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October 18, 2016

David Lastovka, P.E.
ODOT District 12 Transportation Engineer
Ohio Department of Transportation
5500 Transportation Boulevard
Garfield Heights, Ohio 44125-5396

E-mail to: Dave.Lastovka@dot.state.oh.us

Re: September 22, 23, 26, and 27, 2016 Bi-Weekly Readings
CUY-90-15.24 Slope Monitoring
PID 96504
SME Project No. 069032.00

Dear Mr. Lastovka:

Bi-weekly instrument readings for the I-90 west slope taken on September 22, 23, 26, and 27, 2016, are presented in this report. Bi-weekly readings currently include instruments at I/P-001-13, I/P-002-13, I/P-003-10, I/P-004-13, I/P-009-13, B-101, B-102, B-105A, B-05-02, B-05-A-03, B-05-04, B-05-A-11, P-1, P-9N, and TGR I-4. Changes reported for the individual instruments are for the previous two-week period unless noted otherwise.

Piezometer Readings

P-001-13 – Pore pressure readings at this location indicate increases in total head ranging from 1.1 to 1.5 feet. The magnitude of the increase increases with depth except for the deepest piezometer which only increased by 0.2 feet.

P-002-13 – The multichannel logger at this location, which tracks the five shallow piezometers, failed to respond during our attempts to download data. We are currently working to fix this issue by updating the firmware. If this fails, we will send the logger to the manufacturer for repair. Pore pressures in the deep piezometer show virtually no change in total head.

P-003-10 – Pore pressure readings in the three shallowest piezometers at this location indicate total head increases of less than 0.5 feet. Total head in the four deeper piezometers decreased by amounts ranging from 0.3 to 1.2 feet. The largest decrease occurred at 98 feet.

P-004-13 – Total head in the shallow piezometer at this location increased by about 0.5 feet. Total head in the deep piezometer has remained virtually constant since its installation.

P-009-13 – We were unable to download data from the data logger attached to the shallow piezometer. We communicated with the manufacturer and attempted to update the firmware in the data logger. This did not resolve the issue. It appears that the firmware is corrupted. We are sending the data logger to the manufacturer to repair this issue. Pore pressures in the deep piezometer show virtually no change in total head.

B-105A – Total head in the shallow piezometer at this location continued to decrease for the first half of this recording cycle, then became virtually constant for the remainder. From August 13 to September 17, 2016, the total head in this piezometer decreased by 0.9 feet. Pore pressures in the deep piezometer show virtually no change.

B-05-02 – Pore pressure readings in the deep piezometer at this location indicate an increase in total head of 0.3 feet. Total head in this piezometer has been increasing since February 2016. Due to an issue with the data logger, we were not able to download data for the shallow piezometer this week. This was due to a faulty battery which has now been replaced.

B-05-A-03 – At this location, pore pressure readings indicate an increase in total head of 0.3 feet in the shallow piezometer and 0.6 feet in the deep piezometer.

B-05-04 – Pore pressure readings indicate an increase in total head of 0.5 feet in the shallow piezometer and 0.2 feet in the deep piezometer. Total head in the shallow piezometer has been increasing since the beginning of August 2016.

B-05-A-11 – Pore pressure readings at this location indicate a continued increase in total head in both piezometers at this location. Total head has increased by 1.8 feet in the shallow piezometer and 1.3 feet in the deep piezometer since July 9, 2016.

Inclinometer Readings

Inclinometer readings at I-001-13, I-002-13, I-004-13, I-009-13, B-101, B-102, B-105A, B-05-02, B-05-A-03, B-05-04, P-1, P-9N, and TGR I-4 showed virtually no movement. Displacement at the top of some slope tubes is due to surface disturbance adjacent to the installation or flexing of the inclinometer tube as readings were taken in instances where the protective covers have not yet been concreted in place because of the ongoing construction activity.

I-003-10 – Data from our reading at this location shows large checksums and does not plot properly. Therefore, we have omitted the plot from this report. On our next reading date, we will verify the data in the field so that if errors occur, we can take additional readings.

B-05-A-11 – Concrete was placed around the instrument at this location. The contractor cut the inclinometer casing down to make the protective flush-mount cover flush with the new concrete. New baseline readings were taken.

This concludes our report of bi-weekly instrument readings. Please call or email with any questions.

Very truly yours,

SME

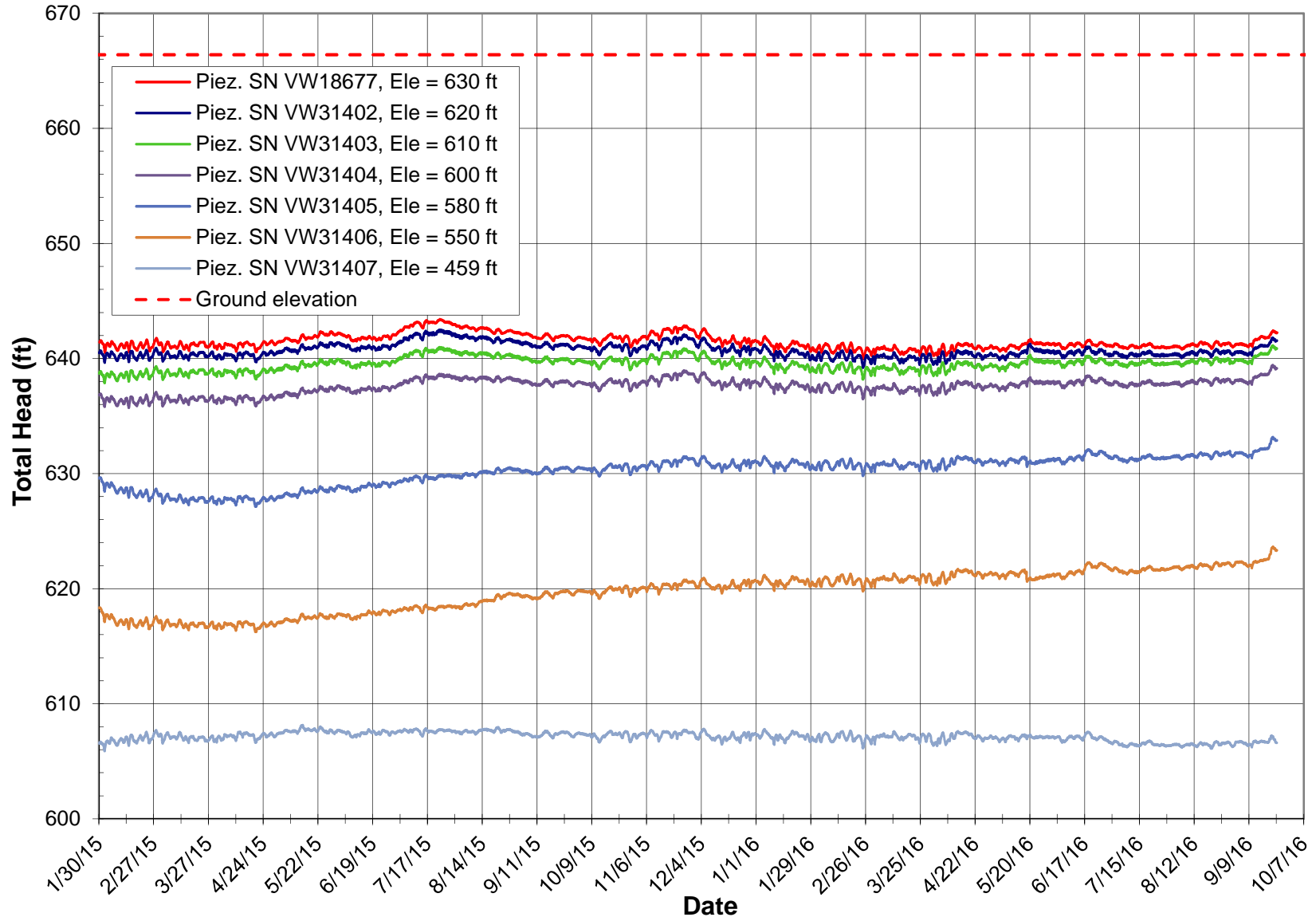
Brendan P. Lieske, P.E.
Senior Staff Engineer

Alan J. Esser, P.E., D.GE
Chief Consultant

Copies sent to distribution list.

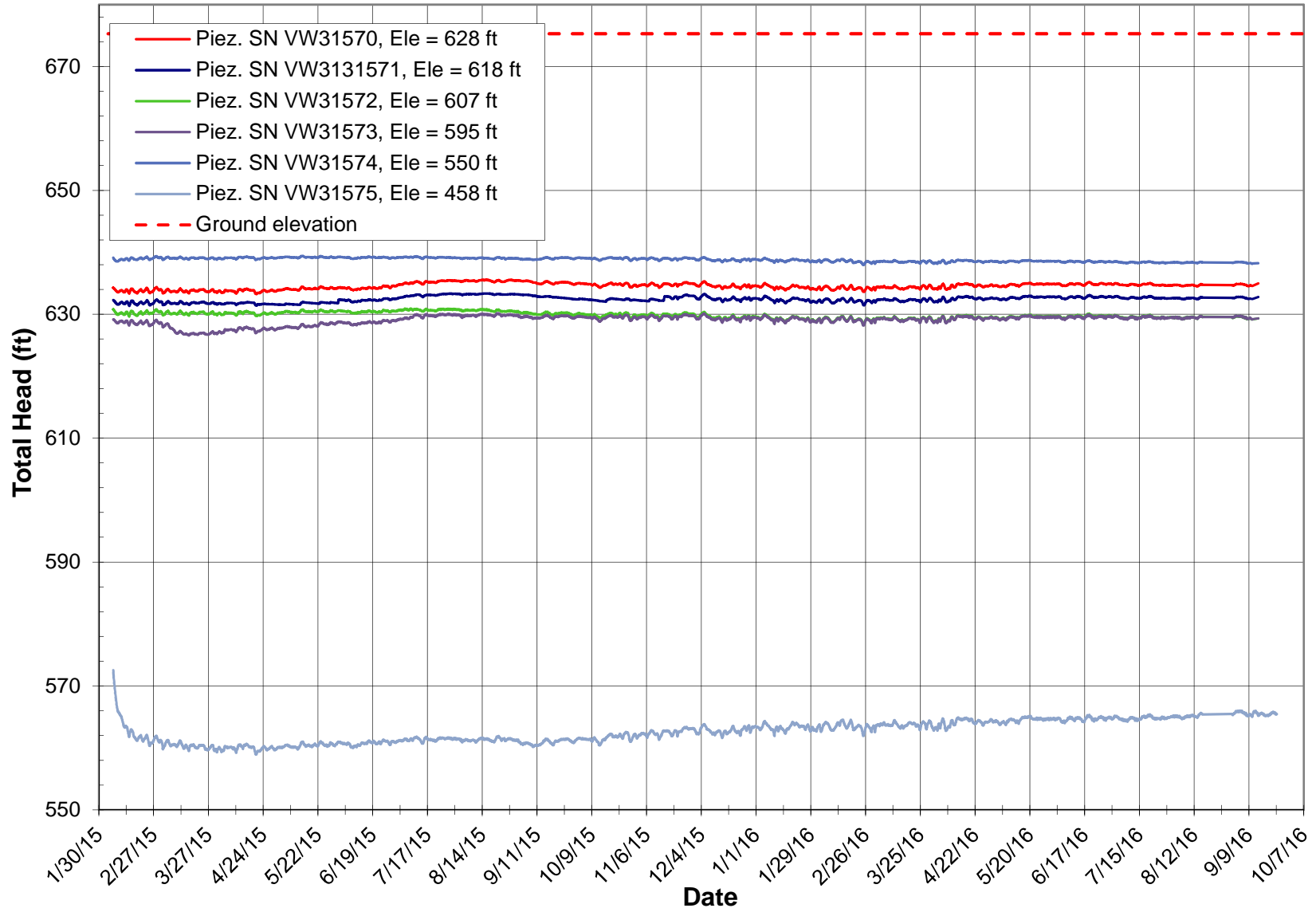
P-001-13 VW Piezometer Readings

Ground surface elevation = 666.4 ft



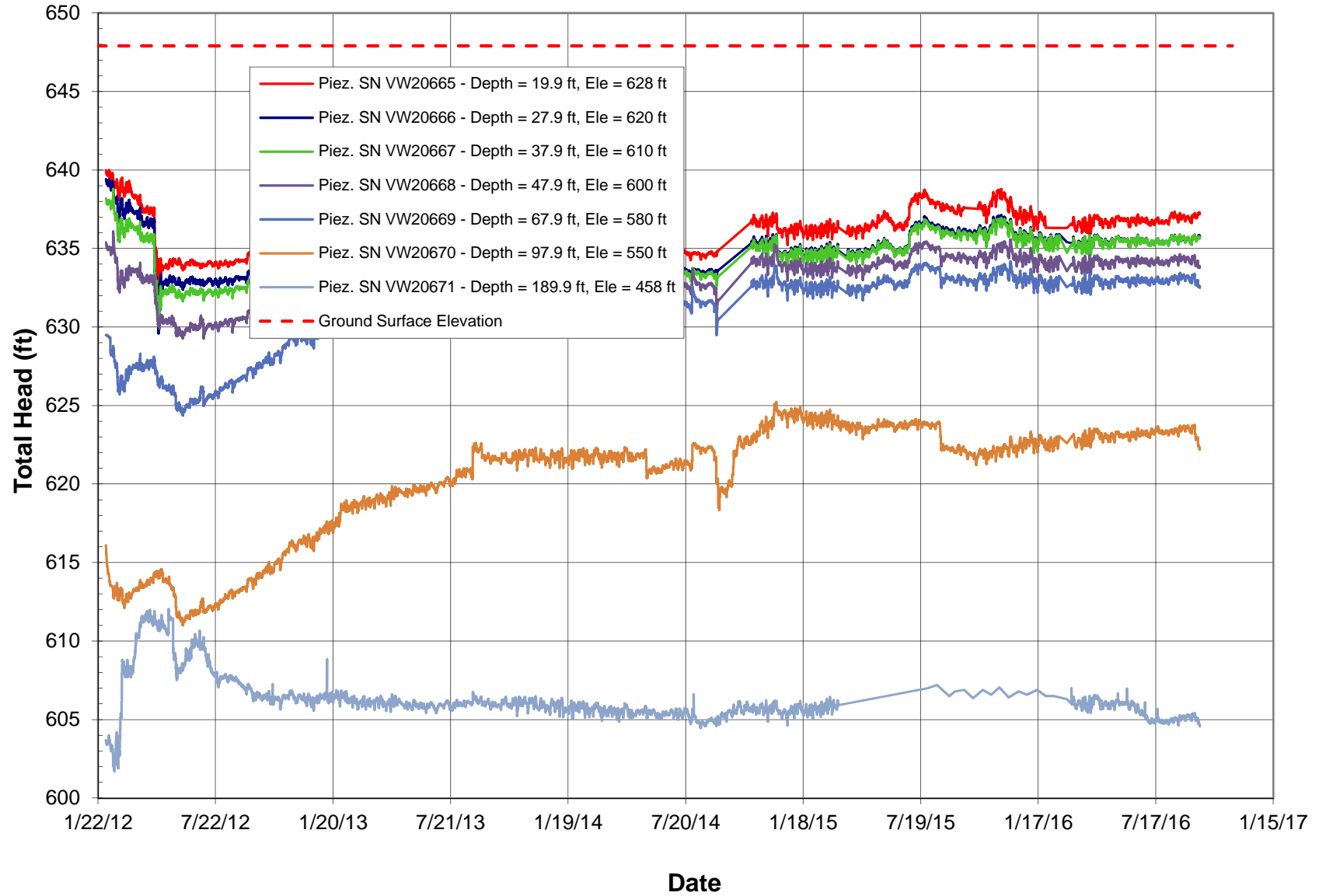
P-002-13 VW Piezometer Readings

Ground surface elevation = 675.29 ft



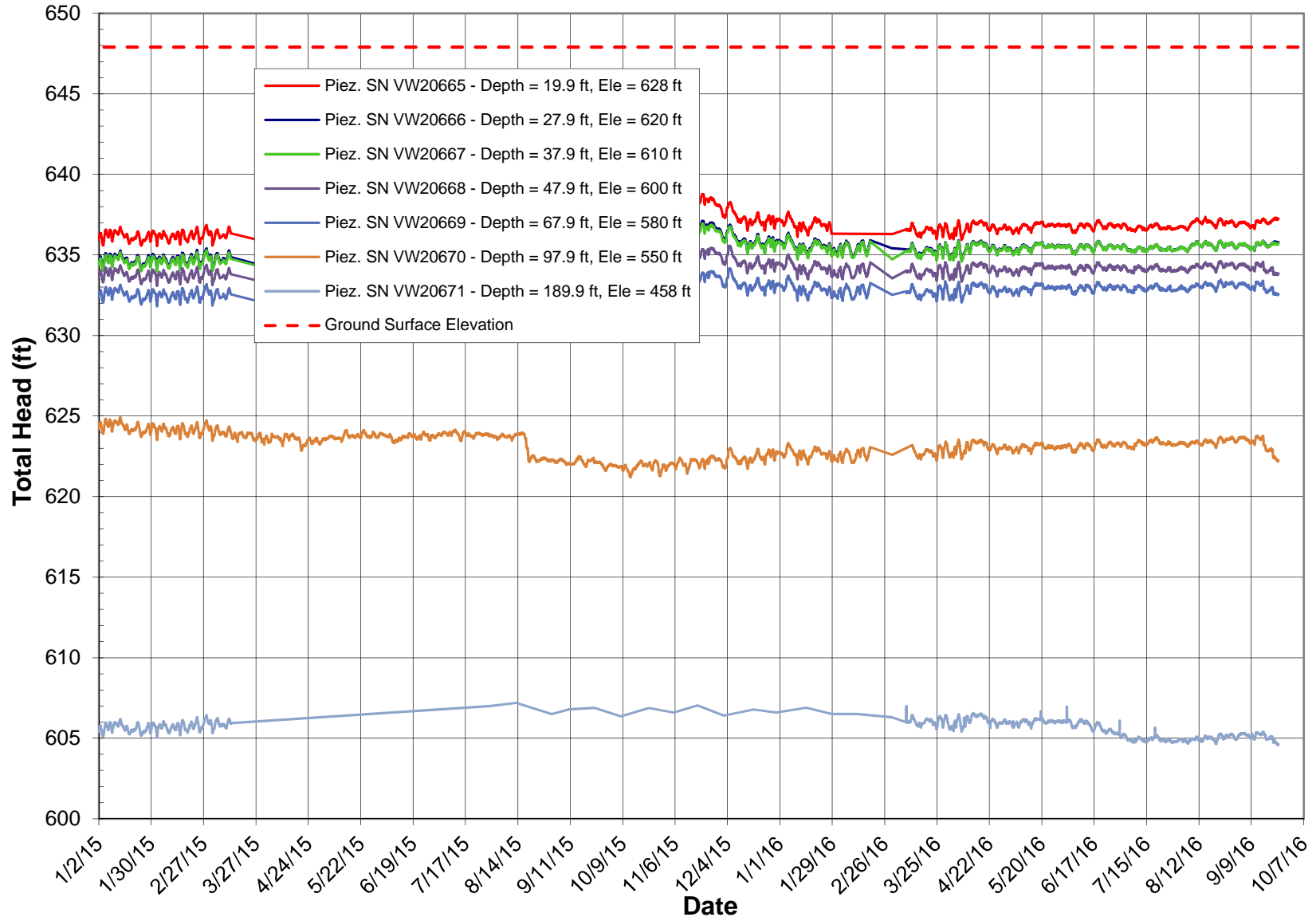
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



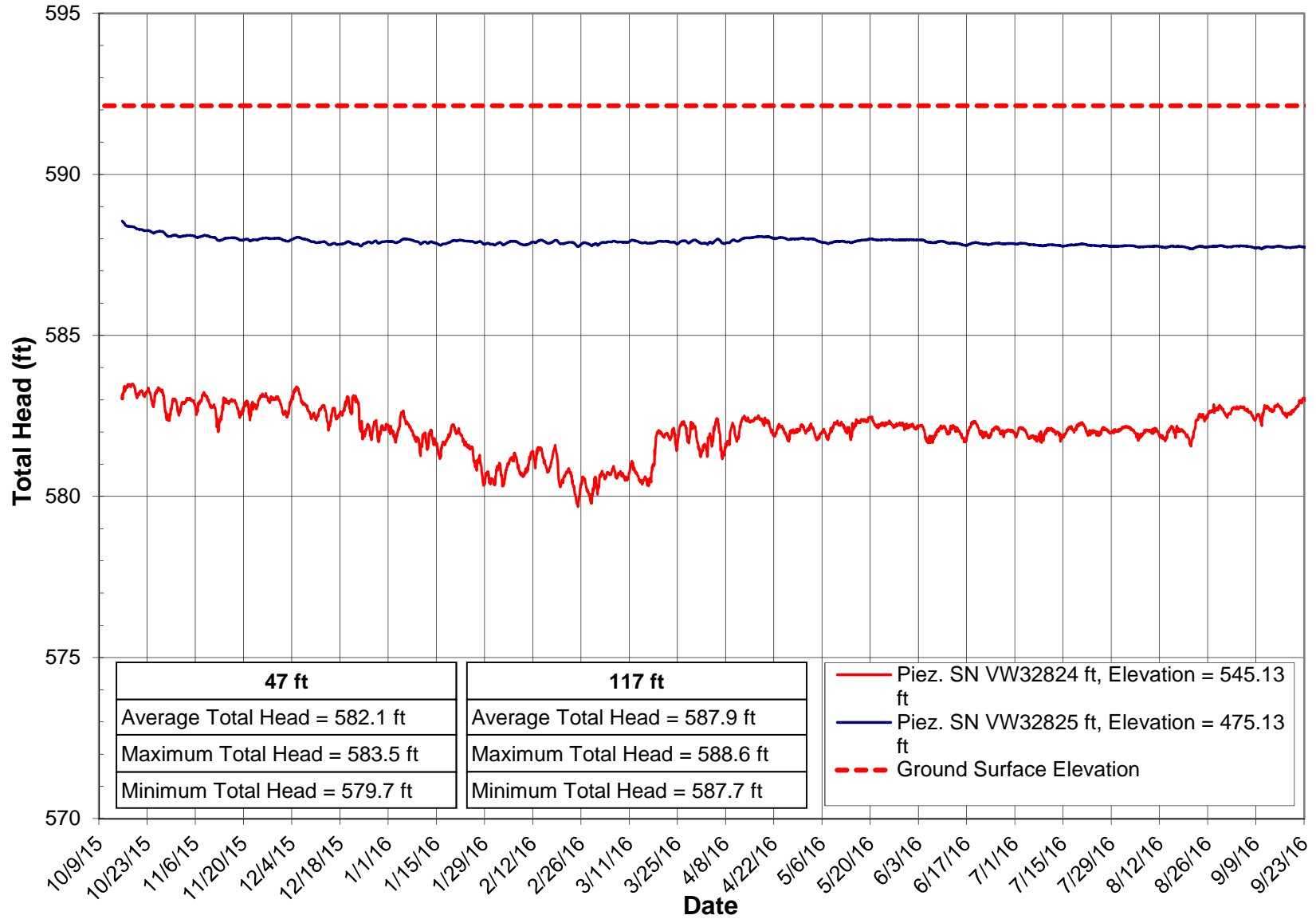
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



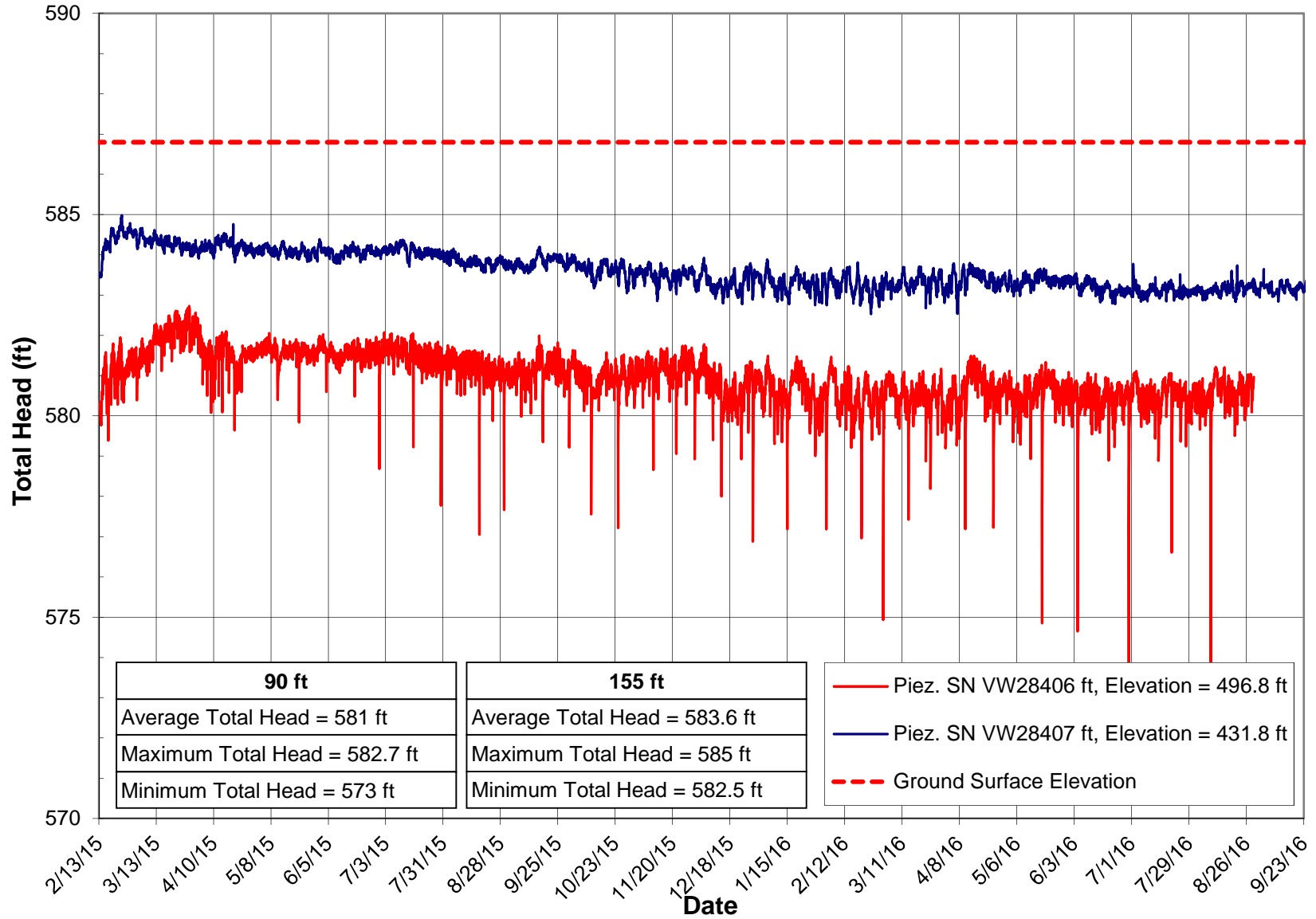
P-004-13 VW Piezometer Readings

Ground surface elevation = 592.13 ft



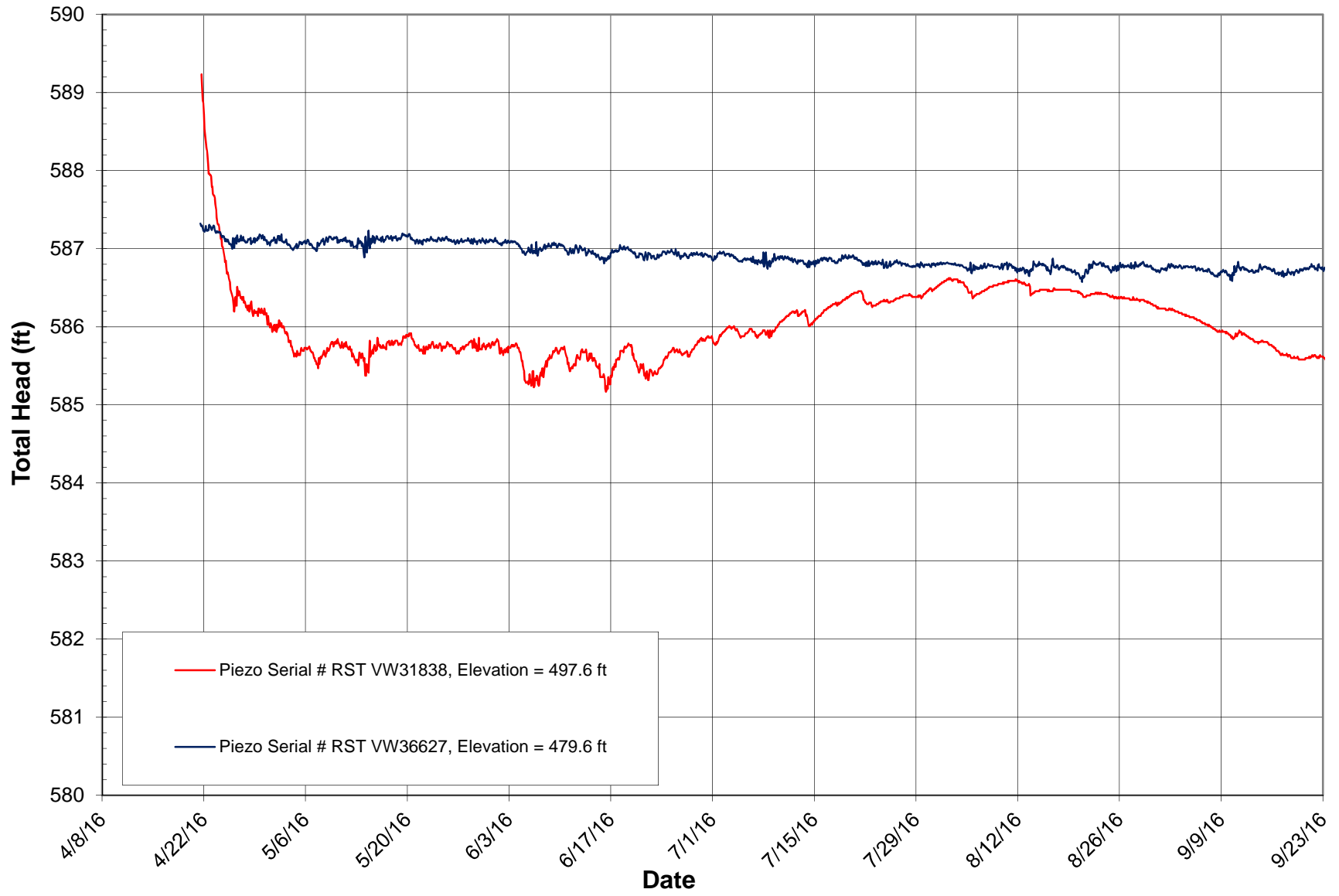
P-009-13 VW Piezometer Readings

Ground surface elevation = 586.6 ft



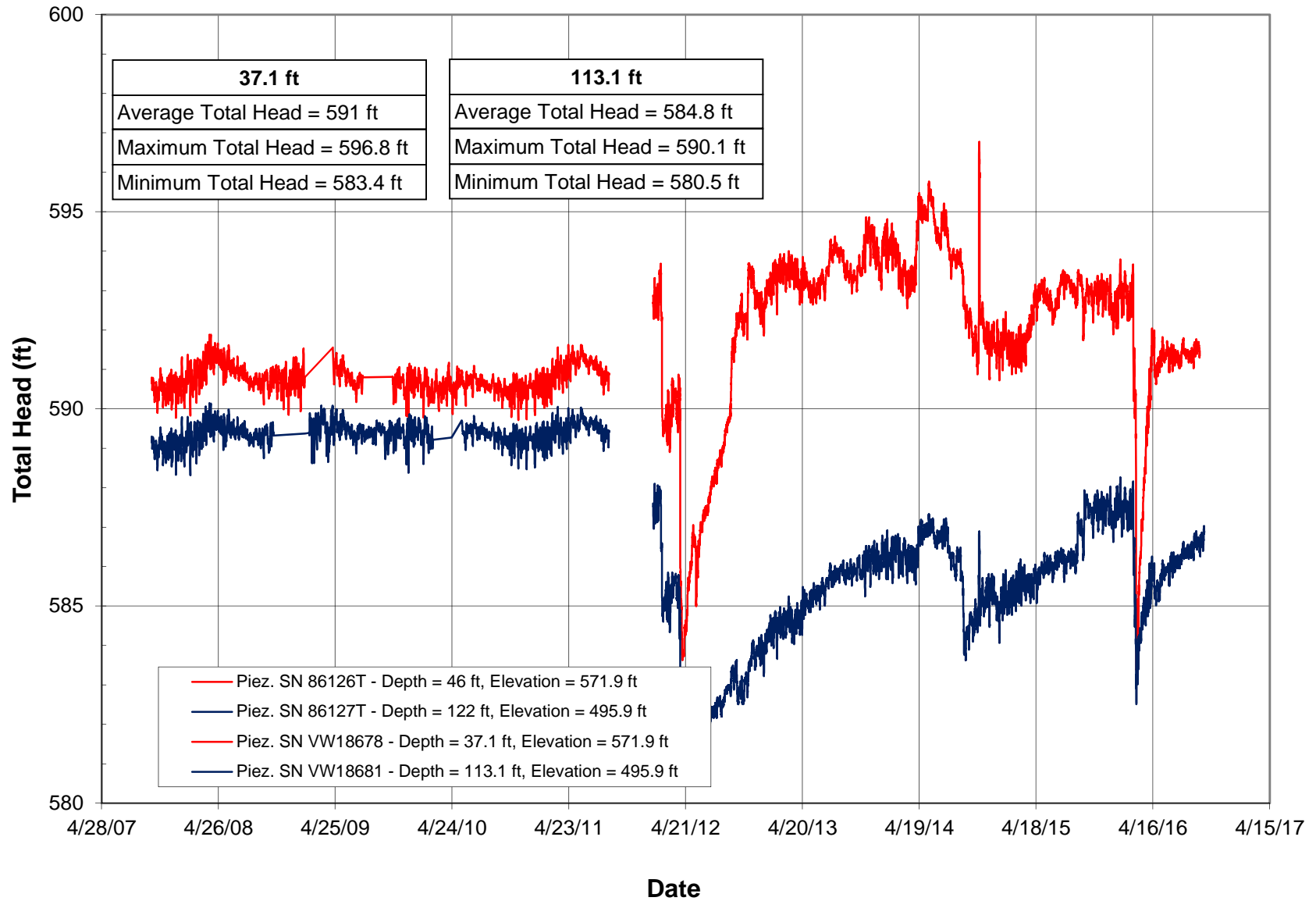
B-105A VW Piezometer Readings

Ground surface elevation = 585.6 ft



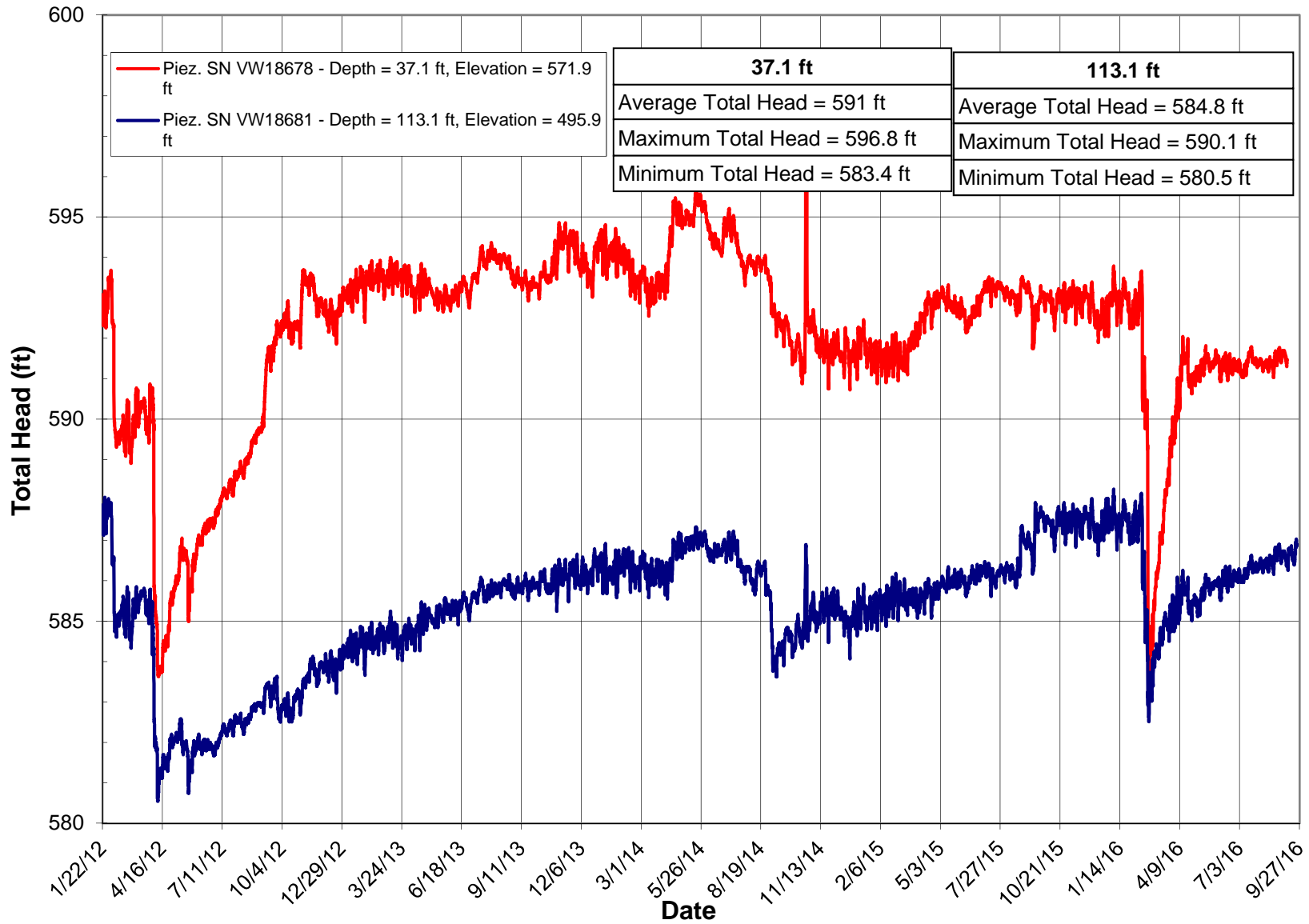
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



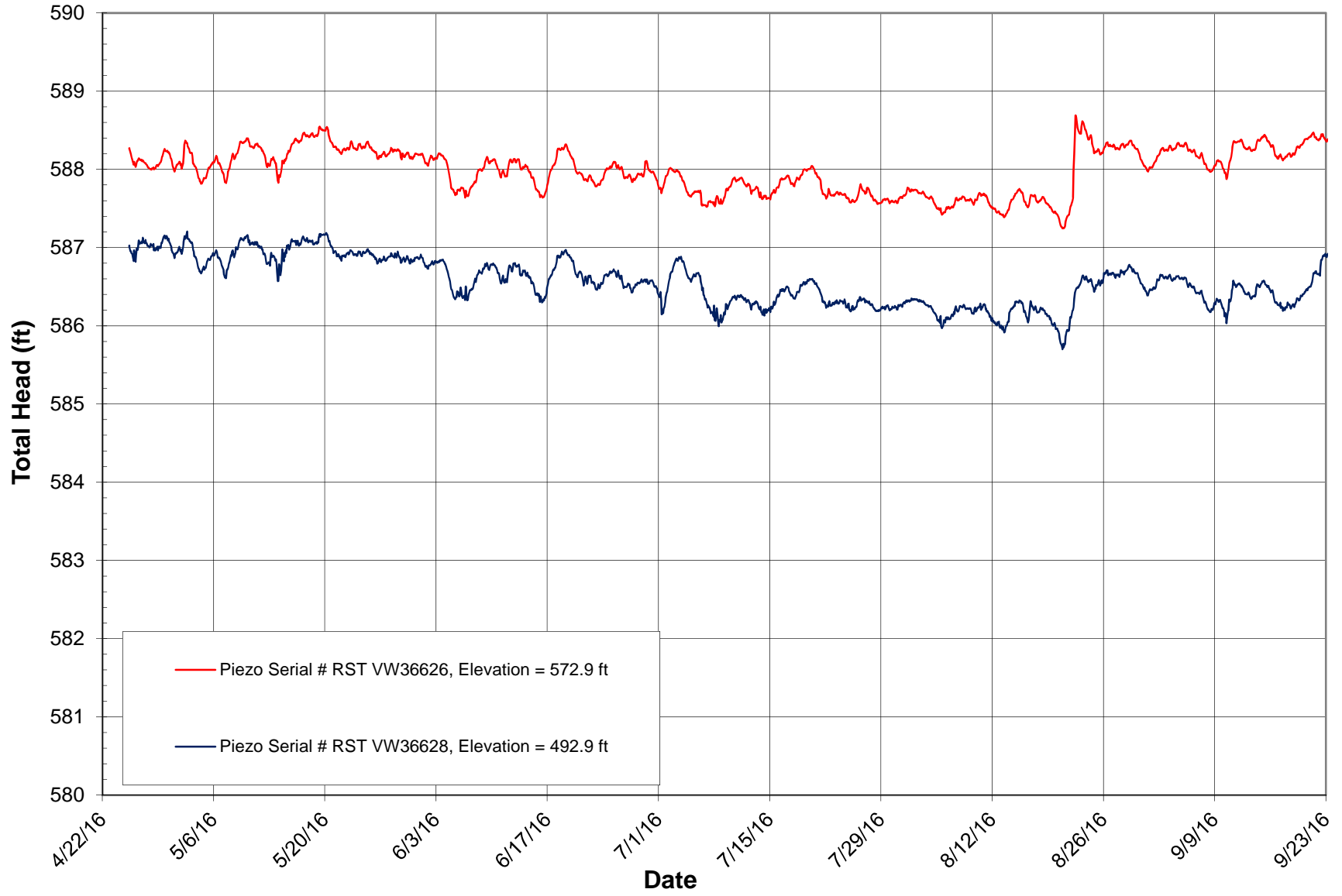
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



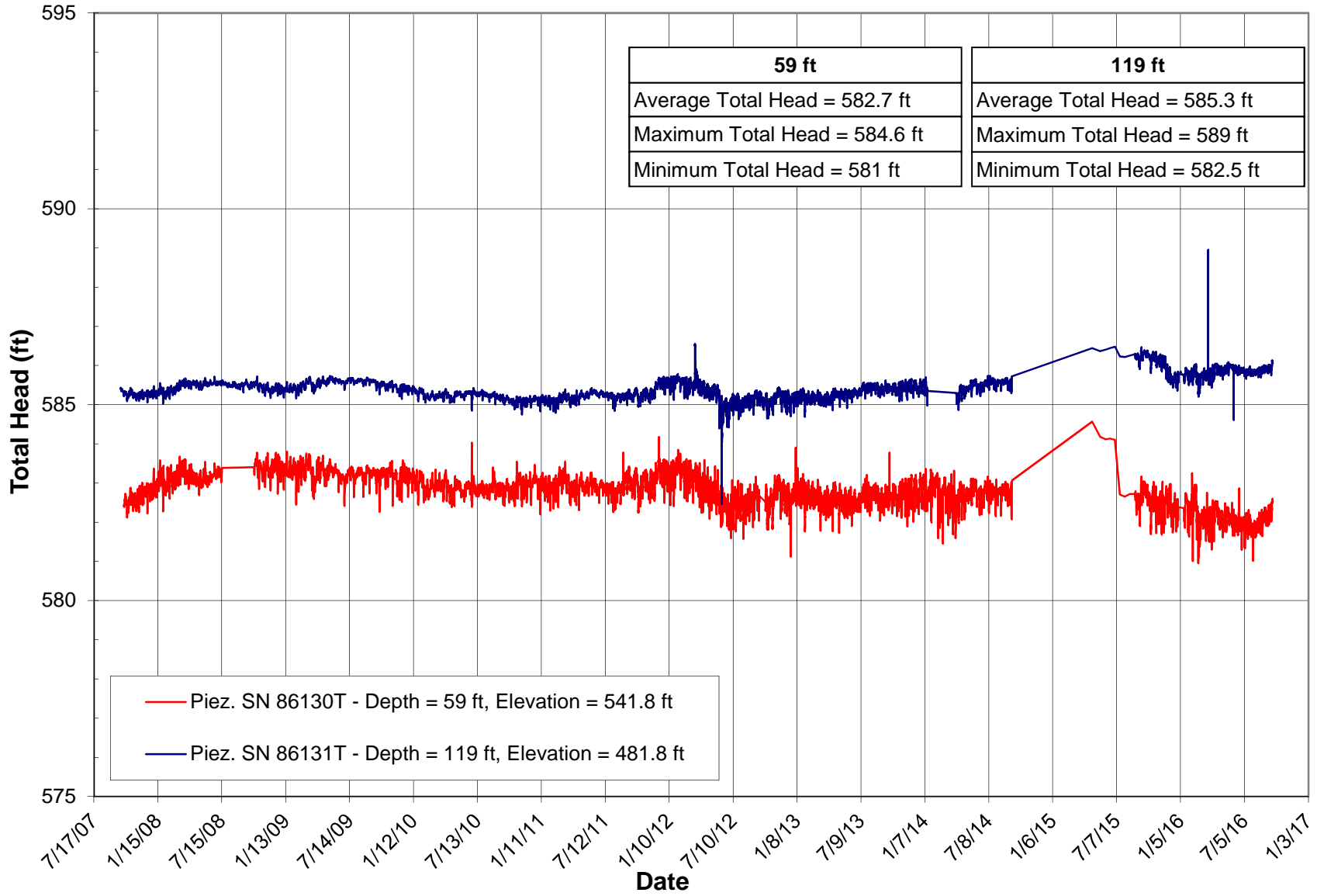
B-05-A-03 VW Piezometer Readings

Ground surface elevation = 599.9 ft



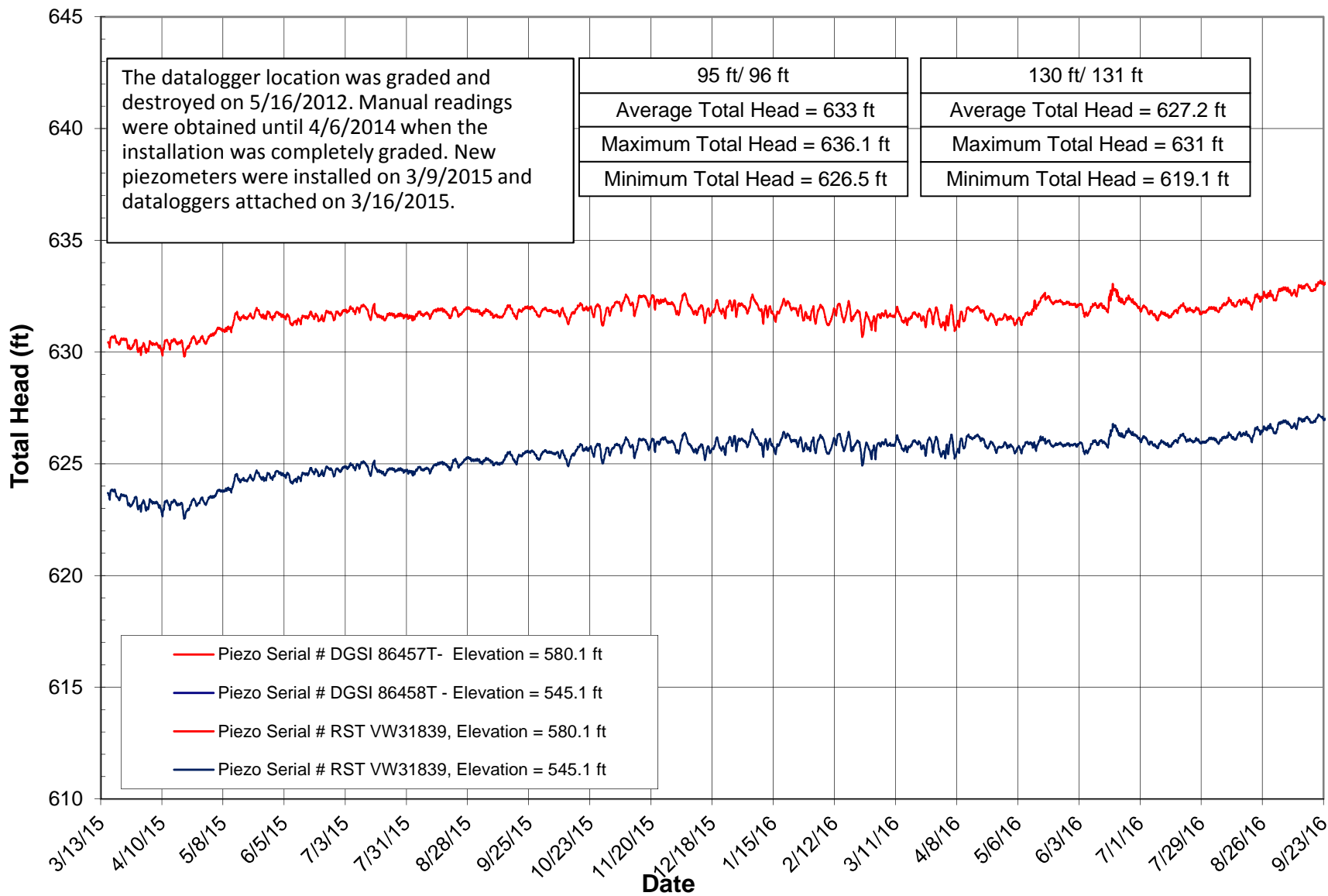
B-05-04 VW Piezometer Readings

Ground surface elevation = 600.8 ft



B-05-11/B-05-A-11 VW Piezometer Readings

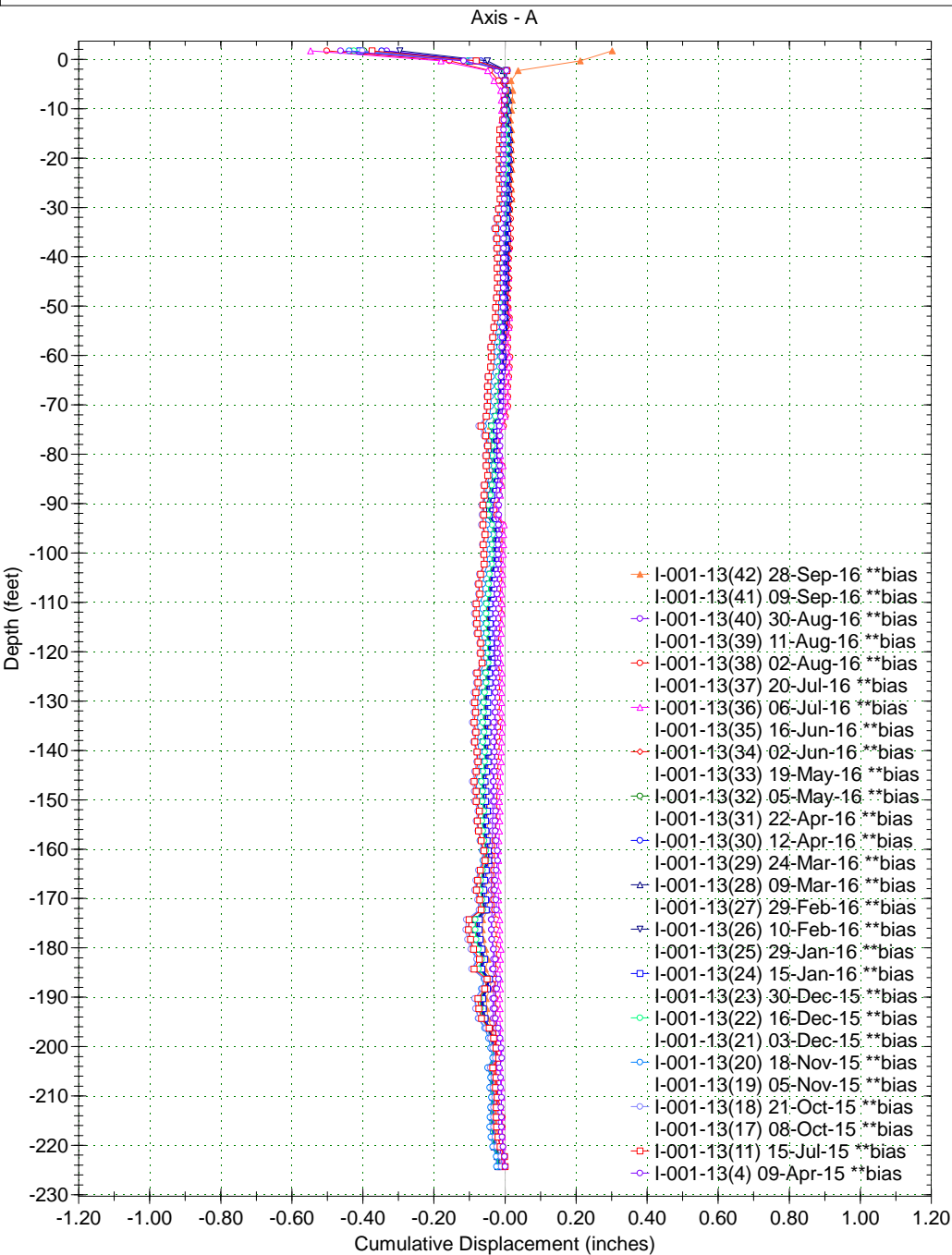
Ground surface elevation = 675.1 ft (B-05-11) / 676.1 ft (B-05-A-11)



Borehole : I-001-13
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :



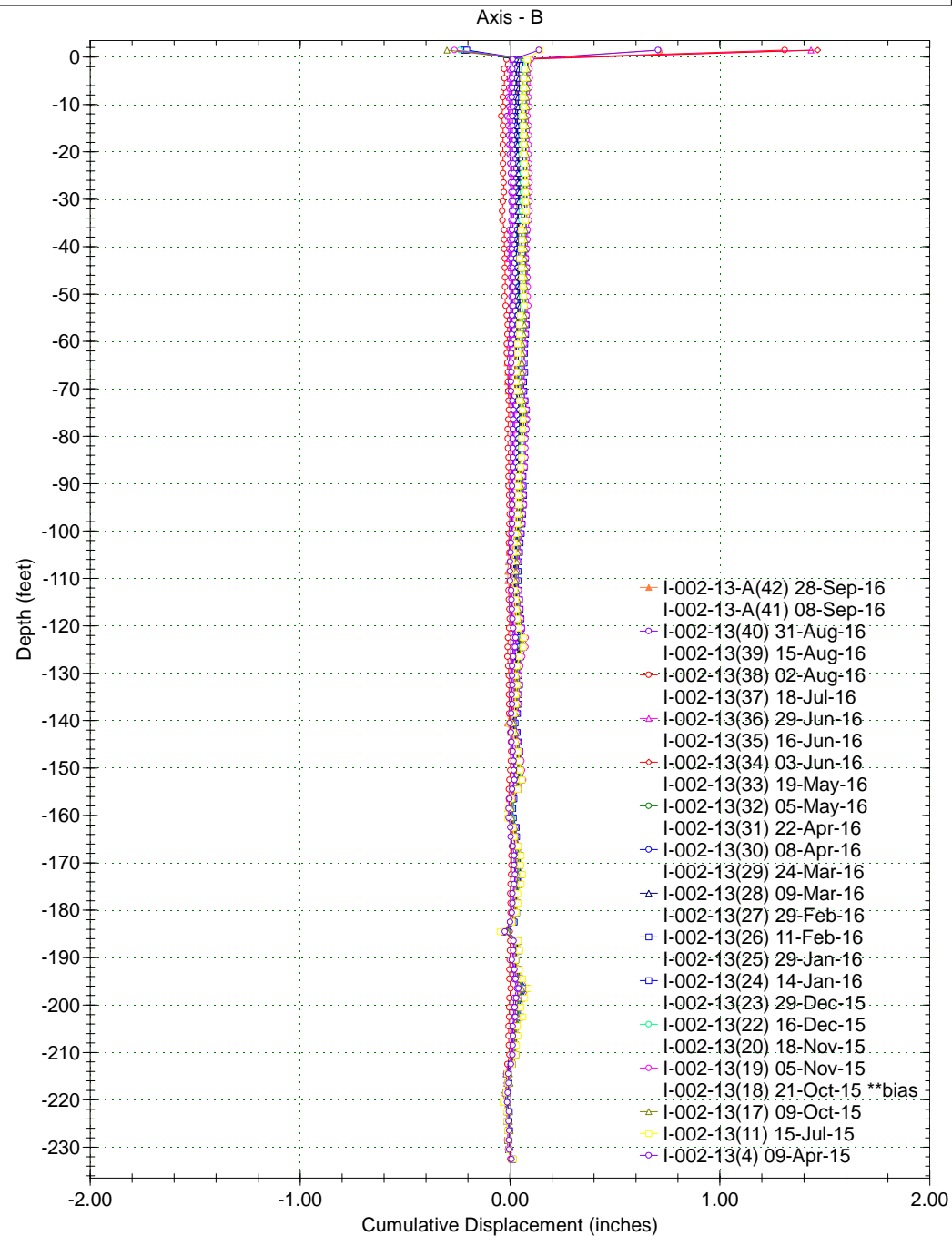
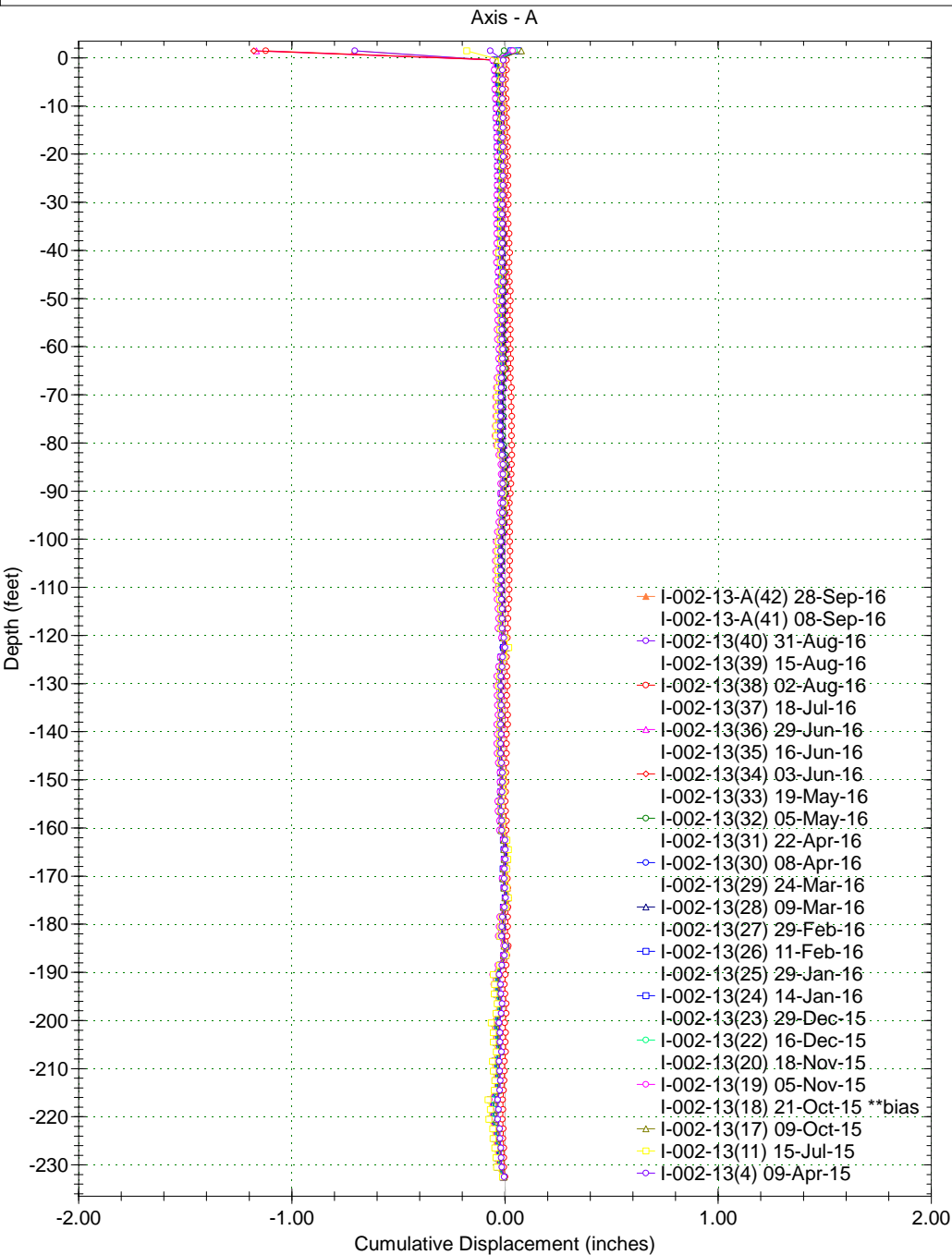
Spiral Correction : N/A
Collar Elevation : 3.7 feet
Borehole Total Depth : 228.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Mar 03 11:14
Applied Azimuth : 0.0 degrees



Borehole : I-002-13
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :



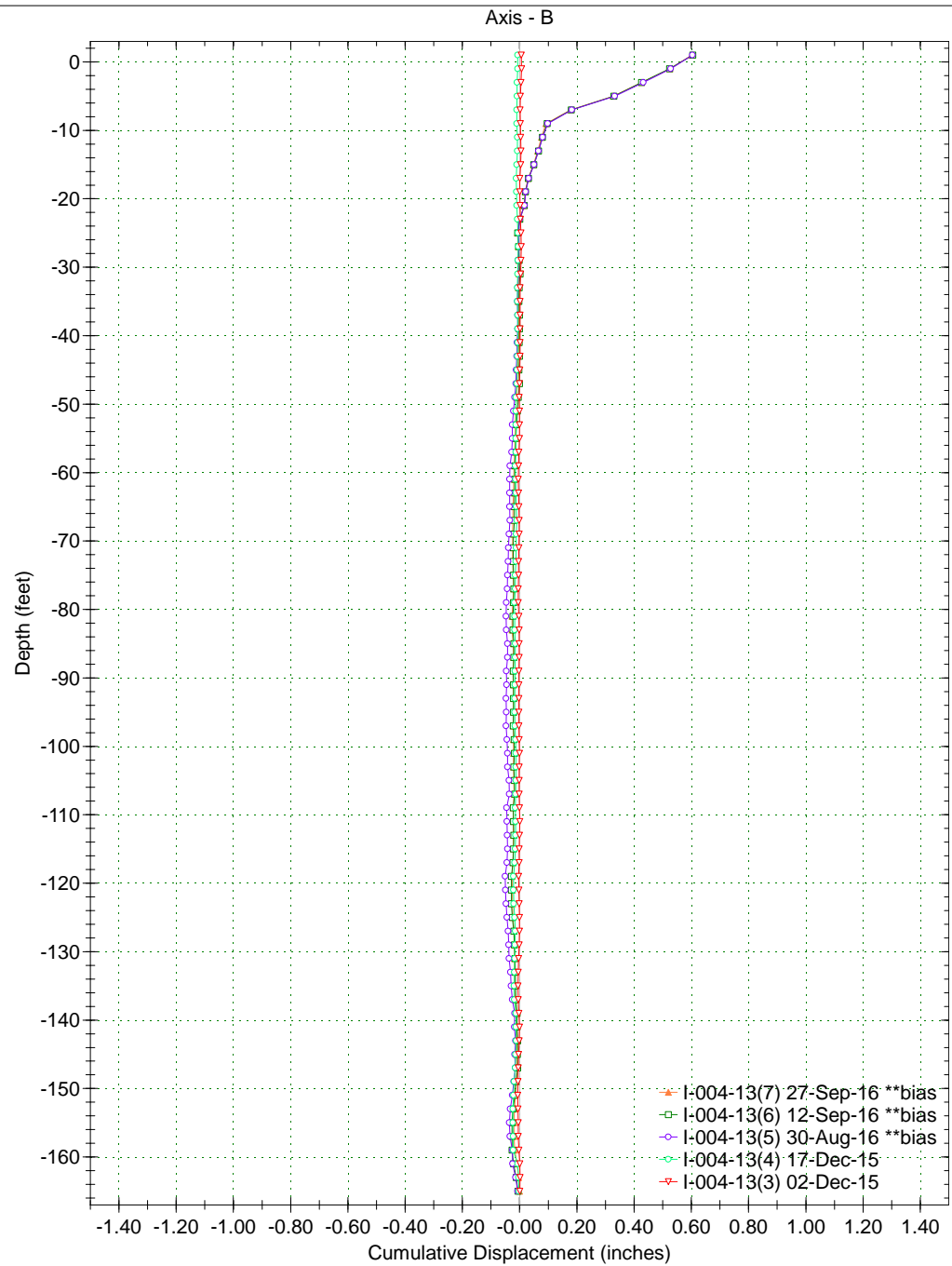
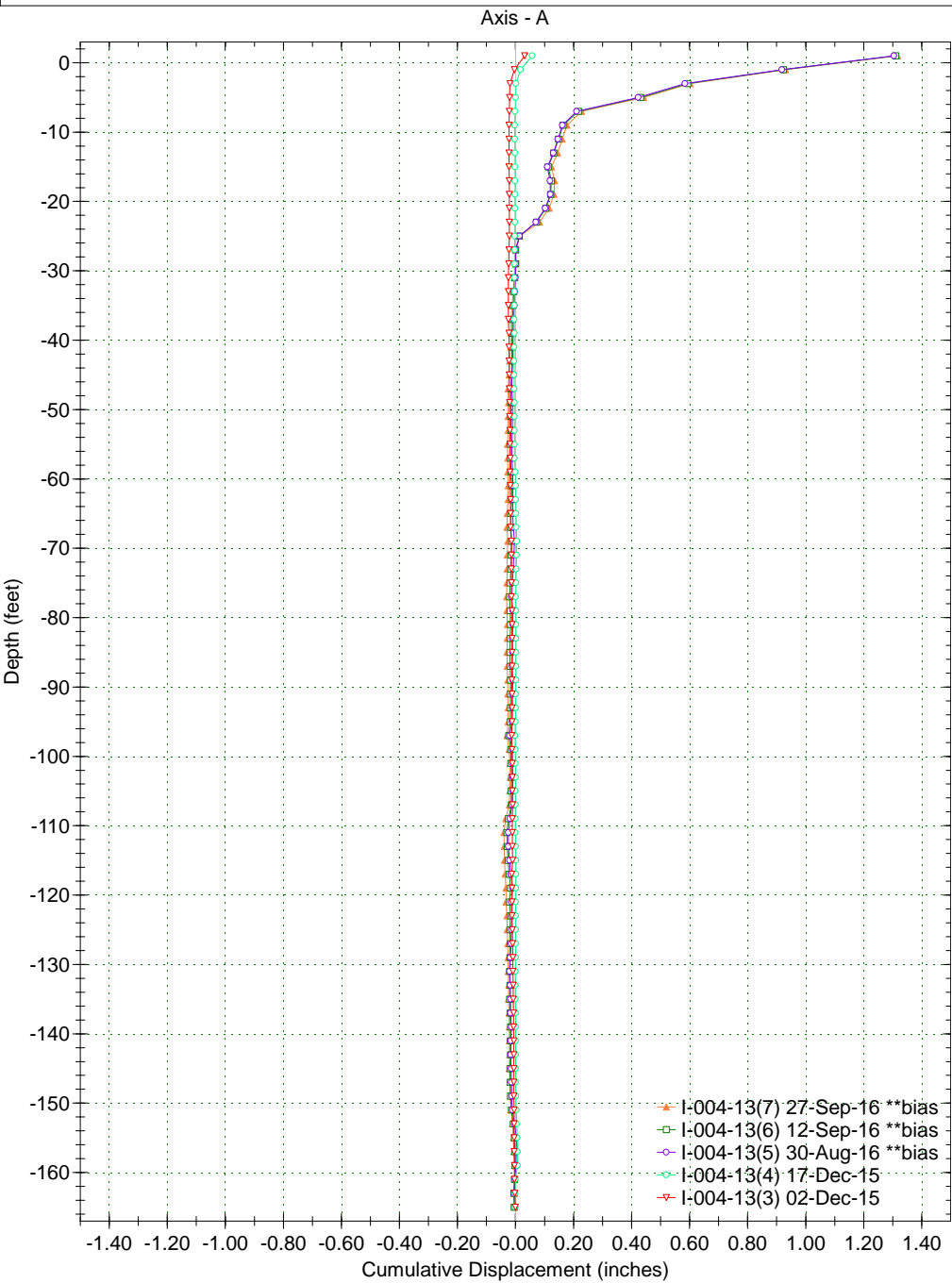
Spiral Correction : N/A
Collar Elevation : 3.5 feet
Borehole Total Depth : 236.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Mar 03 10:04
Applied Azimuth : 0.0 degrees



Borehole : I-004-13
Project : CUY-90-15-24
Location :
Northing :
Easting :
Collar :



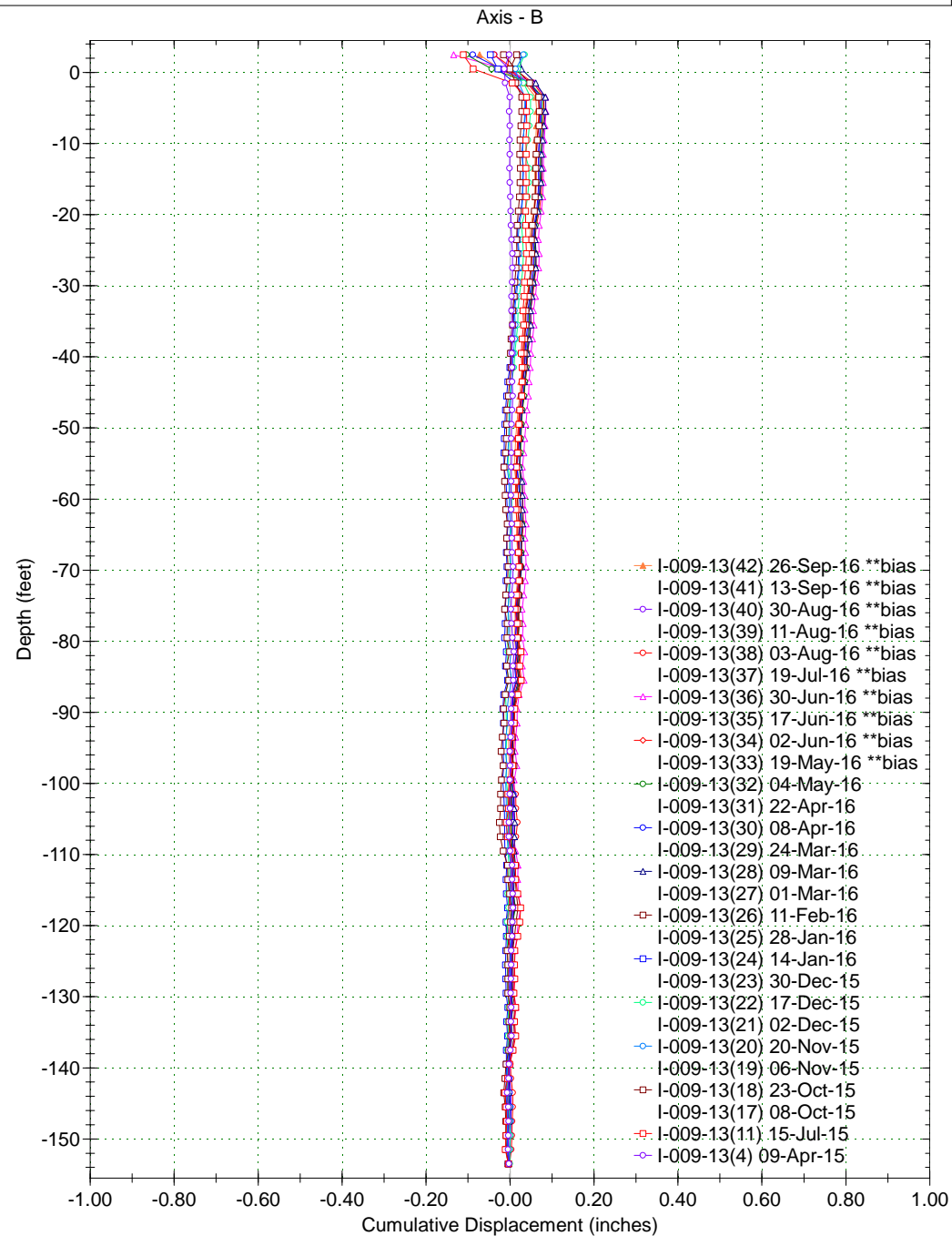
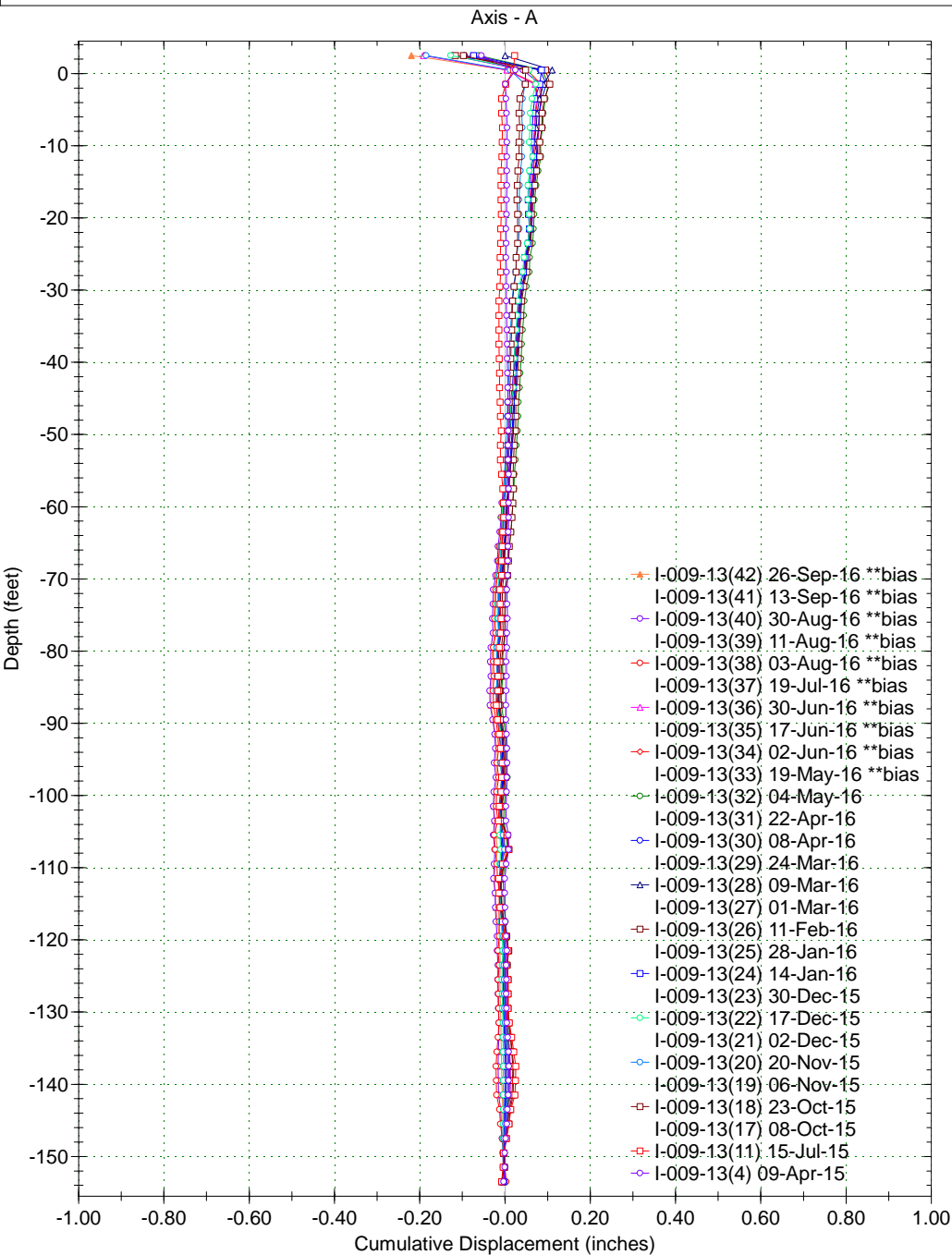
Spiral Correction : N/A
Collar Elevation : 3.0 feet
Borehole Total Depth : 168.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Nov 20 09:09
Applied Azimuth : 0.0 degrees



Borehole : I-009-13
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :



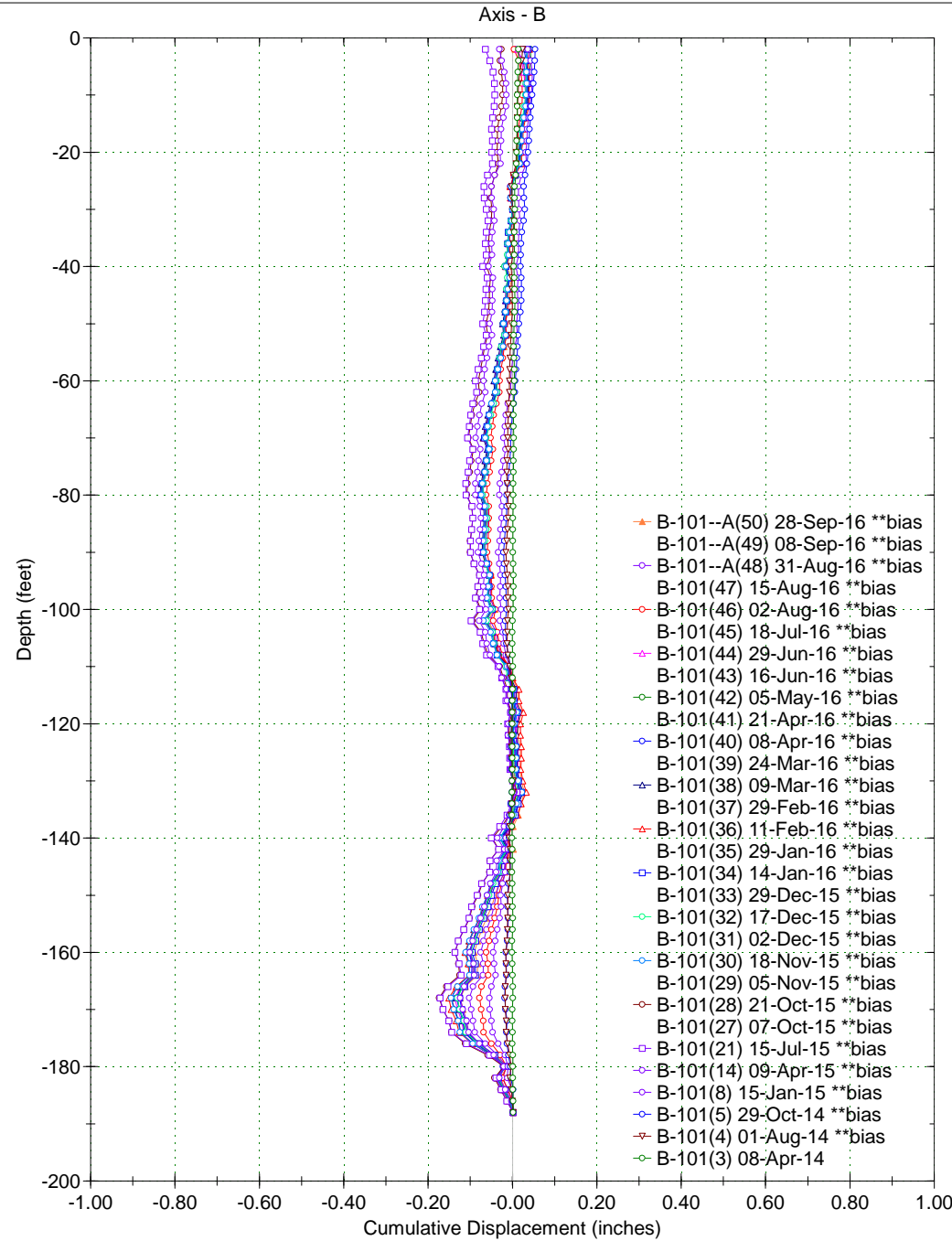
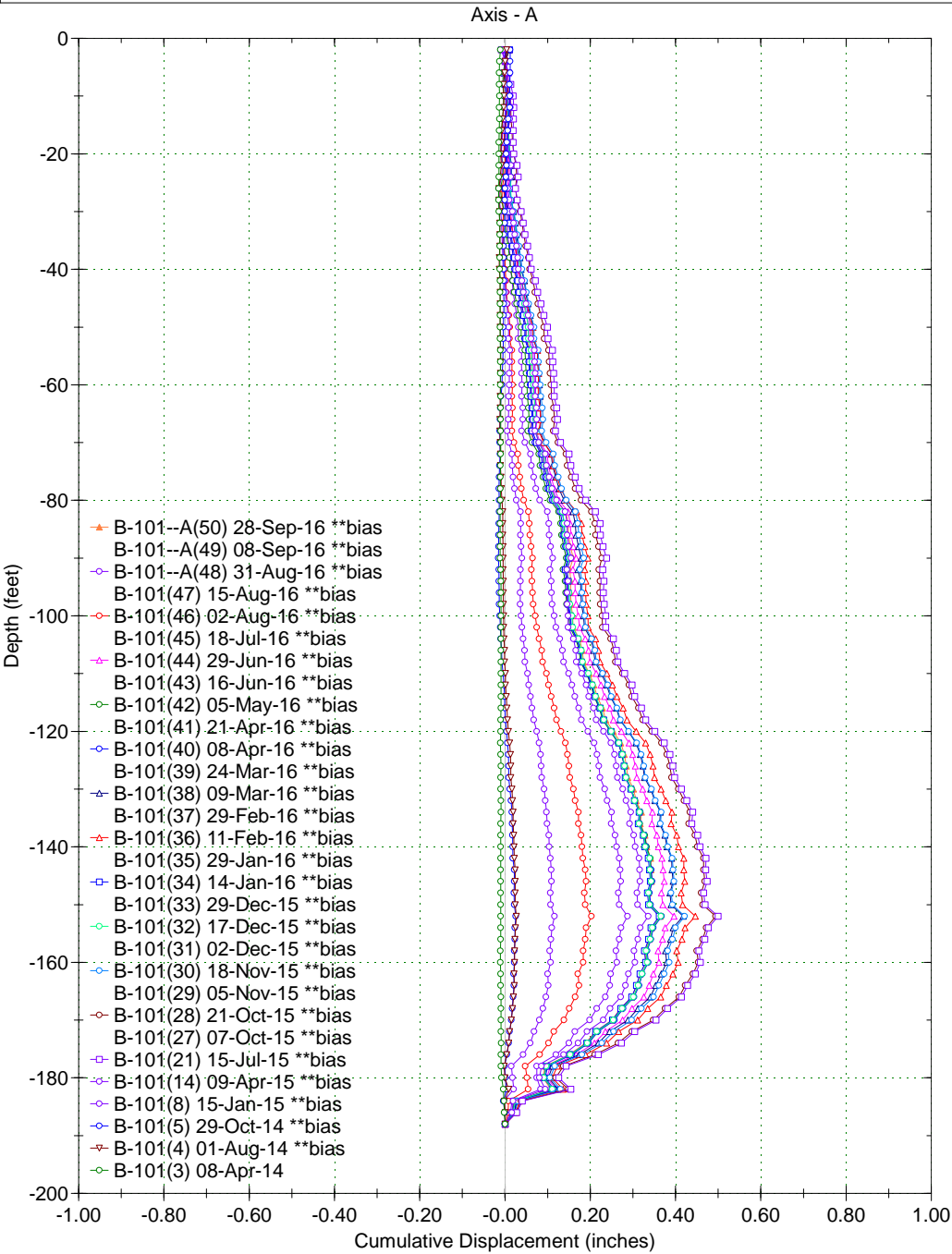
Spiral Correction : N/A
Collar Elevation : 4.5 feet
Borehole Total Depth : 158.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Mar 18 15:56
Applied Azimuth : 0.0 degrees



Borehole : B-101
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing : Sta. 15+06.50
Easting : 120.7' Rt of CL
Collar :



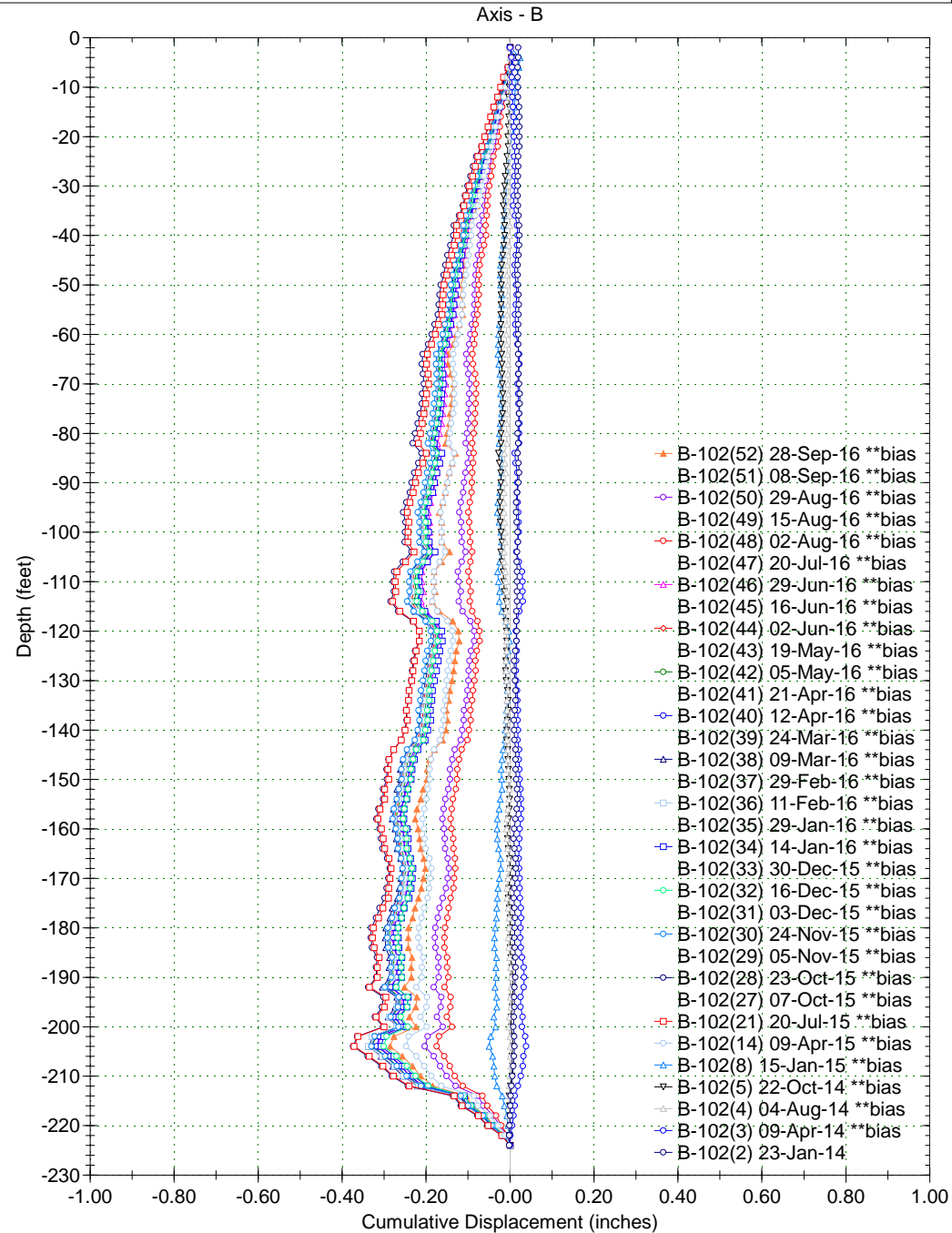
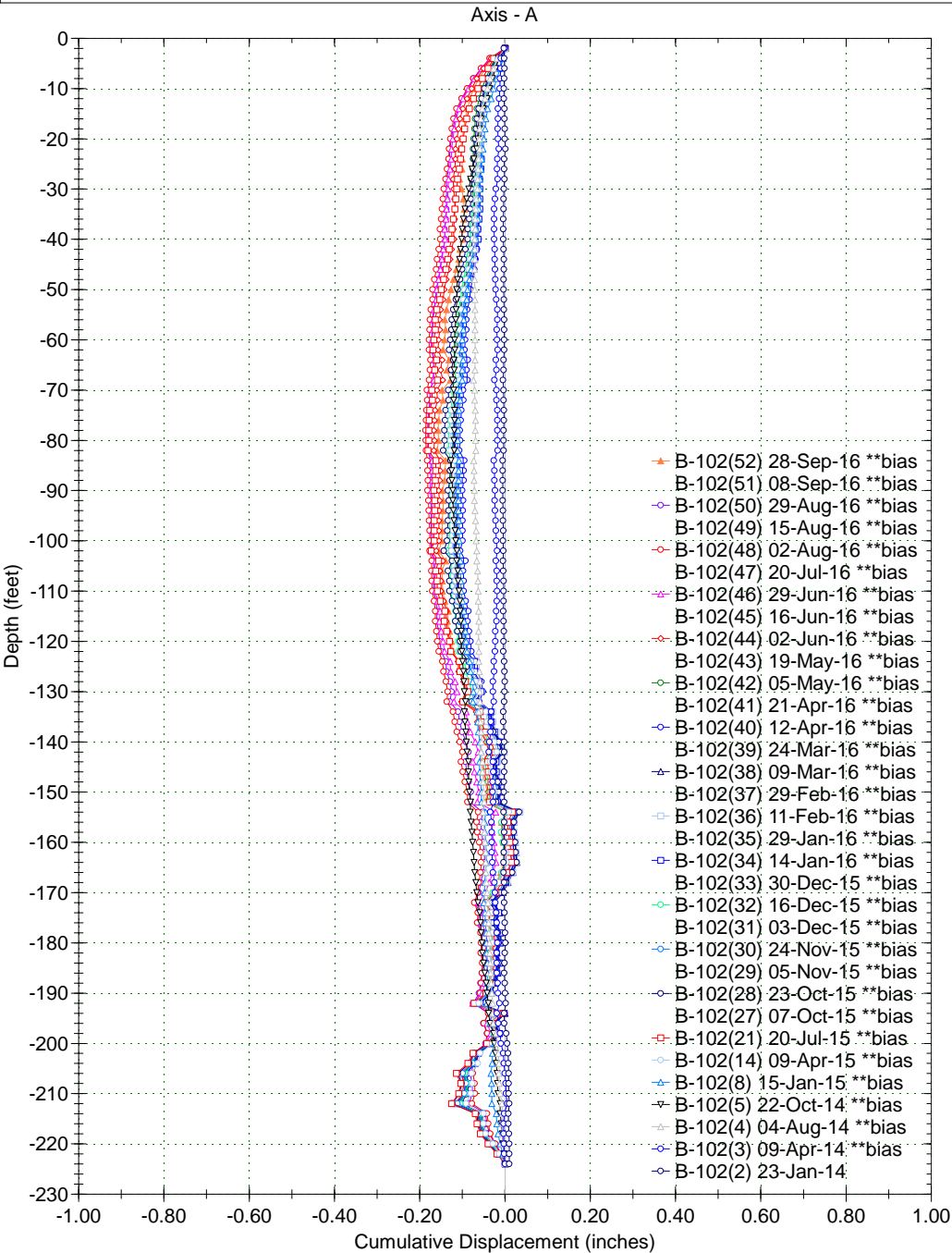
Spiral Correction : N/A
Collar Elevation : 0.0 feet
Borehole Total Depth : 188.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 22 09:01
Applied Azimuth : 0.0 degrees



Borehole : B-102
 Project : CUY-90-15-24
 Location : Cleveland, Ohio
 Northing : Sta. 15+95.34
 Easting : 134.7' Rt of CL
 Collar :



Spiral Correction : N/A
 Collar Elevation : 0.0 feet
 Borehole Total Depth : 224.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 23 08:21
 Applied Azimuth : 0.0 degrees



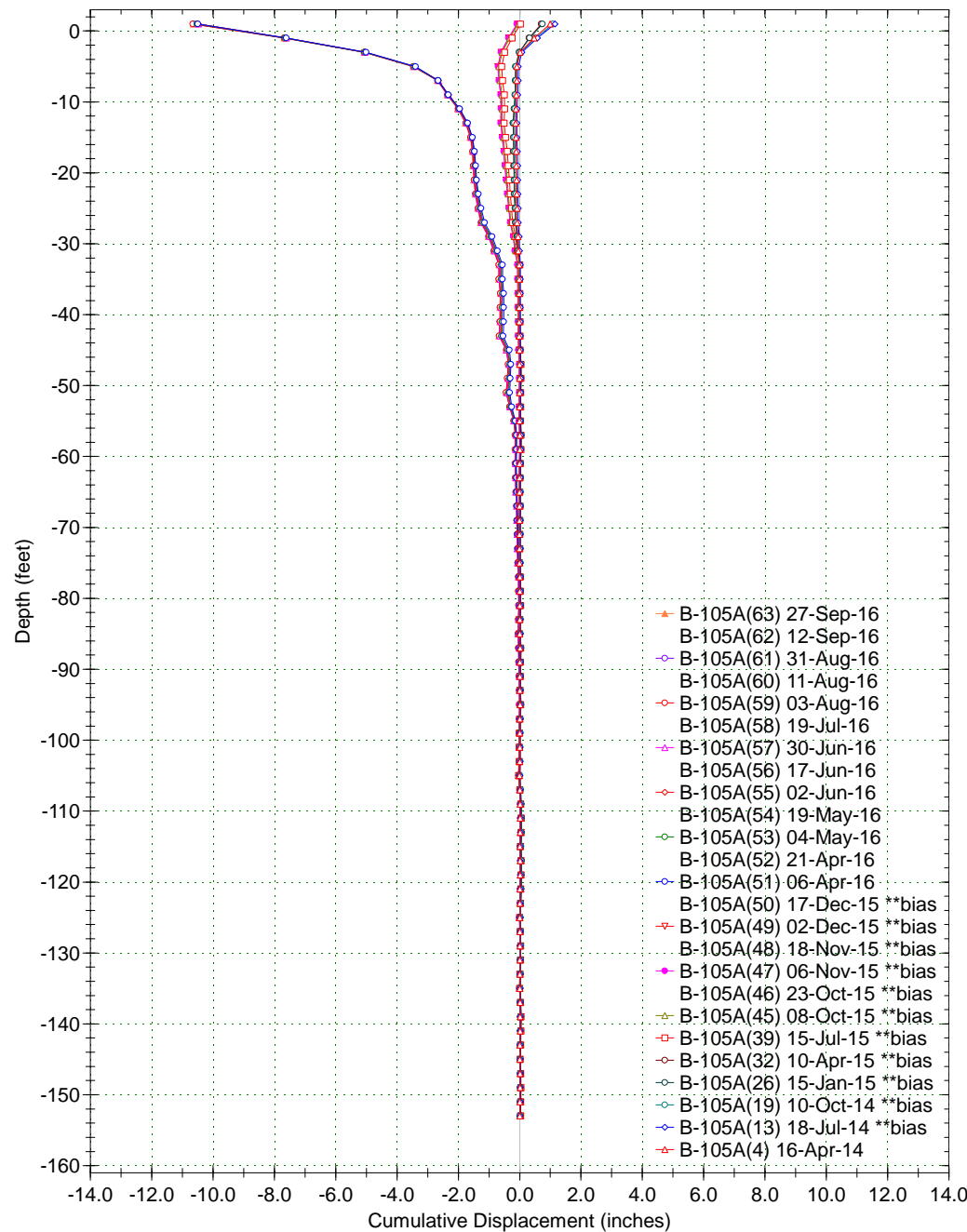
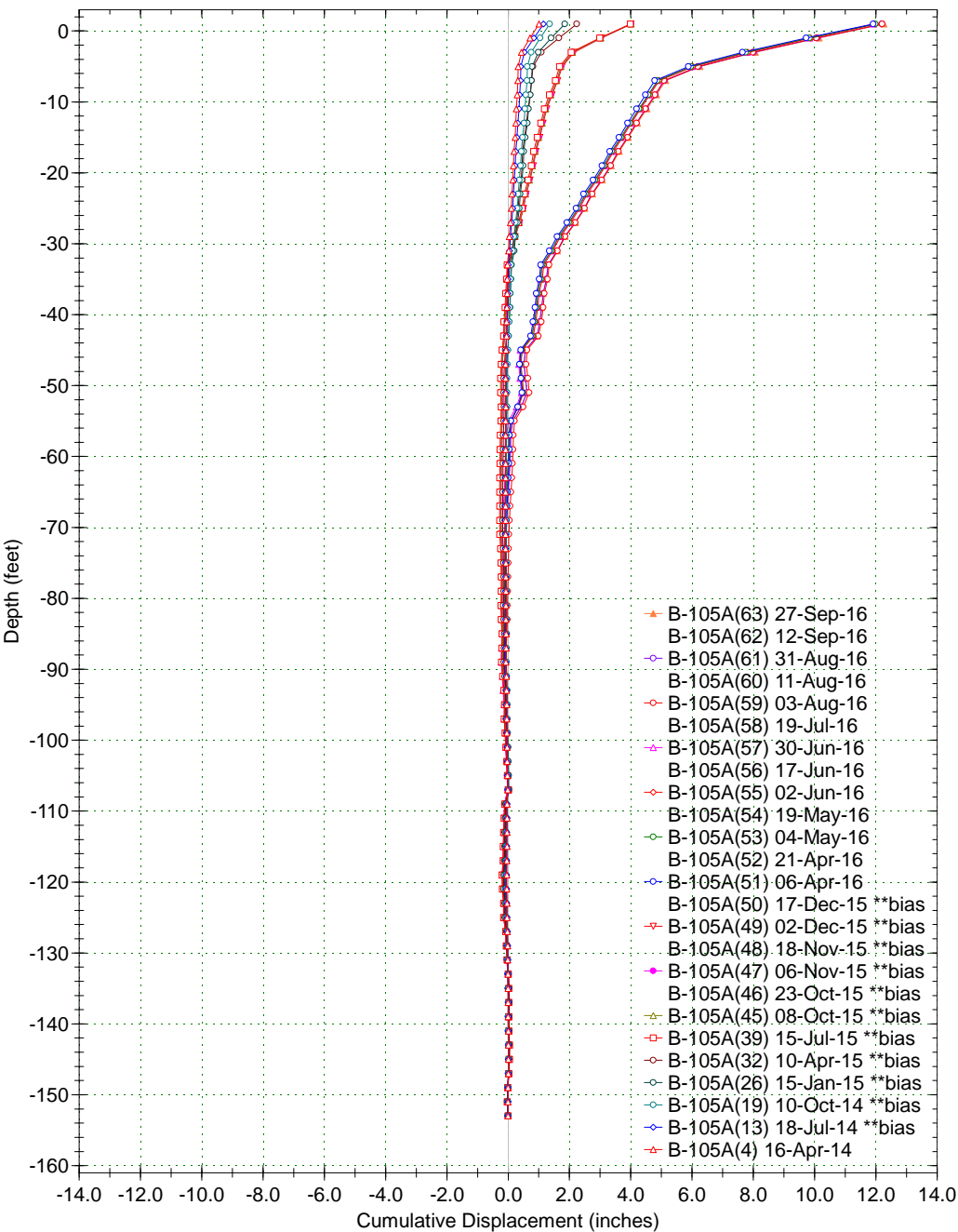
Borehole : B-105A
 Project : CUY-90-15-24
 Location : Cleveland, Ohio
 Northing : Sta. 19+11.38
 Easting : 90.9' Rt of CL
 Collar :



Spiral Correction : N/A
 Collar Elevation : 3.0 feet
 Borehole Total Depth : 156.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 15 09:19
 Applied Azimuth : 0.0 degrees

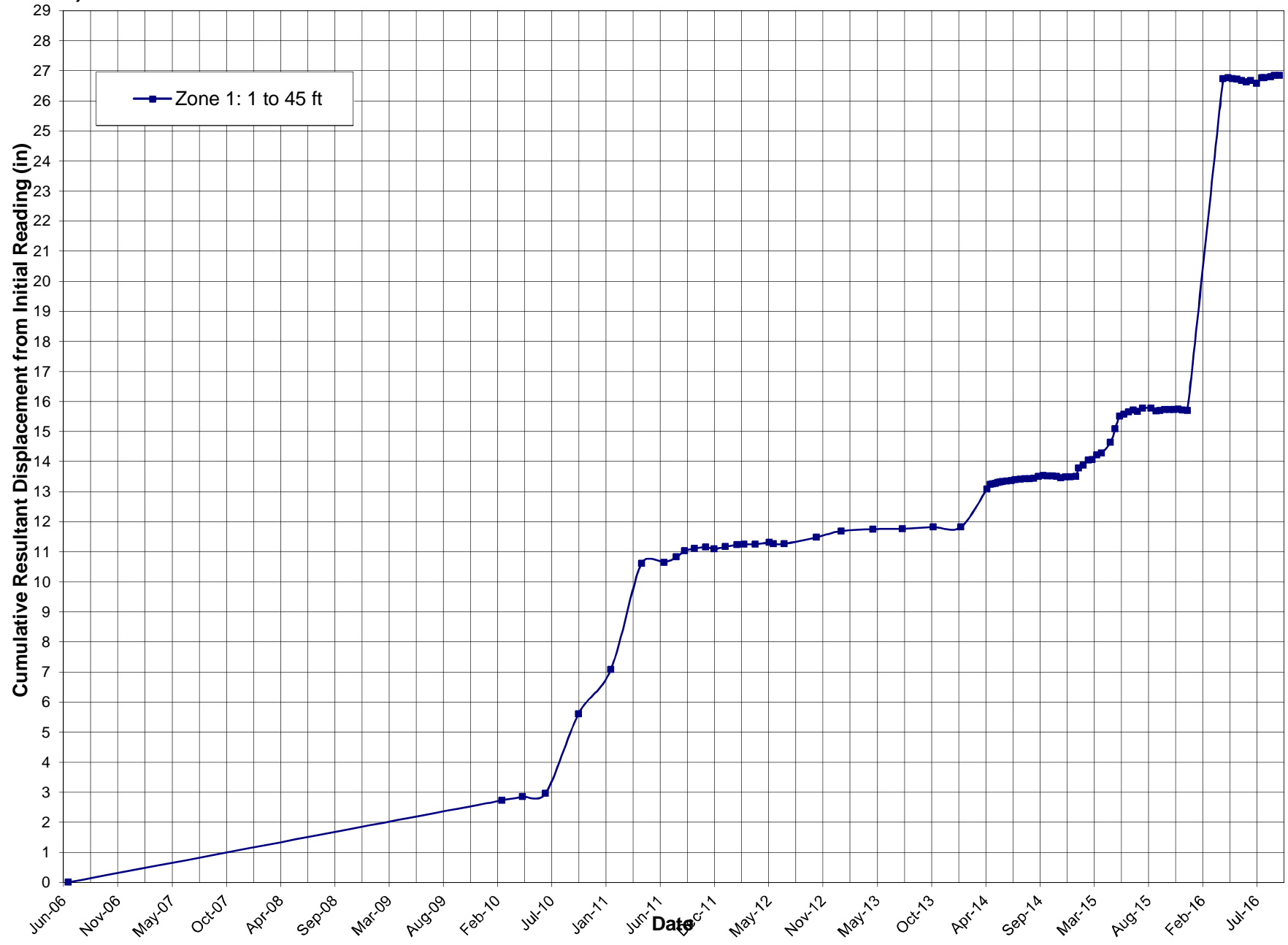
Axis - A

Axis - B



CUY-90-15.24
PID 96504
SME Project#: 069032.00

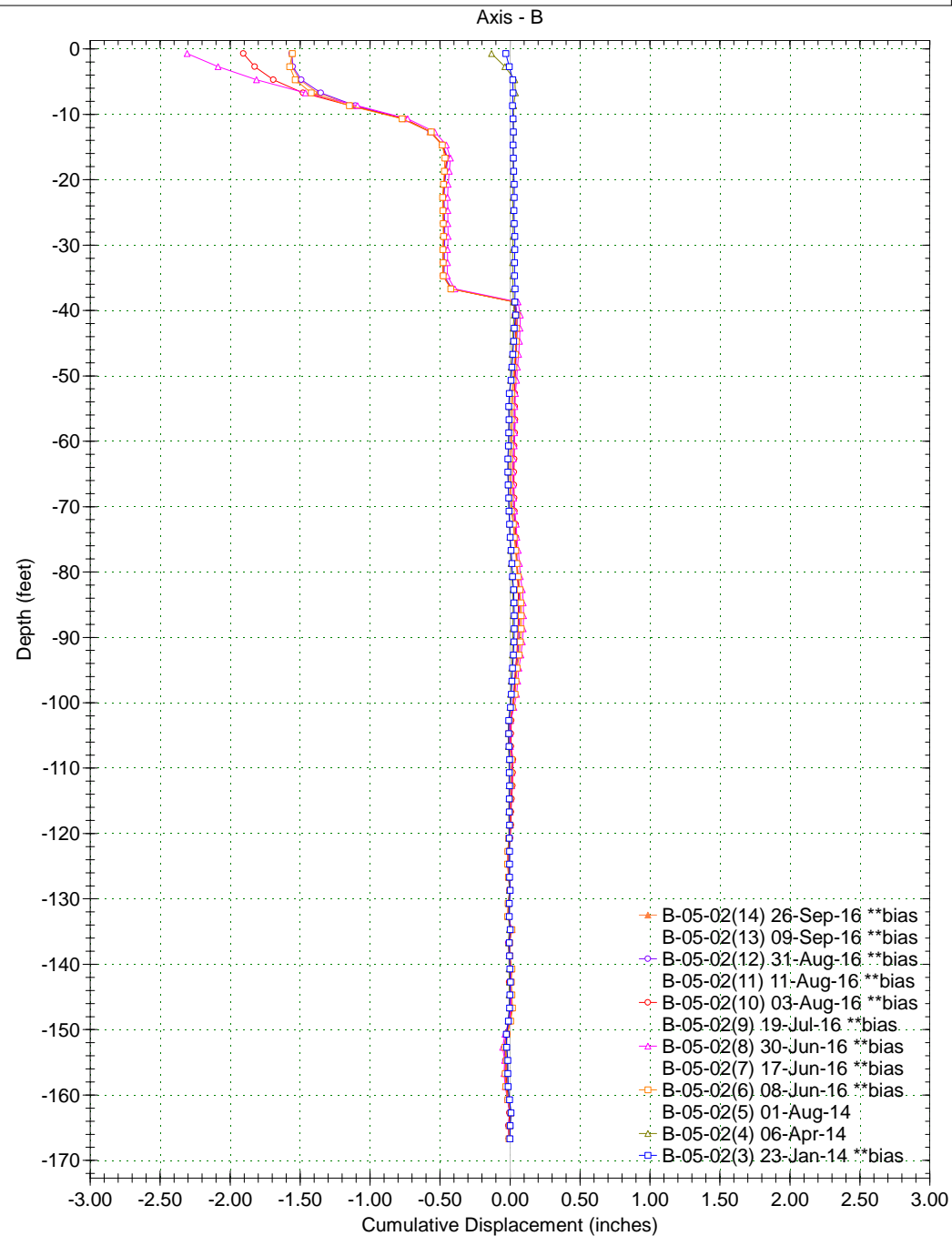
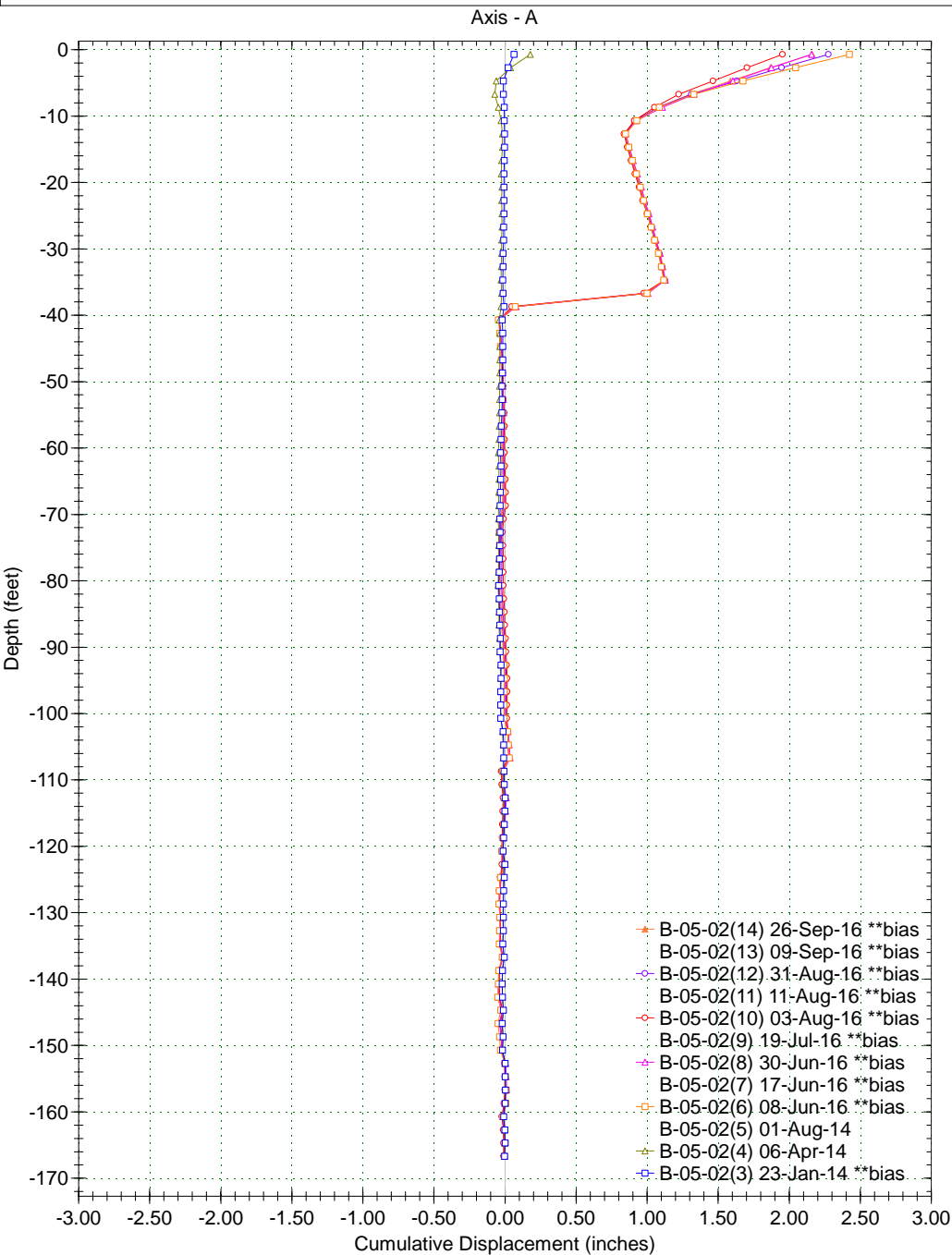
B-105A



Borehole : B-05-02A
 Project : CUY-90-15-24
 Location : Cleveland, Ohio
 Northing : 663737.939
 Easting : 2190289.081
 Collar :

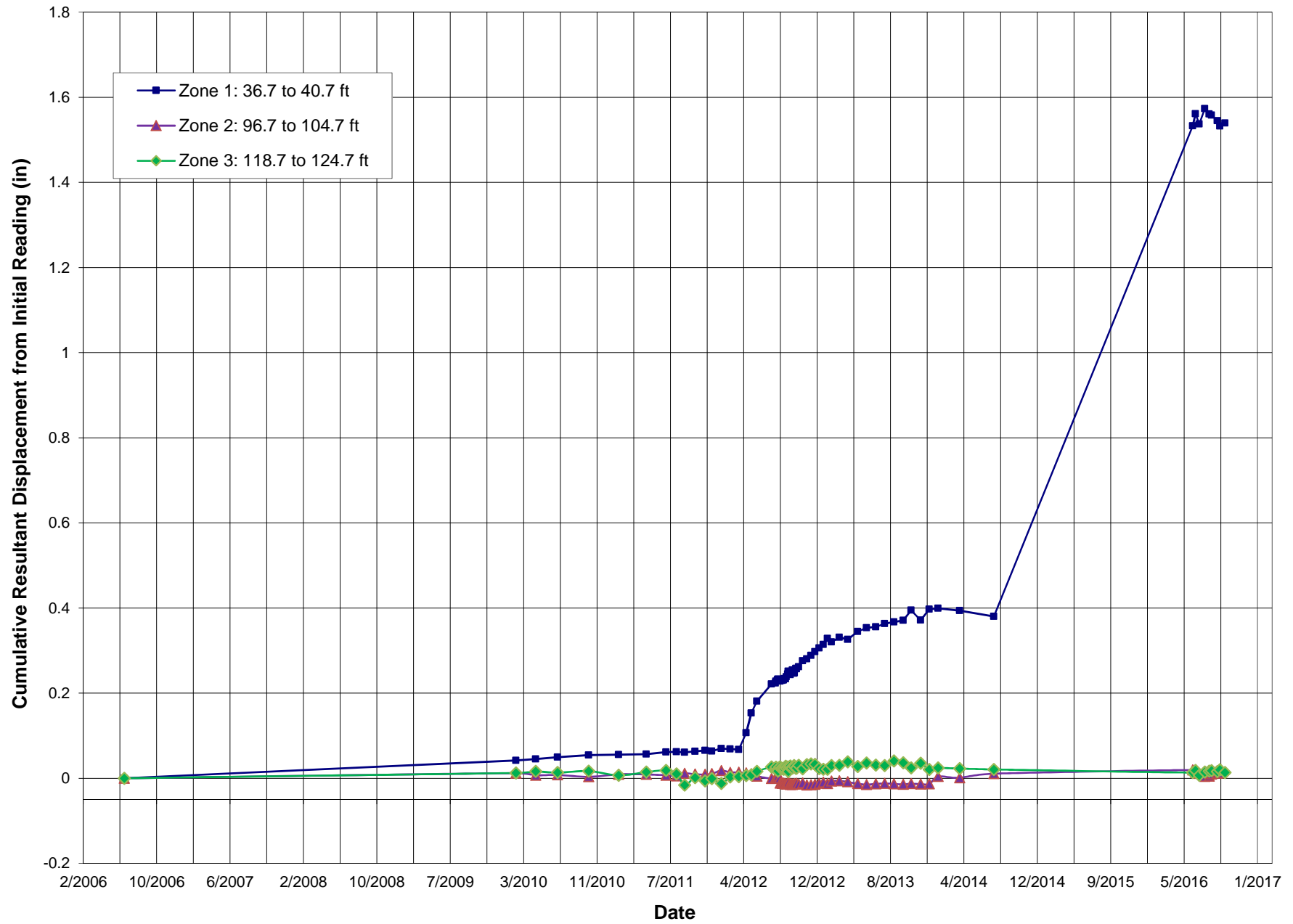


Spiral Correction : N/A
 Collar Elevation : 1.3 feet
 Borehole Total Depth : 168.0 feet
 A+ Groove Azimuth :
 Base Reading : 2013 Dec 24 11:12
 Applied Azimuth : 0.0 degrees



CUY-90-15.24
PID 63504
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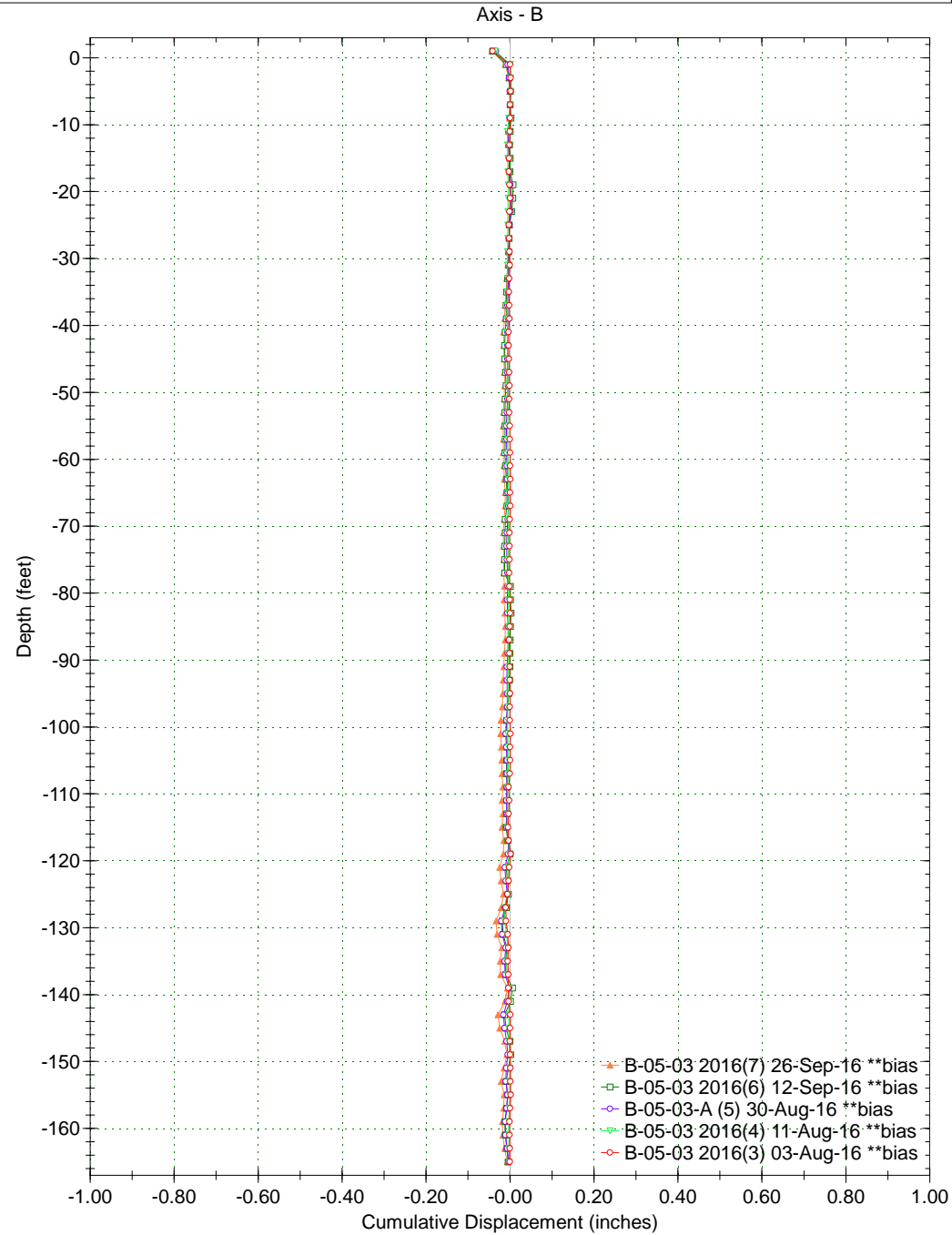
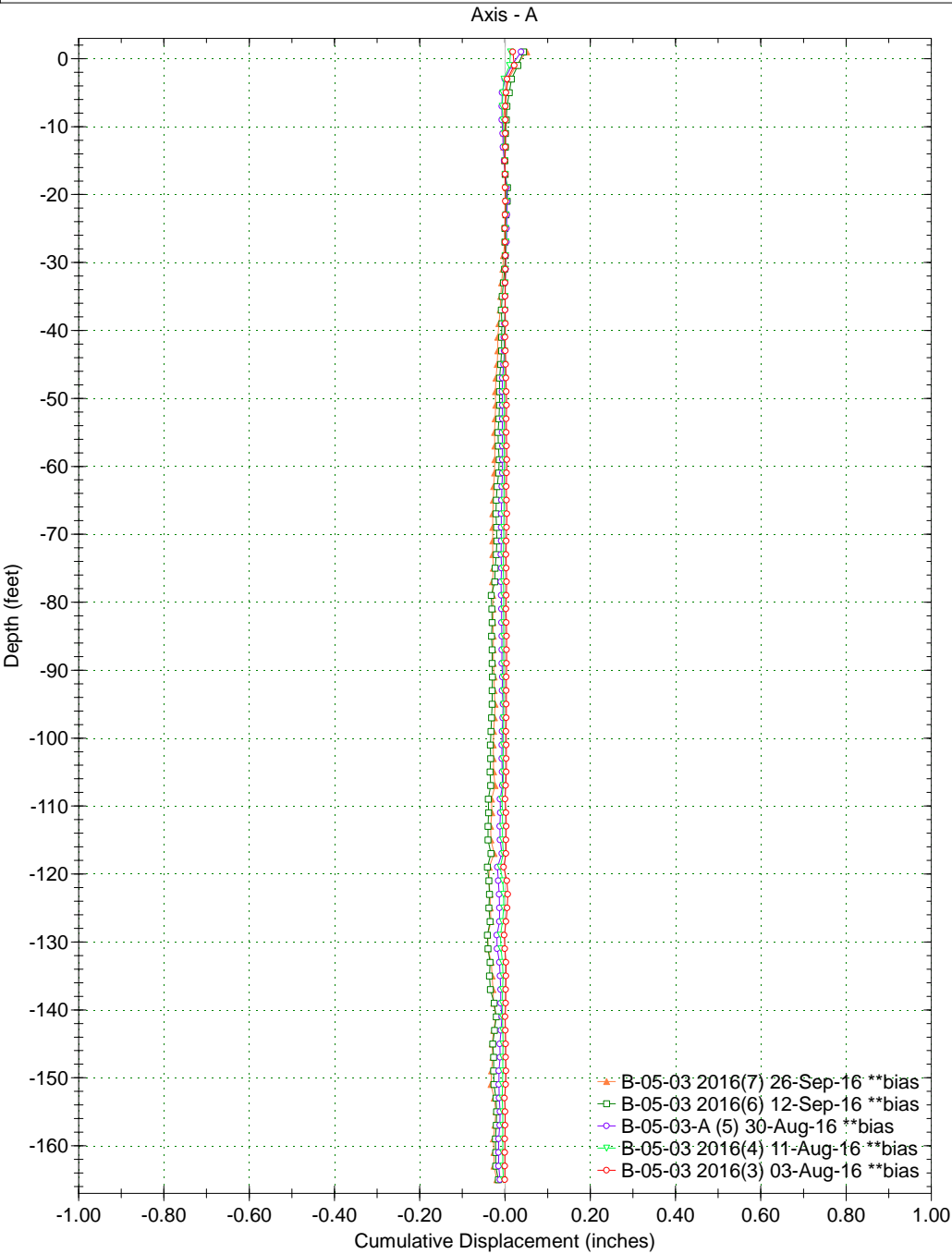
B-05-02



Borehole : B-05-03-A
Project : CUY-90-15-24
Location :
Northing :
Easting :
Collar :



Spiral Correction : N/A
Collar Elevation : 3.0 feet
Borehole Total Depth : 168.0 feet
A+ Groove Azimuth :
Base Reading : 2016 Jul 19 09:08
Applied Azimuth : 0.0 degrees



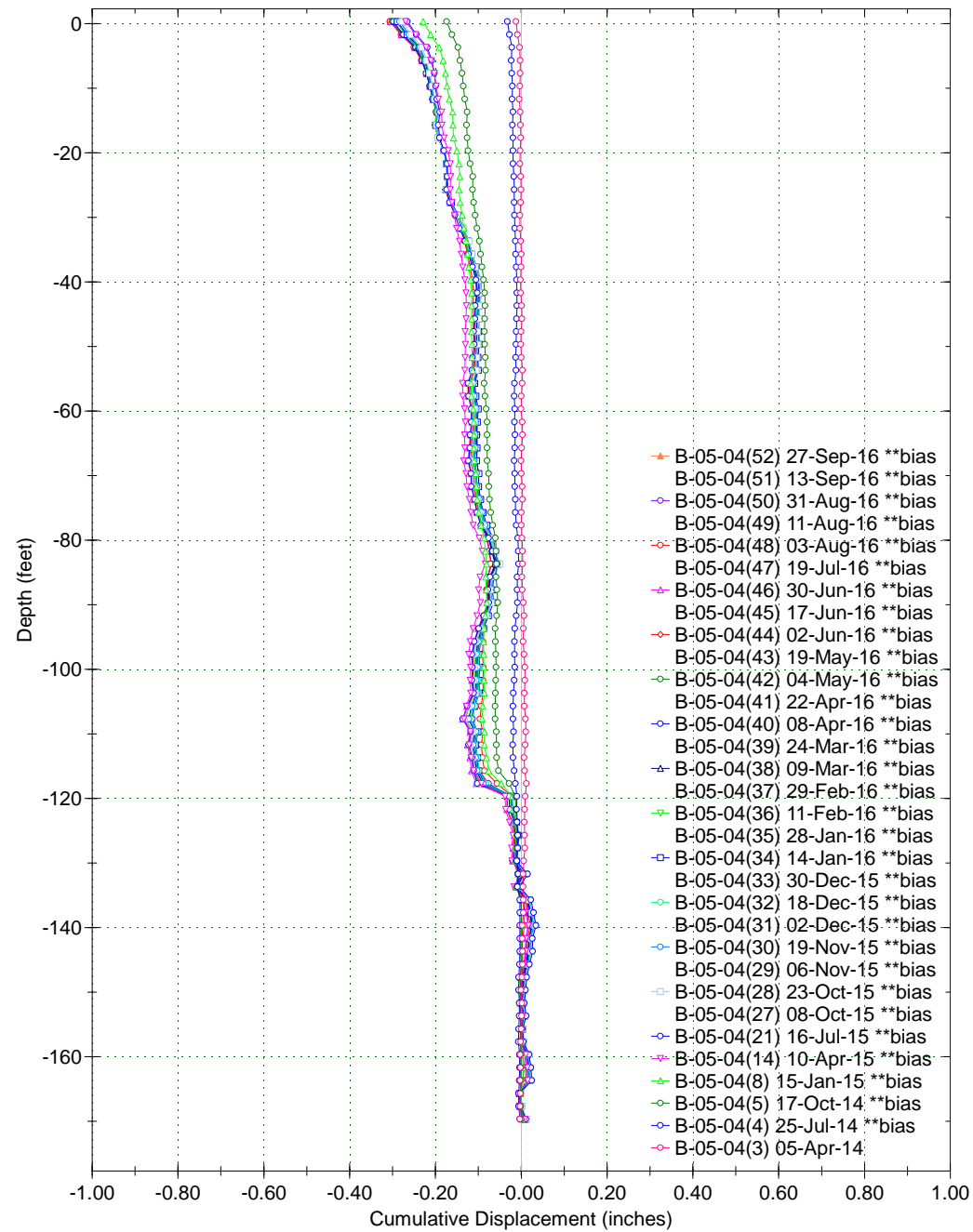
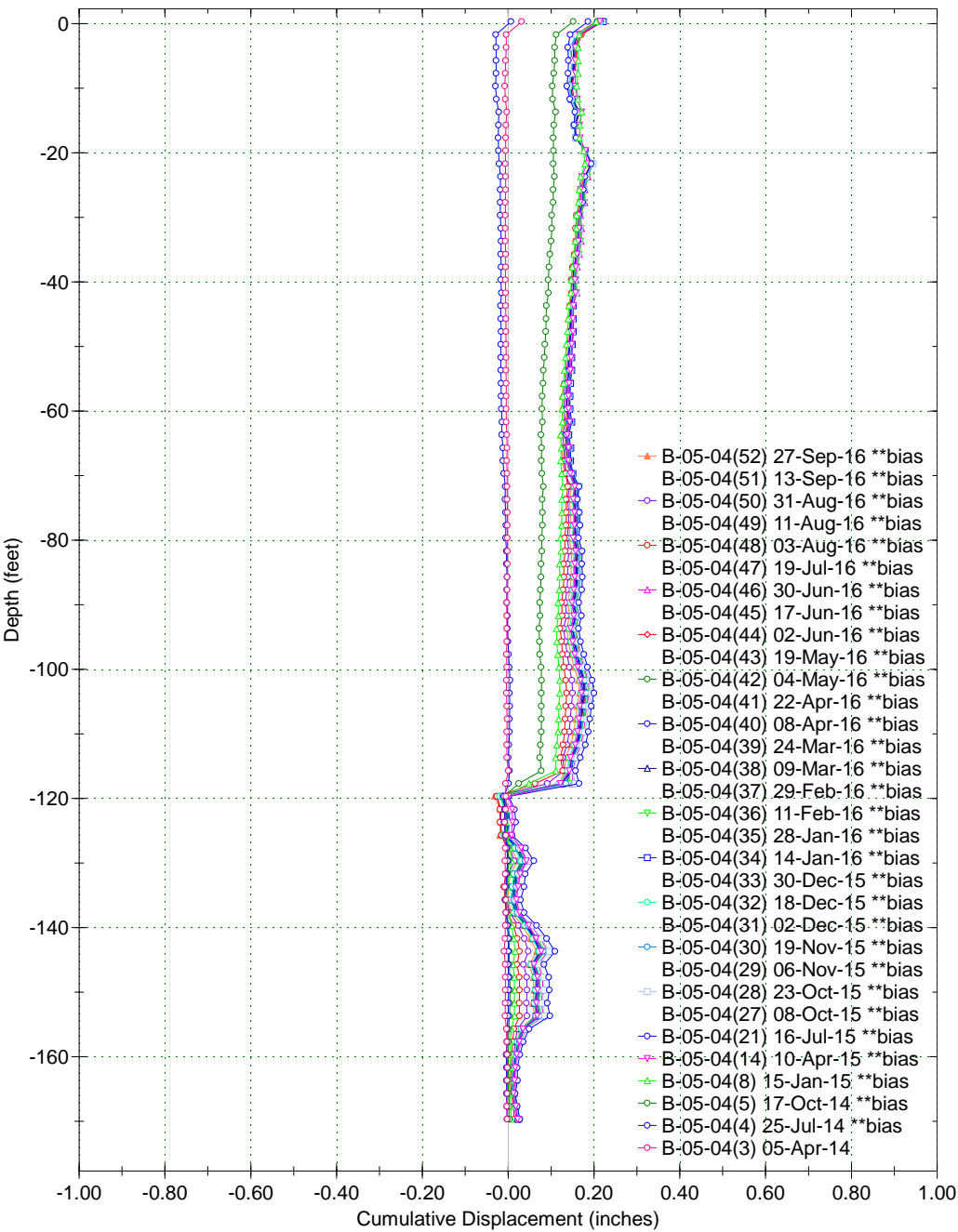
Borehole : B-05-04
 Project : CUY-90-15-24
 Location : Cleveland, Ohio
 Northing : Sta. 133+51.67
 Easting : 242.09' Rt of CL
 Collar :



Spiral Correction : N/A
 Collar Elevation : 2.3 feet
 Borehole Total Depth : 172.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 22 12:30
 Applied Azimuth : 0.0 degrees

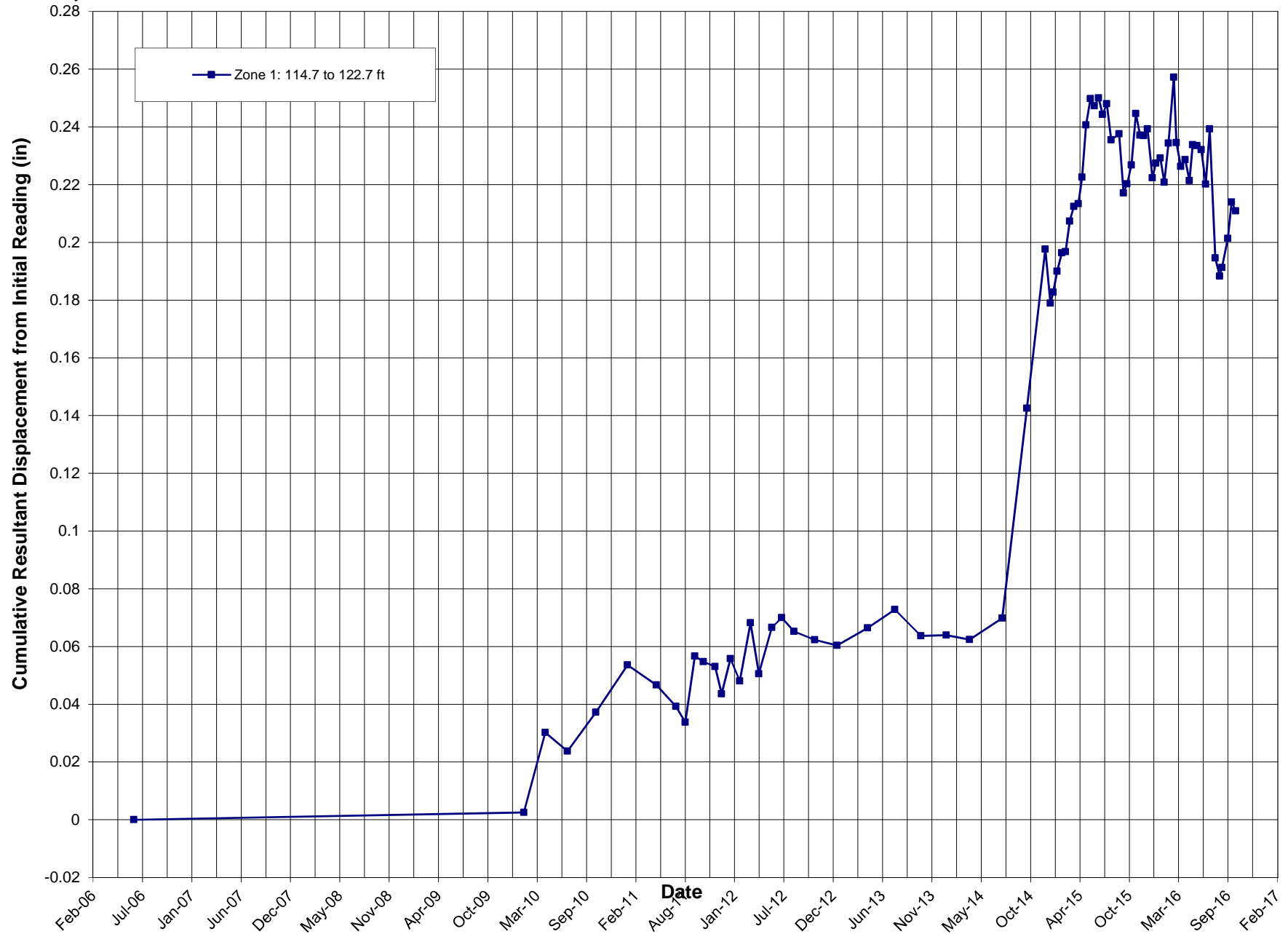
Axis - A

Axis - B



CUY-90-15.24
PID 96504
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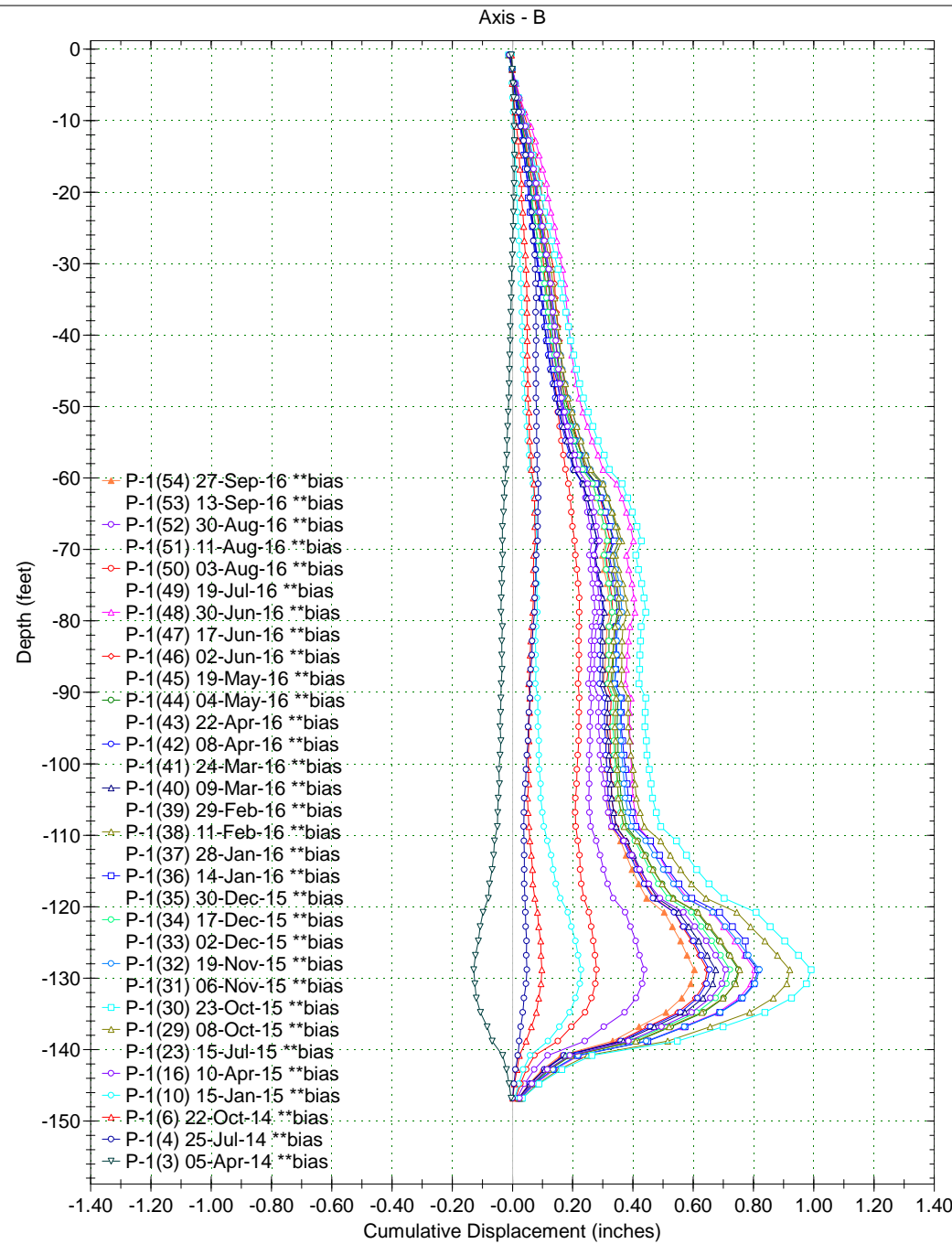
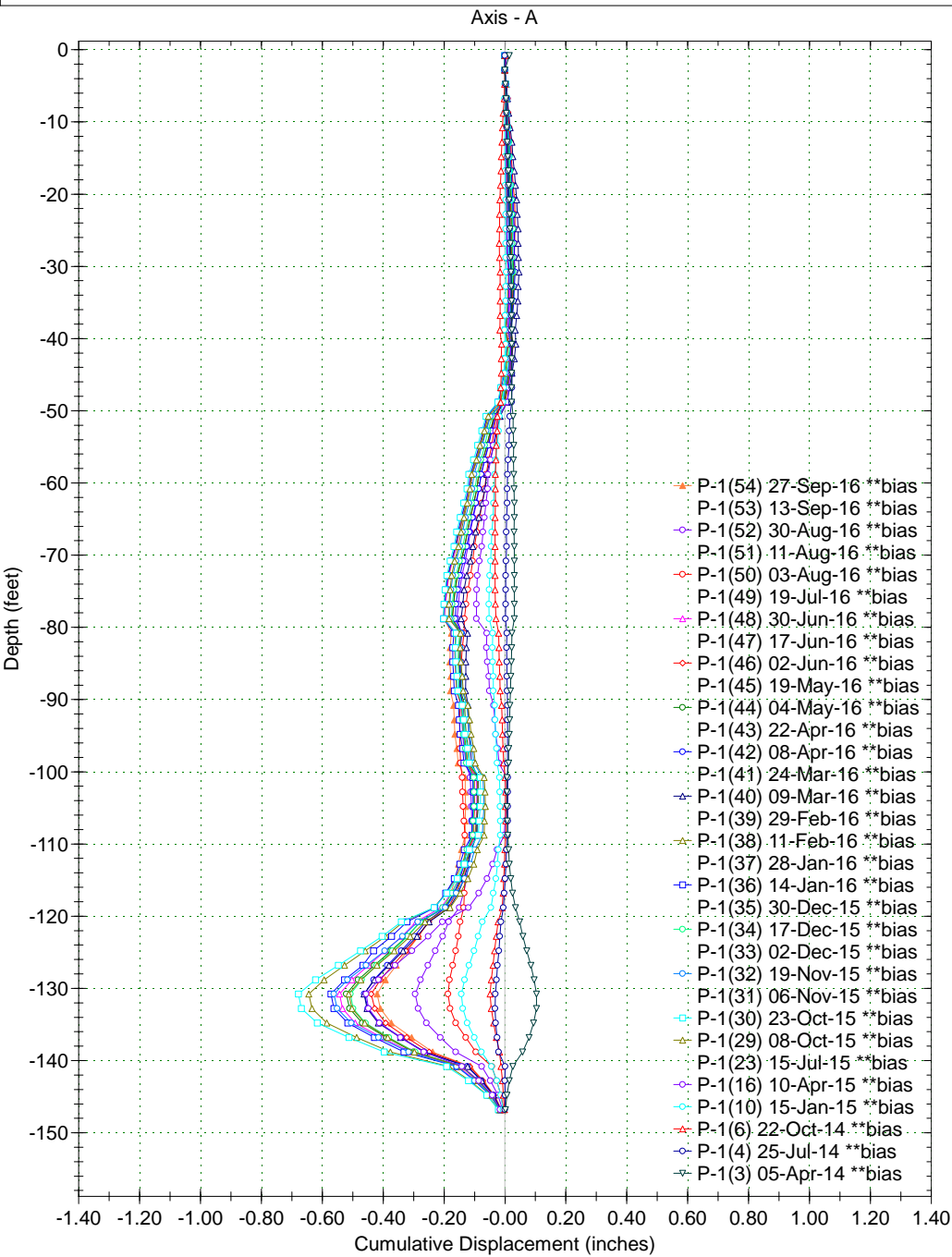
B-05-04



Borehole : P-1
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :

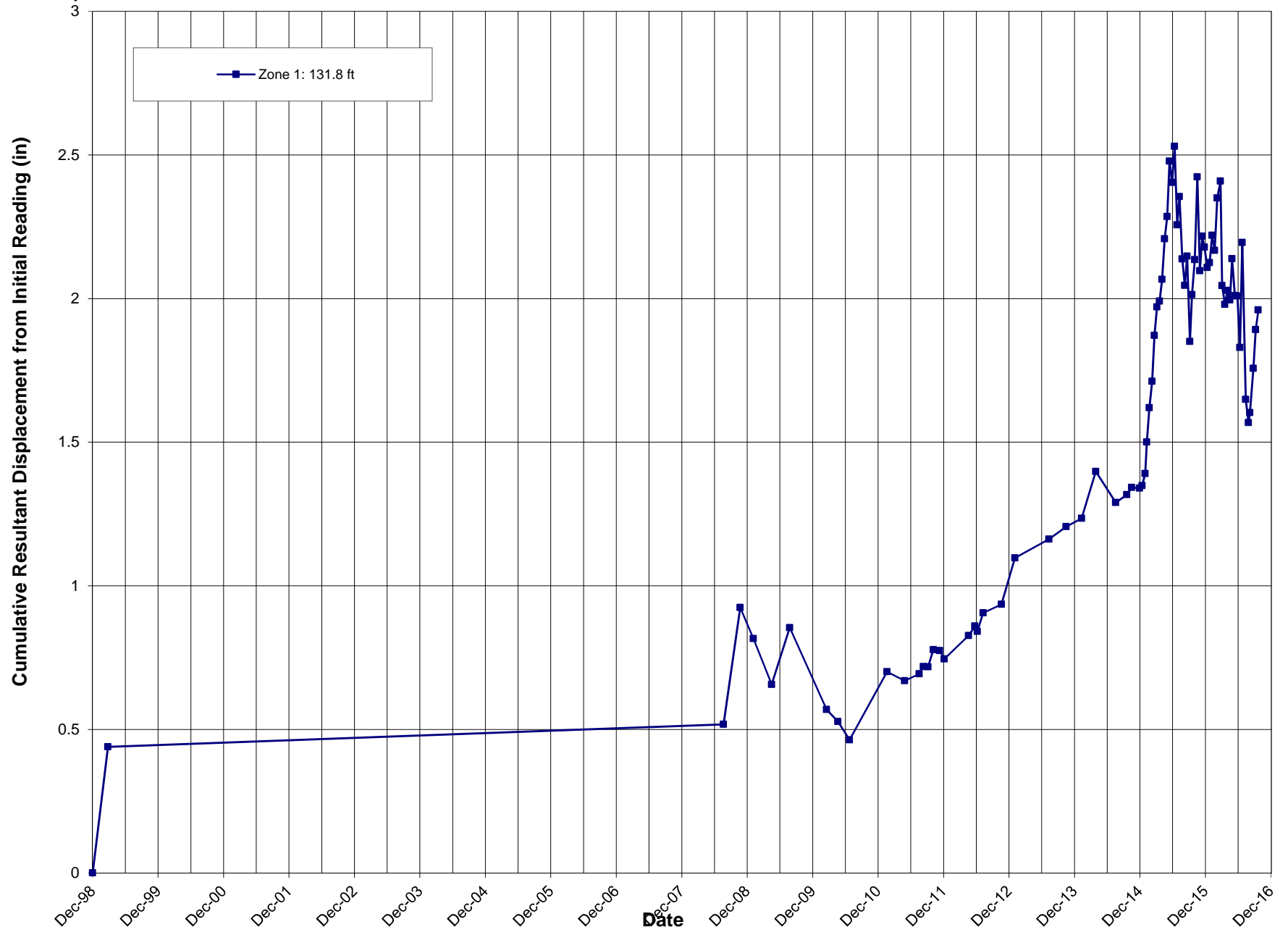


Spiral Correction : N/A
Collar Elevation : 1.2 feet
Borehole Total Depth : 148.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 22 10:47
Applied Azimuth : 0.0 degrees



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P-1



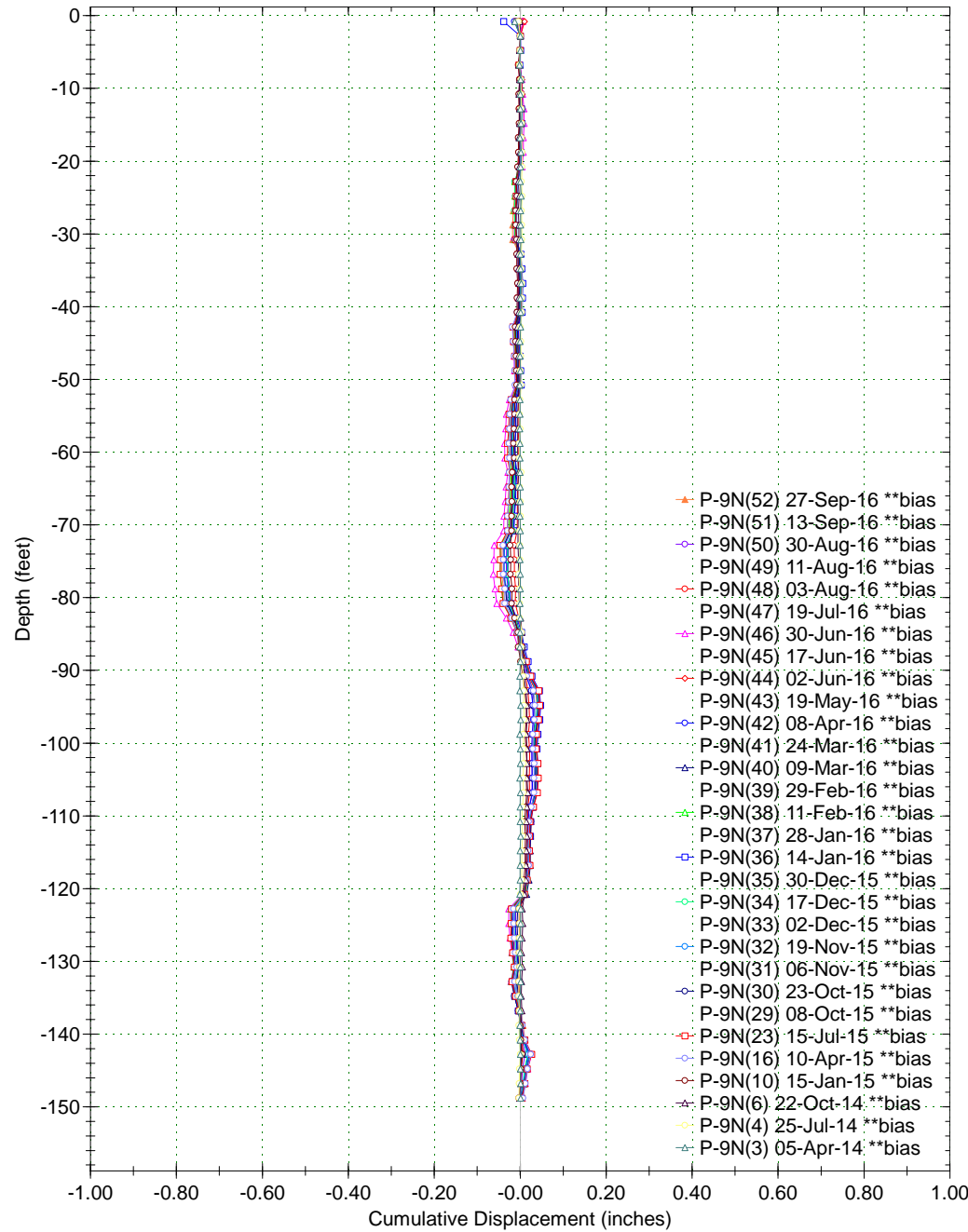
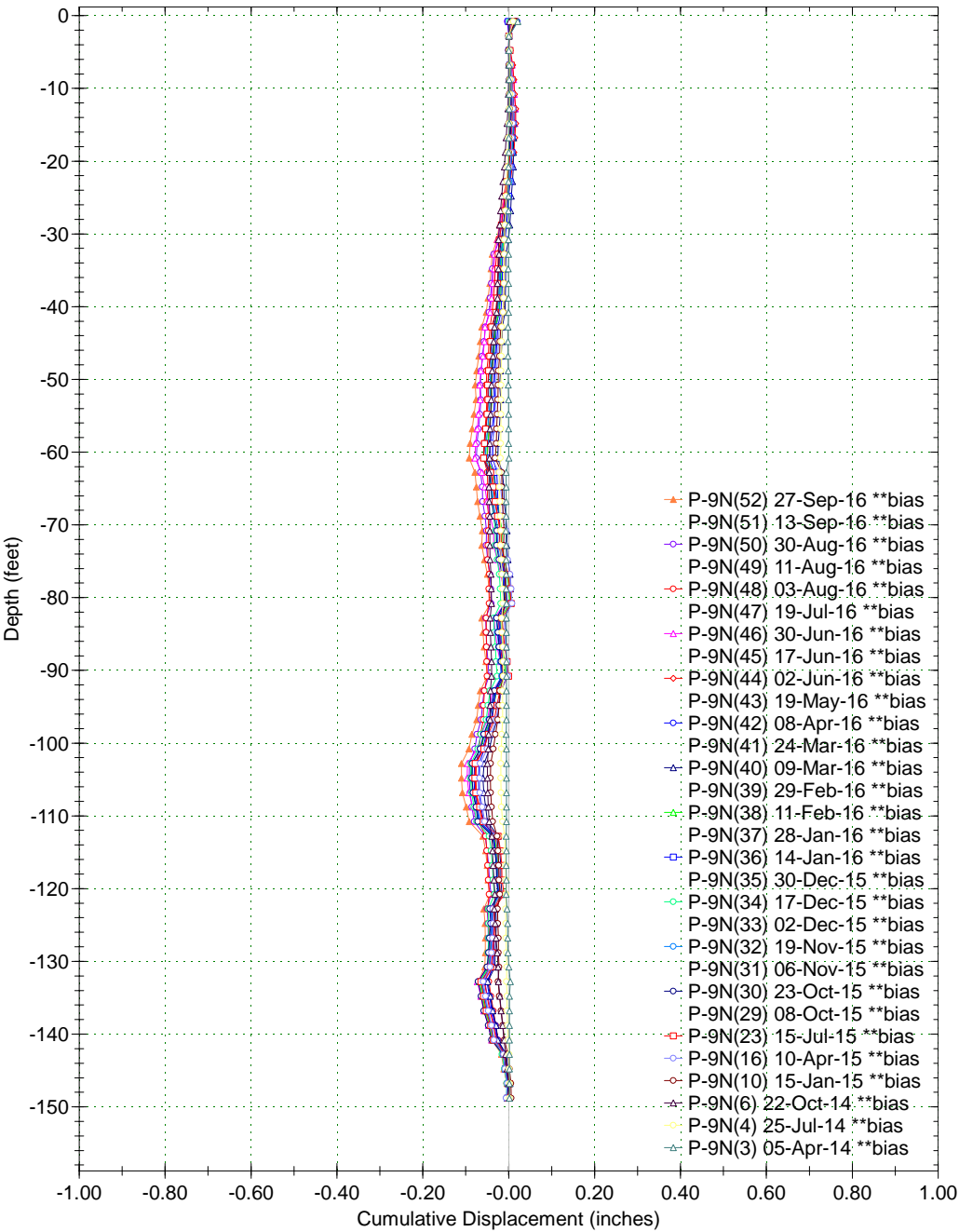
Borehole : P-9N
 Project : CUY-90-15-24
 Location : Cleveland, Ohio
 Northing :
 Easting :
 Collar :



Spiral Correction : N/A
 Collar Elevation : 1.2 feet
 Borehole Total Depth : 150.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 16 09:28
 Applied Azimuth : 0.0 degrees

Axis - A

Axis - B



Borehole : TGR I-4
Project : CUY-90-15-24
Location :
Northing :
Easting :
Collar :



Spiral Correction : N/A
Collar Elevation : 3.0 feet
Borehole Total Depth : 58.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Sep 23 10:39
Applied Azimuth : 0.0 degrees

