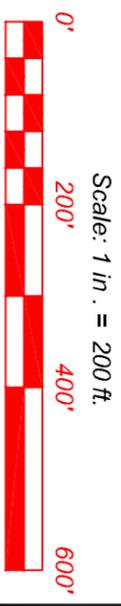


Tim Vandersall, P.E.
General Manager

cc: Bill Skowronski, OEPA-NEDO
Kurt Princic, OEPA-NEDO
Jeff Martin, OEPA-CO
Kirk Norris, SCHD
Dan Aleman, CCHD
Todd Hamilton, CWRDF
Clarke Lundell, Republic Services
Michael Beaudoin, Earth Tech
Peter Carey, PJC Associates
Chris Bower, DEI



- LEGEND**
- ☒ West Slope Monitoring Iron Pins
 - ◆ Inclinometers
 - Crack Monitoring Iron Pins



Scale: 1 in. = 40 ft.

COUNTYWIDE RDF

PROJECT: WEST SLOPE MONITORING POINTS

SHEET TITLE: WEST SLOPE MONITORING IPS, CRACK MONITORING IPS, AND INCLINOMETERS

SHEET 1 OF 1

REVISIONS	DATE	BY	DESCRIPTION

SCALE: 1" = 200' CTR-S-2

SURVEYOR: []

DRAWN: CMH (07/2008)

CHECKER: BWS (07/2008)

REVISED DATE: []

DIVERSIFIED ENGINEERING INC.

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 Website: www.diversifiedeng.com

227 Park Avenue, NY
 10022-3009, NY 10022
 518-536-4311

Attachment A

Memorandum

Memorandum

To: Michael Beaudoin
From: Peter Carey
CC:
Date: 1/9/07
Re: Summary of Monitoring to Date
West Slope Countywide RFD

On August 17, 2007, Countywide began monitoring the West Slope of the landfill for potential movement. This memo is a summary of the monitoring to date, which includes surveying of surface iron pins and inclinometer readings. The monitoring data has been supplied to PJ Carey & Associates (PJCA) by Diversified Engineering, Inc. (DEI) and SCS Engineers.

Surface Pin Monitoring

Surveying has been ongoing on 6 station lines, 3 times per week, using GPS technique, with station line C surveyed once per week using total stationing (higher resolution than GPS) by DEI. Attached are graphs presenting total horizontal movement, change in Elevation, change in Northing, and change in Easting for all the surveyed points from August 17 through January 7, 2008. In addition are graphs presenting the same, but for total station read points only.

GPS Surveying

For the approximately 143 days of monitoring, the maximum total horizontal movement was 1.12 ft, which is a rate less than 0.01 ft/day. Based on the change in Northing graph, the majority of this movement is reflected in a negative change in Northing, which indicates movement to the south. The maximum change was -1.10 (movement to the south) and -0.58 (movement to the west) for Northing and Easting, respectively. The maximum change in Elevation was -1.9 ft. These graphs are shown in Figures 1 through 4.

Total Station Surveying

The total station technique was used only on line C. These points were first surveyed on September 5, 2007 and the most recent reading was on January 2, 2008, 119 days. The maximum total horizontal movement was 0.21 ft, which is a rate less than 0.002 ft/day. The maximum change was -0.14 ft (movement to the south) and -0.18 ft (movement to the west) for Northing and Easting, respectively. The maximum change in Elevation was -0.93 ft. In contrast, the GPS survey indicated maximum changes for line C as -0.54 ft in Northing, -0.42 ft in Easting, and -1.28 ft in Elevation. These graphs are shown in Figures 5 through 8. Clearly, the slope is not moving in a fashion other than expected for every solid waste slope. No signs of instability are present.

Inclinometer Monitoring

Inclinometers were installed during the months of August and September 2007 and have been subsequently read by SCS Engineers on Wednesdays of each week with the exception of the 9/17/07 and after 12/14/2007, when the inclinometer sensor malfunctioned and had to be returned to Geokon for repair and recalibration. In addition, no readings were taken for Incl-3 on December 14, 2007. Tops of the inclinometer casings were surveyed by DEI approximately on the same days that the inclinometers were read.

Baseline readings were obtained for each inclinometer on the dates shown below

Inclinometer	Initial/Baseline Reading Date
INC-3	8/2/2007
INC-7	8/29/2007
INC-8	9/26/2007
INC-9	8/29/2007
INC-10	9/26/2007

No survey data was taken for the inclinometers prior to 8/29/2007, therefore no readings for 8/2/2007 and 8/16/2007 are presented on the plots for INC-3; however 8/2/2007 represents the first date of INC-3's reading and is used as the baseline reading for calculation purposes. The graphs for the above inclinometers are shown on Figures 9 through 18.

Calculations of the profile of the inclinometer have been performed using the profile method described in the Geokon users manual for the 603 readout box. Changes in the gauge factor, determined by Geokon upon recalibration of the device, have been incorporated into the calculations.

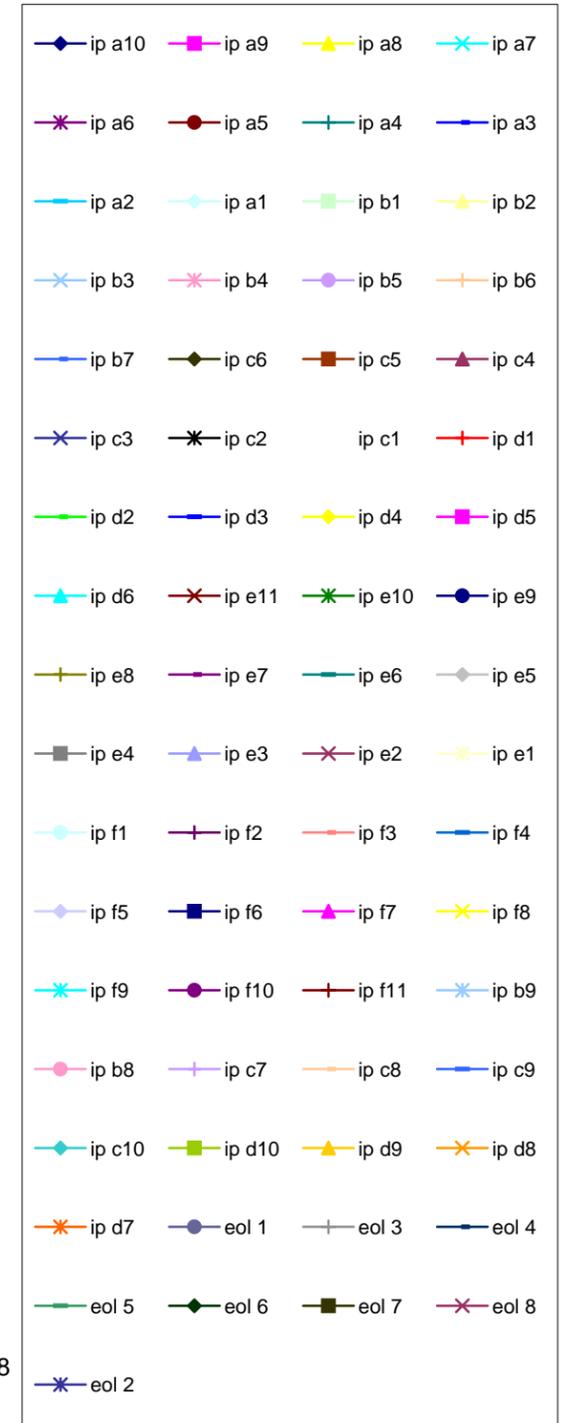
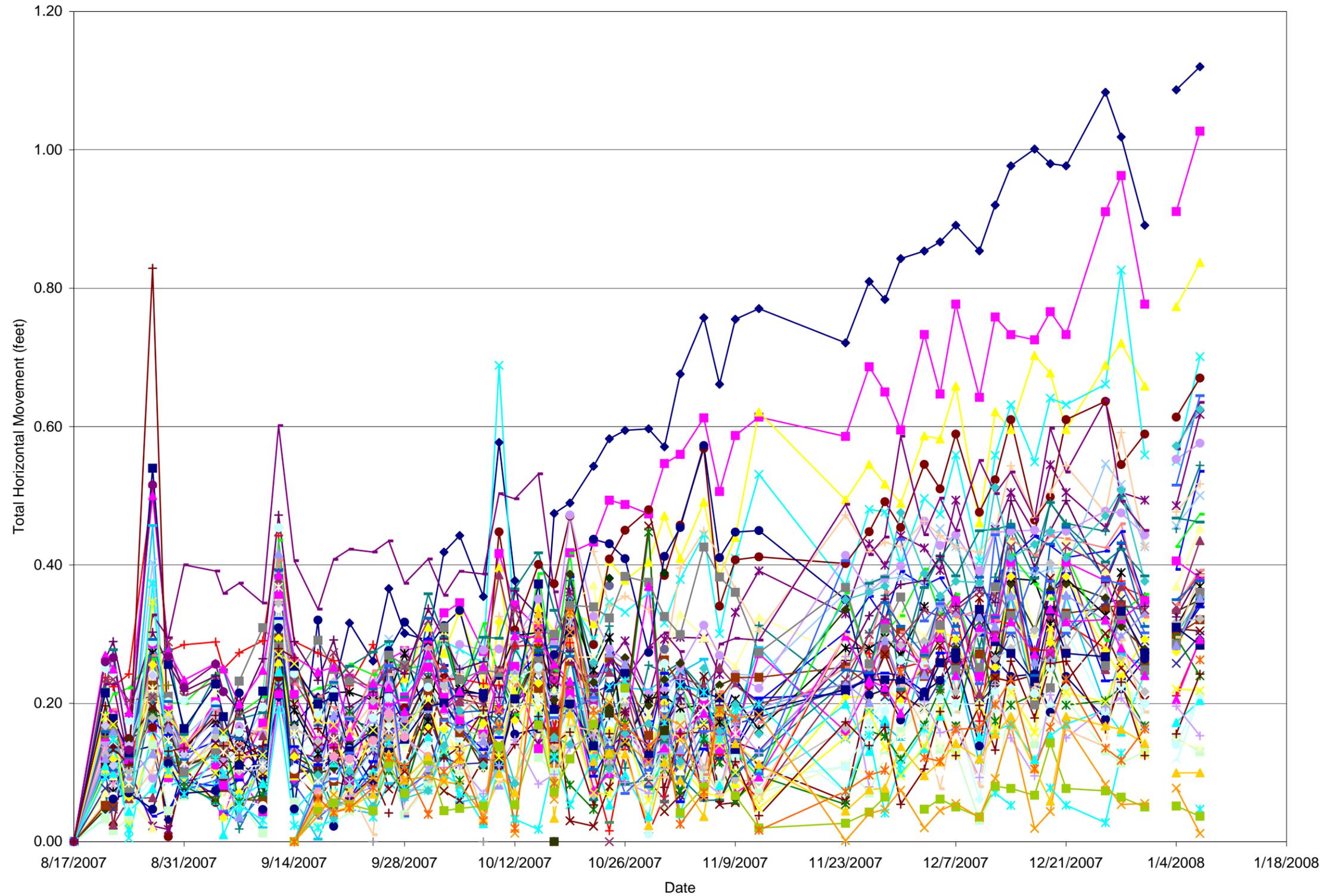
The attached plots indicate that little, if any, outward motion of the slopes is occurring. No defined planes of motion are apparent. The movement of the slopes documented in the graphs is not indicative of any instability but is typical of the normal spread and settlement of waste slopes. This is consistent with the survey data collected on the slopes and the survey of the inclinometer casings themselves. It should be noted that there has been some problems with the inclinometer readouts not coming to equilibrium on occasion, and the results are sometimes not reflective of the actual movement within the inclinometer. Subsequent readings show that these readings are anomalies and should be ignored.

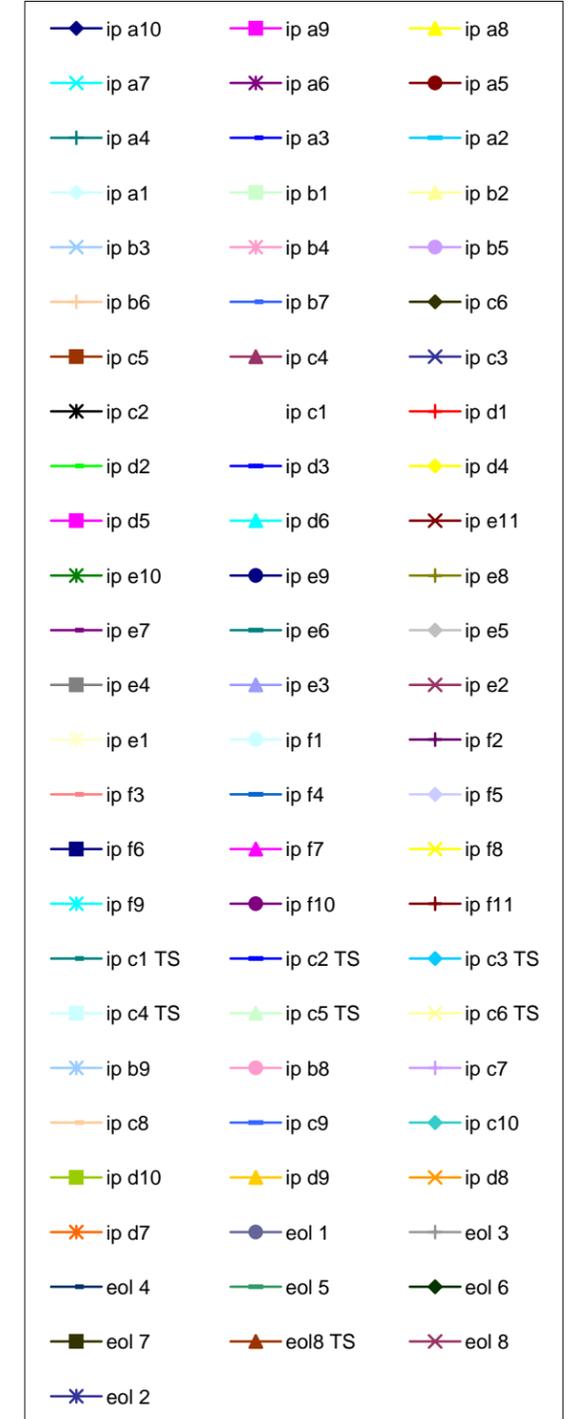
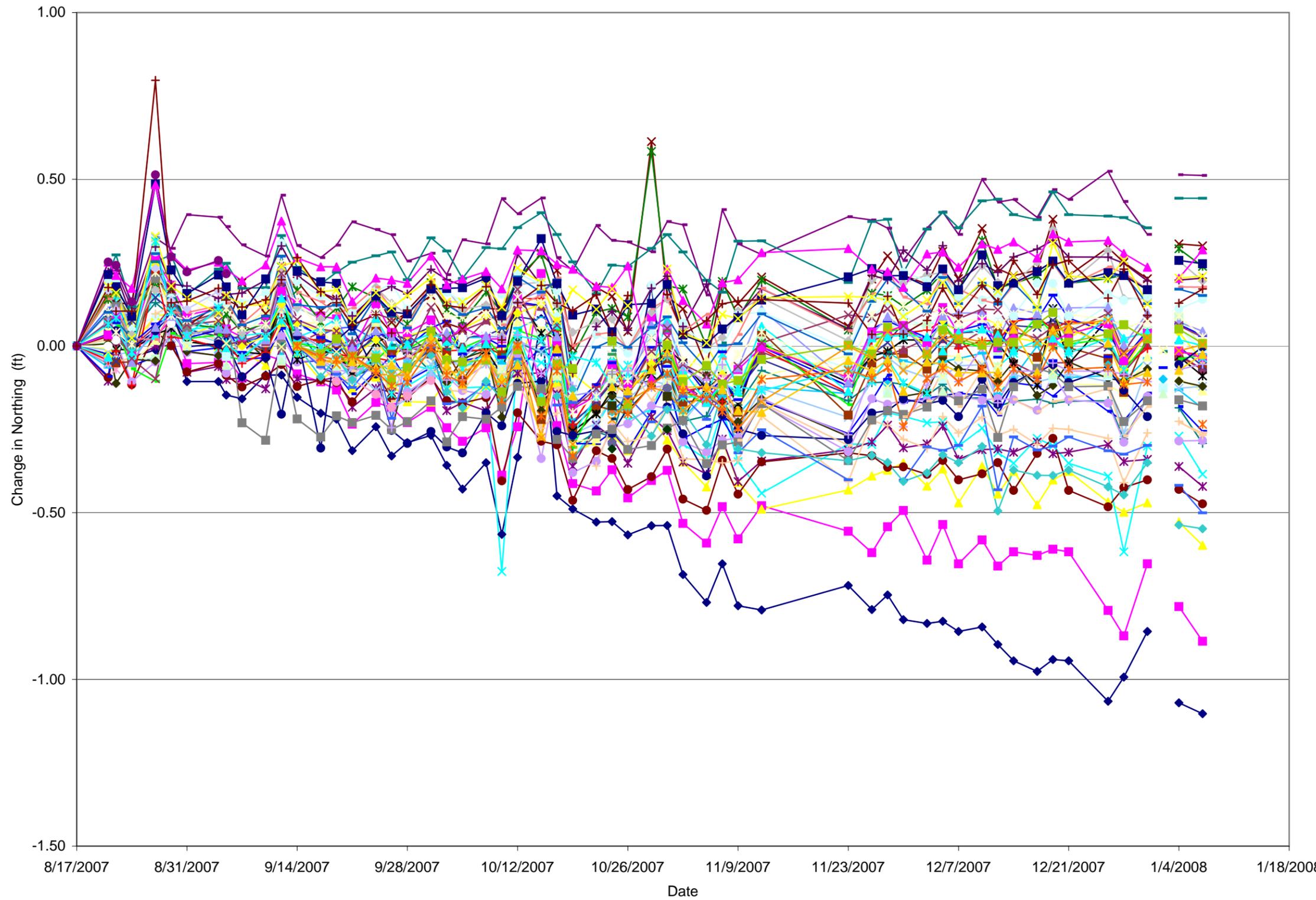
The attached plots depict the change in location along northing and easting axes for each inclinometer location with time. The depictions of movement have been calculated from the

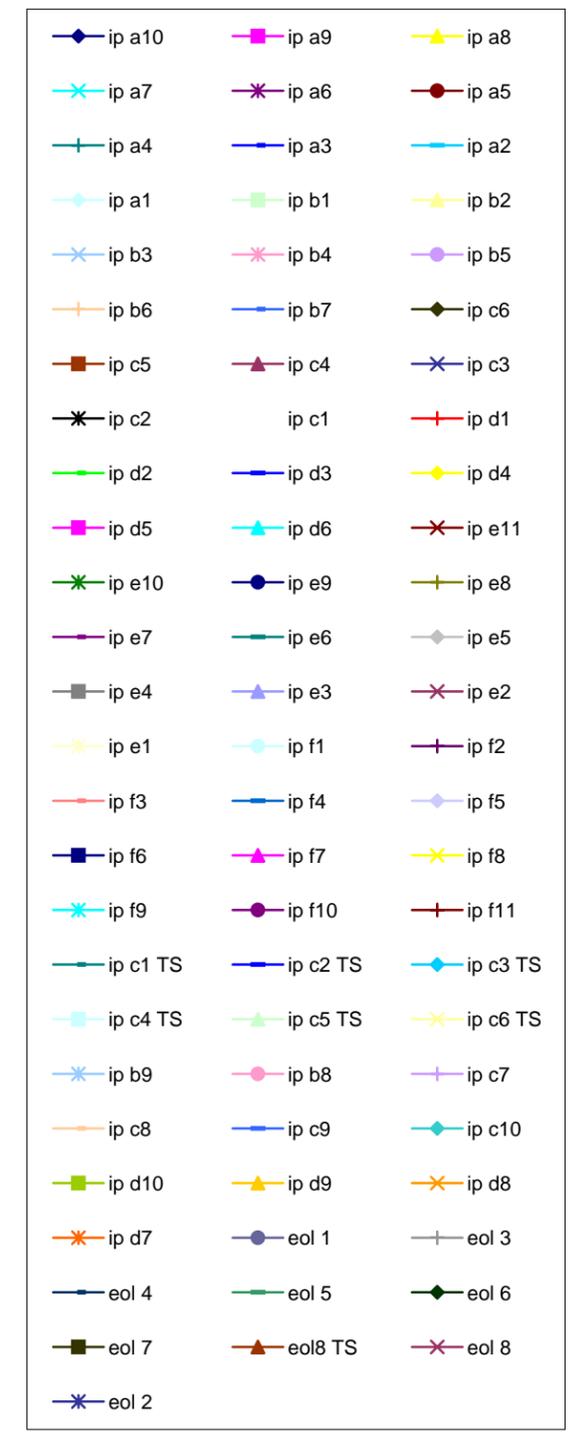
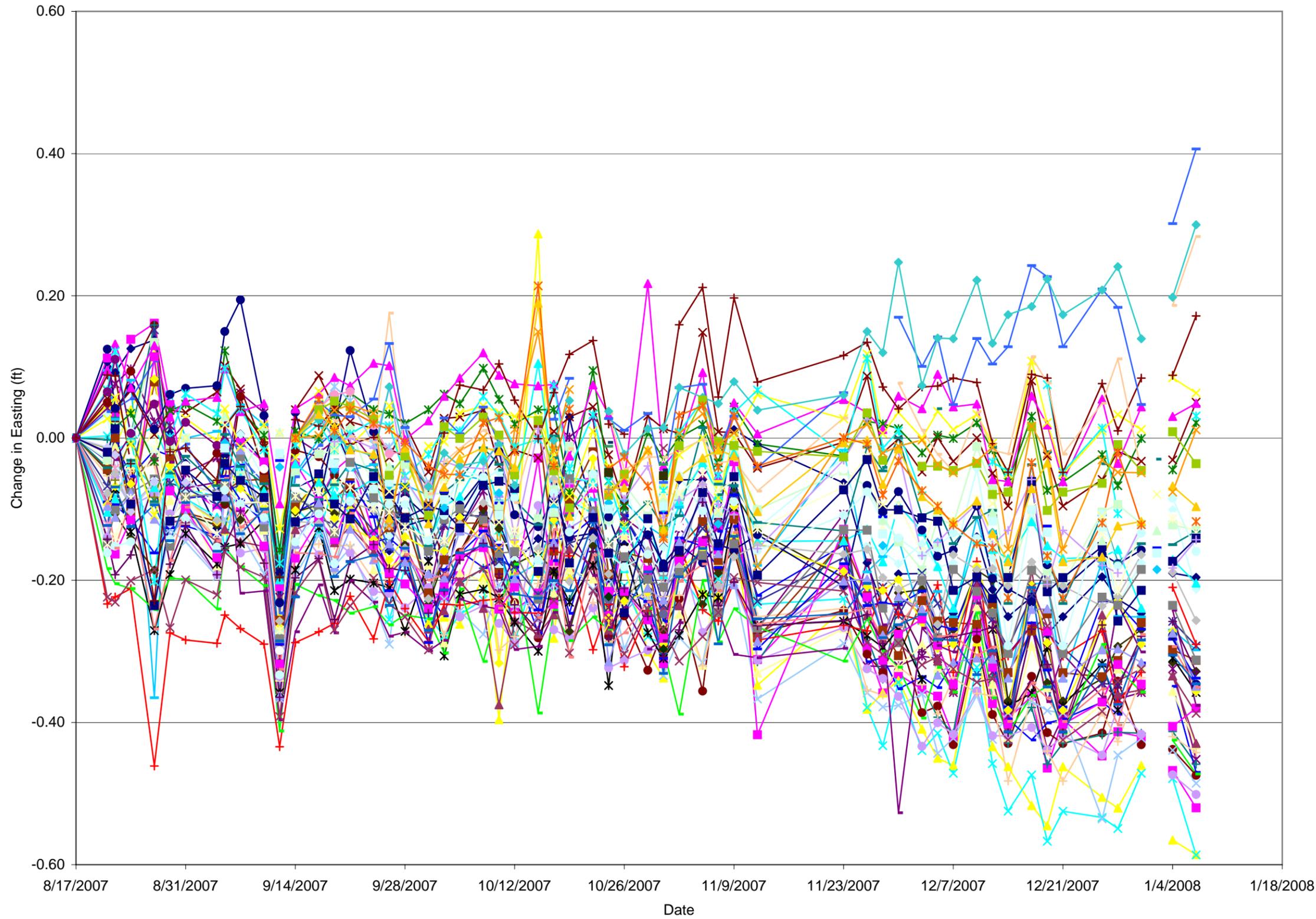
surface, using the survey shots taken at each reading date using optical survey methods. An optical reflective prism has been affixed to each casing to allow reproducible survey results.

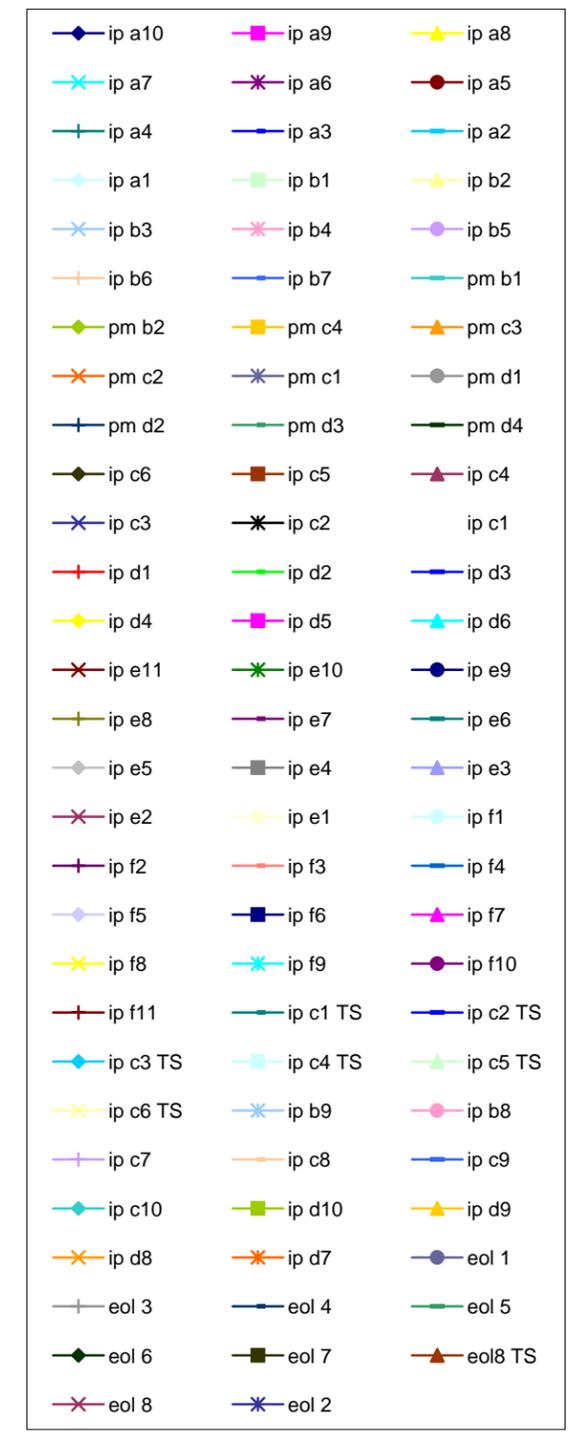
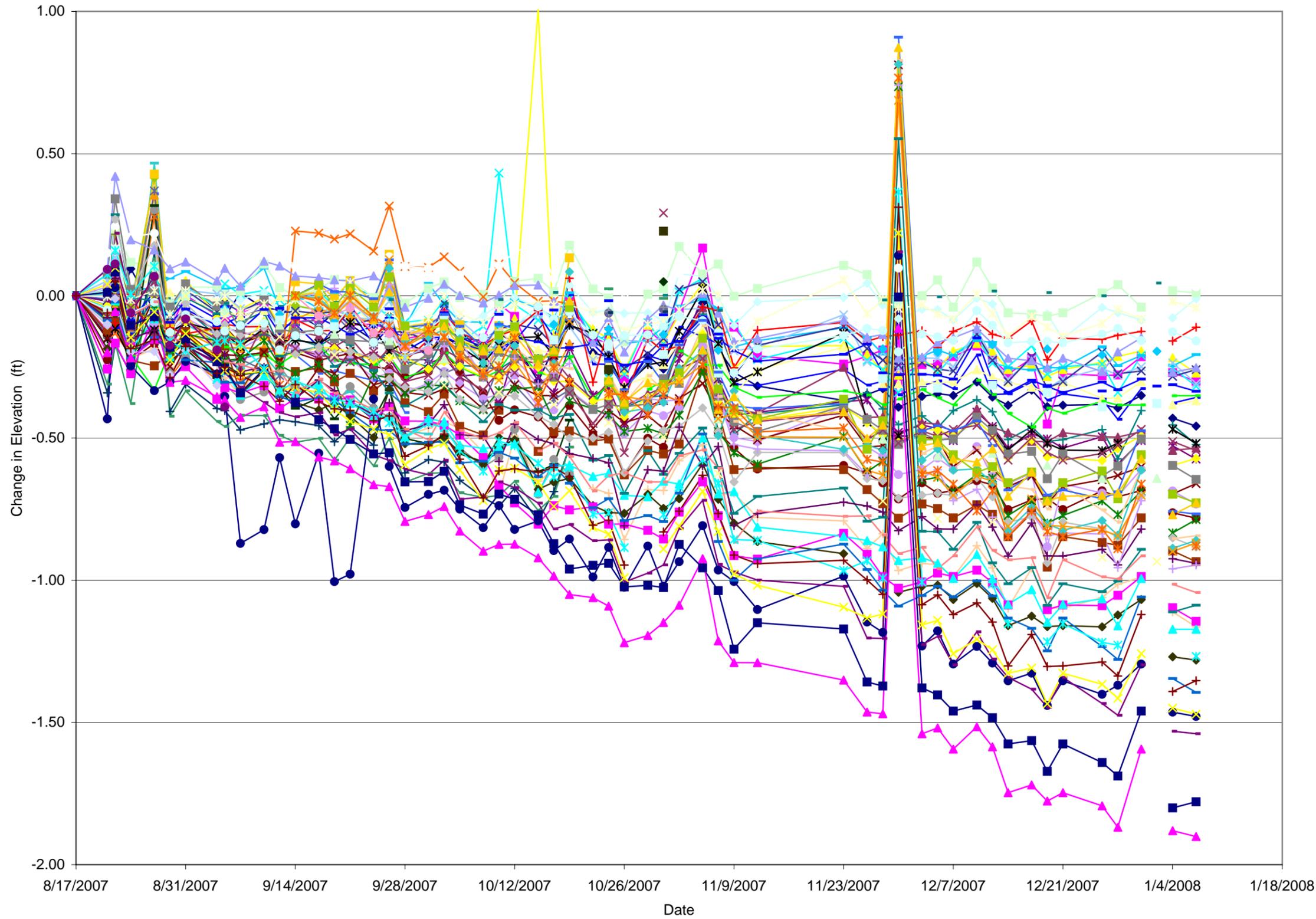
Temperature Monitoring

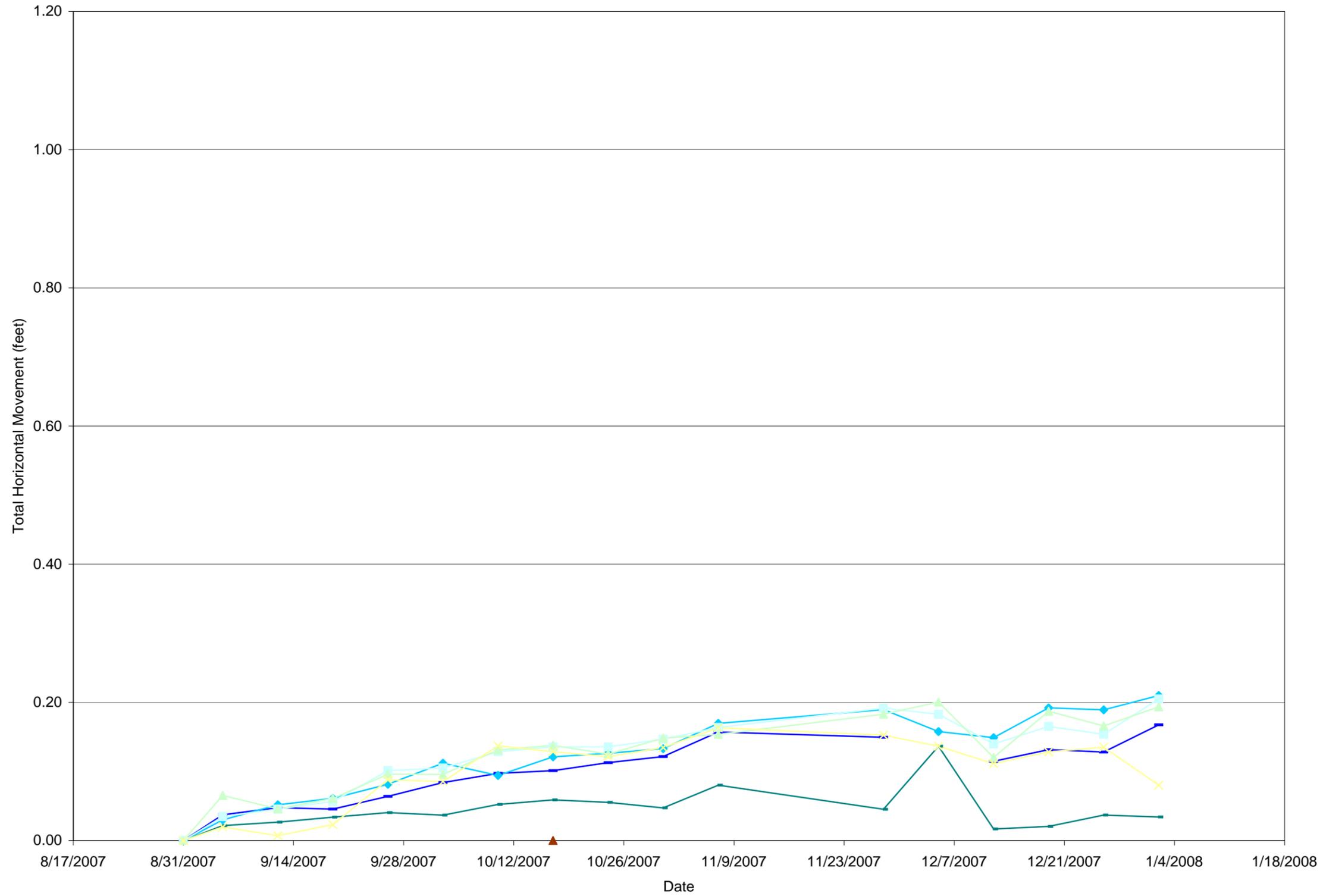
Thermistor readings have been conducted by SCS since the end of August. The attached graph shows the temperature readings in degrees Celcius versus depth for the various monitored locations and depths. This graph (Figure 19) shows an overall trend of decreasing temperature.



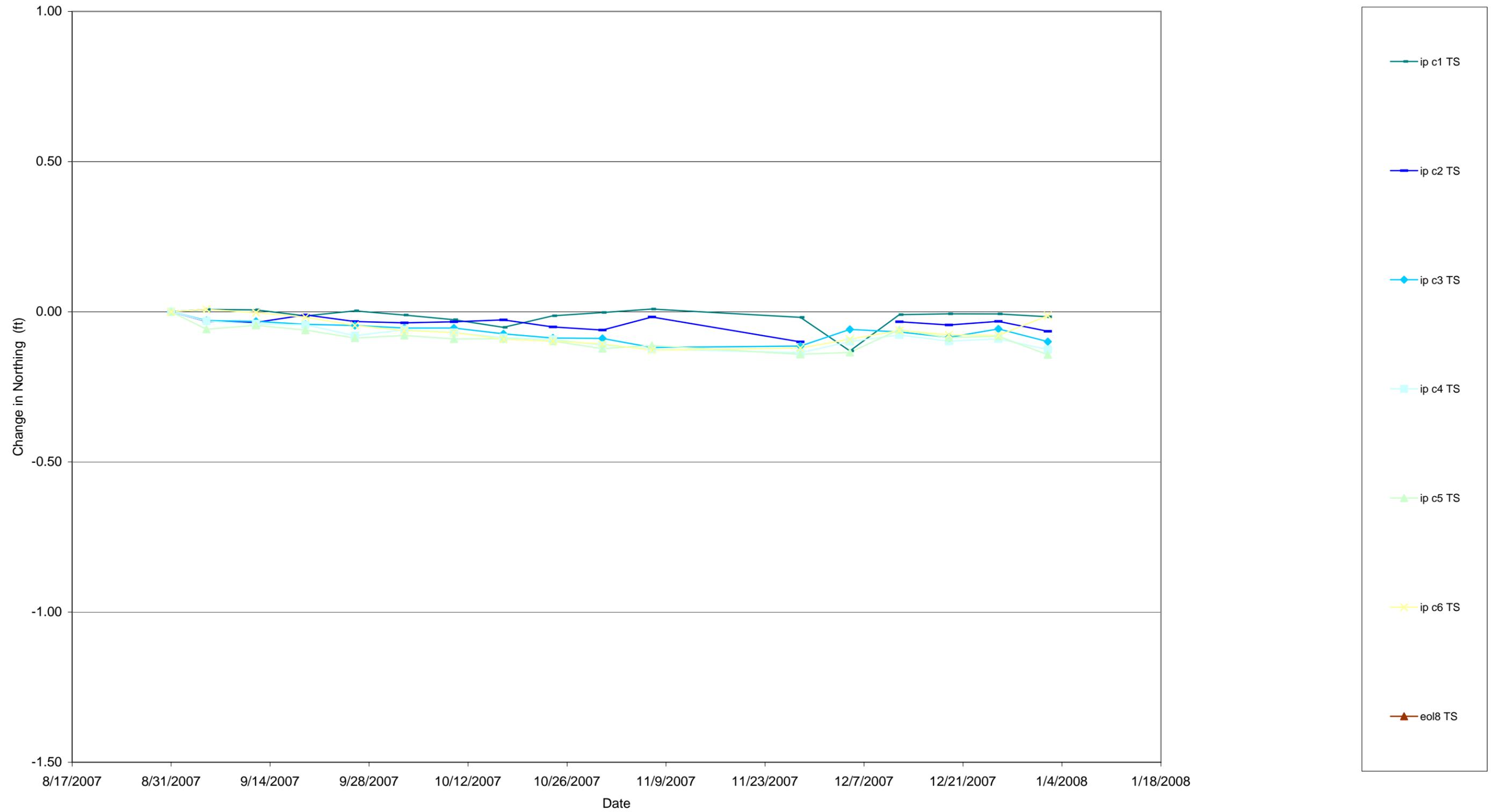




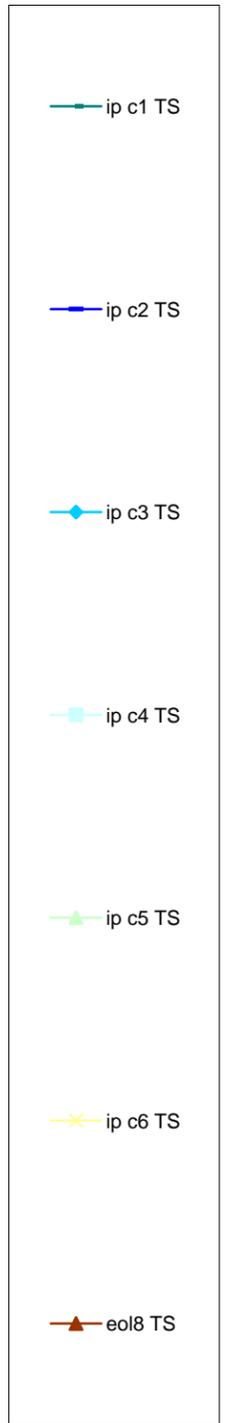
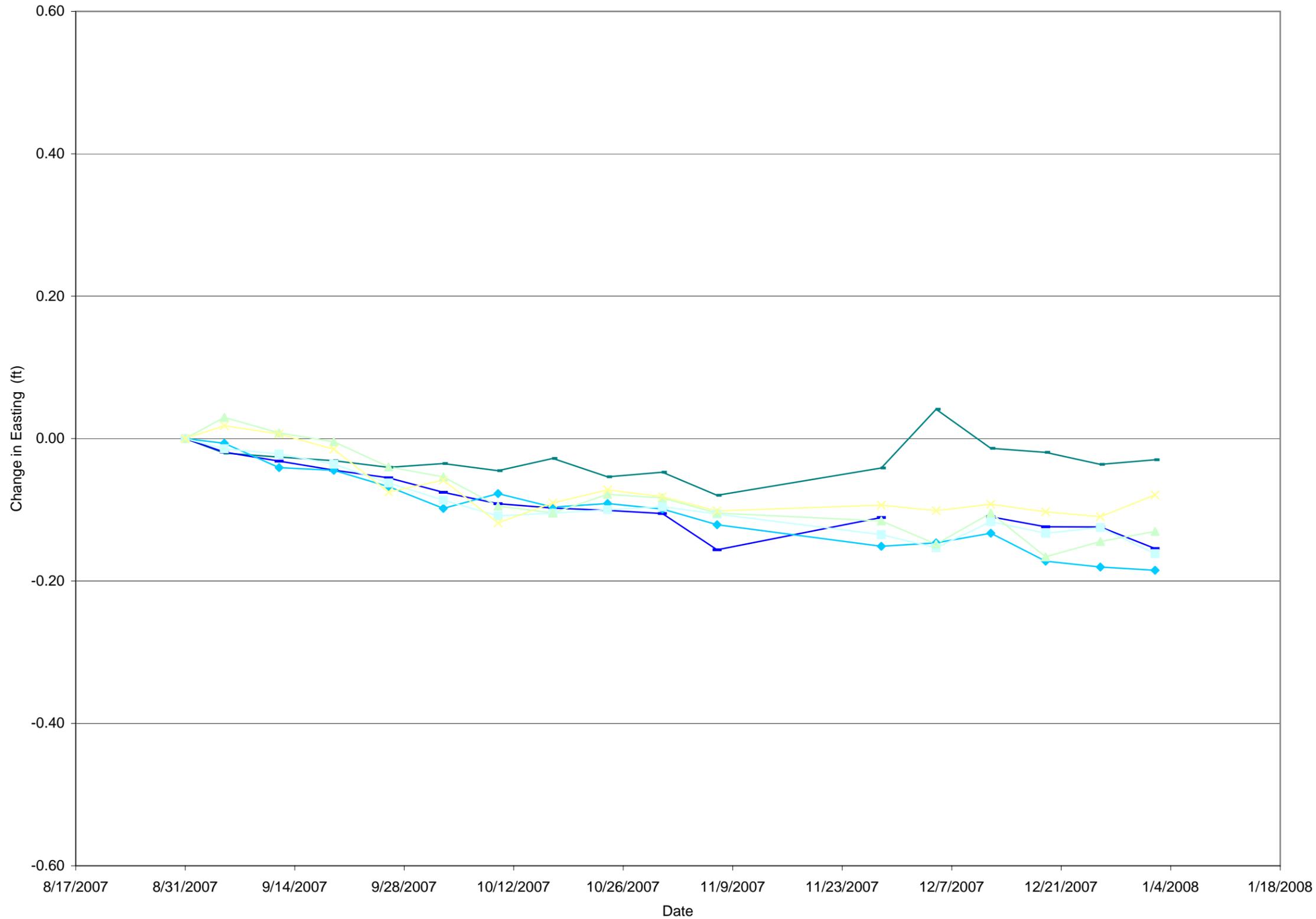


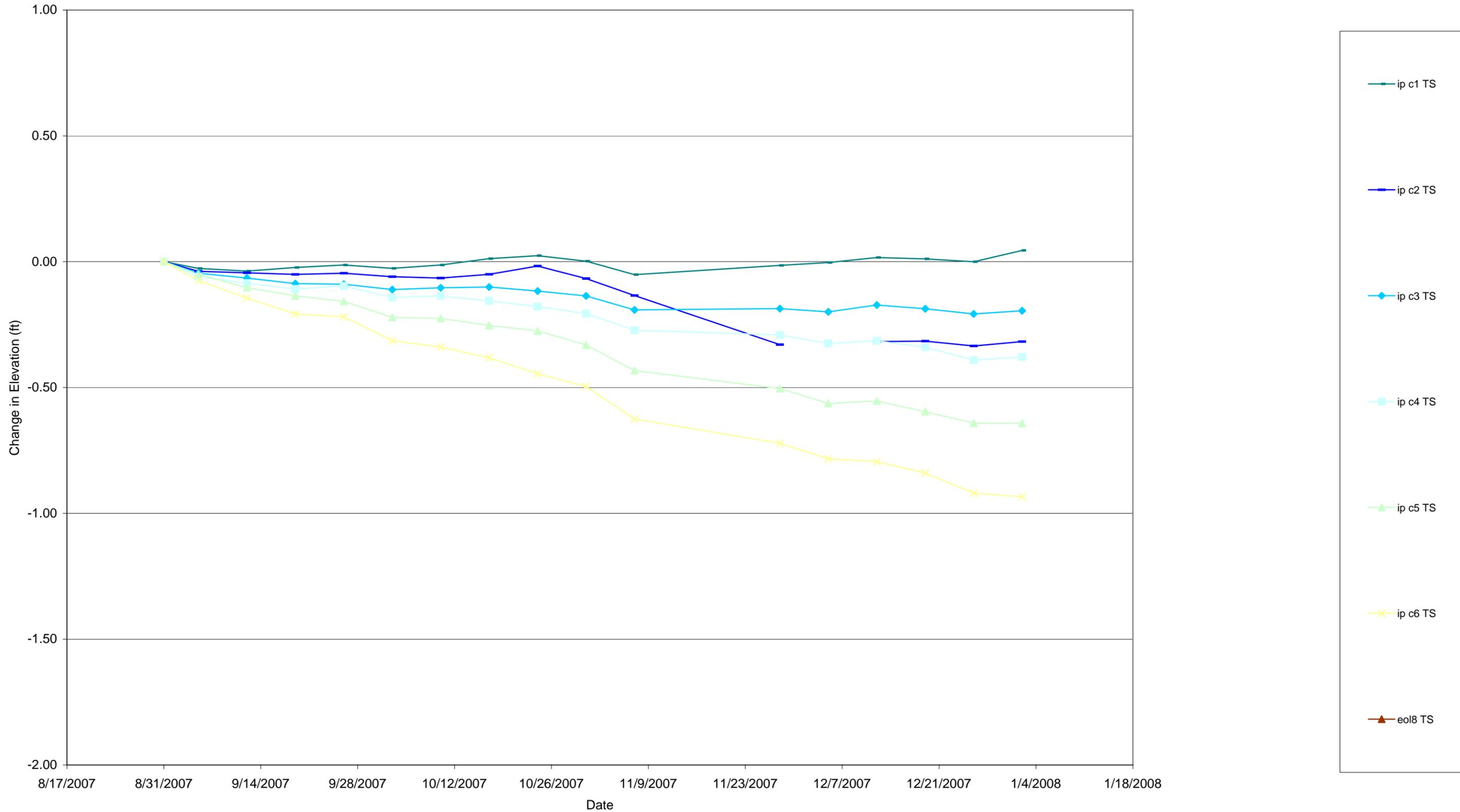


TOTAL HORIZONTAL MOVEMENT (TOTAL STATION READINGS ONLY)
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 5

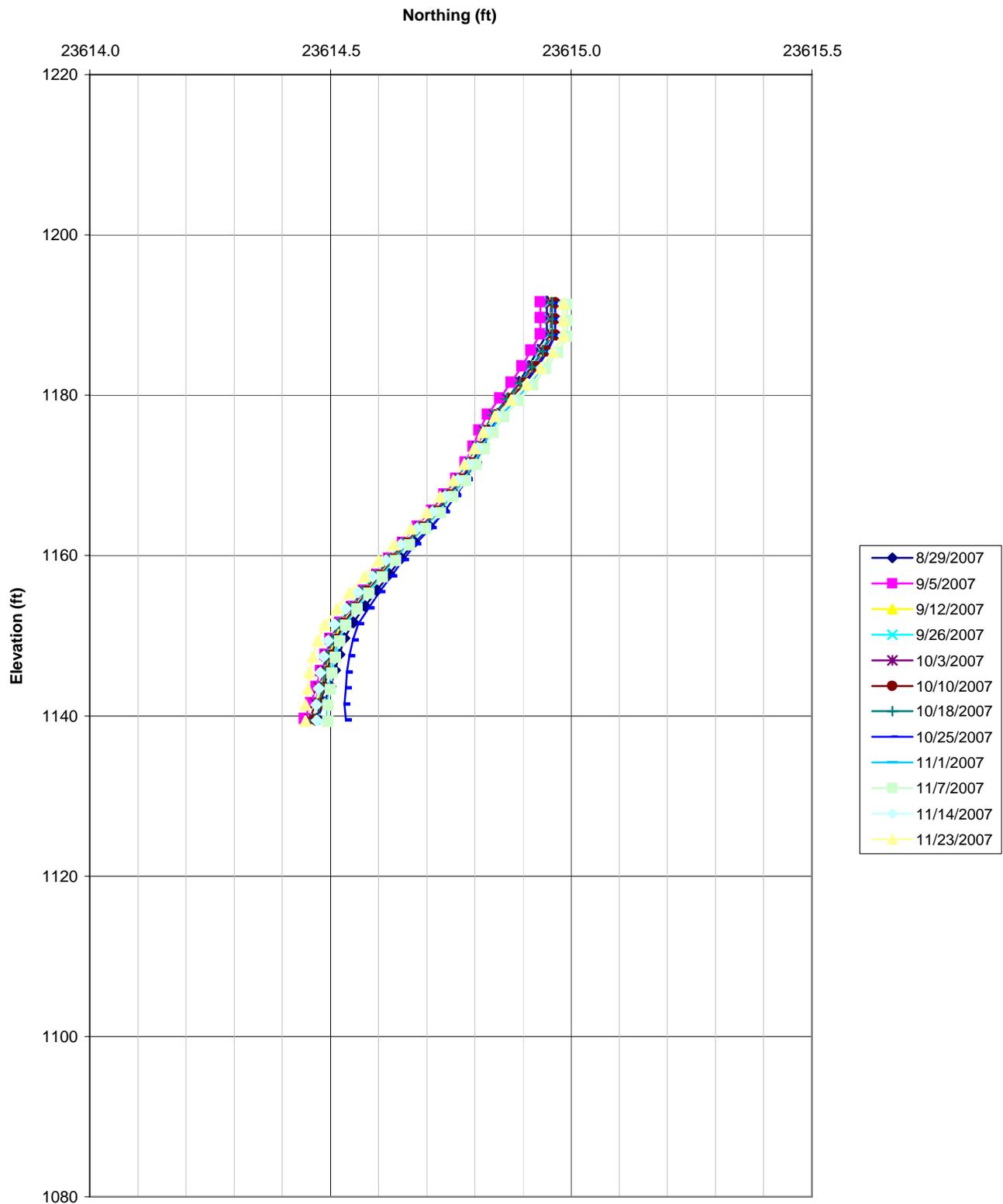


CHANGE IN NORTHING (TOTAL STATION READINGS ONLY)
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 6

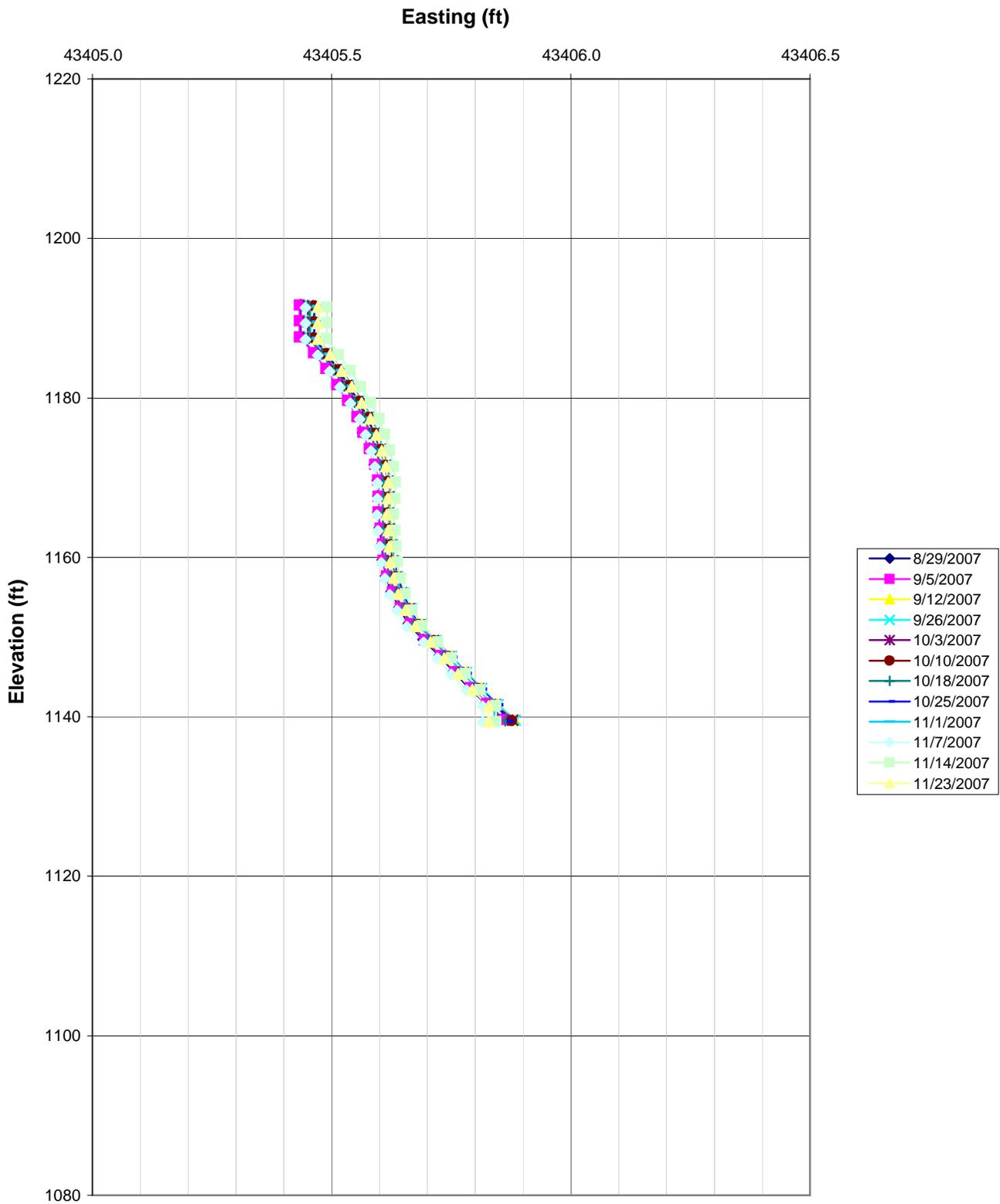




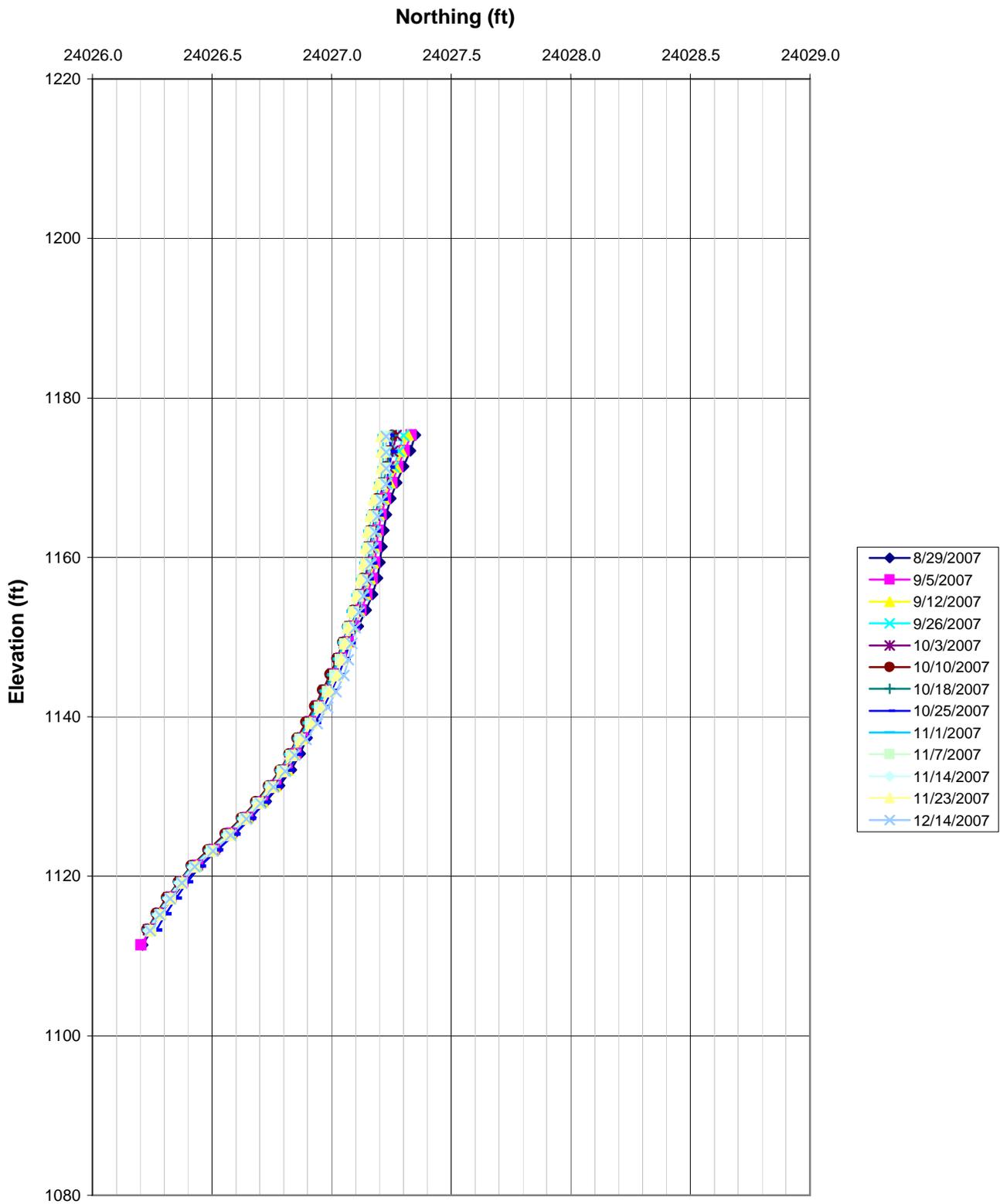
CHANGE IN ELEVATION (TOTAL STATION ONLY)
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 8



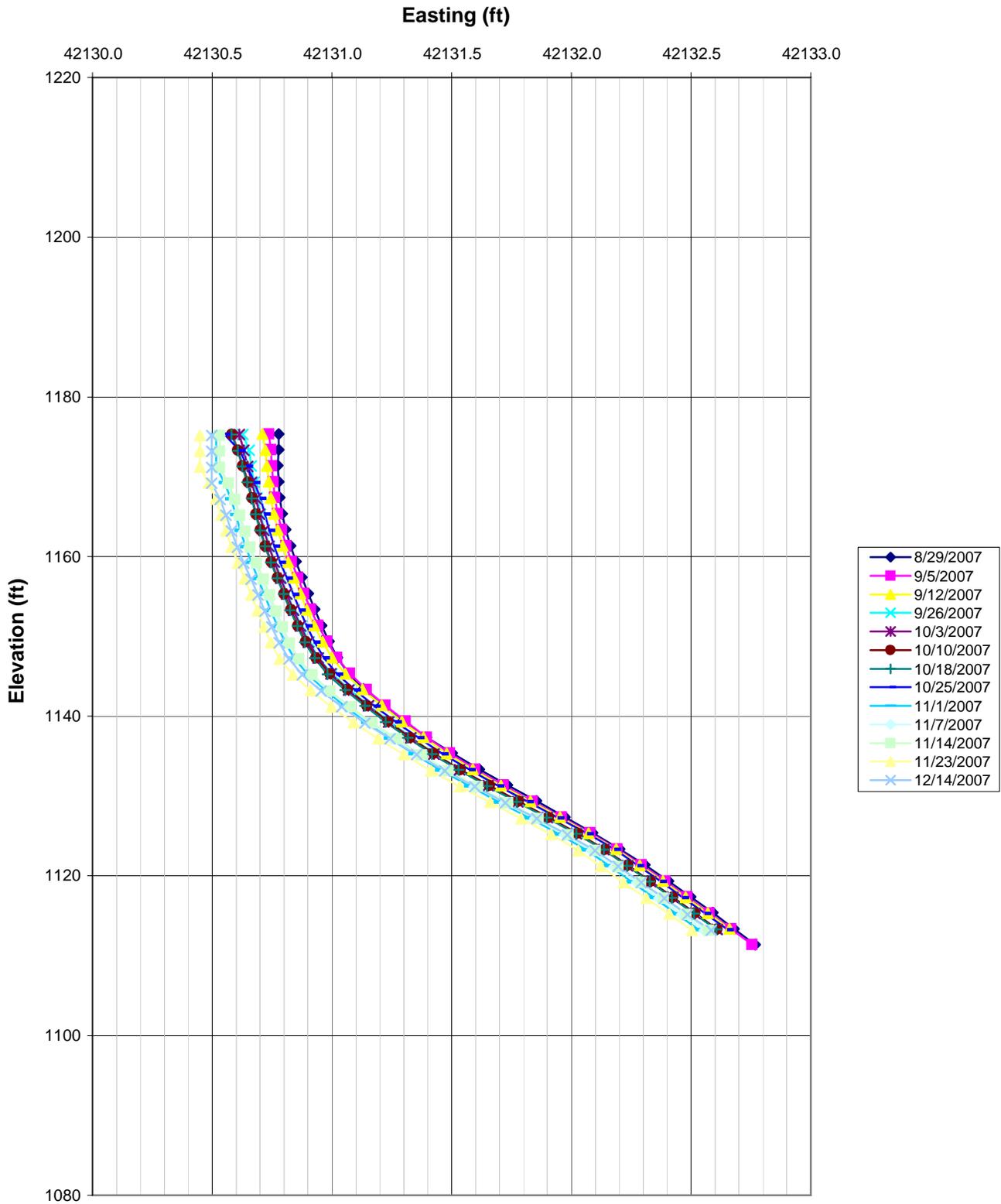
Northing Axis Movement - Inclinator 3
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 9



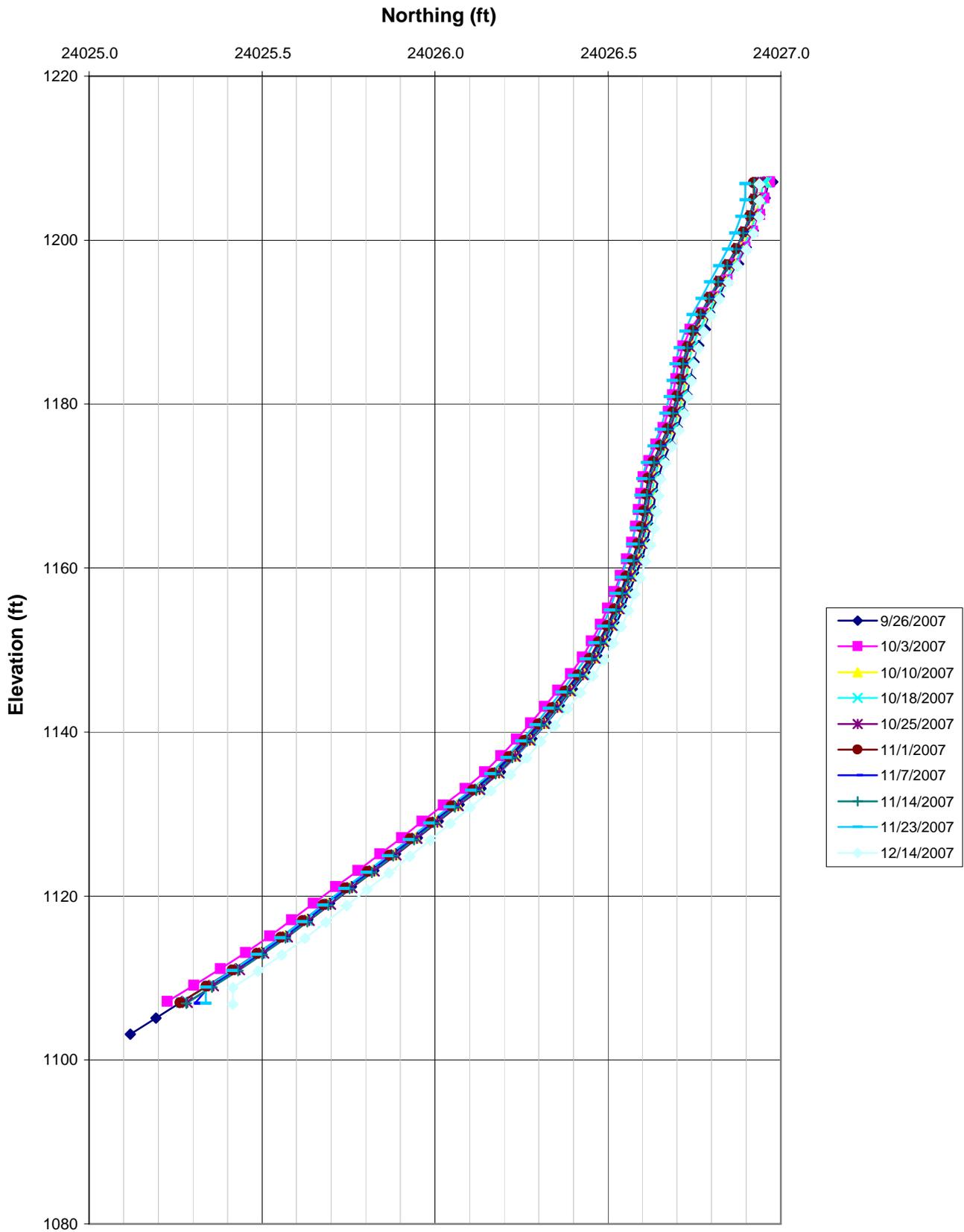
Easting Axis Movement - Inclinator 3
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 10



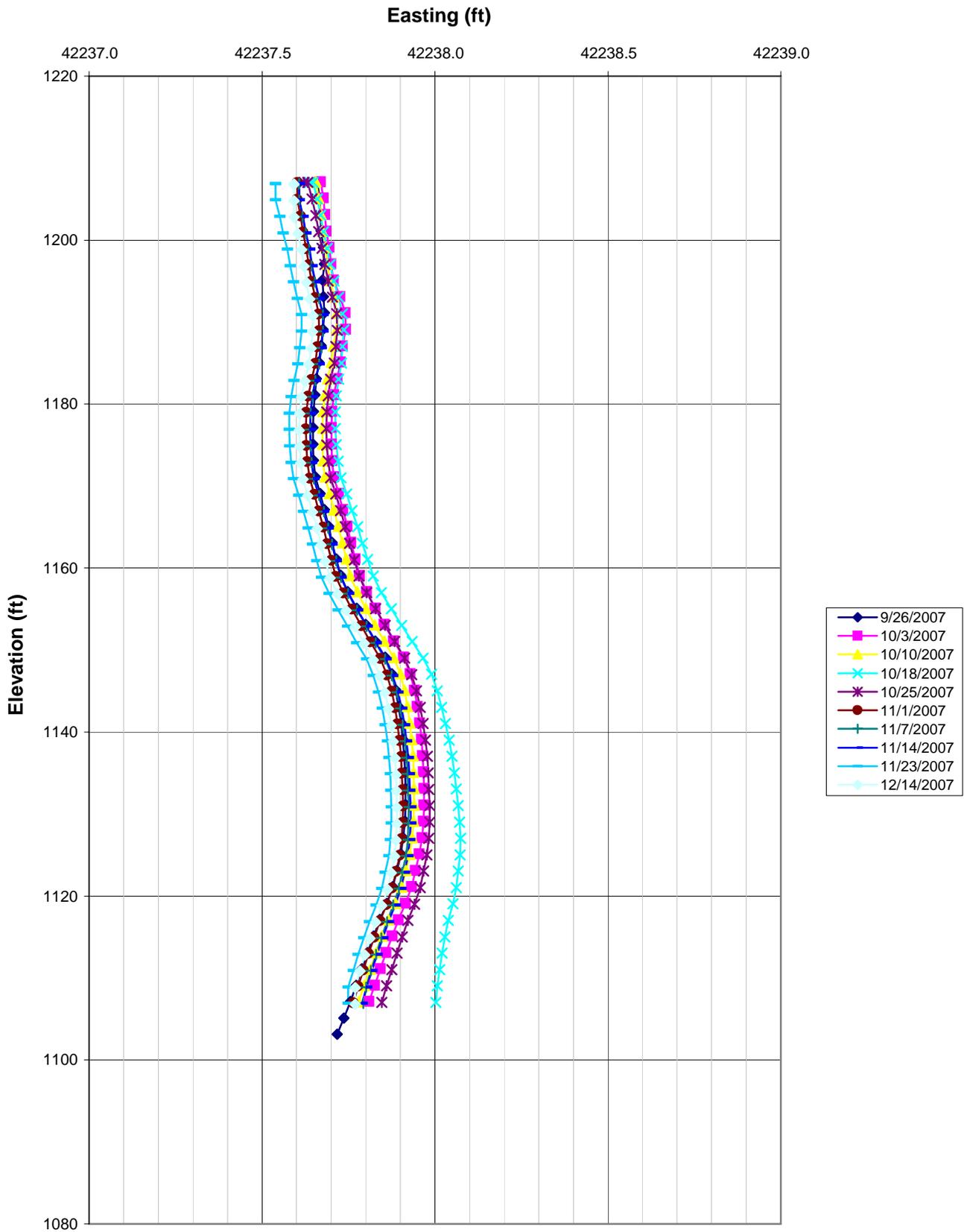
Northing Axis Movement - Inclinometer 7
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 11



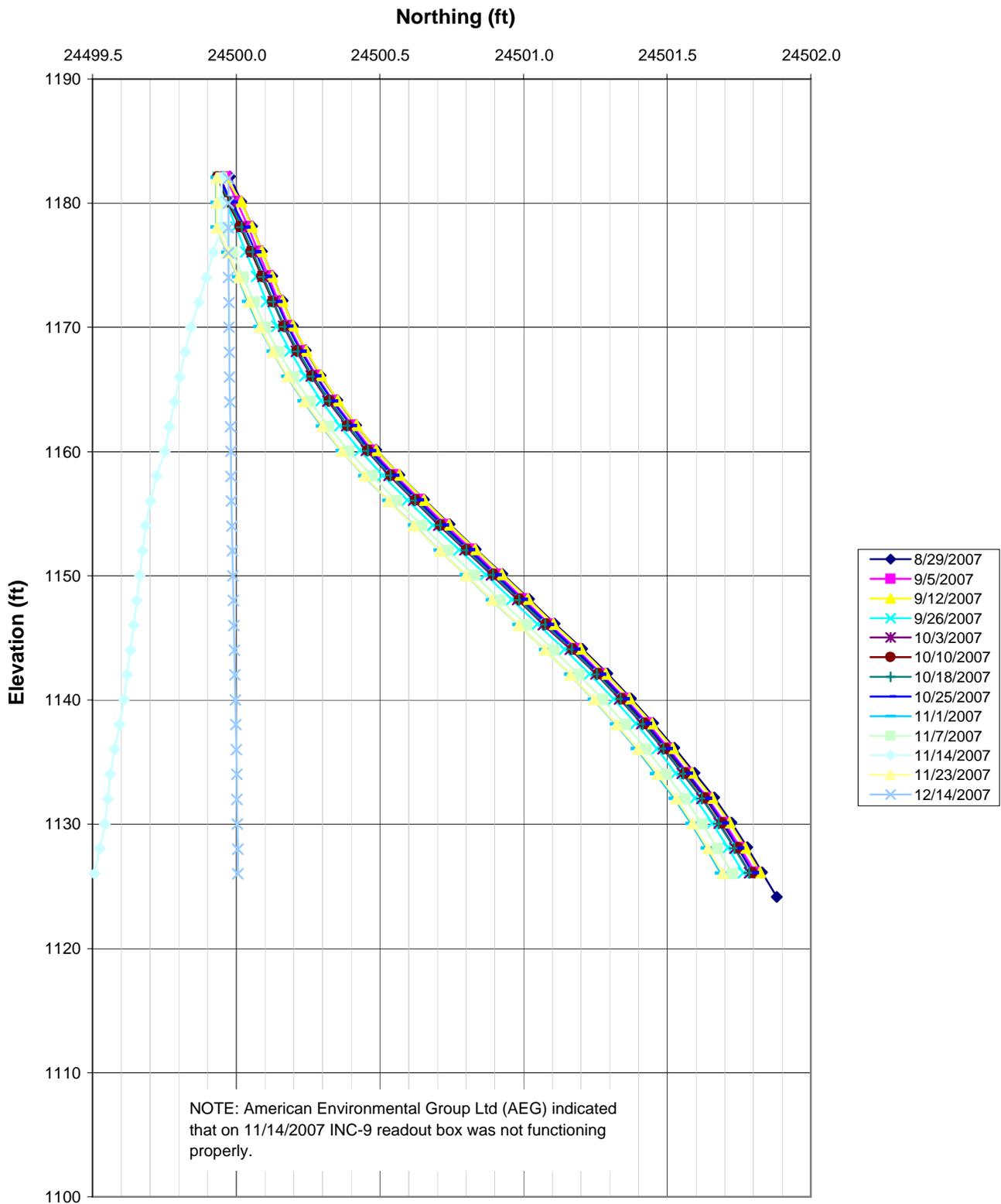
Easting Axis Movement - Inclinator 7
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 12



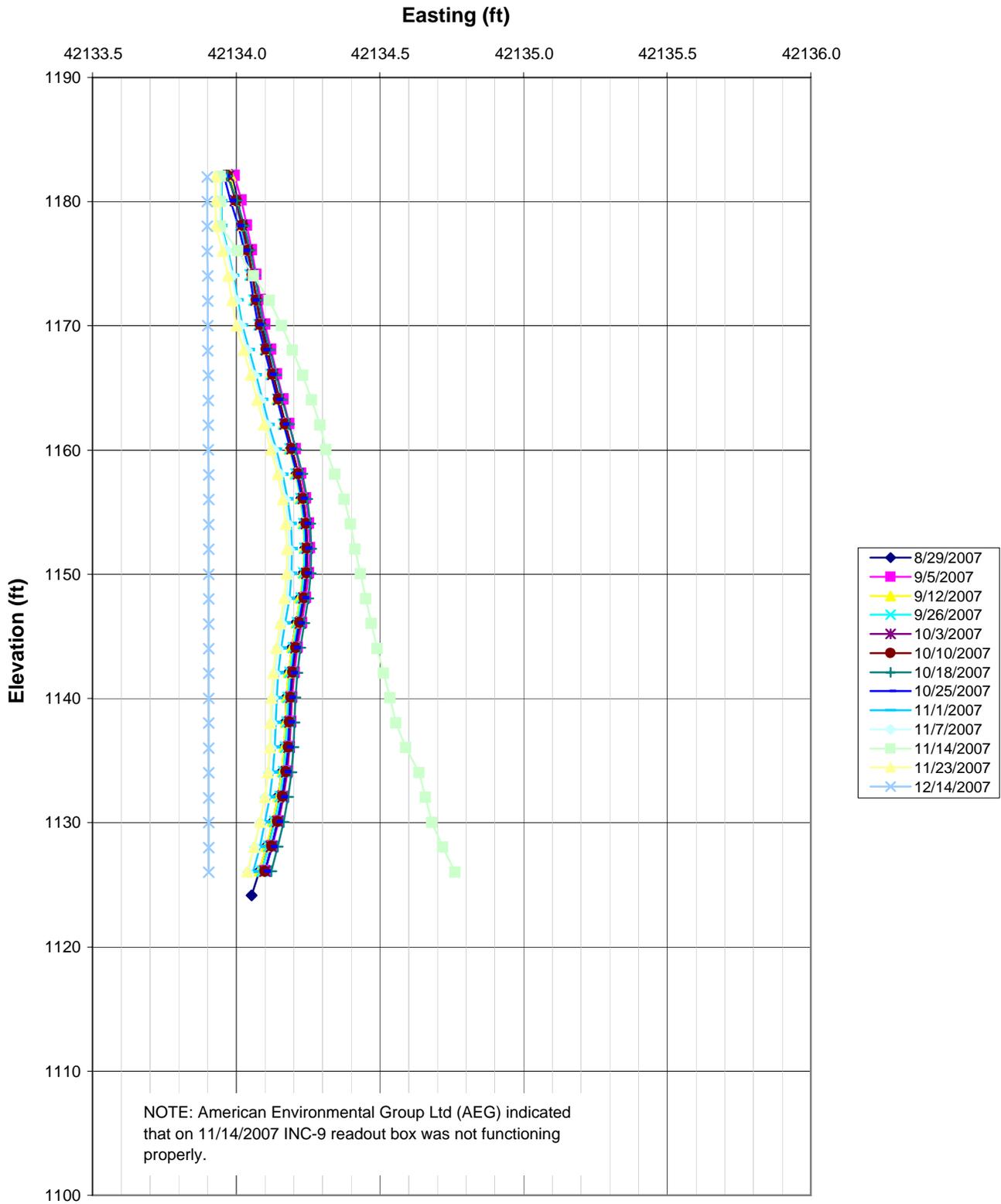
Northing Axis Movement - Inclinator 8
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 13



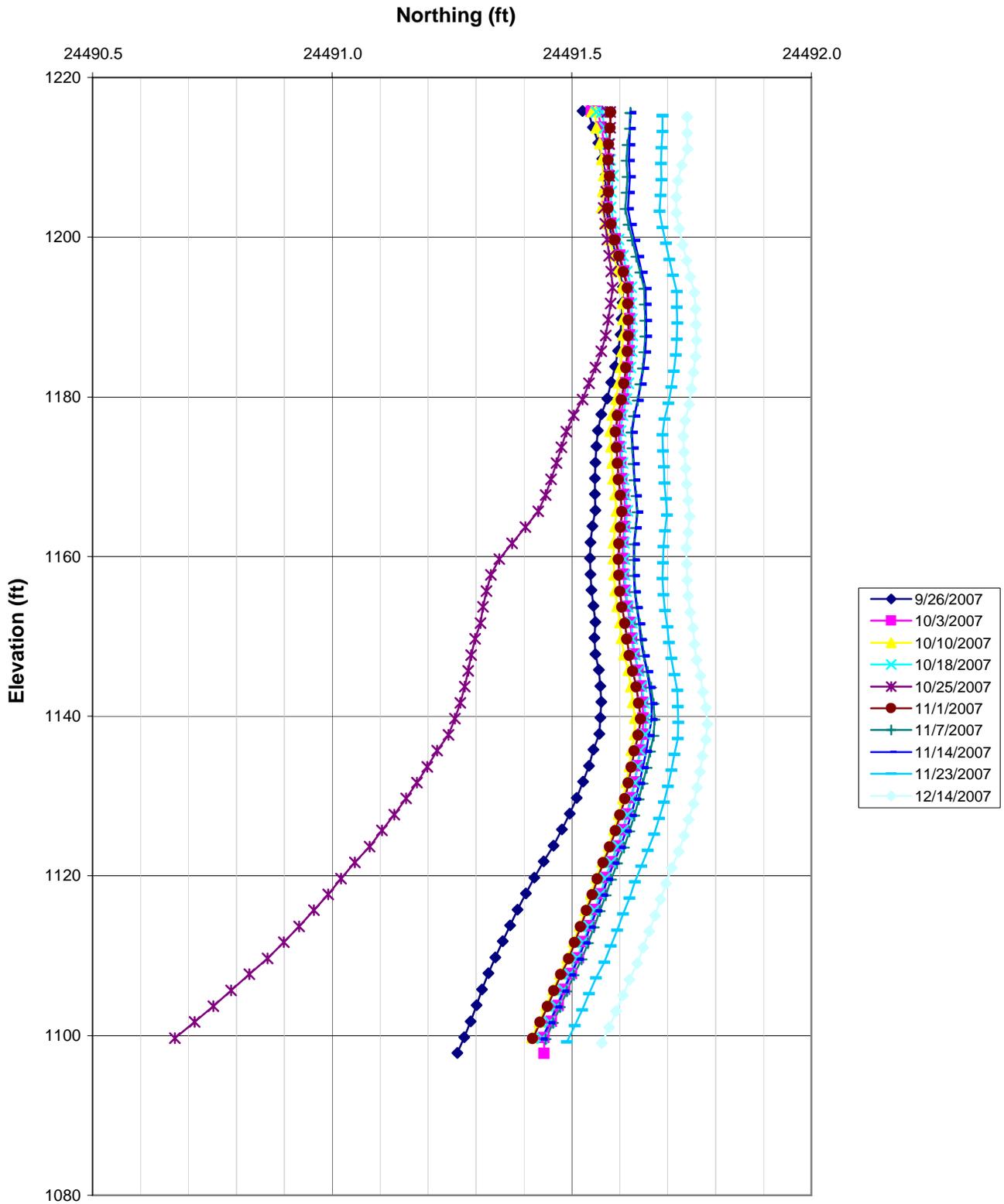
Easting Axis Movement - Inclinator 8
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 14



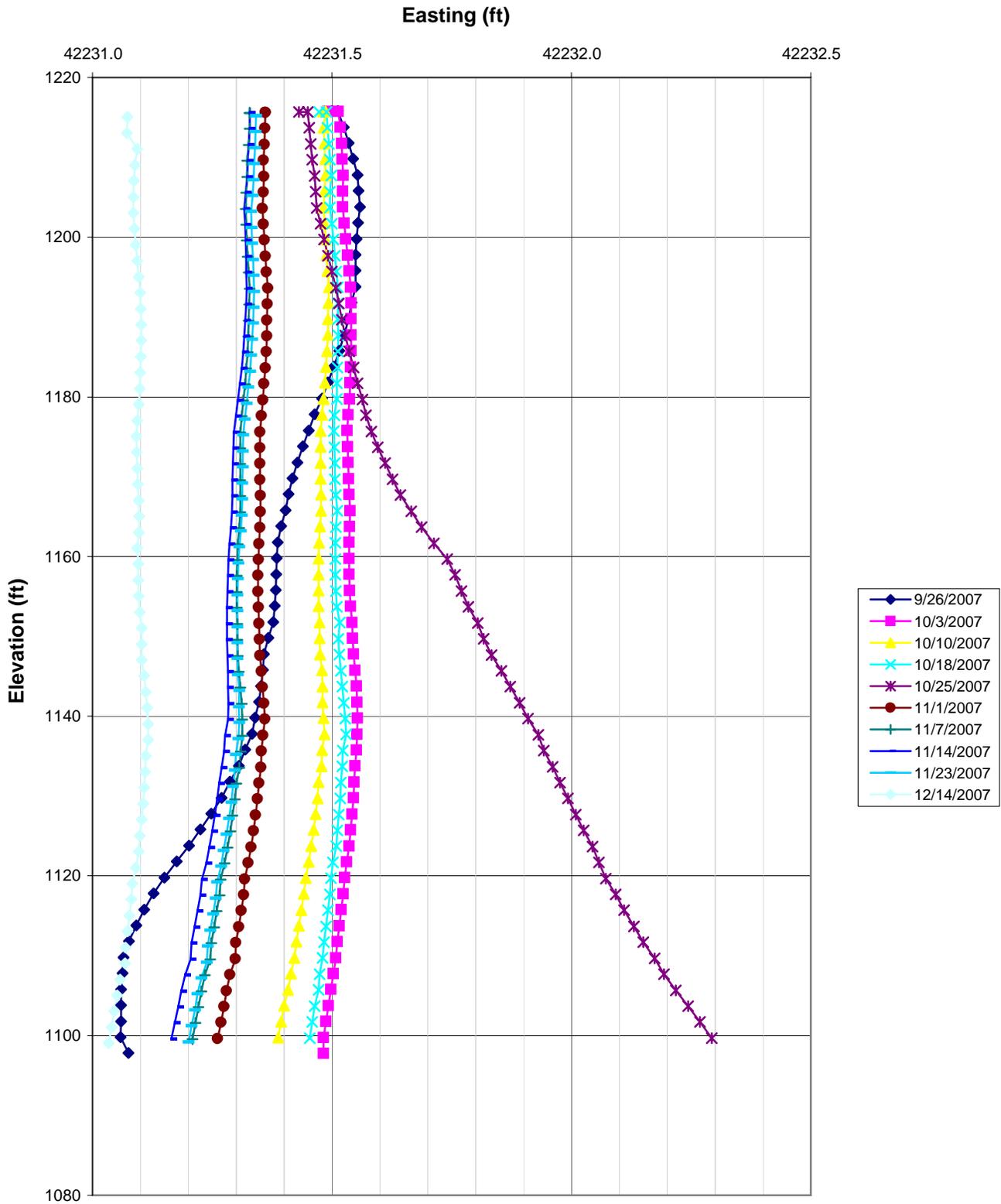
Northing Axis Movement - Inclinerometer 9
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 15



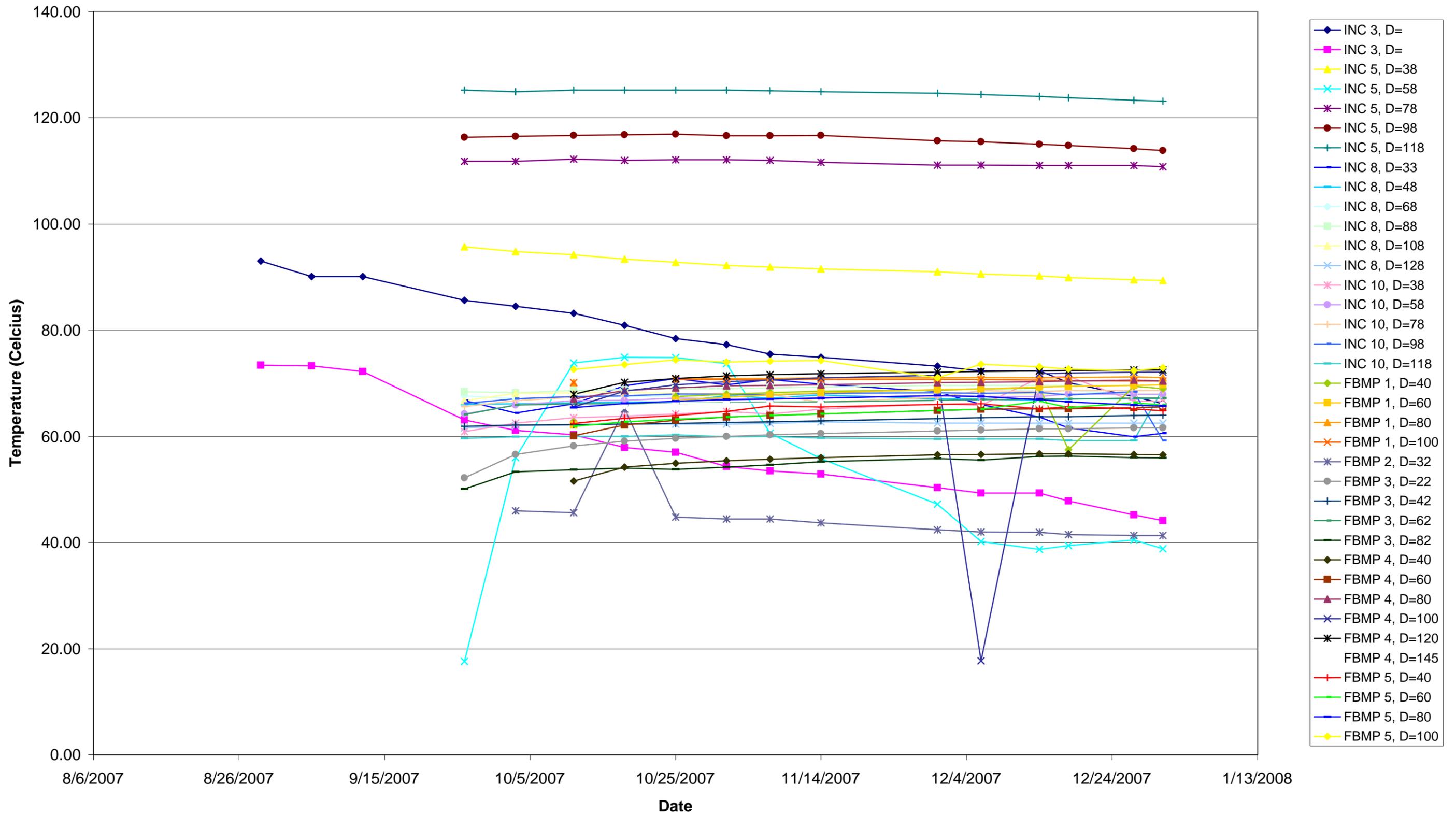
Easting Axis Movement - Inclinometer 9
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 16



Northing Axis Movement - Inclinator 10
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 17



Easting Axis Movement - Inclinator 10
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 18



Thermister Readings
 REQUEST TO REDUCE FREQUENCY OF MONITORING OF WEST SLOPE
 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY
 FIGURE 19

Attachment B

Crack Monitoring Results

COUNTYWIDE RDF

88Ac. Crack Monitoring

		8/20/2007	8/22/2007	8/24/2007	8/27/2007	8/29/2007	8/31/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Friday
#1N	ft	2.00	2.02	2.02	2.03	2.03	2.03
#1S	ft	2.00	2.00	2.00	2.02	2.04	2.02
#1A	ft	2.00	2.00	2.00	2.02	2.02	2.01
#2	ft	2.00	2.00	2.00	2.00	2.00	2.01
#3N	ft	2.00	2.00	2.03	2.01	2.00	2.00
#3S	ft	2.00	2.03	2.03	2.03	2.03	2.02
#4	ft	2.00	2.00	1.98	1.98	1.98	1.98
#5	ft	2.00	2.00	2.00	2.00	2.00	2.01
#6	ft	--	--	--	--	--	--

		9/4/2007	9/5/2007	9/7/2007	9/10/2007	9/12/2007	9/14/2007
Crack	Units	Tuesday	Wednesday	Friday	Monday	Wednesday	Friday
#1N	ft	2.03	2.03	2.03	2.04	2.06	2.05
#1S	ft	2.05	2.05	2.06	2.06	2.06	2.07
#1A	ft	2.02	2.02	2.03	2.03	2.03	2.03
#2	ft	2.01	2.01	2.02	2.02	2.03	2.03
#3N	ft	2.01	2.01	2.01	2.01	2.01	2.02
#3S	ft	2.03	2.03	2.04	2.05	2.05	2.05
#4	ft	1.99	1.99	1.99	1.99	1.99	1.99
#5	ft	2.02	2.02	2.03	2.03	2.03	2.03
#6	ft	--	--	--	--	6.00	6.01

		9/17/2007	9/19/2007	9/21/2007	9/24/2007	9/26/2007	9/28/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Friday
#1N	ft	2.05	2.05	2.06	2.07	2.07	2.08
#1S	ft	2.08	2.08	2.09	2.09	2.10	2.10
#1A	ft	2.04	2.06	2.05	2.06	2.06	2.06
#2	ft	2.04	2.05	2.05	2.06	2.07	2.06
#3N	ft	2.02	2.03	2.02	2.03	2.03	2.03
#3S	ft	2.06	2.06	2.07	2.07	2.08	2.08
#4	ft	2.00	1.99	2.00	2.00	2.00	2.00
#5	ft	2.04	2.05	2.05	2.05	2.05	2.06
#6	ft	6.05	6.06	6.09	6.11	6.13	6.13

		10/1/2007	10/3/2007	10/5/2007	Cumulative
Crack	Units	Monday	Wednesday	Friday	Movement
#1N	ft	2.08	Disturbed	Covered	0.08
#1S	ft	2.10	2.10	Covered	0.10
#1A	ft	2.07	Gone	Covered	0.07
#2	ft	2.07	2.08	Covered	0.08
#3N	ft	2.03	2.03	2.03	0.03
#3S	ft	2.08	2.09	2.10	0.10
#4	ft	2.01	2.01	2.00	0.00
#5	ft	2.06	2.06	2.06	0.06
#6	ft	6.14	6.15	6.17	0.17

COUNTYWIDE RDF

88Ac. Crack Monitoring

		10/8/2007	10/10/2007	10/12/2007	10/15/2007	10/17/2007	10/19/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Wednesday
Reset #1N	ft	2.00	2.00	2.00	2.01	2.01	2.01
Reset #1S	ft	2.00	2.00	2.00	2.01	2.01	2.01
Reset #1A	ft	2.00	2.00	2.00	2.02	2.02	2.03
Reset #2	ft	2.00	2.00	2.02	2.03	2.03	2.04
#3N	ft	2.04	2.04	2.04	2.07	2.07	2.08
#3S	ft	2.10	2.12	2.11	2.12	2.13	2.13
#4	ft	2.01	2.03	2.01	2.02	2.02	2.02
#5	ft	2.07	2.08	2.07	2.08	2.08	2.08
#6	ft	6.18	6.20	6.20	6.20	6.20	6.20

		10/22/2007	10/24/2007	10/26/2007	10/29/2007	10/31/2007	11/2/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Friday
Reset #1N	ft	2.01	2.01	2.00	2.00	2.00	2.00
Reset #1S	ft	2.01	2.01	2.01	2.01	2.00	2.00
Reset #1A	ft	2.04	2.04	2.05	2.05	2.05	2.06
Reset #2	ft	2.05	2.05	2.04	2.04	2.05	2.06
#3N	ft	2.08	2.08	2.09	2.09	2.09	2.09
#3S	ft	2.14	2.14	2.14	2.15	2.15	2.16
#4	ft	2.02	2.03	2.03	2.03	2.03	2.04
#5	ft	2.09	2.08	2.08	2.08	2.08	2.08
#6	ft	6.21	6.21	6.21	6.21	6.22	6.22

		11/5/2007	11/7/2007	11/9/2007	11/12/2007	11/14/2007	11/16/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Friday
Reset #1N	ft	2.00	2.00	2.00	2.01	2.01	2.01
Reset #1S	ft	2.00	2.01	2.01	2.02	2.01	2.01
Reset #1A	ft	2.06	2.07	2.08	2.10	2.09	2.09
Reset #2	ft	2.06	2.09	2.10	2.11	2.11	2.11
#3N	ft	2.09	2.09	2.09	2.09	2.09	2.10
#3S	ft	2.15	2.18	2.19	2.20	2.18	2.09
#4	ft	2.04	2.04	2.04	2.05	2.05	2.05
#5	ft	2.08	2.09	2.09	2.10	2.09	2.09
#6	ft	6.23	6.22	6.22	6.22	6.20	Gone

		11/19/2007	11/21/2007	11/23/2007	11/26/2007	11/28/2007	11/30/2007
Crack	Units	Monday	Wednesday	Friday	Monday	Wednesday	Friday
Reset #1N	ft	2.01	2.02	2.02	2.02	2.00	2.00
Reset #1S	ft	2.01	2.02	2.02	2.02	2.00	2.00
Reset #1A	ft	2.09	2.11	2.12	2.11	2.09	2.09
Reset #2	ft	2.11	2.13	2.13	2.13	2.11	2.11
#3N	ft	2.11	2.09	2.09	2.09	2.09	2.09
#3S	ft	2.09	2.20	2.21	2.21	2.20	2.20
#4	ft	2.06	2.05	2.05	2.05	2.06	2.05
#5	ft	2.08	2.10	2.10	2.10	2.10	2.10
#6	ft	Gone	Gone	Gone	Gone	Gone	Gone

COUNTYWIDE RDF

88Ac. Crack Monitoring

		12/5/2007	12/7/2007	12/10/2007	12/12/2007	12/14/2007	12/17/2007
Crack	Units	Wednesday	Friday	Monday	Wednesday	Friday	Monday
Reset #1N	ft	2.00	2.00	2.00	2.00	2.01	2.01
Reset #1S	ft	2.00	2.00	2.00	2.00	2.00	2.00
Reset #1A	ft	2.10	2.10	2.10	2.11	2.11	2.11
Reset #2	ft	2.11	2.11	2.11	2.11	2.11	2.13
#3N	ft	2.09	2.10	2.11	2.11	2.11	2.11
#3S	ft	2.22	2.22	2.22	2.22	2.22	2.23
#4	ft	2.05	2.05	2.05	2.05	2.05	2.05
#5	ft	2.11	2.11	2.11	2.11	2.11	2.11
#6	ft	Gone	6.00	6.00	6.01	6.01	6.01

		12/19/2007	12/21/2007	12/26/2007	12/28/2007	1/2/2008	1/4/2008
Crack	Units	Wednesday	Friday	Wednesday	Friday	Wednesday	Friday
Reset #1N	ft	2.01	2.01	2.01	2.01	2.01	2.01
Reset #1S	ft	2.01	2.01	2.01	2.01	2.02	2.05
Reset #1A	ft	2.11	2.10	2.11	2.11	2.11	2.10
Reset #2	ft	2.13	2.13	2.13	2.13	2.14	2.14
#3N	ft	2.11	2.11	2.11	2.11	2.11	2.08
#3S	ft	2.23	2.23	2.24	2.25	2.25	2.09
#4	ft	2.05	2.04	2.04	2.05	2.05	2.06
#5	ft	2.12	2.10	2.10	2.11	2.10	2.13
#6	ft	6.02	6.02	6.02	6.02	6.02	6.02

		1/7/2008	Cumulative
Crack	Units	Monday	Movement
Reset #1N	ft	2.01	0.09
Reset #1S	ft	2.05	0.15
Reset #1A	ft	2.11	0.18
Reset #2	ft	2.14	0.22
#3N	ft	2.08	0.08
#3S	ft	2.18	0.15
#4	ft	2.06	0.06
#5	ft	2.13	0.13
#6	ft	6.03	0.23

		1/9/2008	1/11/2008	Cumulative
Crack	Units	Wednesday	Friday	Movement
Reset #1N	ft	3.00	3.00	0.09
Reset #1S	ft	3.00	3.01	0.16
Reset #1A	ft	3.00	3.00	0.18
Reset #2	ft	3.00	3.00	0.22
#3N	ft	2.08	2.07	0.07
#3S	ft	2.18	2.19	0.16
#4	ft	2.06	2.07	0.07
#5	ft	2.13	2.13	0.13
#6	ft	6.03	6.04	0.24

= monitors were reset to 2.00 due to construction activities.
 The cumulative movement shown is the total of cumulative movement observed prior to, and after resetting the monitors.

COUNTYWIDE RDF

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 = monitors were reset to 6.00 due to construction activities.
The cumulative movement shown is the total of
cumulative movement observed prior to, and after resetting the monitors.

 = monitors were reset to 3.00 due construction.
The cumulative movement shown is the total of
cumulative movement observed prior to, and after resetting the monitors.