



9375 Chillicothe Road  
Kirtland, OH 44094-8501

T (440) 256-6500

[www.sme-usa.com](http://www.sme-usa.com)

February 2, 2017

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](mailto:Dave.Lastovka@dot.state.oh.us)

Re: January 3, 4, 5, and 6, 2017 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 January 3, 4, 5, and 6, 2017, are presented in this report. Bi-weekly readings currently include instruments at I/P-001-13, I/P-002-13, I/P-003-10, P-003-13, I/P-004-13, I-008-10, 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**

Pore pressure readings at P-004-13, P-009-13, and B-05-A-03 show changes in total head of less than 0.5 feet for the period.

**P-001-13** – Pore pressure readings in all piezometers at this location indicate a decrease of about 1 foot in total head.

**P-002-13** – Pore pressure readings in the piezometers at this location show decreases in total head ranging from 0.5 feet to 1.7 feet, with the greatest decrease occurring at elevation 458 feet.

**P-003-10** – Pore pressure readings in the piezometers at this location show decreases in total head ranging from 1.0 feet to 1.3 feet, with the greatest decrease occurring at elevation 550 feet.

**P-003-13** – Pore pressure readings in all piezometers at this location indicate a decrease of about 1 foot in total head.

B-105A – Pore pressures varied by more than 0.5 feet in the shallow piezometer during the period but the net change for the period was less than 0.5 feet.

**B-05-02** – Pore pressures in both piezometers decreased after the last report and then increased during the second half of this period. The net change for this period is a pore pressure increase of 0.9 feet in the shallow piezometer and a decrease of 1.2 feet in the deep piezometer.

**B-05-04** – At this location, pore pressure readings indicate a decrease of about 0.8 feet in the shallow piezometer and virtually no change in the deep piezometer.

**B-05-A-11** – Pore pressure readings show decreases of about 1 foot and 0.6 feet in the shallow and deep piezometers, respectively. Pore pressures have been trending downward since late September 2016.

### **Inclinometer Readings**

Inclinometer readings at I-001-13, I-002-13, I-003-10, I-008-10, 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 this period. In some cases, the plots indicated displacement at the top of the casing. This is due to disturbance of the area around the casing that occurred during construction. Protective covers have not yet been permanently concreted in place because of the ongoing construction near these instruments.

I-004-13 – The plot for this location suggest a slight increase in positive A and B-axis displacement from about 10 to 20 feet.

B-05-A-11 – We recently had the wheels replaced and calibration checked on our slope inclinometer. This may be why most of the variations no longer appear in this plot.

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

Very truly yours,

SME

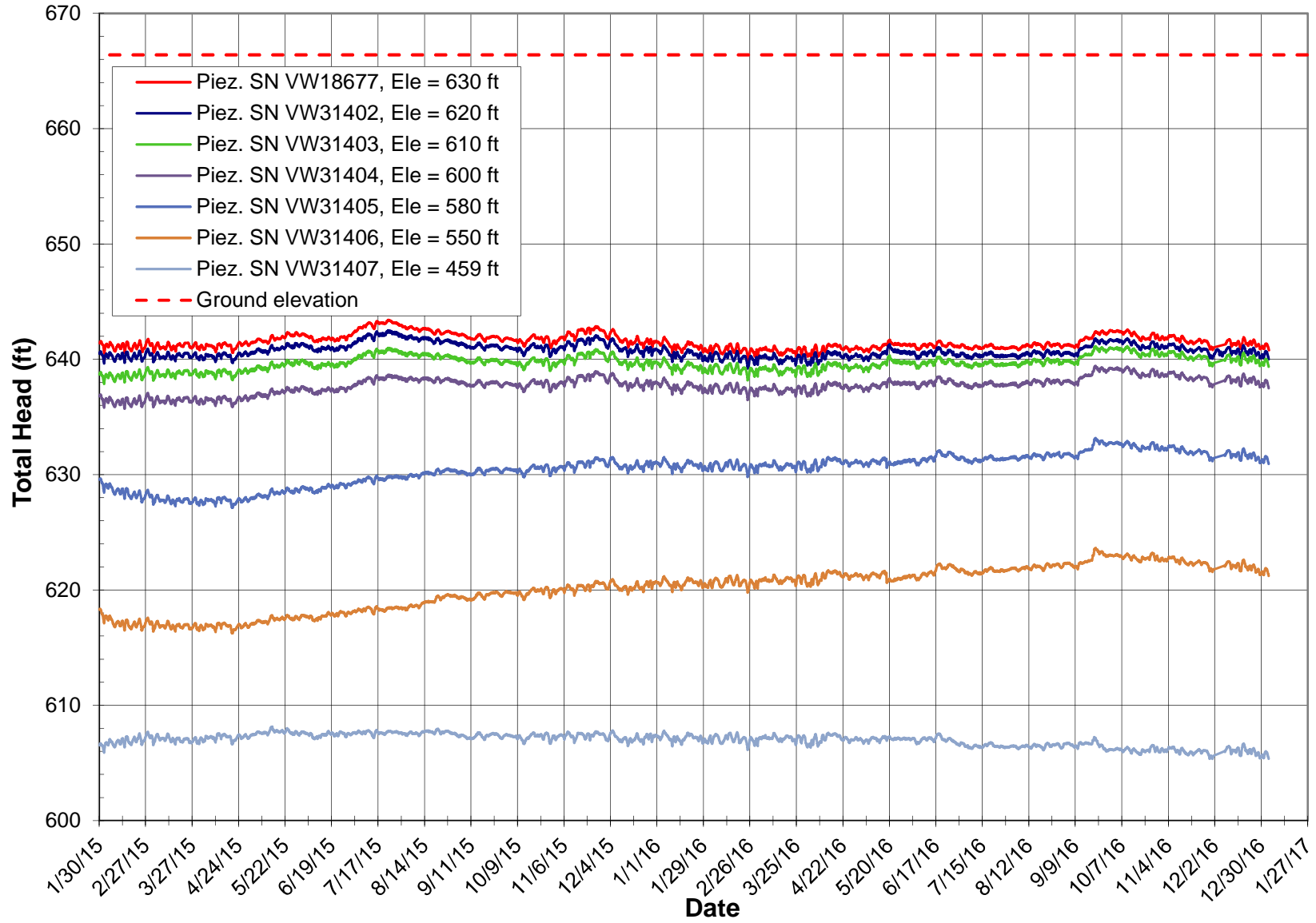
Brendan P. Lieske, P.E.  
Senior Staff Engineer

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

Copies sent to distribution list.

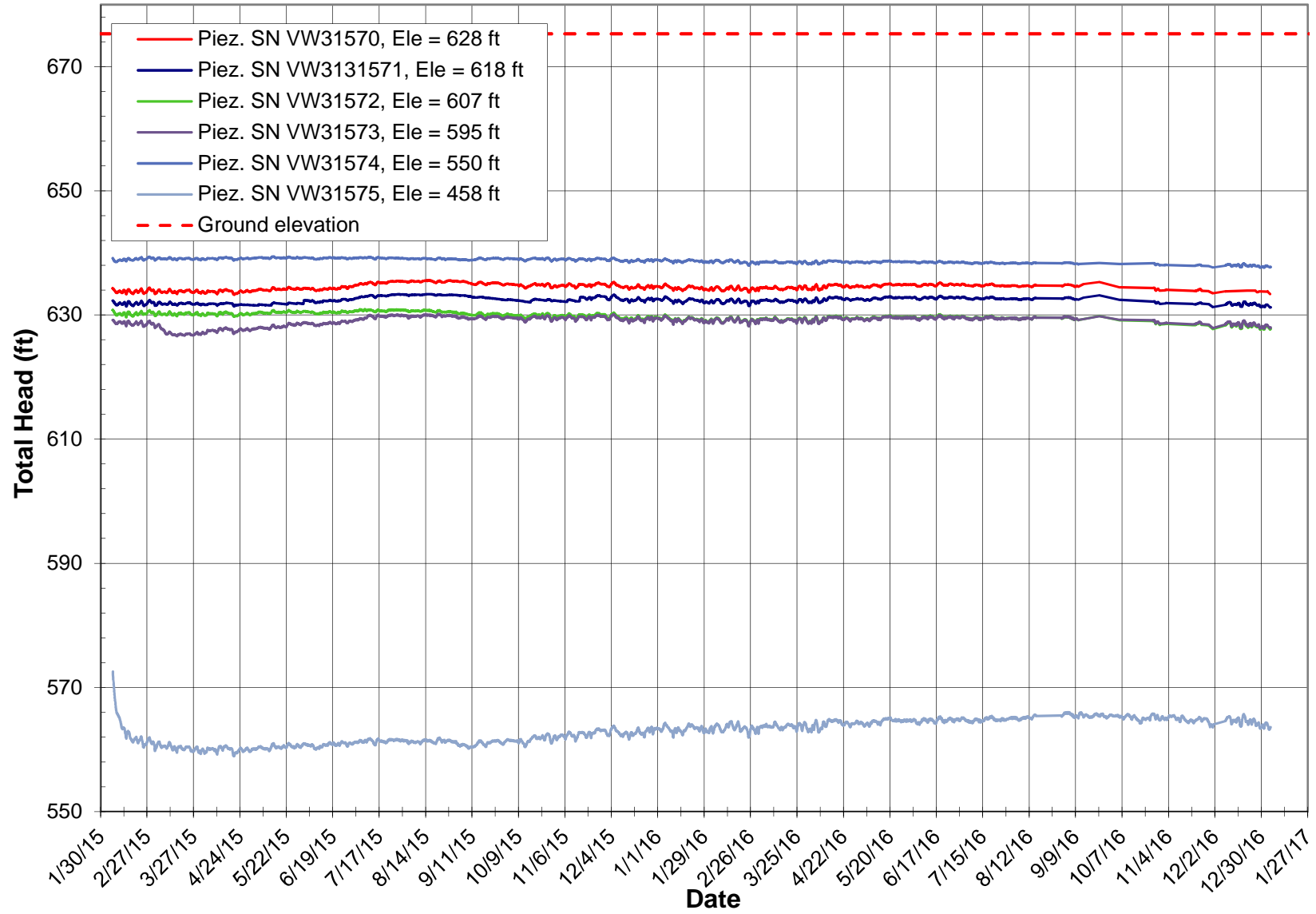
# P-001-13 VW Piezometer Readings

Ground surface elevation = 666.4 ft



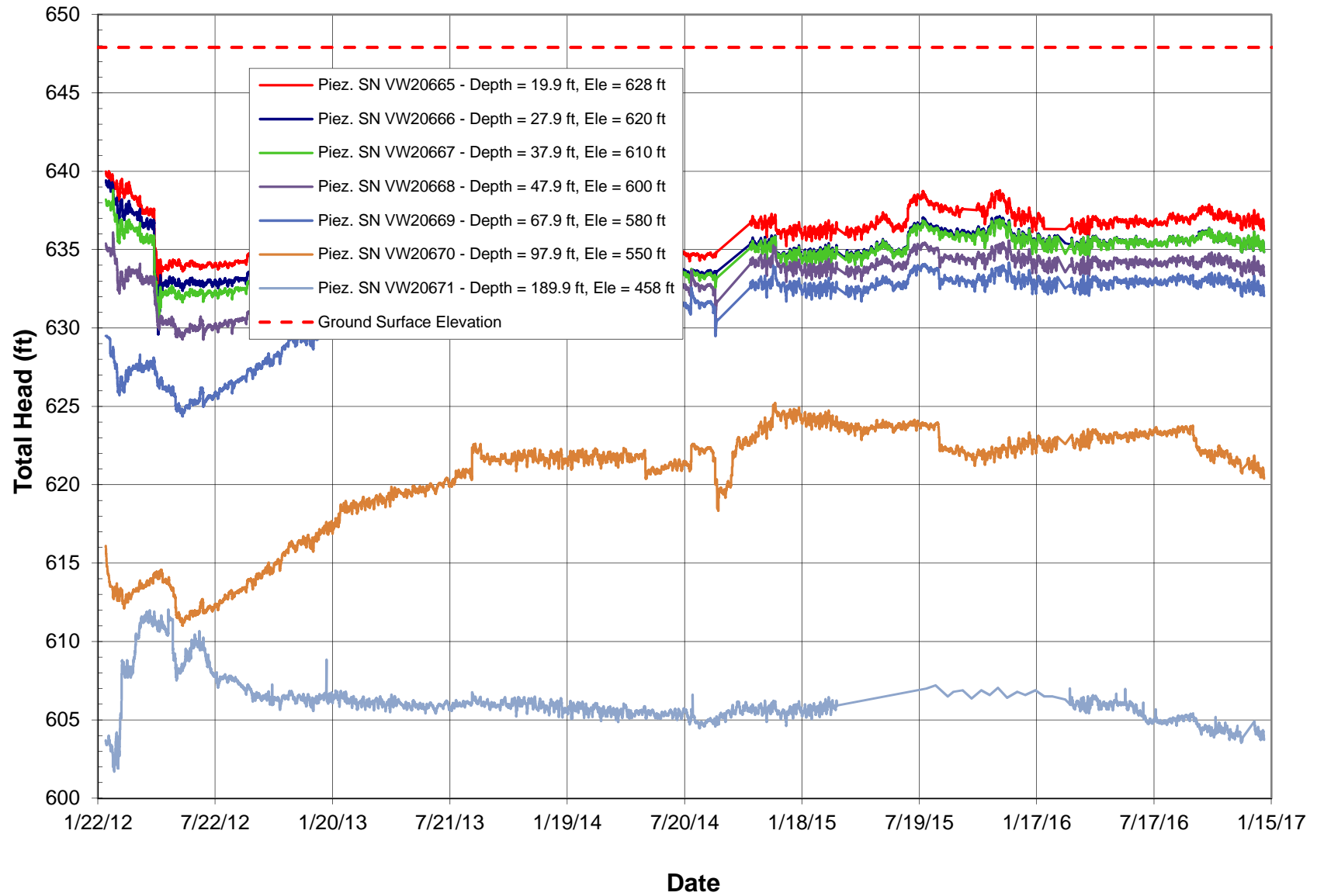
# P-002-13 VW Piezometer Readings

Ground surface elevation = 675.29 ft



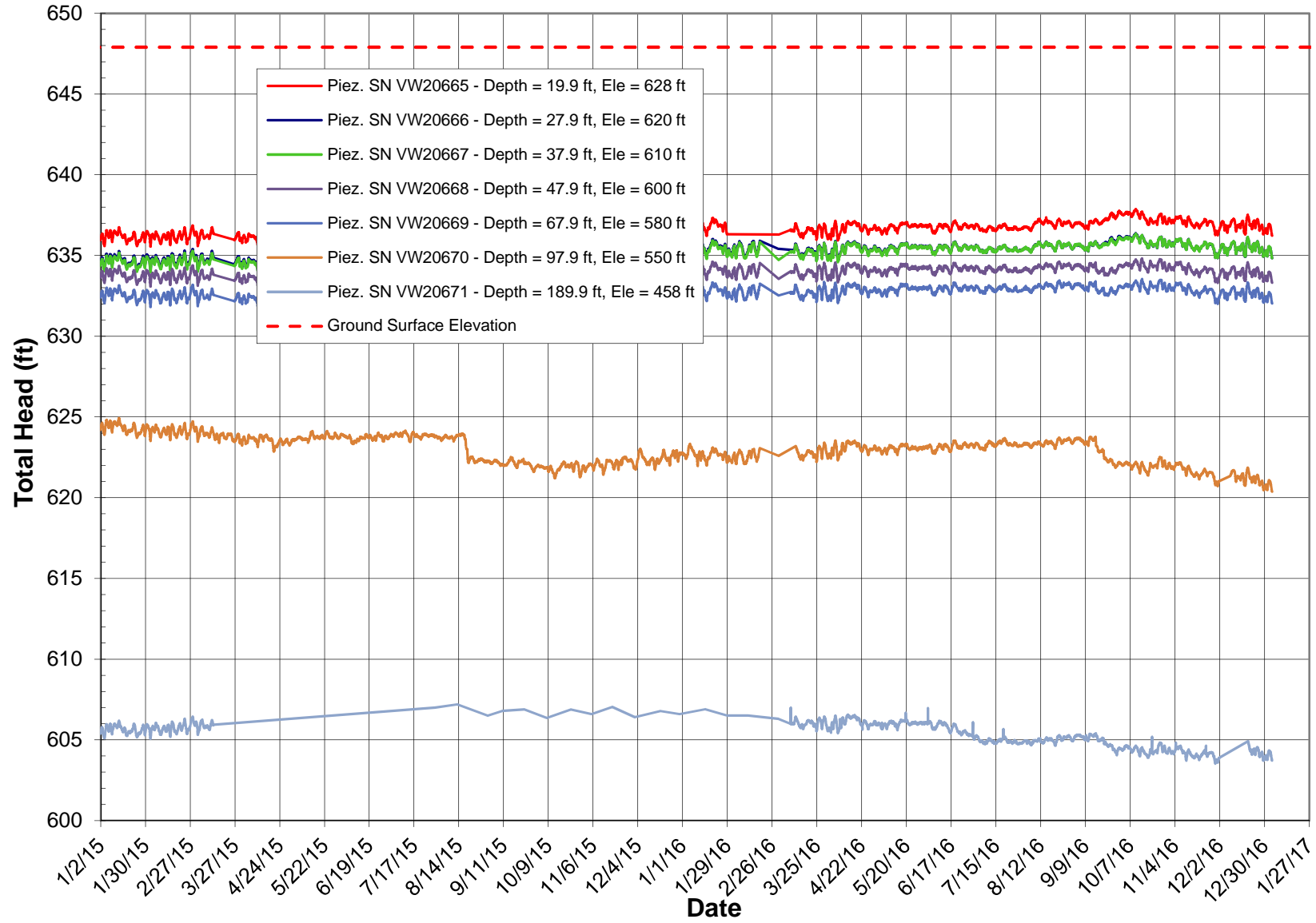
# P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



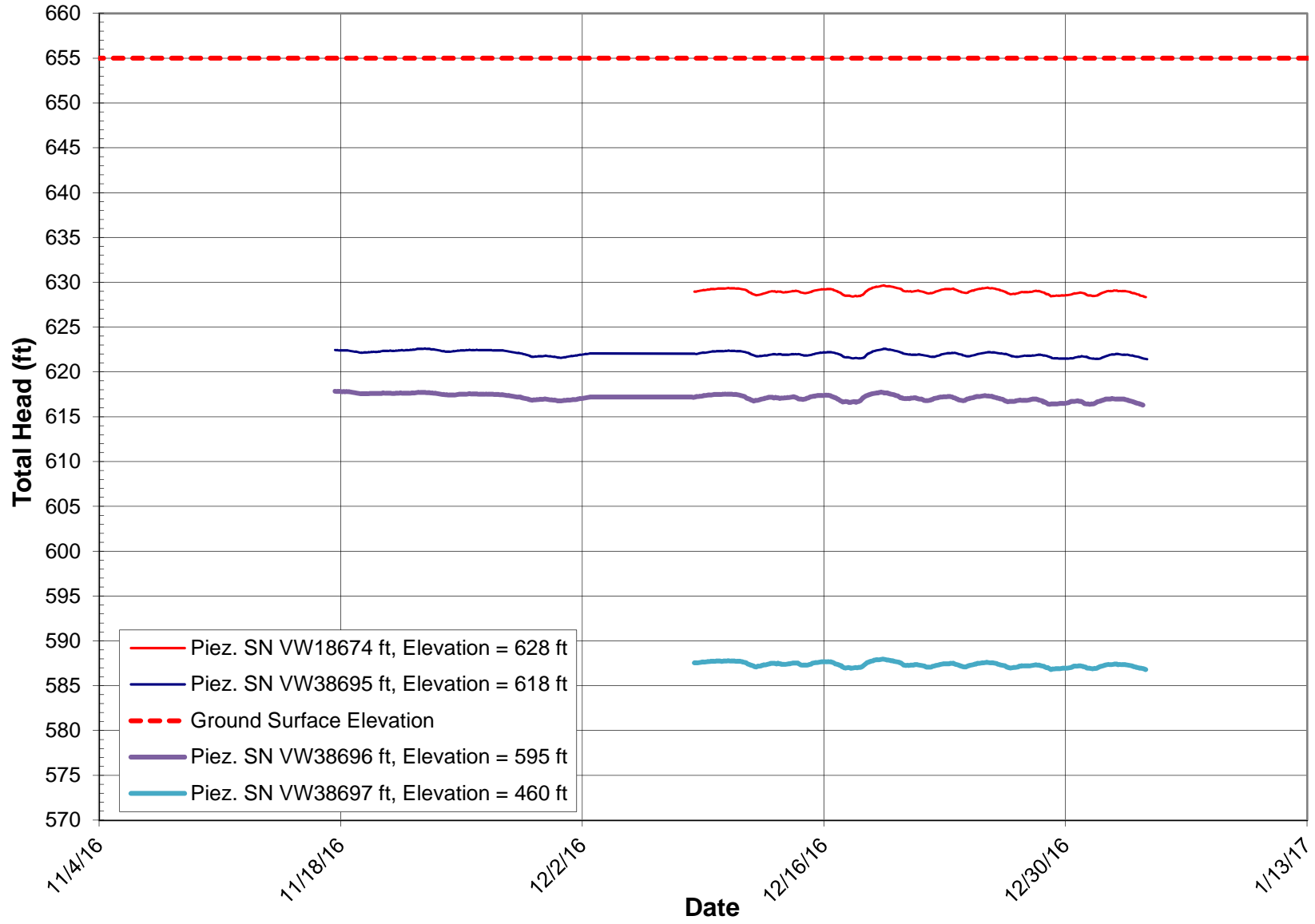
# P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



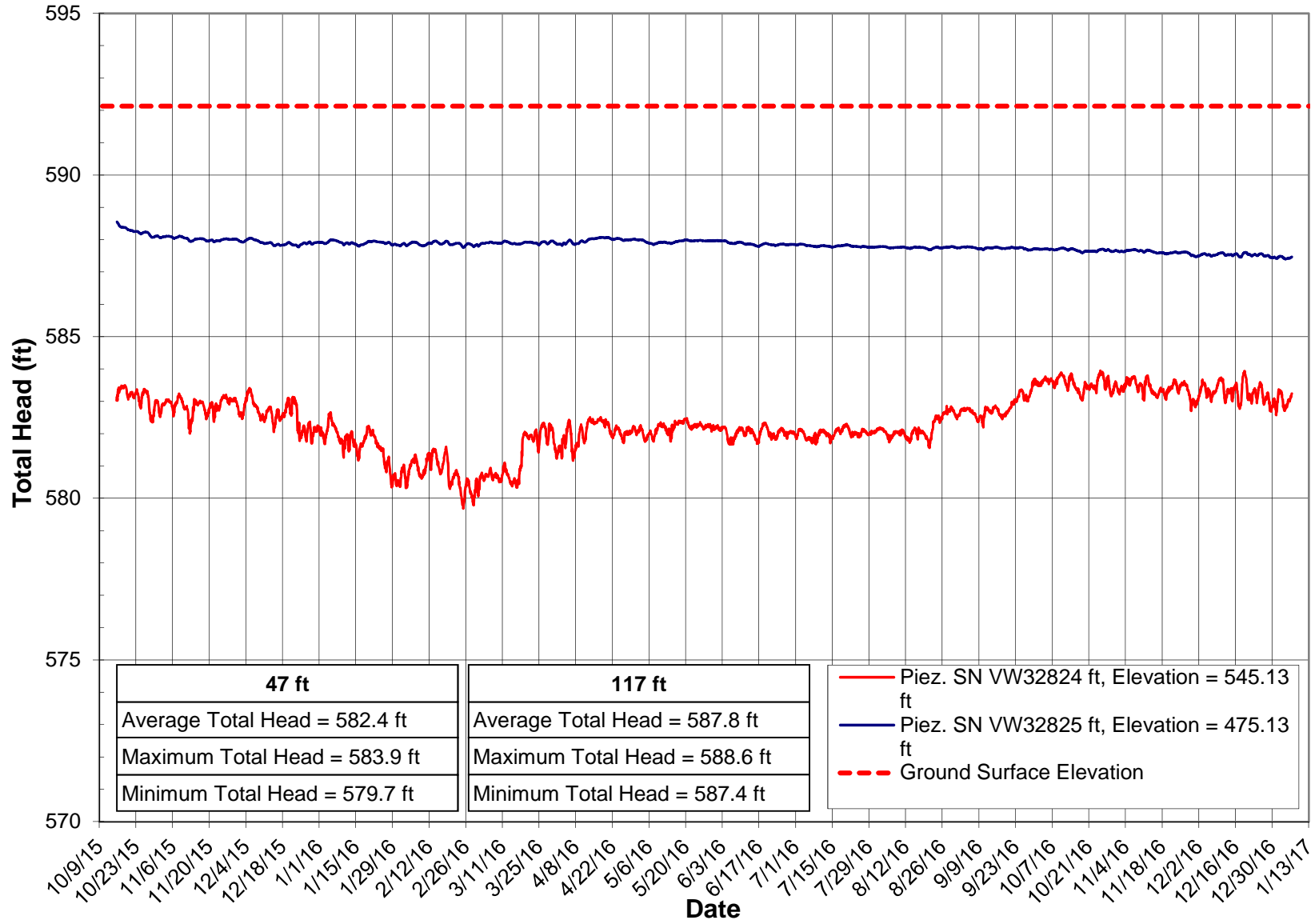
# P-003-13 VW Piezometer Readings

Ground surface elevation = 655 ft



# P-004-13 VW Piezometer Readings

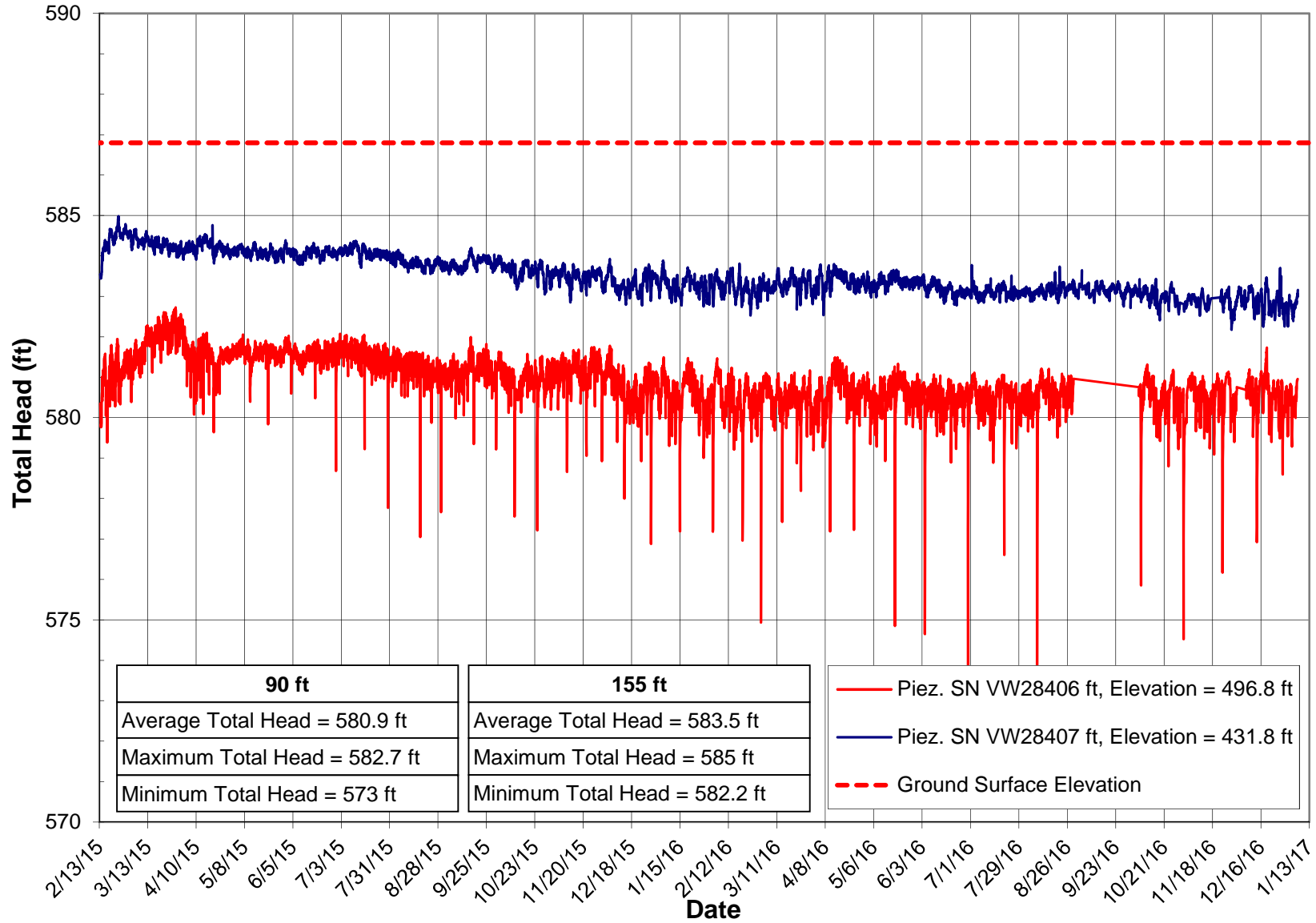
Ground surface elevation = 592.13 ft





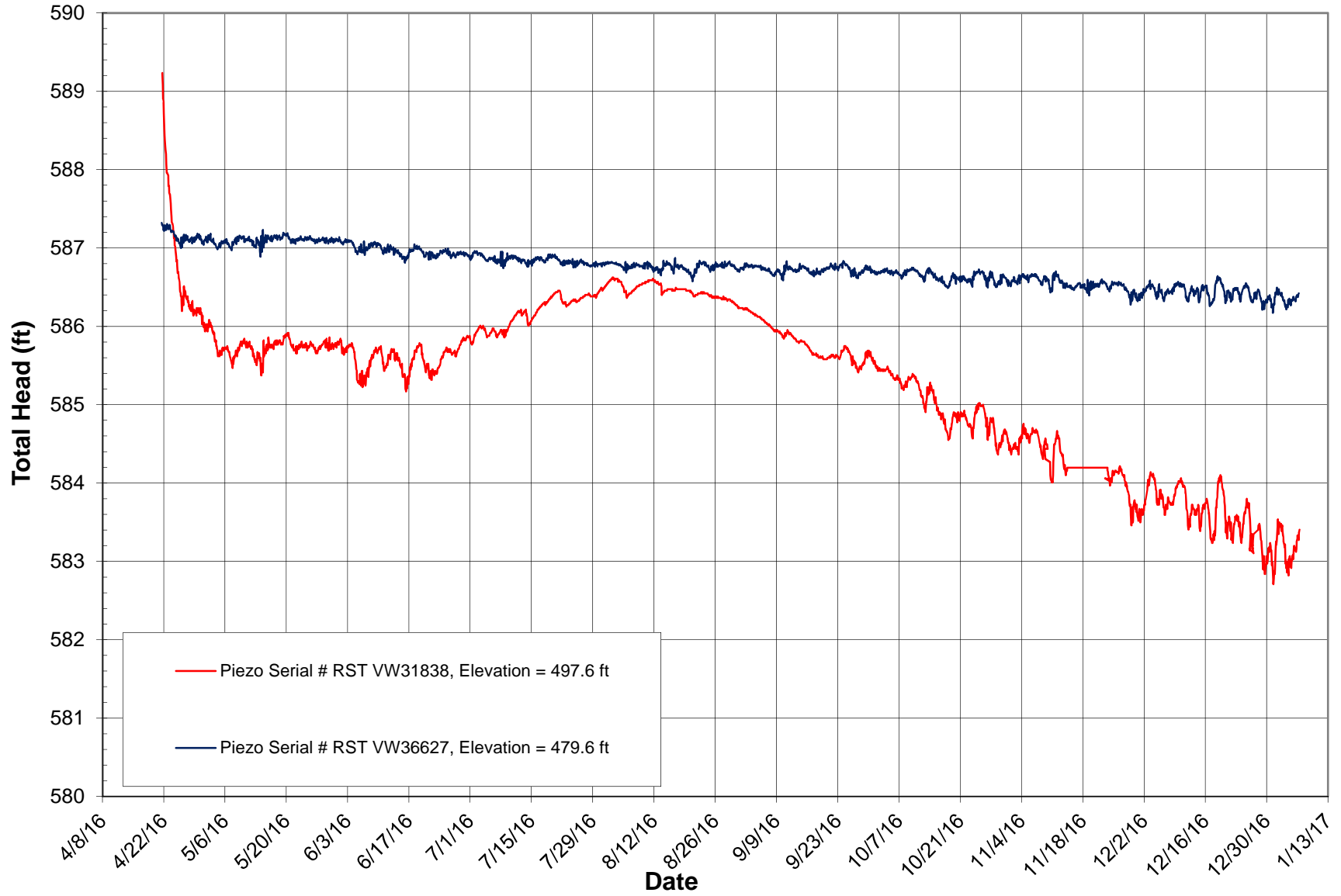
# P-009-13 VW Piezometer Readings

Ground surface elevation = 586.6 ft



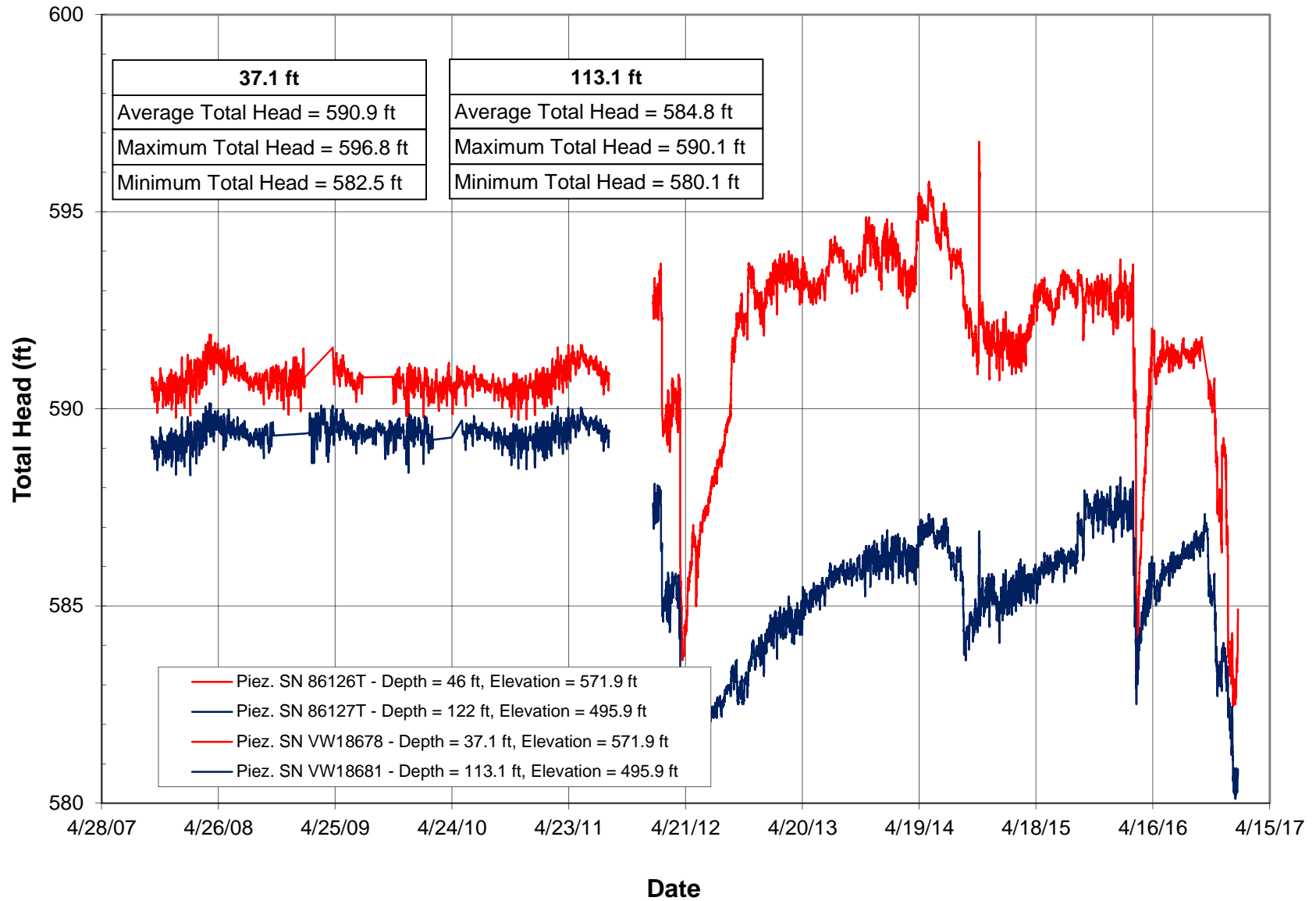
# B-105A VW Piezometer Readings

Ground surface elevation = 585.6 ft



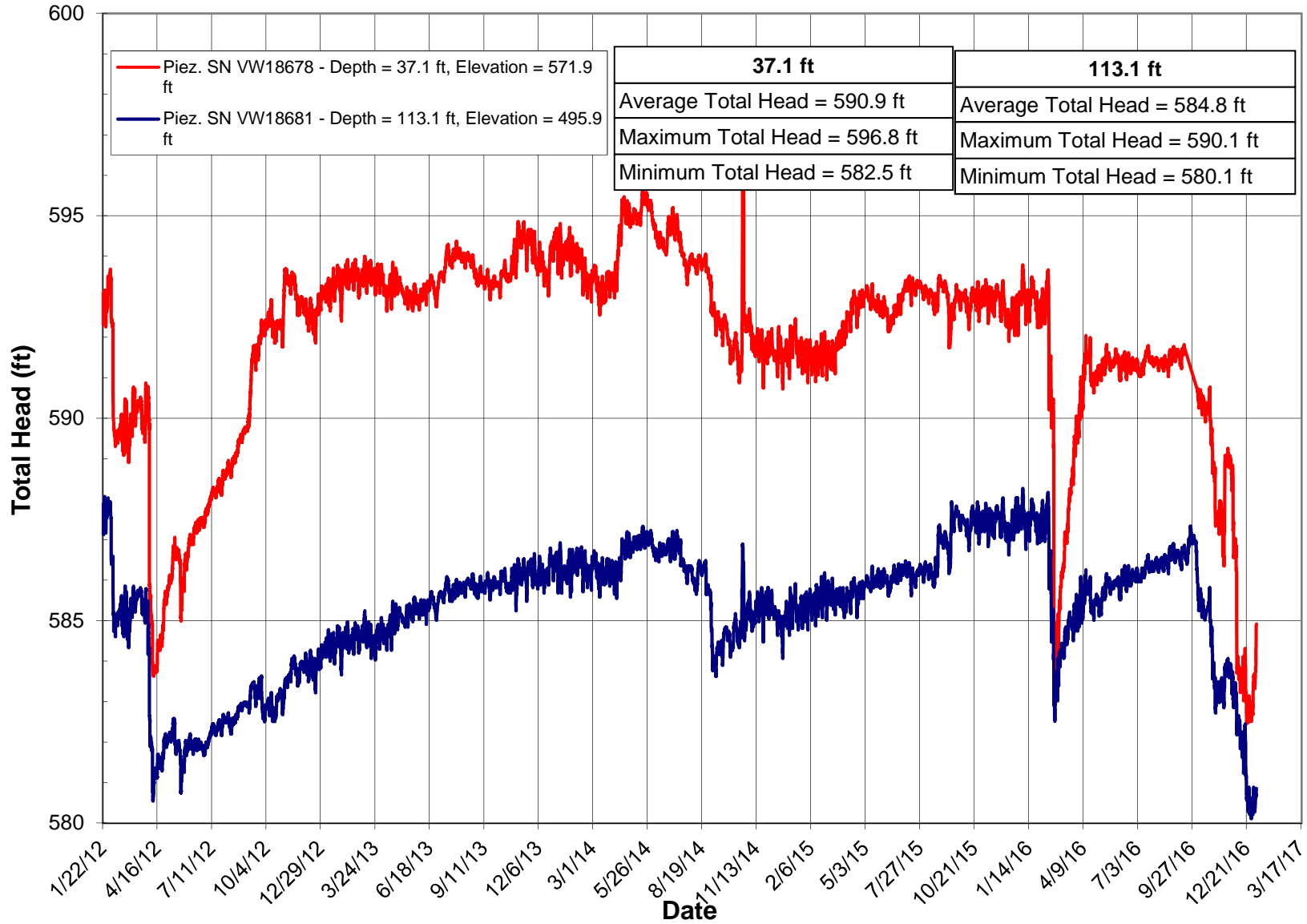
# B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



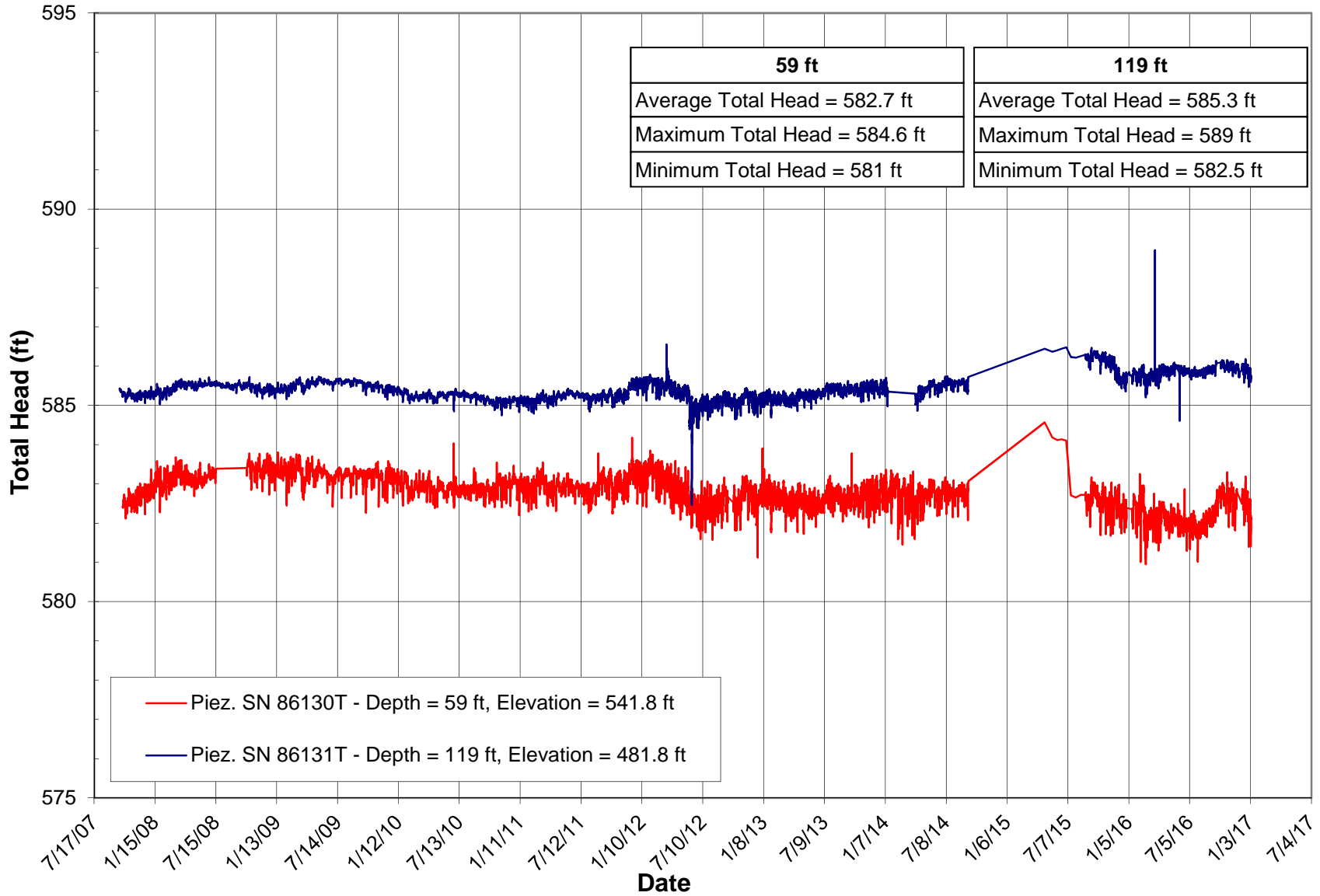
# B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



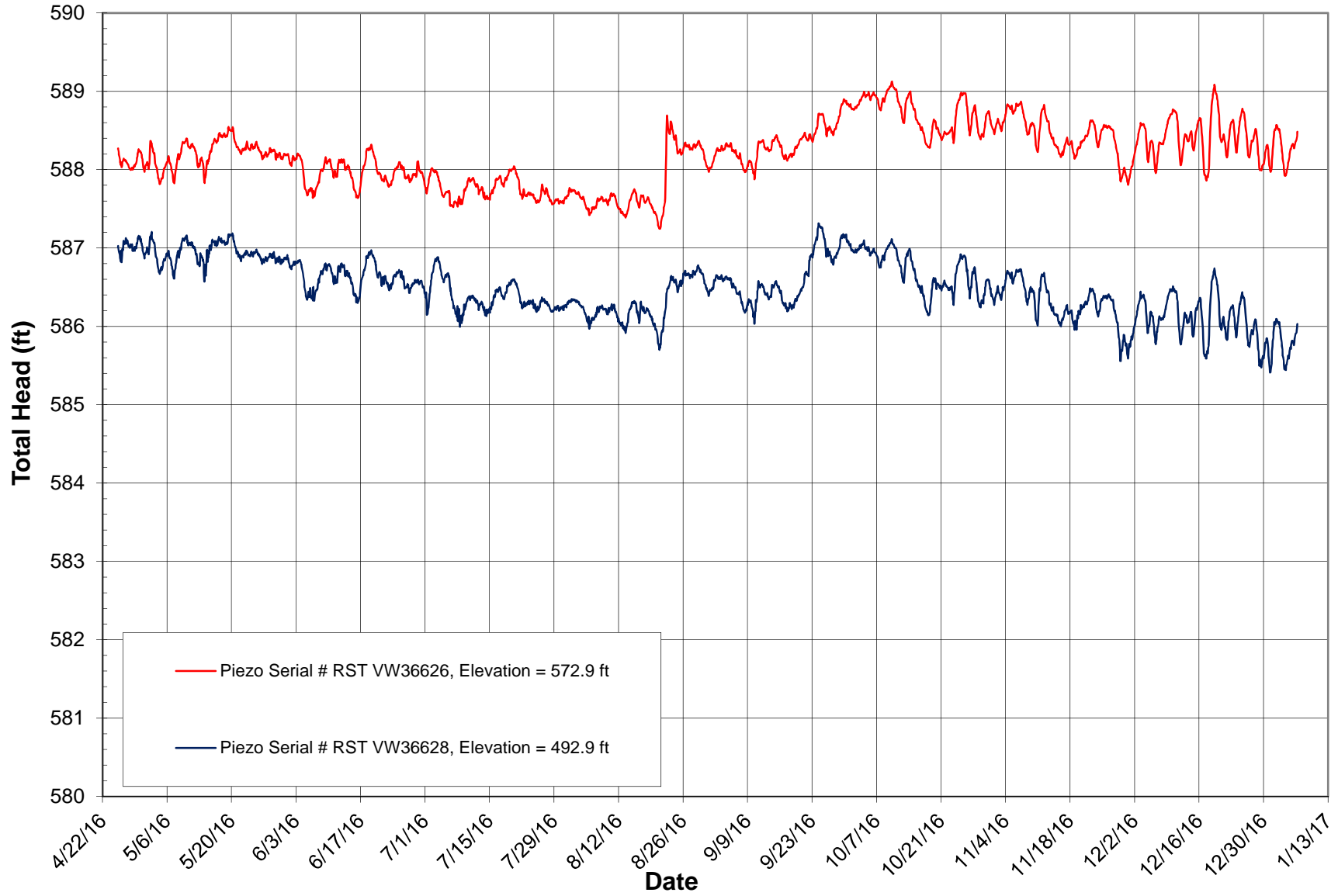
# B-05-04 VW Piezometer Readings

Ground surface elevation = 600.8 ft



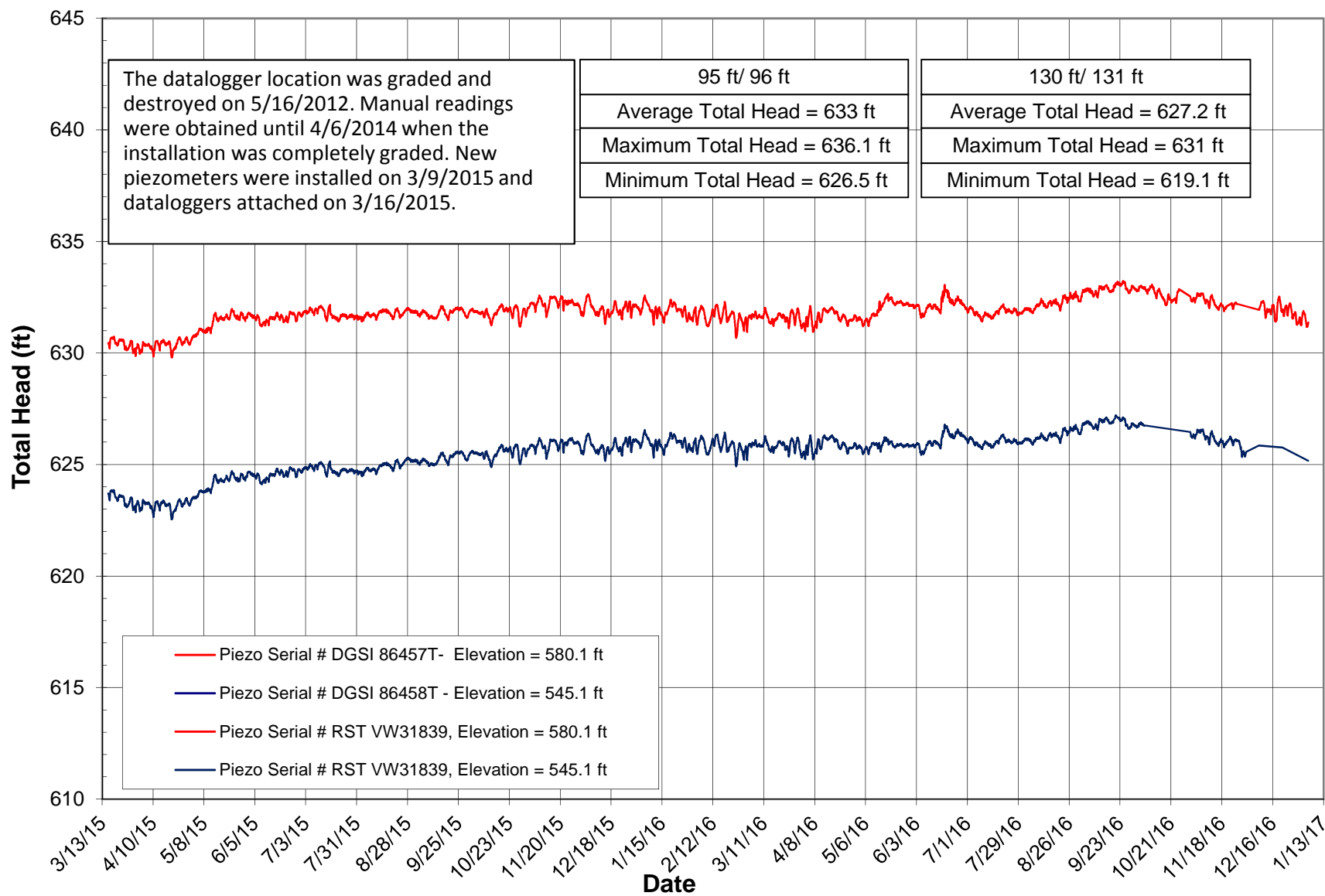
# B-05-A-03 VW Piezometer Readings

Ground surface elevation = 599.9 ft



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

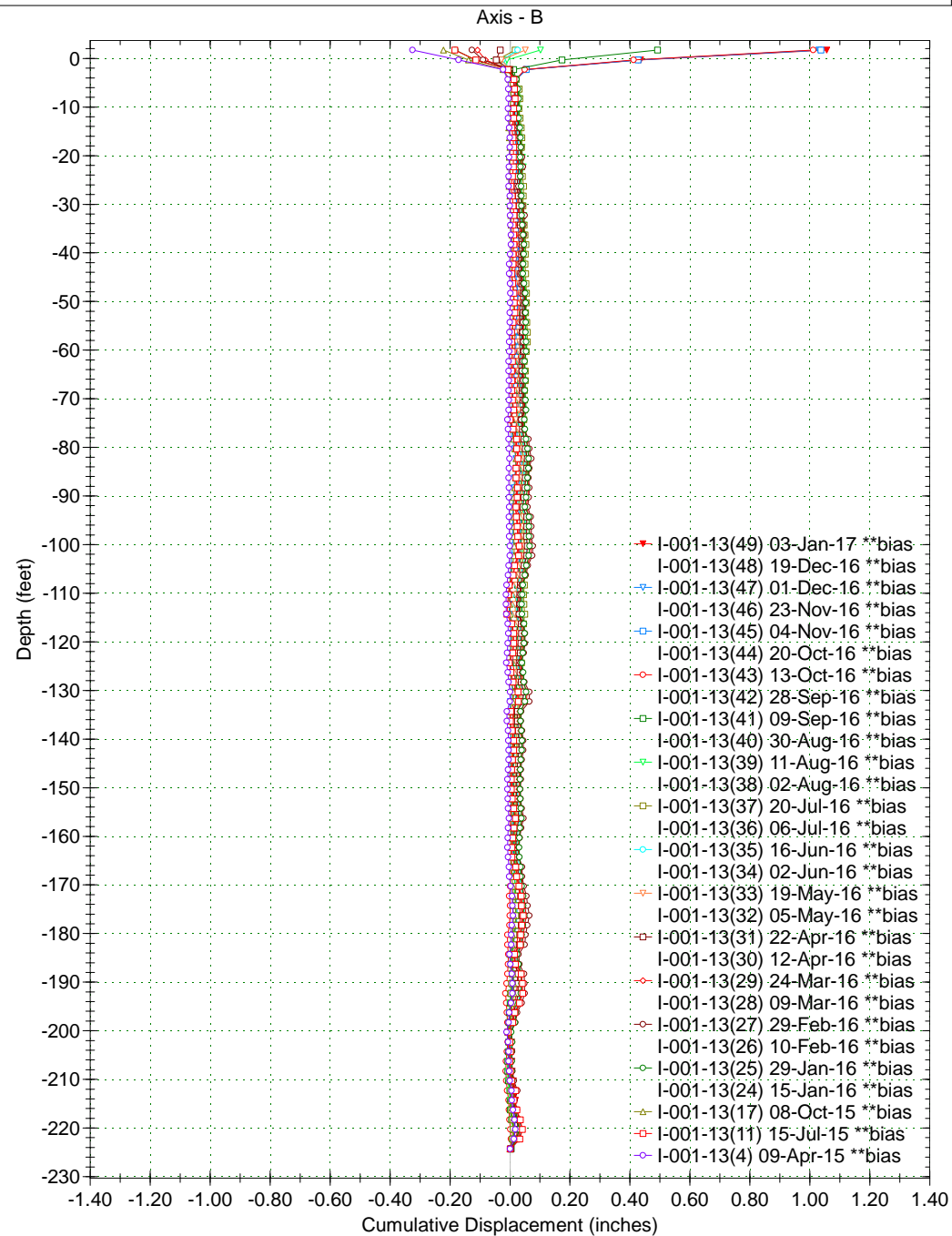
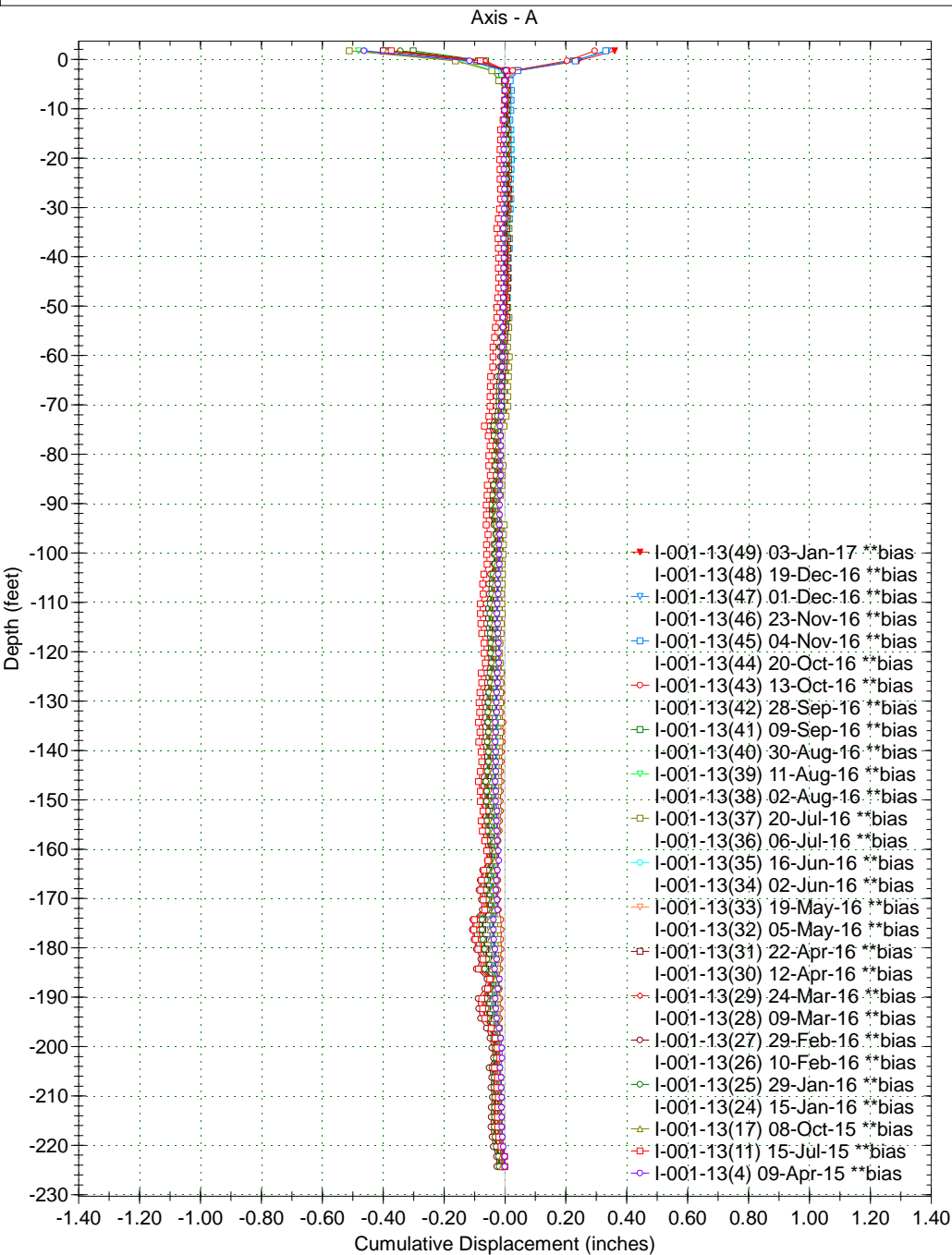
Ground surface elevation = 675.1 ft (B-05-11) / 676.1 ft (B-05-A-11)



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

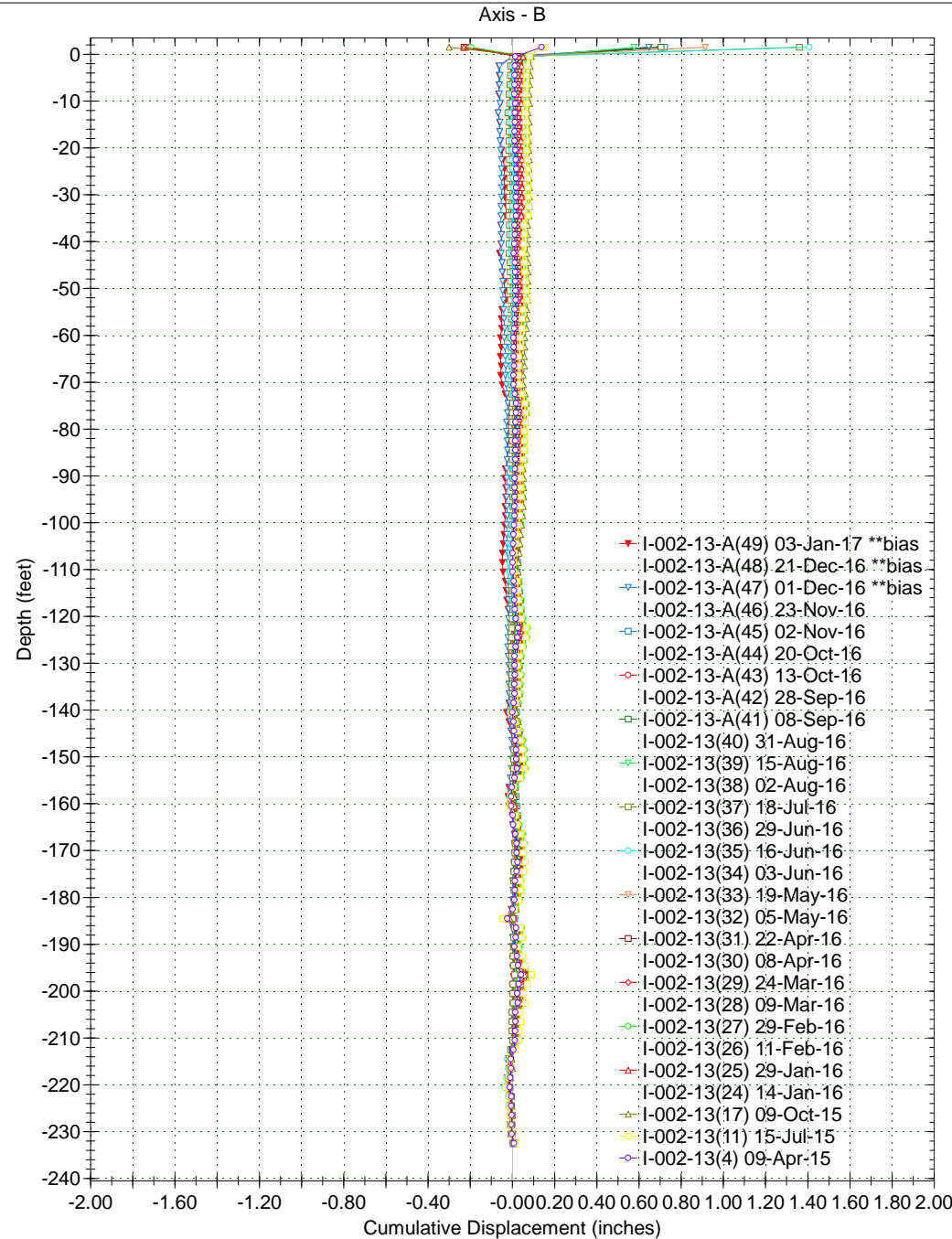
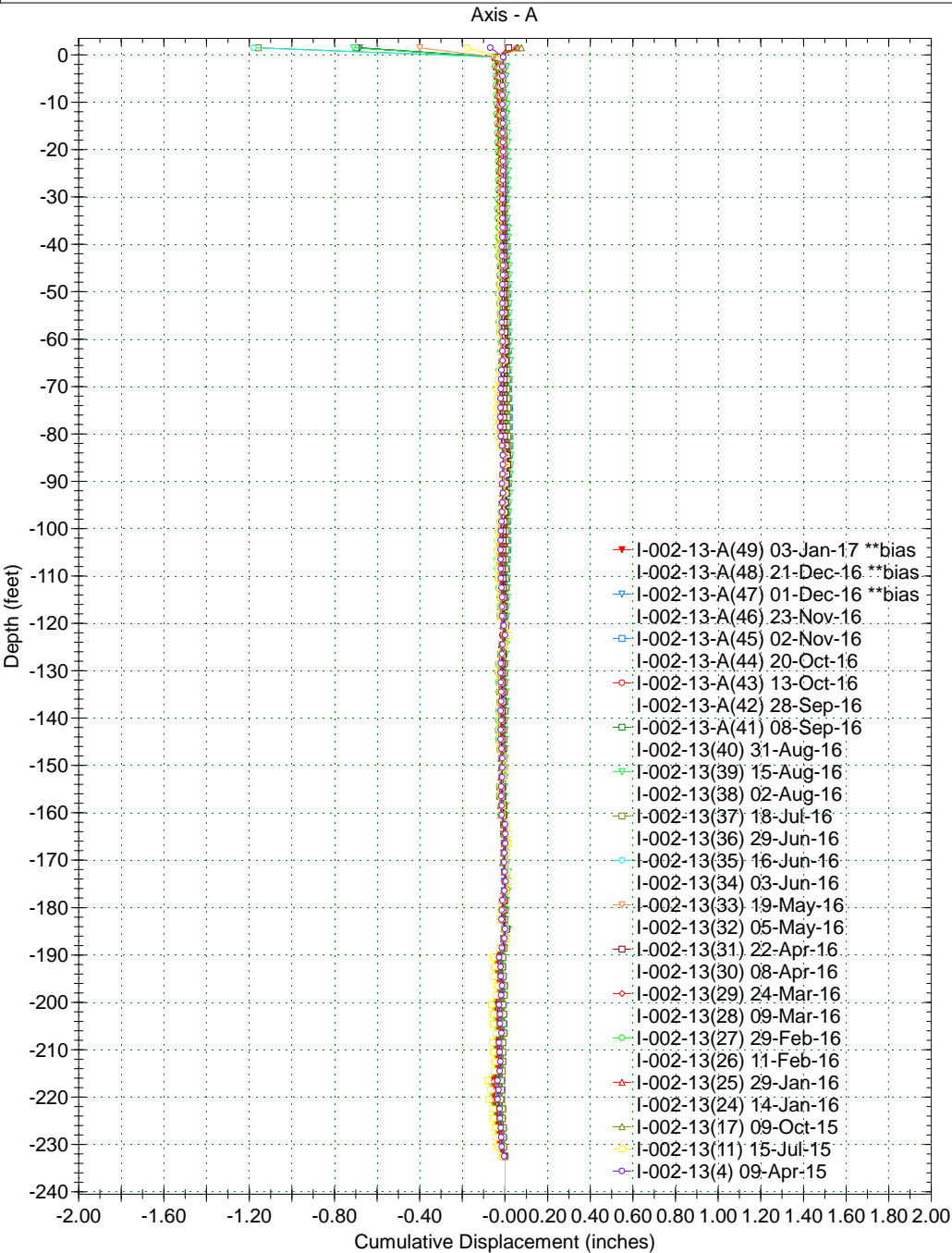




Borehole : I-002-13  
Project : CUY-90-15-24  
Location : Cleveland, Ohio  
Northing :  
Easting :  
Collar :



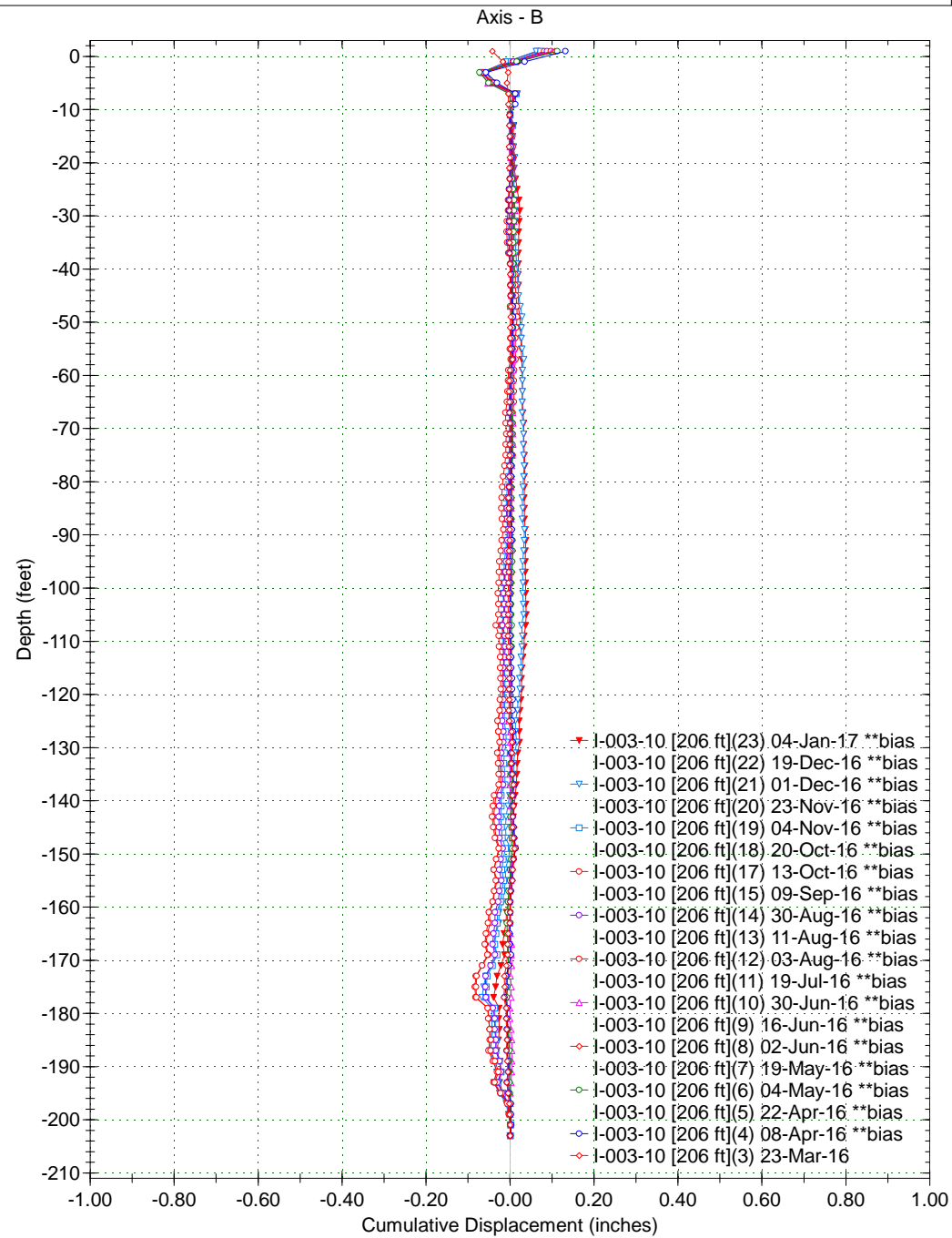
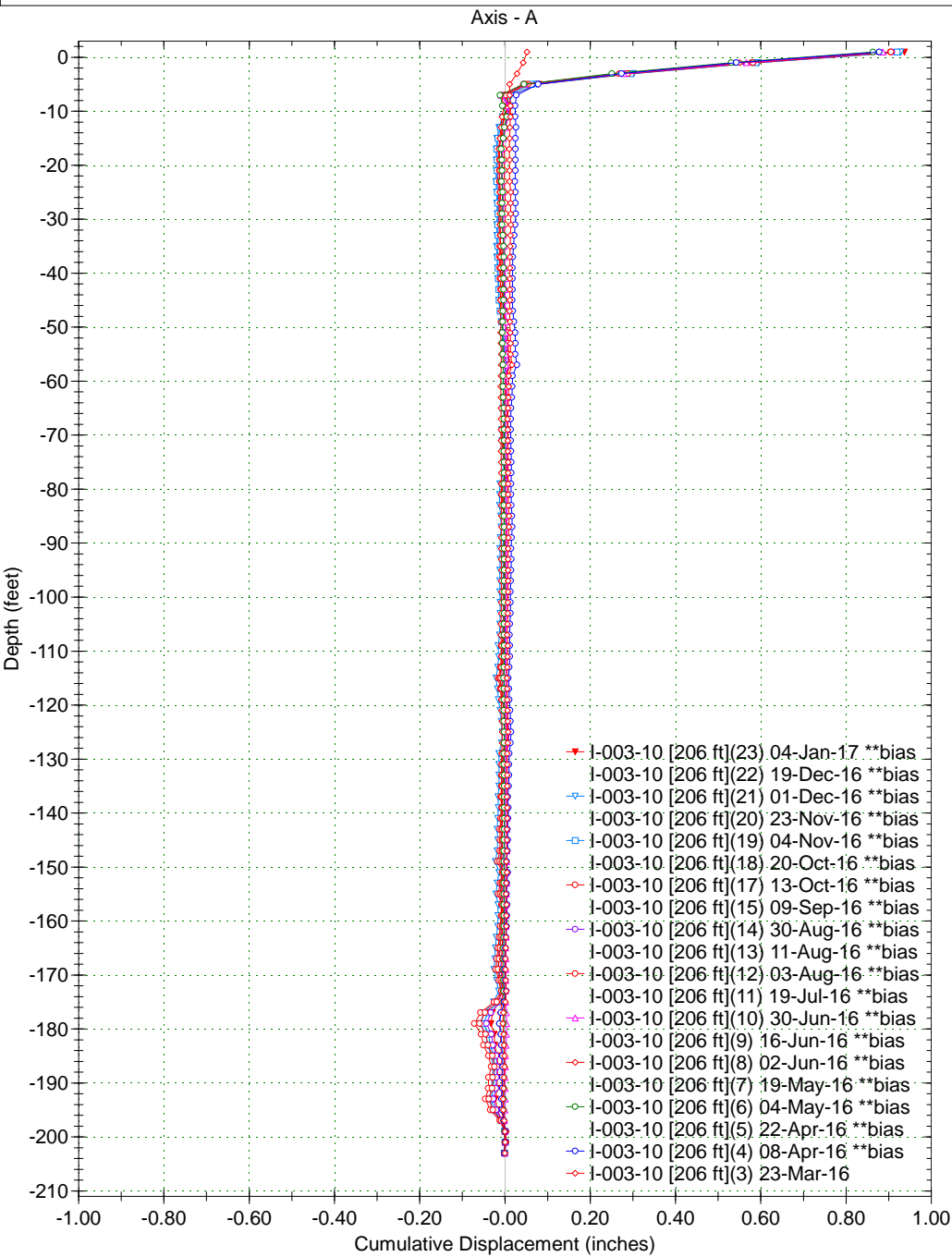
Spiral Correction : N/A  
Collar Elevation : 3.5 feet  
Borehole Total Depth : 236.0 feet  
A+ Groove Azimuth :  
Base Reading : 2015 Mar 03 10:04  
Applied Azimuth : 0.0 degrees



Borehole : I-003-10 [206 ft]  
Project : CUY-90-15-24  
Location :  
Northing :  
Easting :  
Collar :



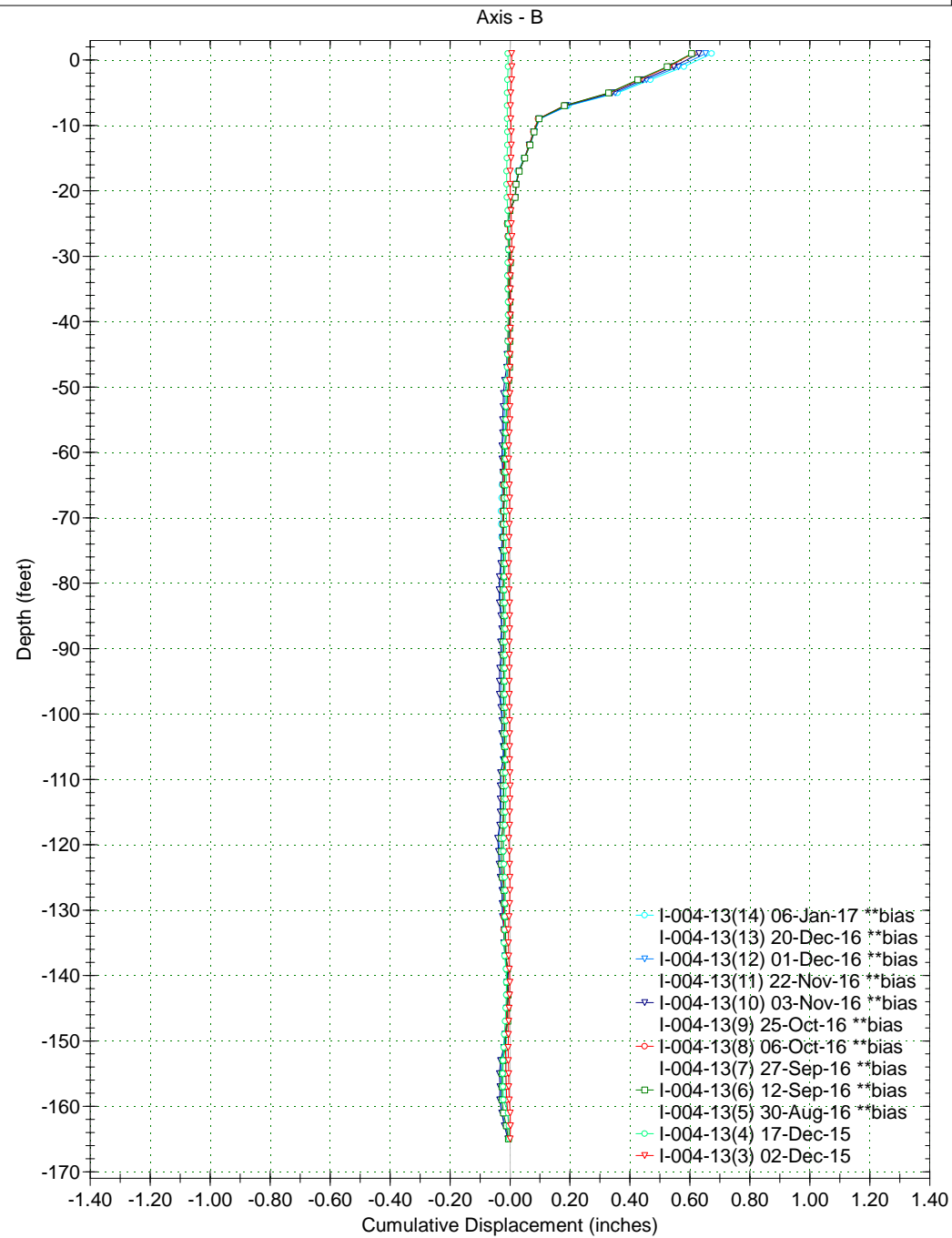
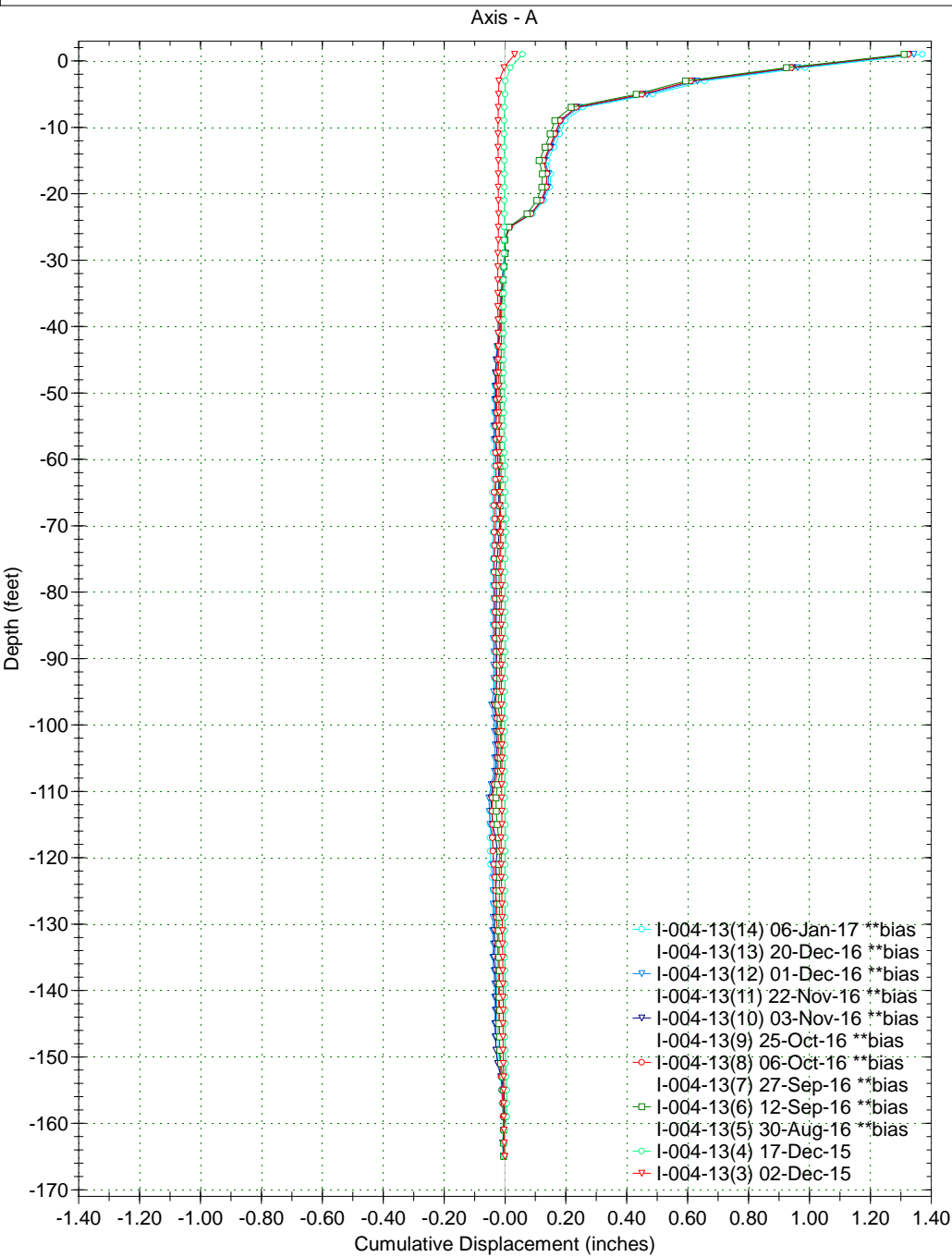
Spiral Correction : N/A  
Collar Elevation : 3.0 feet  
Borehole Total Depth : 206.0 feet  
A+ Groove Azimuth :  
Base Reading : 2016 Mar 08 15:42  
Applied Azimuth : 0.0 degrees



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



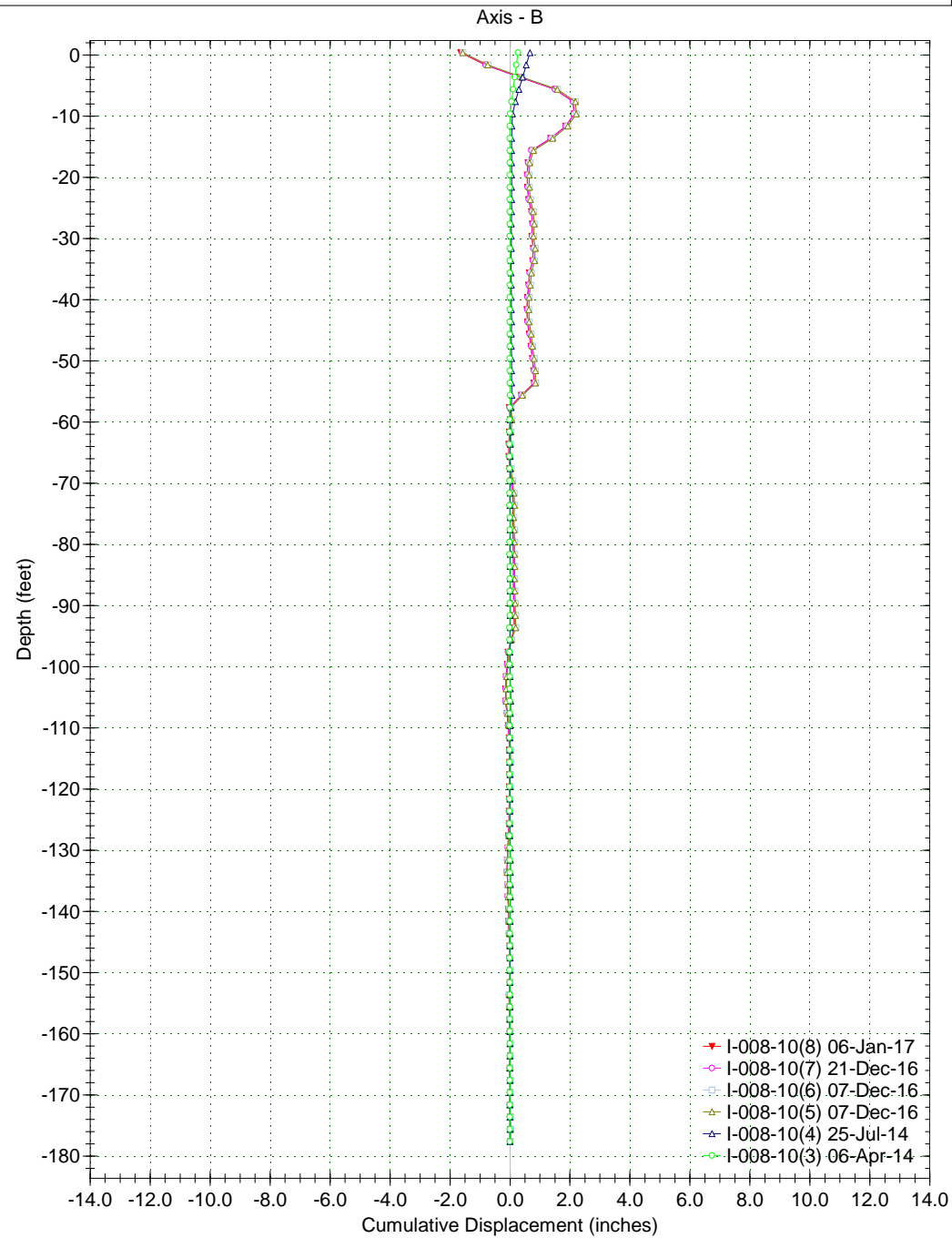
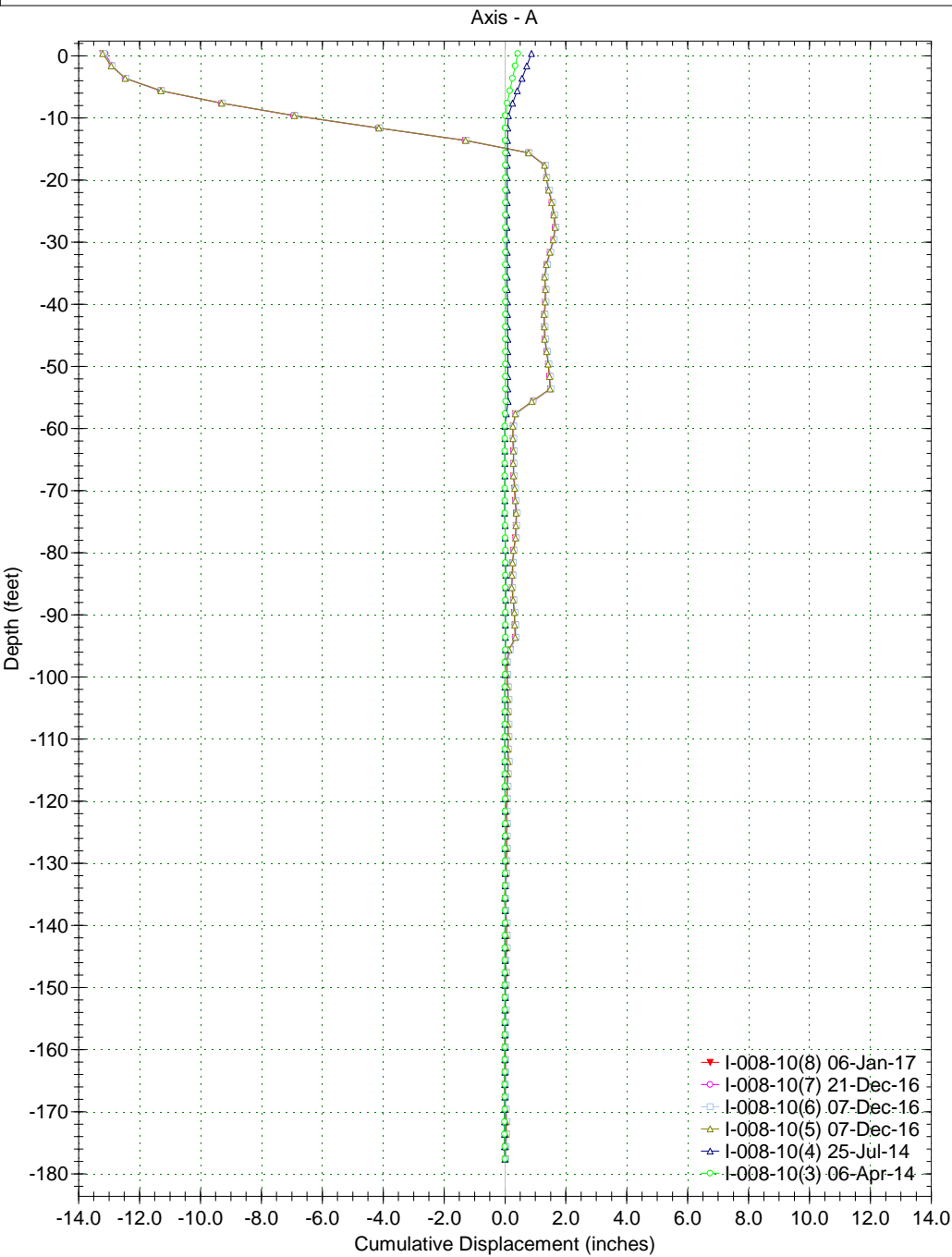
Spiral Correction : N/A  
Collar Elevation : 3.0 feet  
Borehole Total Depth : 168.0 feet  
A+ Groove Azimuth :  
Base Reading : 2015 Nov 20 09:09  
Applied Azimuth : 0.0 degrees



Borehole : I-008-10  
Project : CUY-90-15-24  
Location : Cleveland, Ohio  
Northing :  
Easting :  
Collar :



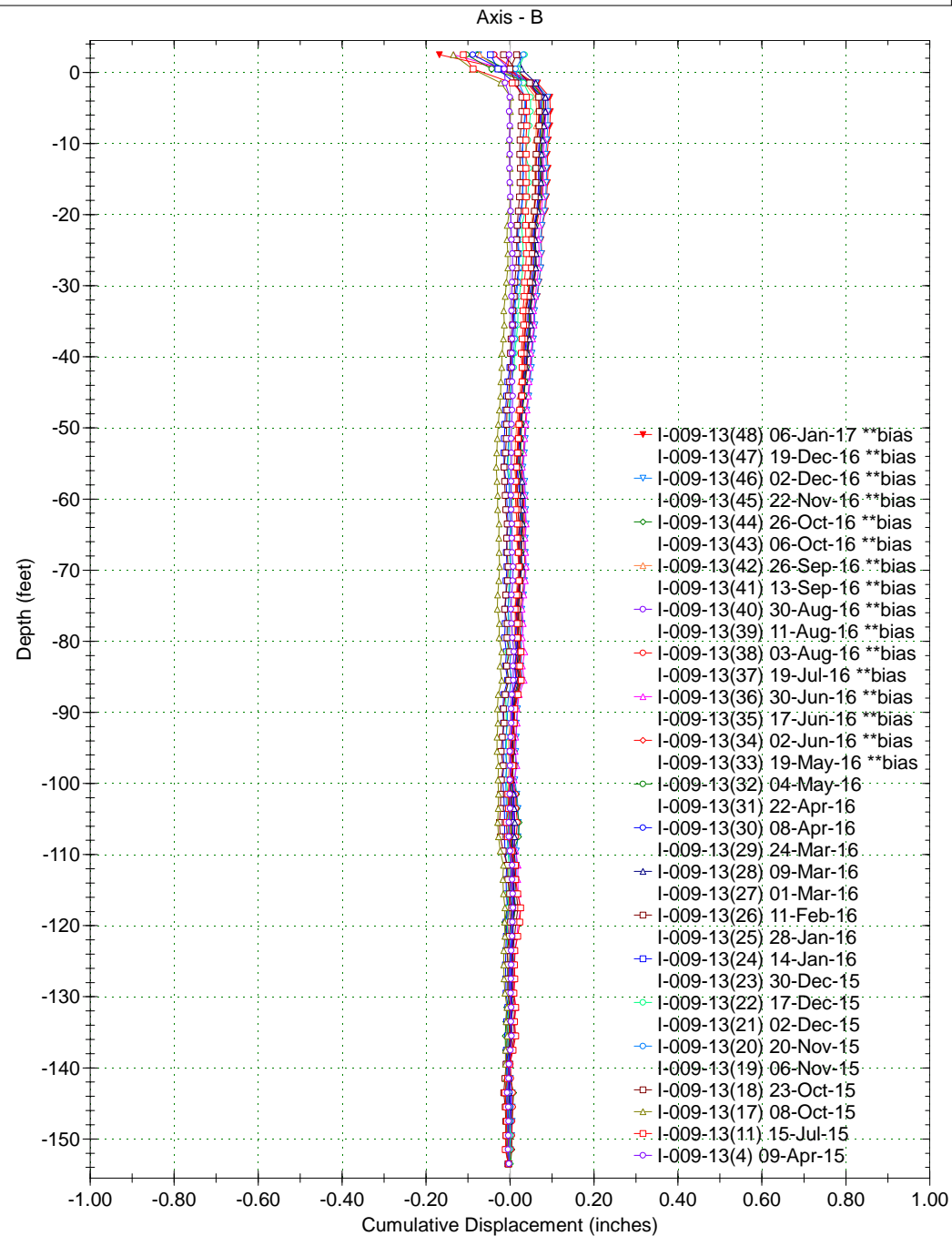
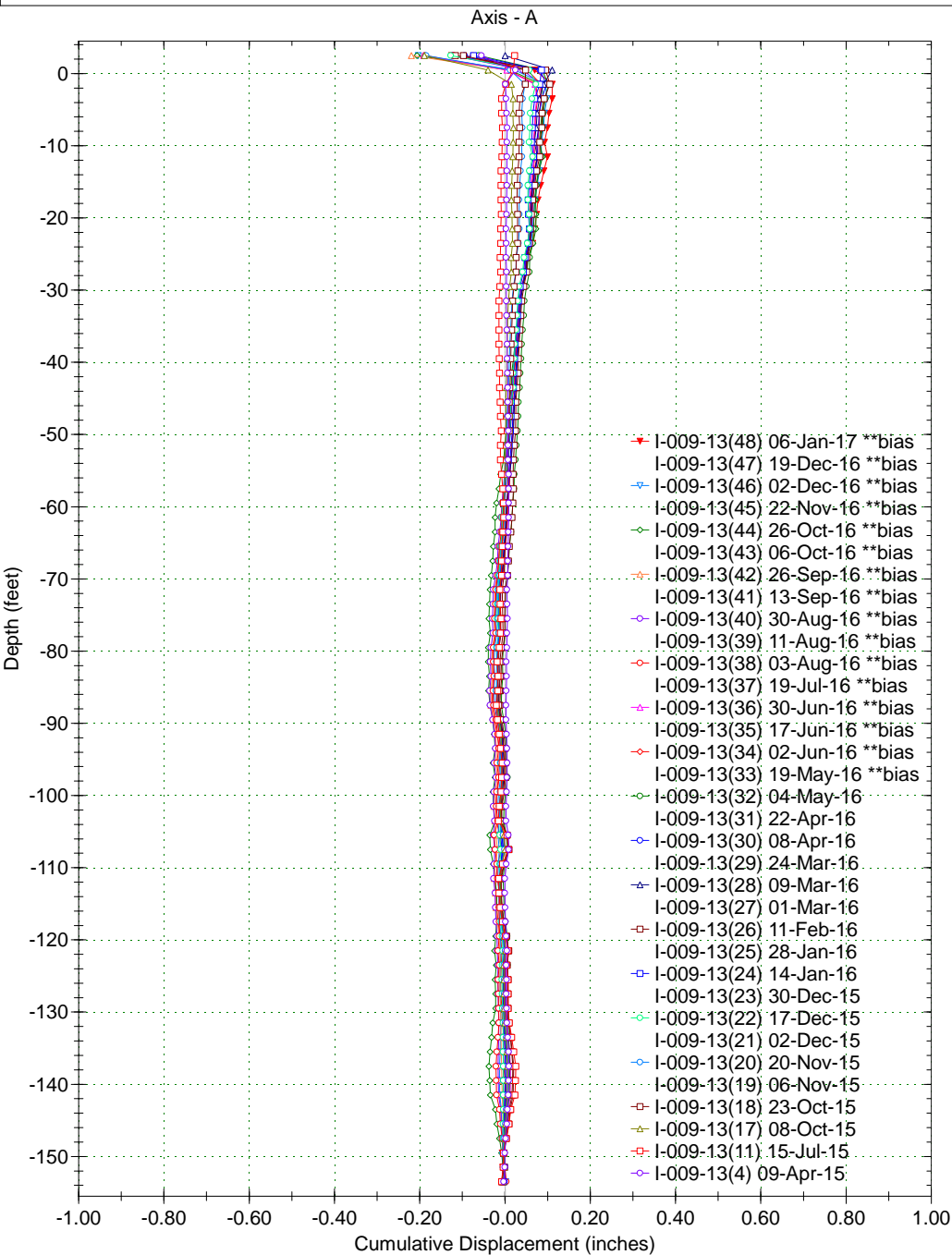
Spiral Correction : N/A  
Collar Elevation : 2.4 feet  
Borehole Total Depth : 180.0 feet  
A+ Groove Azimuth :  
Base Reading : 2014 Jan 14 07:26  
Applied Azimuth : 0.0 degrees



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



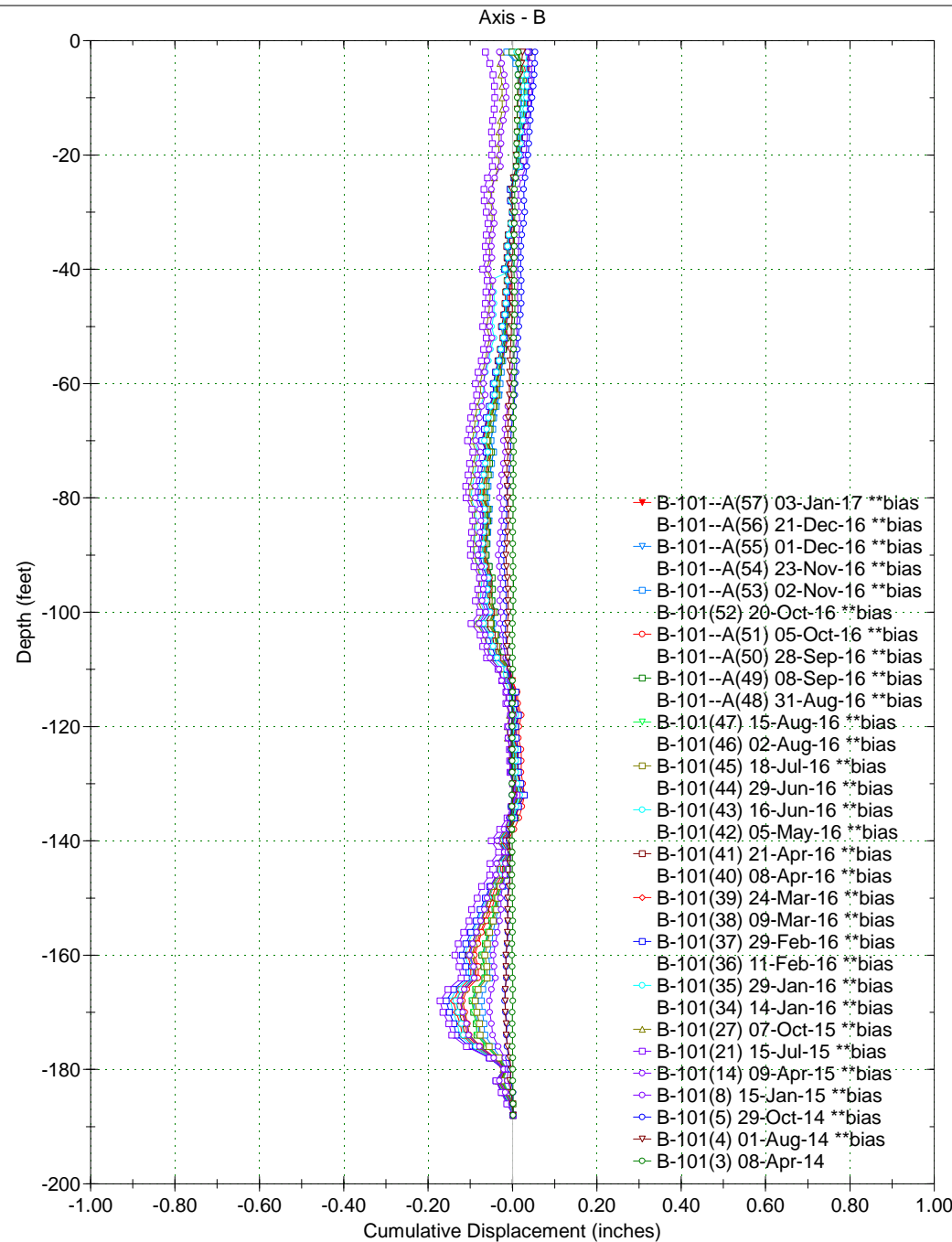
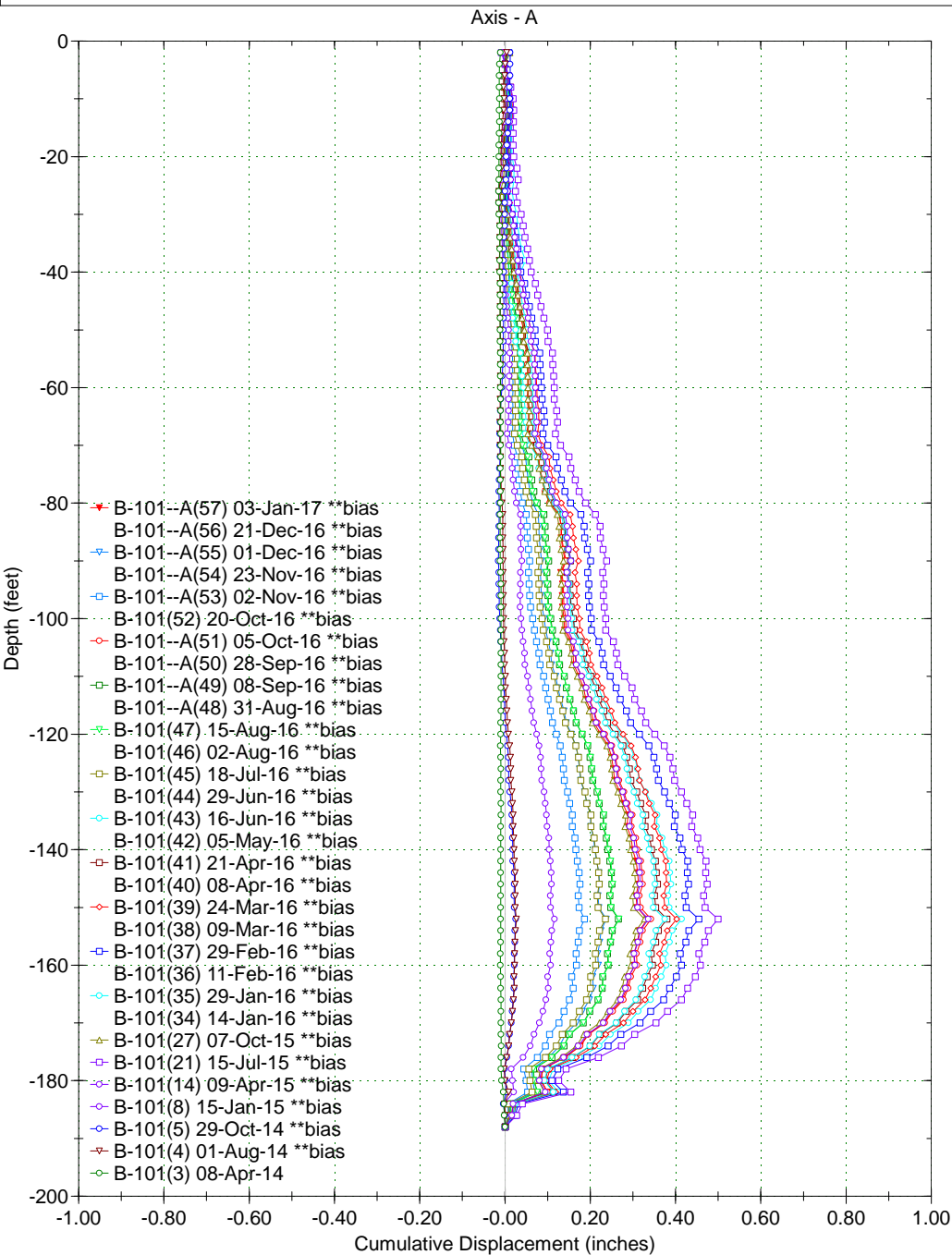
Spiral Correction : N/A  
Collar Elevation : 4.5 feet  
Borehole Total Depth : 158.0 feet  
A+ Groove Azimuth :  
Base Reading : 2015 Mar 18 15:56  
Applied Azimuth : 0.0 degrees



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



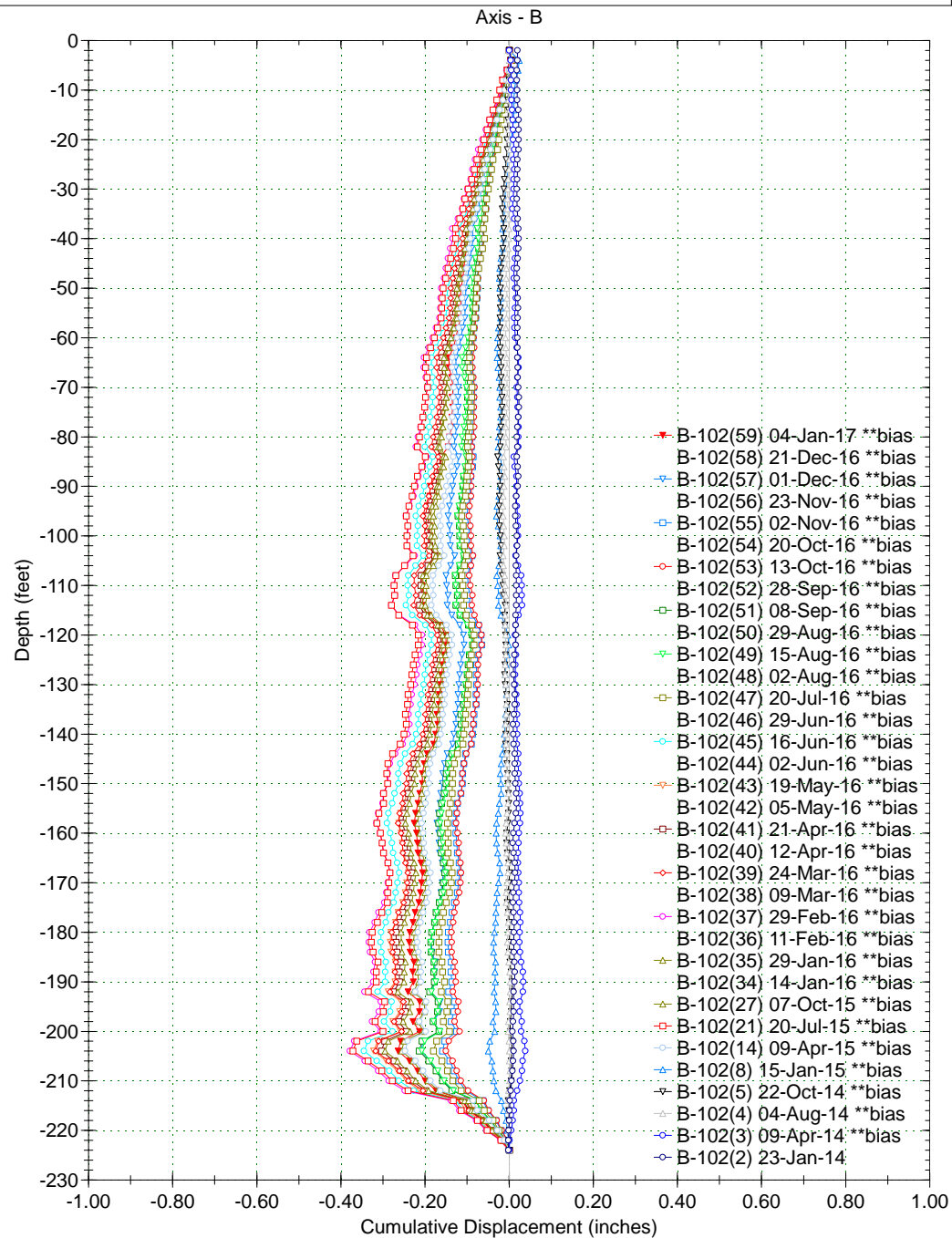
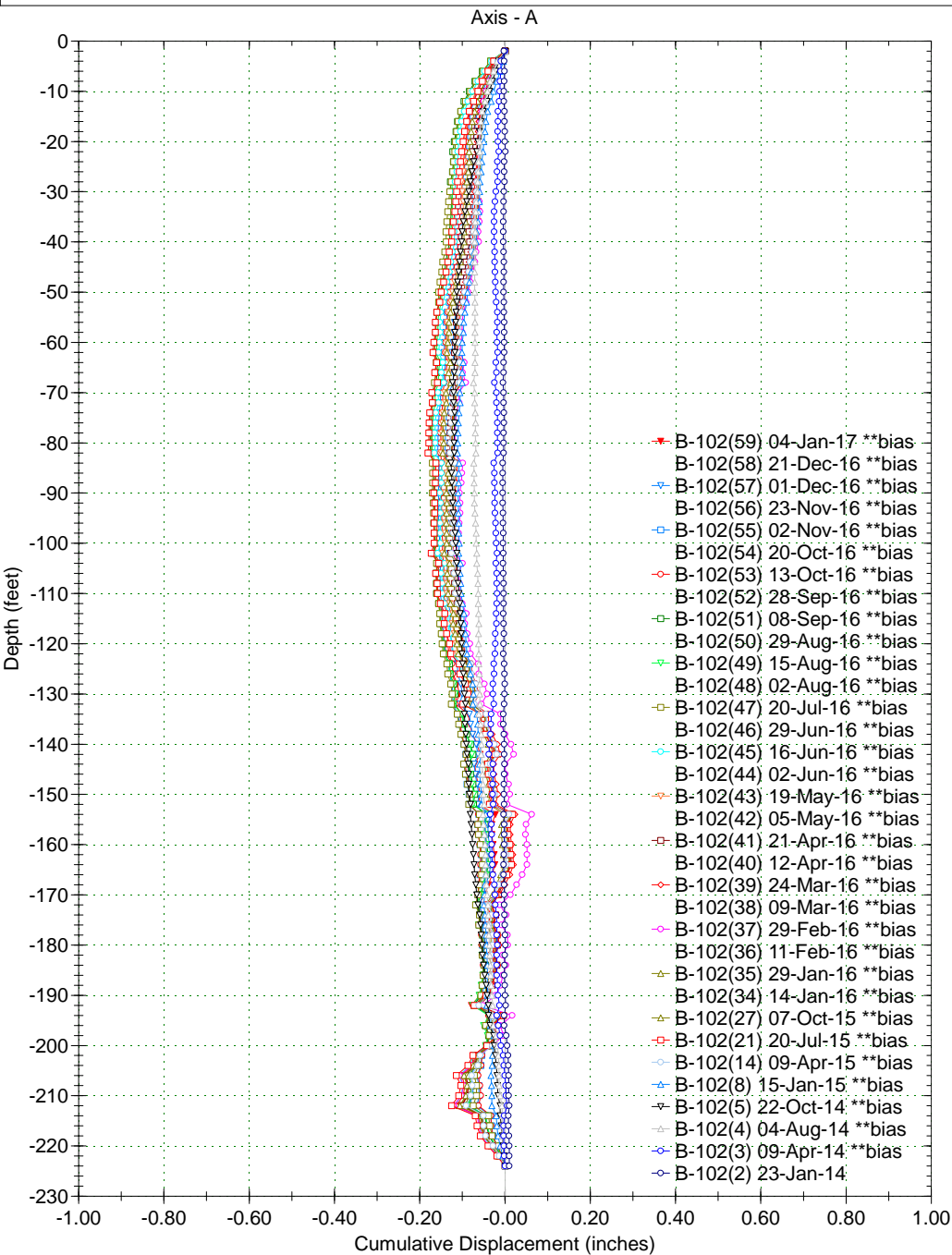
Spiral Correction : N/A  
Collar Elevation : 0.0 feet  
Borehole Total Depth : 188.0 feet  
A+ Groove Azimuth :  
Base Reading : 2014 Jan 22 09:01  
Applied Azimuth : 0.0 degrees



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



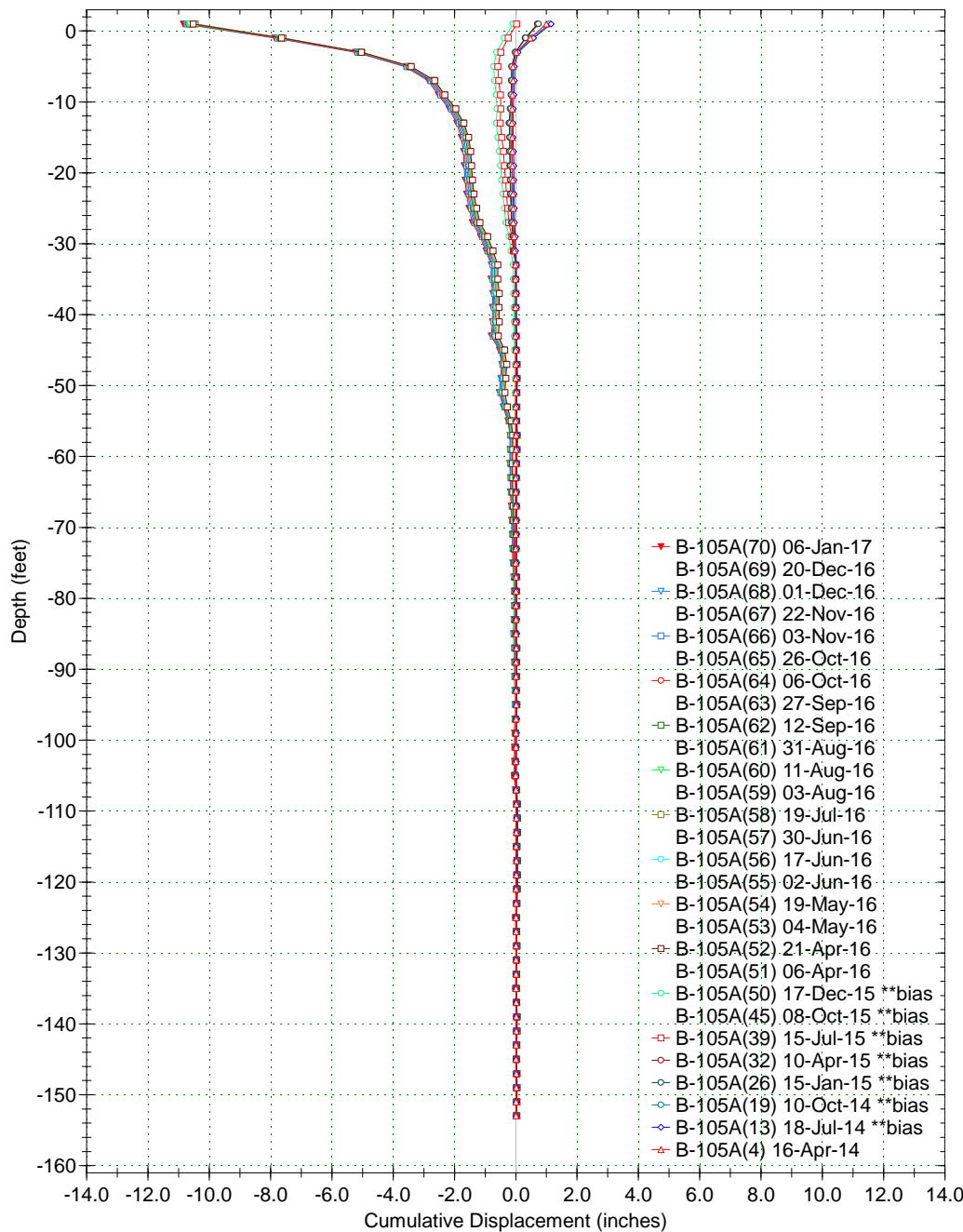
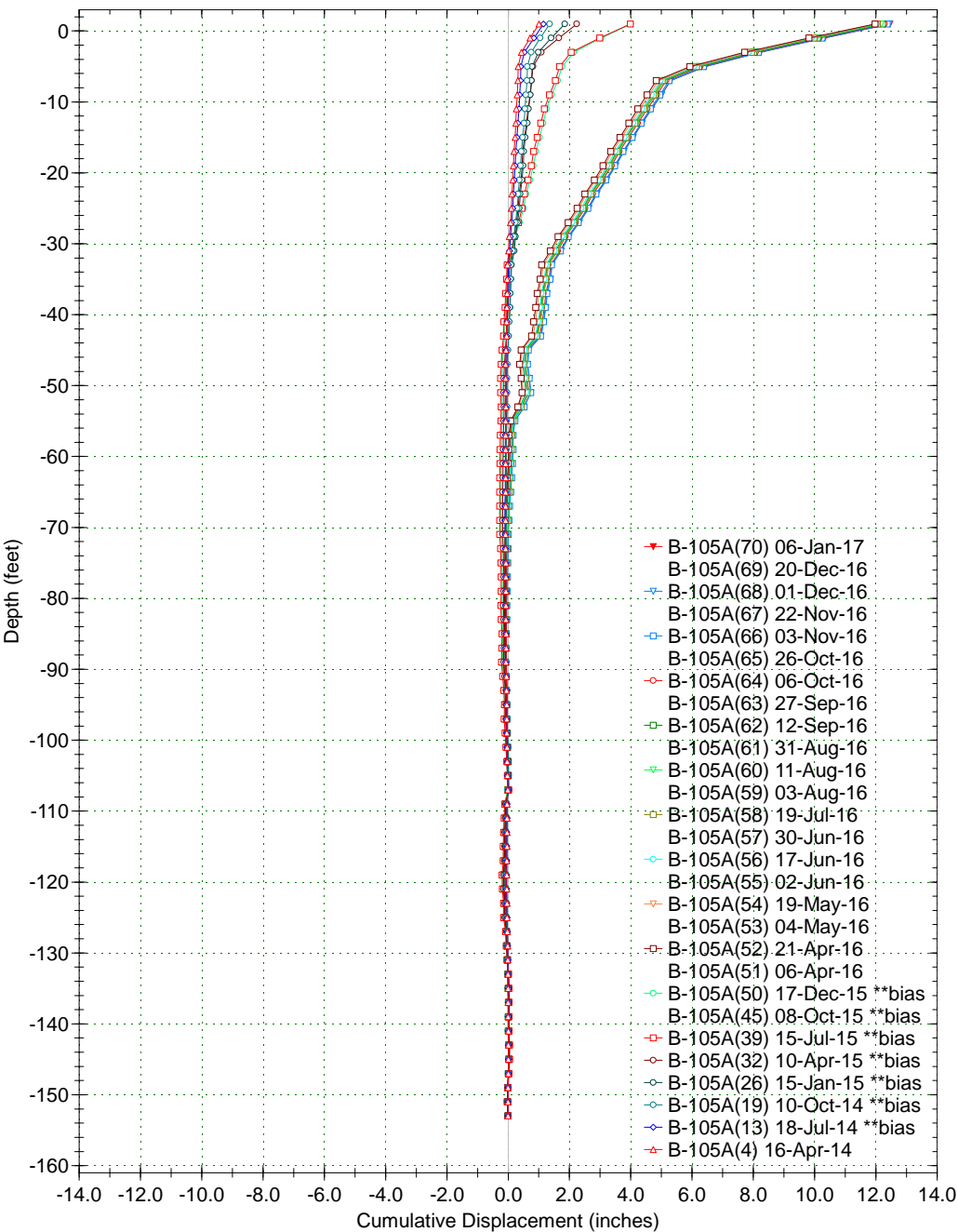
Borehole : B-105A  
 Project : CUY-90-15-24  
 Location : Cleveland, Ohio  
 Northing : Sta. 19+11.38  
 Easting : 90.9' Rt of CL  
 Collar :



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

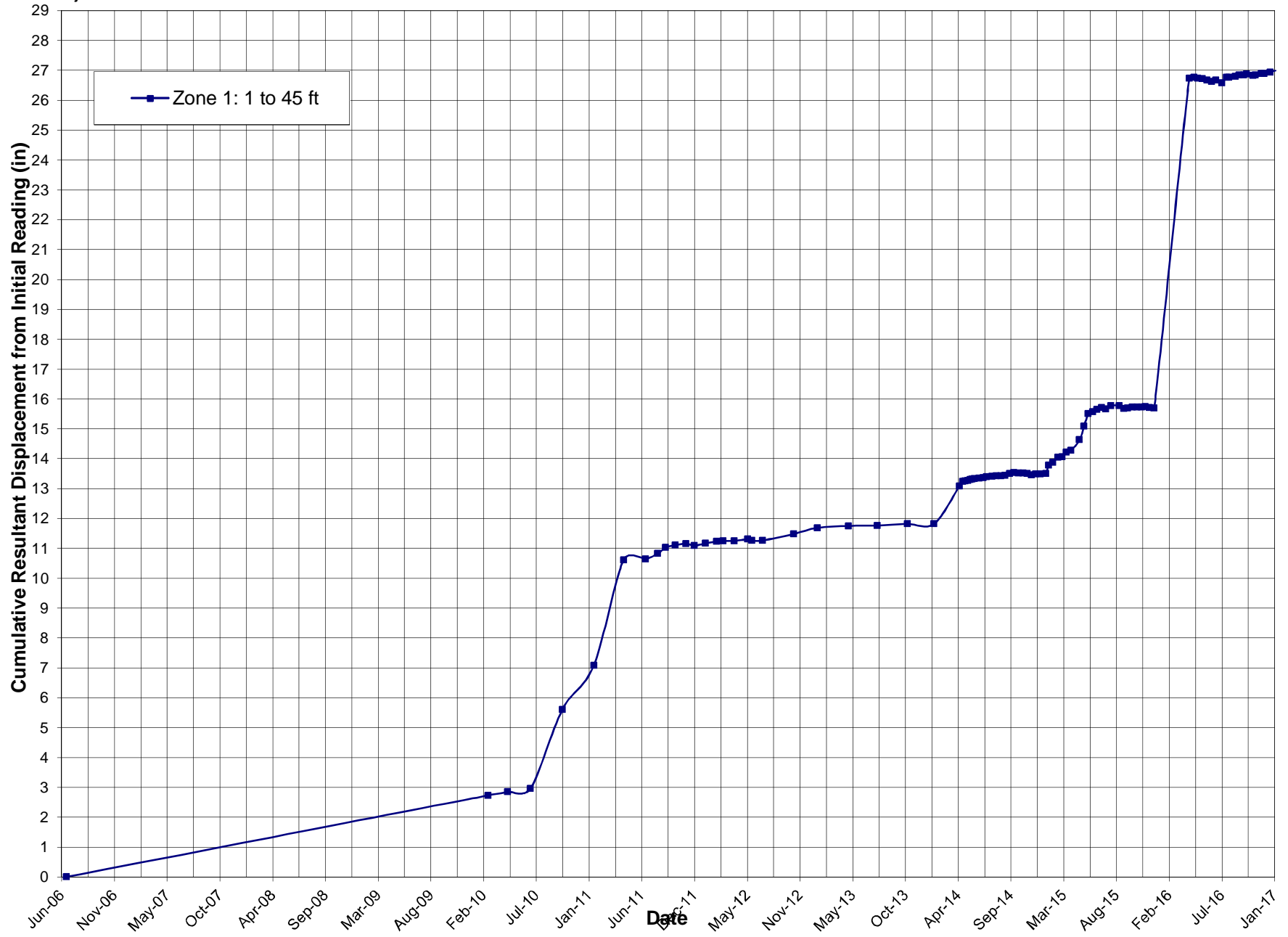
Axis - B





CUY-90-15.24  
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SME Project#: 069032.00

### B-105A



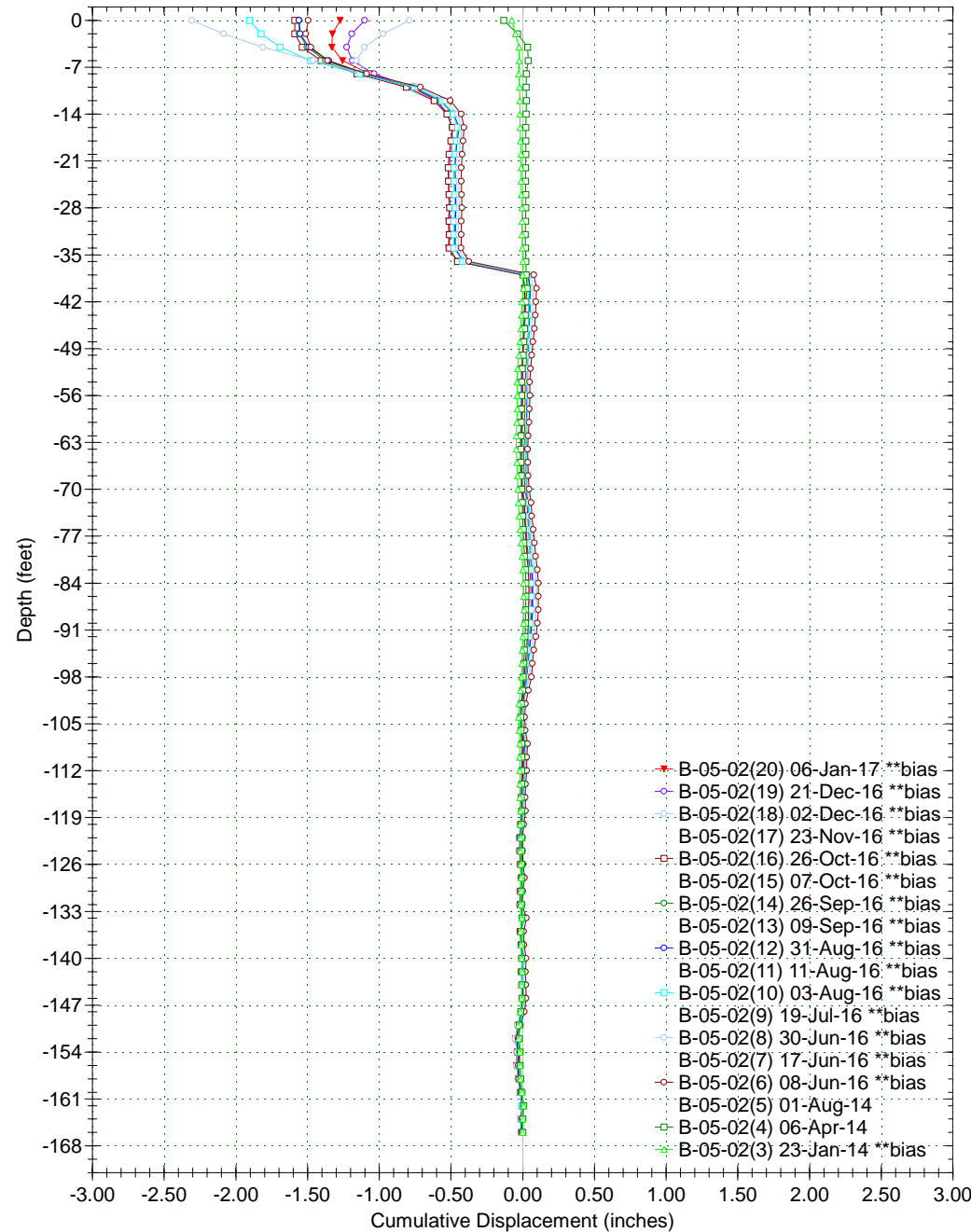
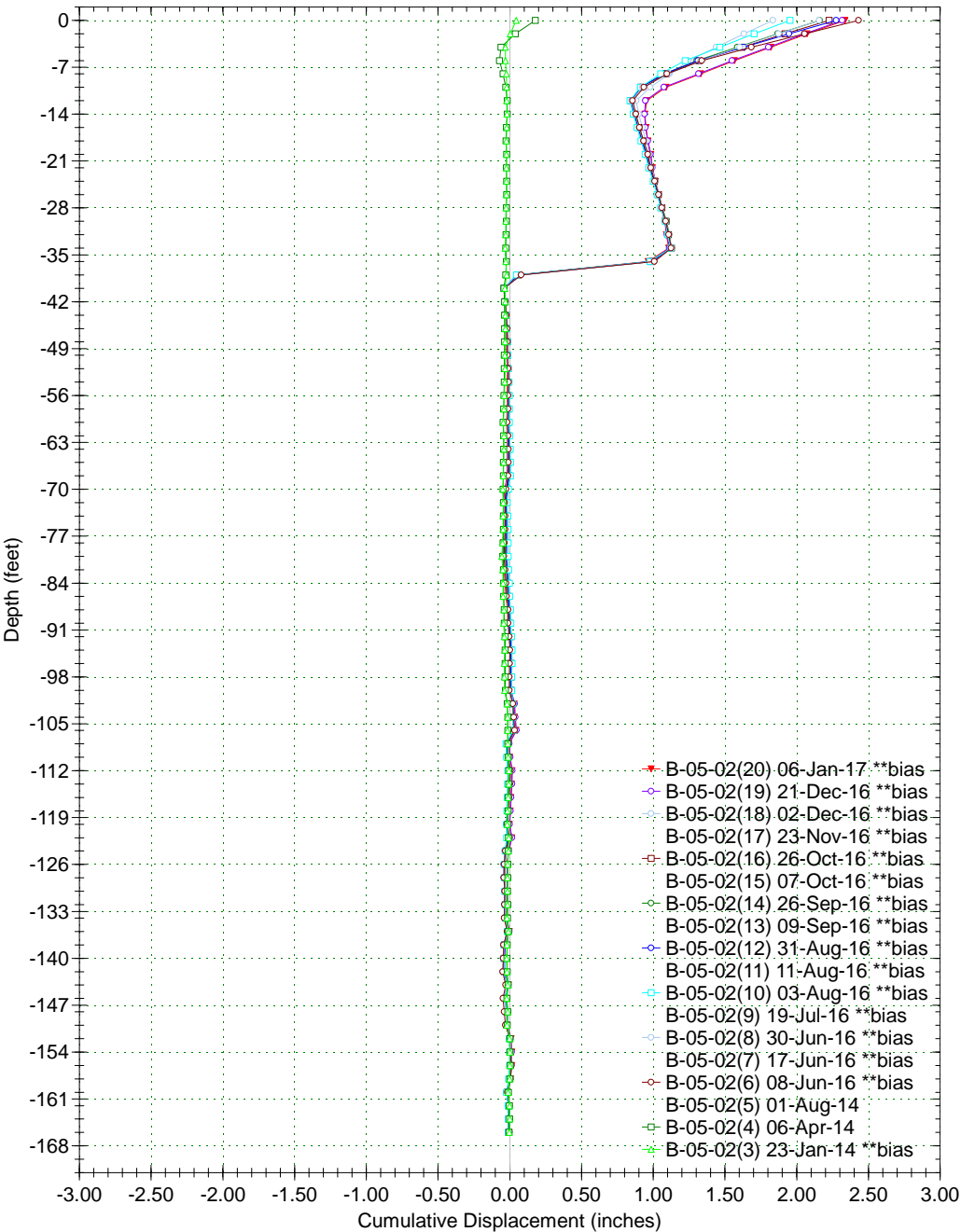
Borehole : B-05-02  
 Project : CUY-90-15-24  
 Location : Cleveland, Ohio  
 Northing : 663737.939  
 Easting : 2190289.081  
 Collar :



Spiral Correction : N/A  
 Collar Elevation : 2.0 feet  
 Borehole Total Depth : 168.0 feet  
 A+ Groove Azimuth :  
 Base Reading : 2013 Dec 24 11:12  
 Applied Azimuth : 0.0 degrees

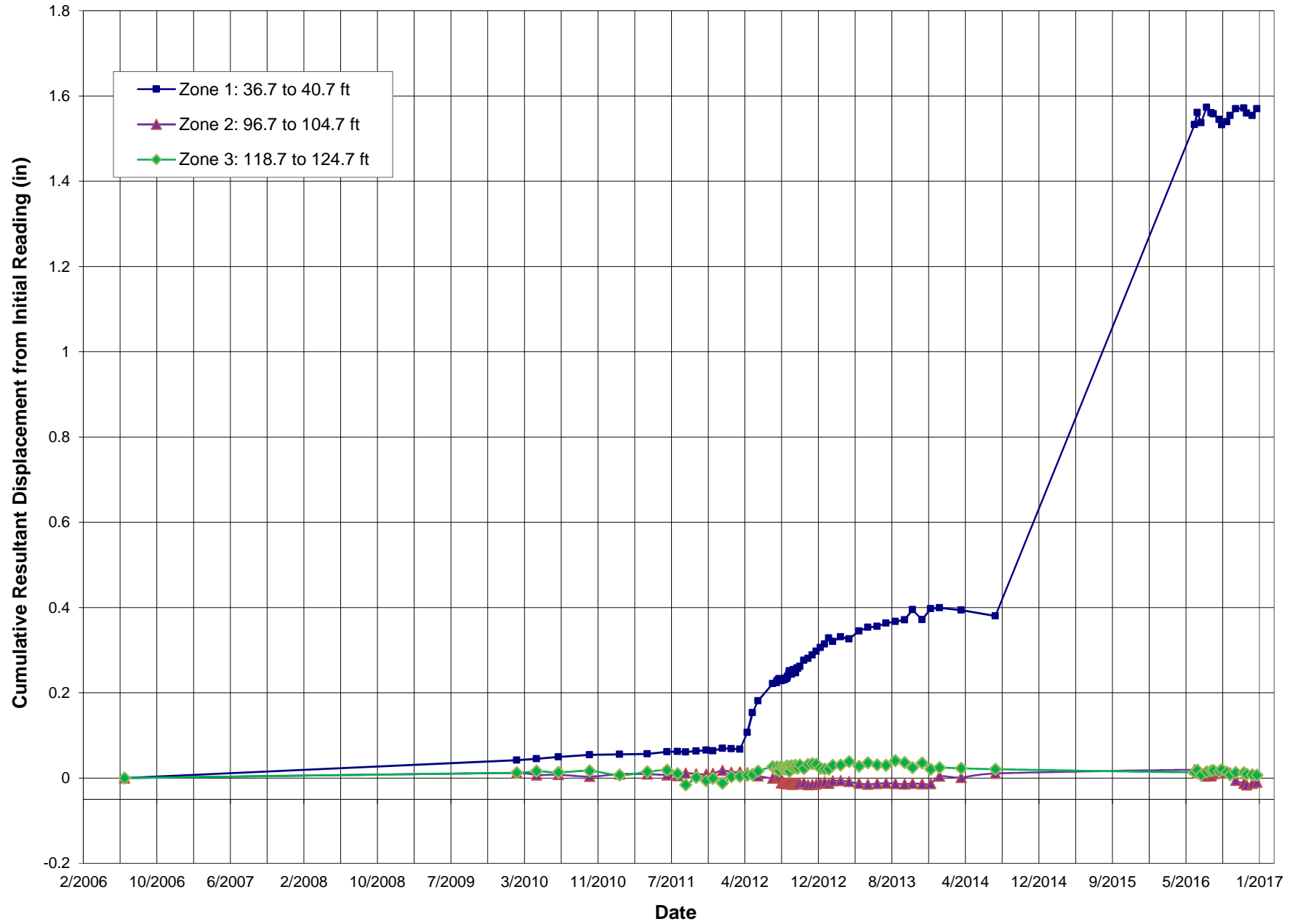
Axis - A

Axis - B



CUY-90-15.24  
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SME Project#: 069032.00

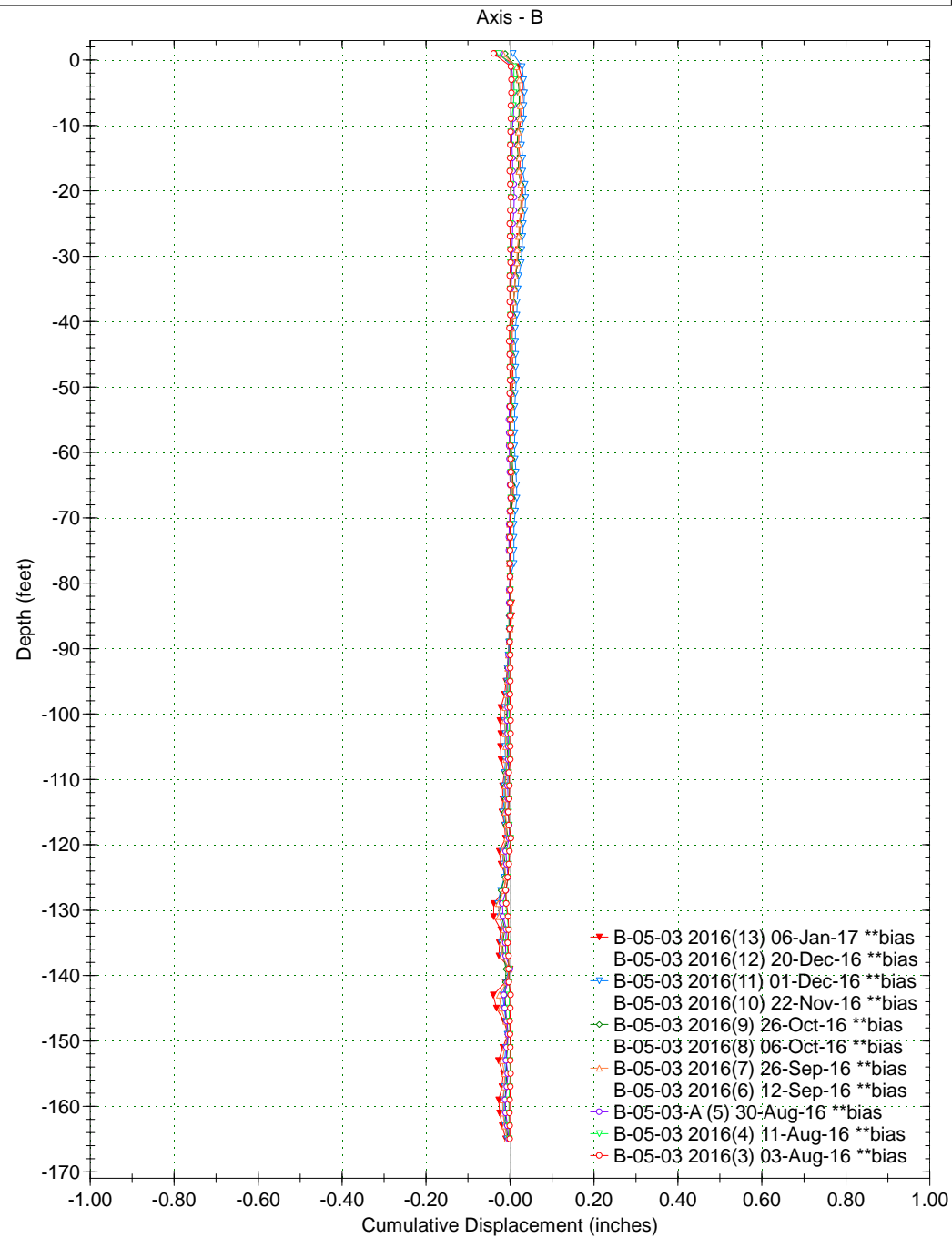
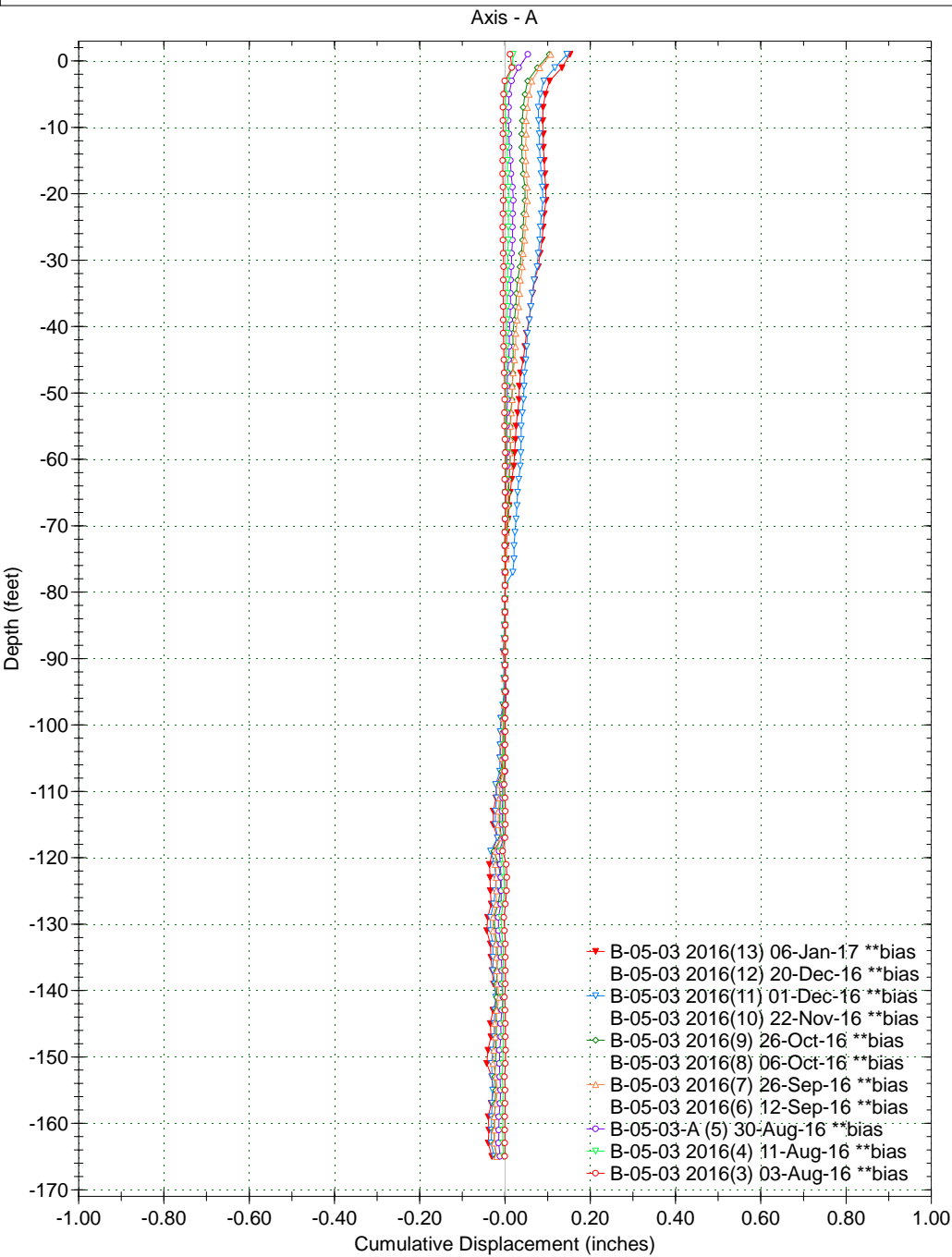
### B-05-02



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



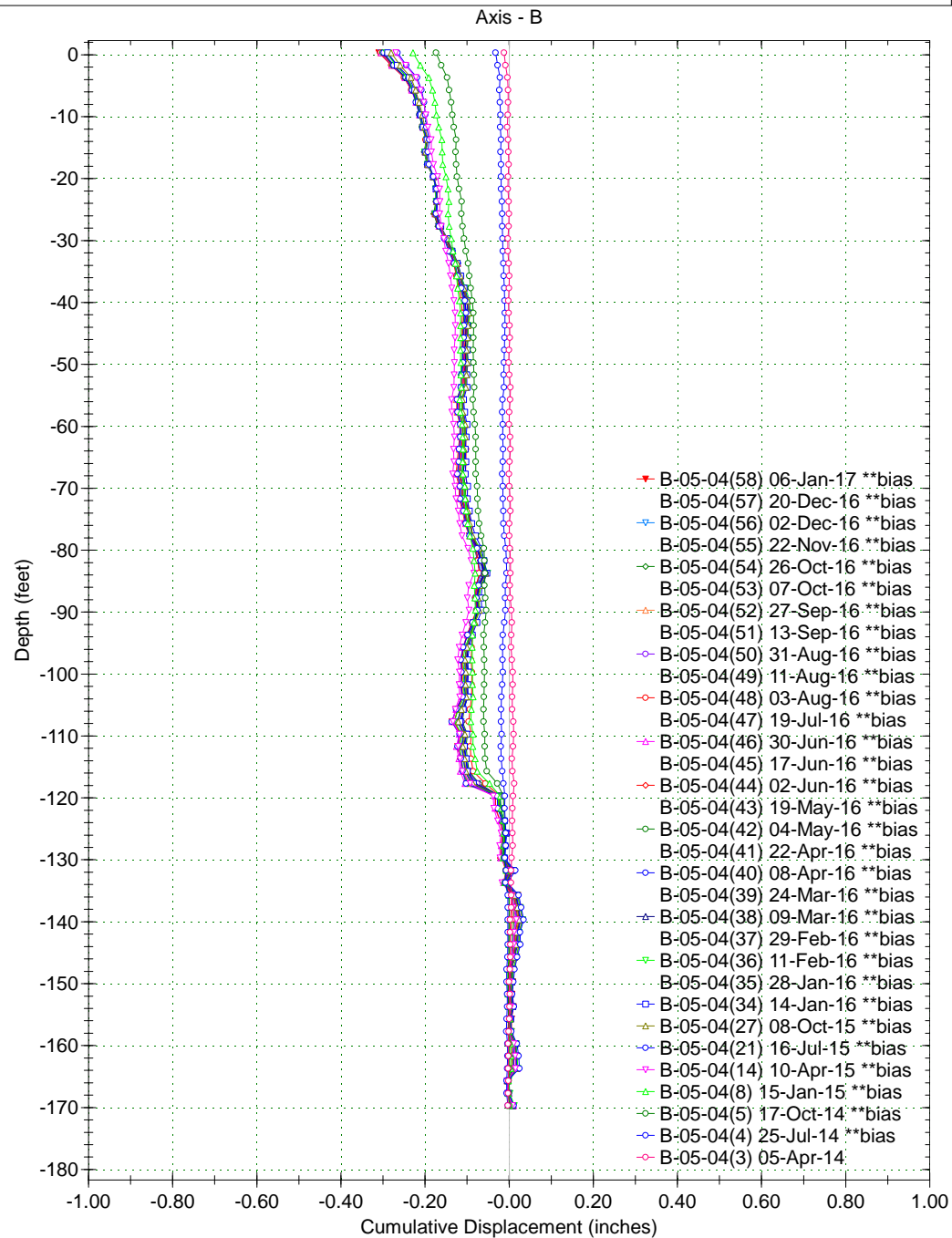
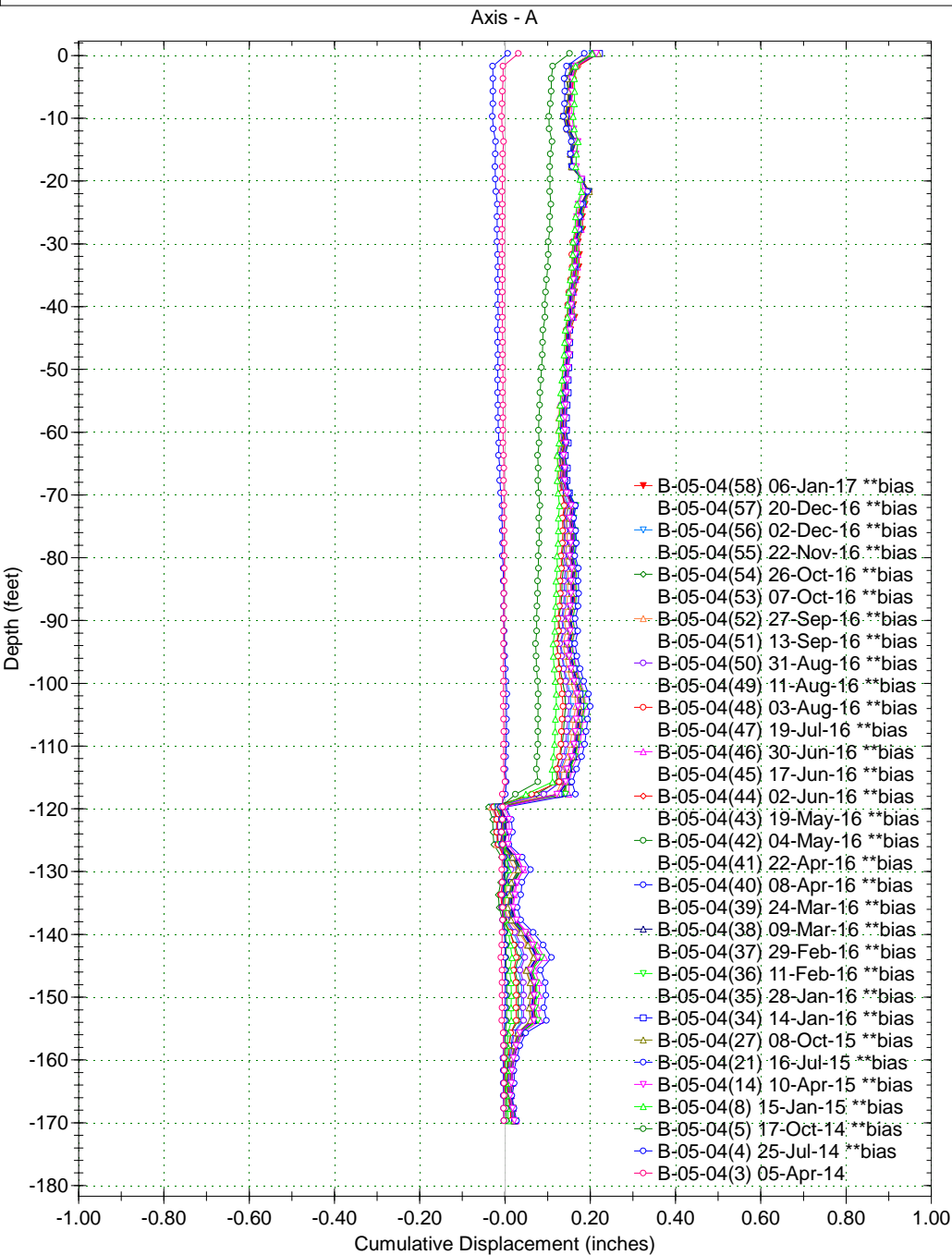
Spiral Correction : N/A  
 Collar Elevation : 3.0 feet  
 Borehole Total Depth : 168.0 feet  
 A+ Groove Azimuth :  
 Base Reading : 2016 Jul 19 09:08  
 Applied Azimuth : 0.0 degrees



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

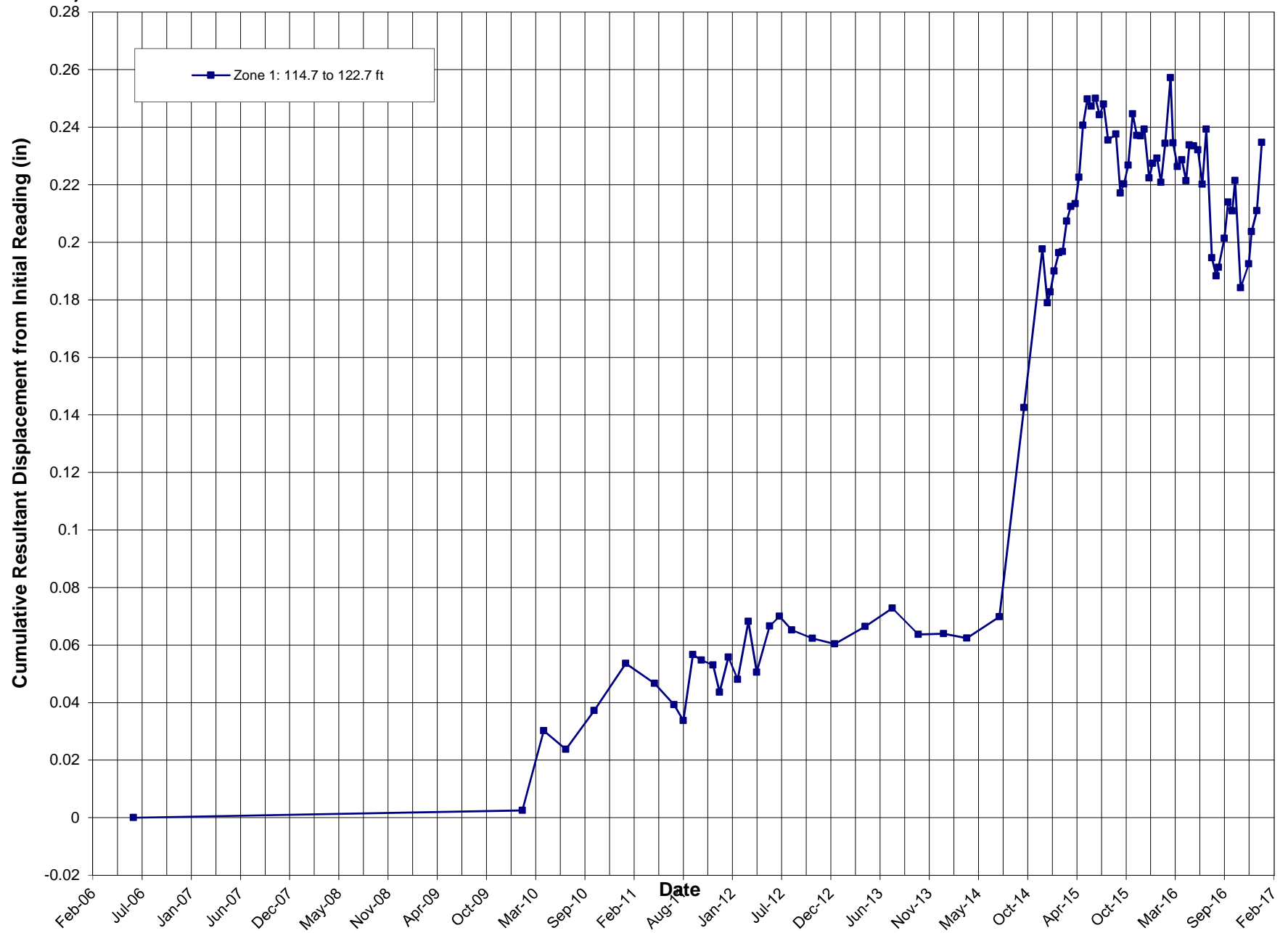


Spiral Correction : N/A  
 Collar Elevation : 2.3 feet  
 Borehole Total Depth : 172.0 feet  
 A+ Groove Azimuth :  
 Base Reading : 2014 Jan 22 12:30  
 Applied Azimuth : 0.0 degrees



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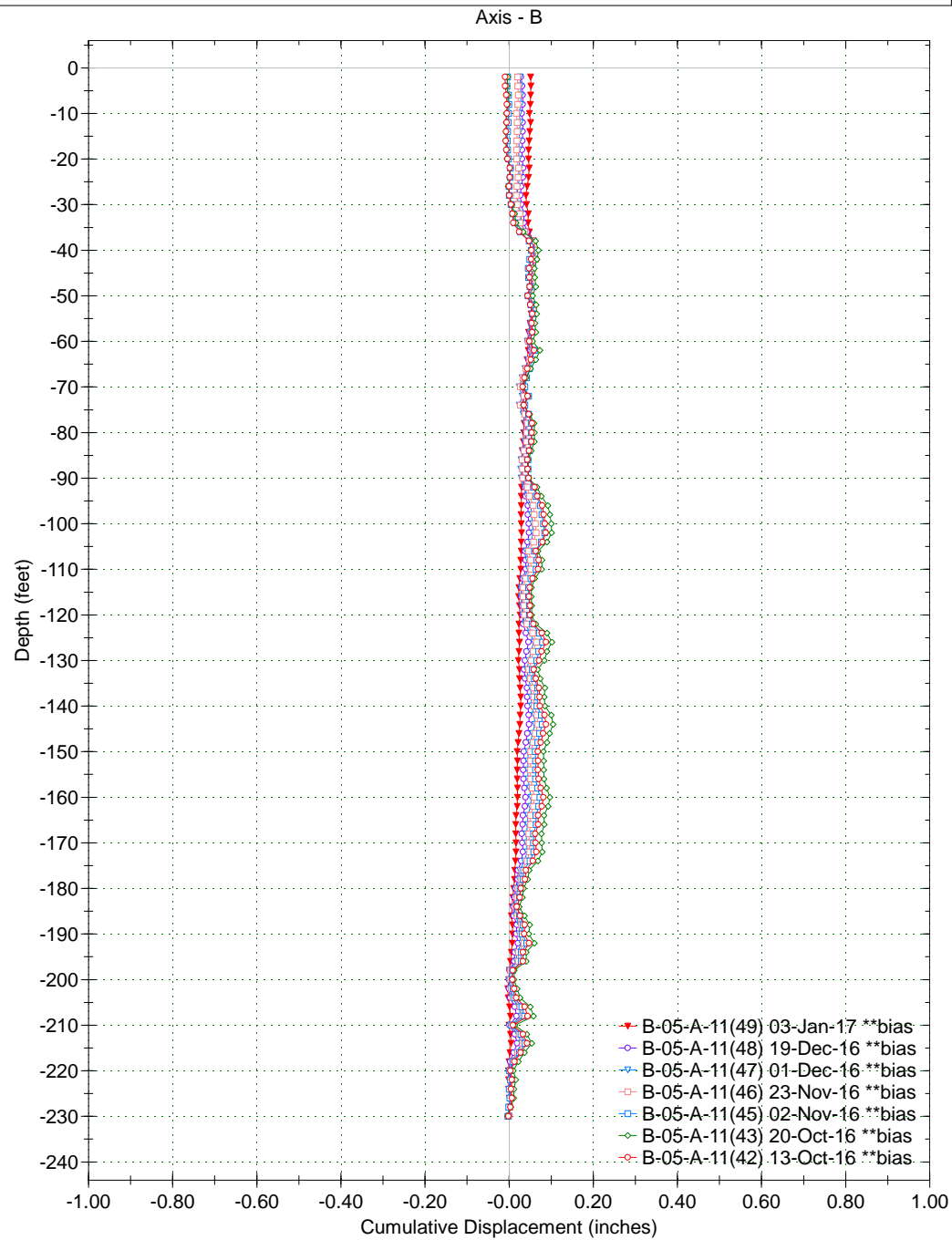
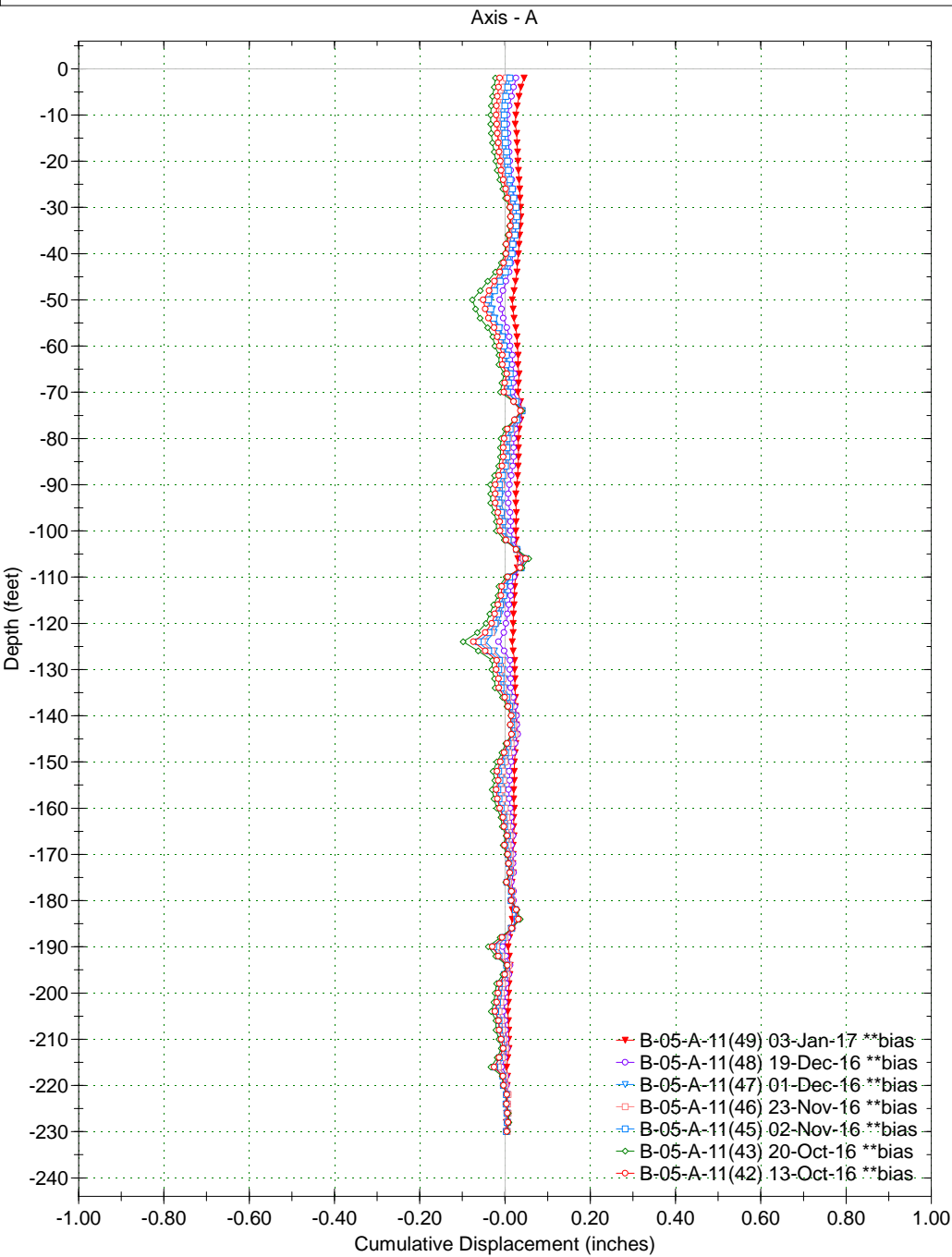
**B-05-04**



Borehole : B-05-A-11 230 ft  
Project : CUY-90-15-24  
Location :  
Northing :  
Easting :  
Collar :



Spiral Correction : N/A  
Collar Elevation : 0.0 feet  
Borehole Total Depth : 230.0 feet  
A+ Groove Azimuth :  
Base Reading : 2016 Sep 28 08:37  
Applied Azimuth : 0.0 degrees

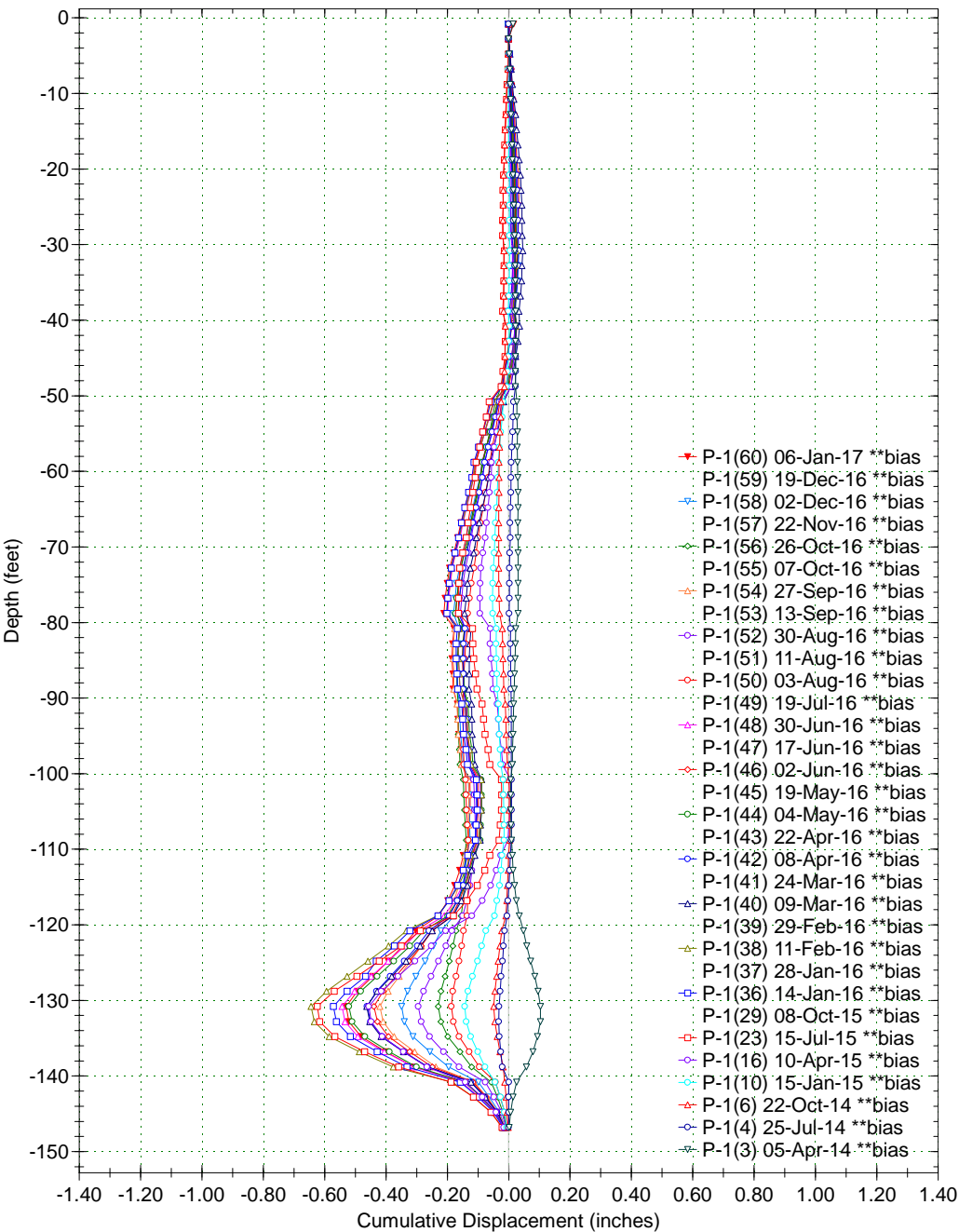


Borehole : P-1  
Project : CUY-90-15-24  
Location : Cleveland, Ohio  
Northing :  
Easting :  
Collar :

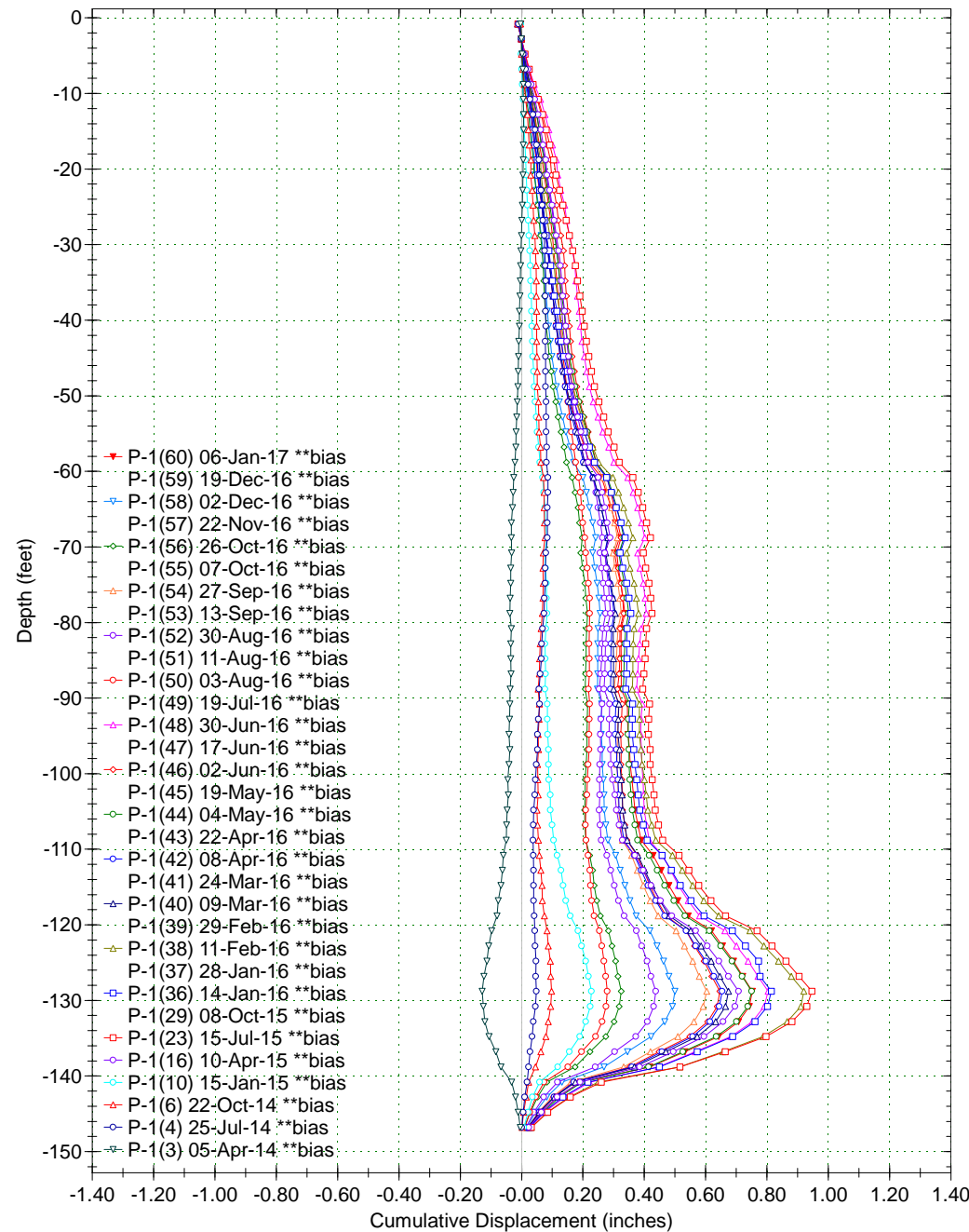


Spiral Correction : N/A  
Collar Elevation : 1.2 feet  
Borehole Total Depth : 148.0 feet  
A+ Groove Azimuth :  
Base Reading : 2014 Jan 22 10:47  
Applied Azimuth : 0.0 degrees

Axis - A



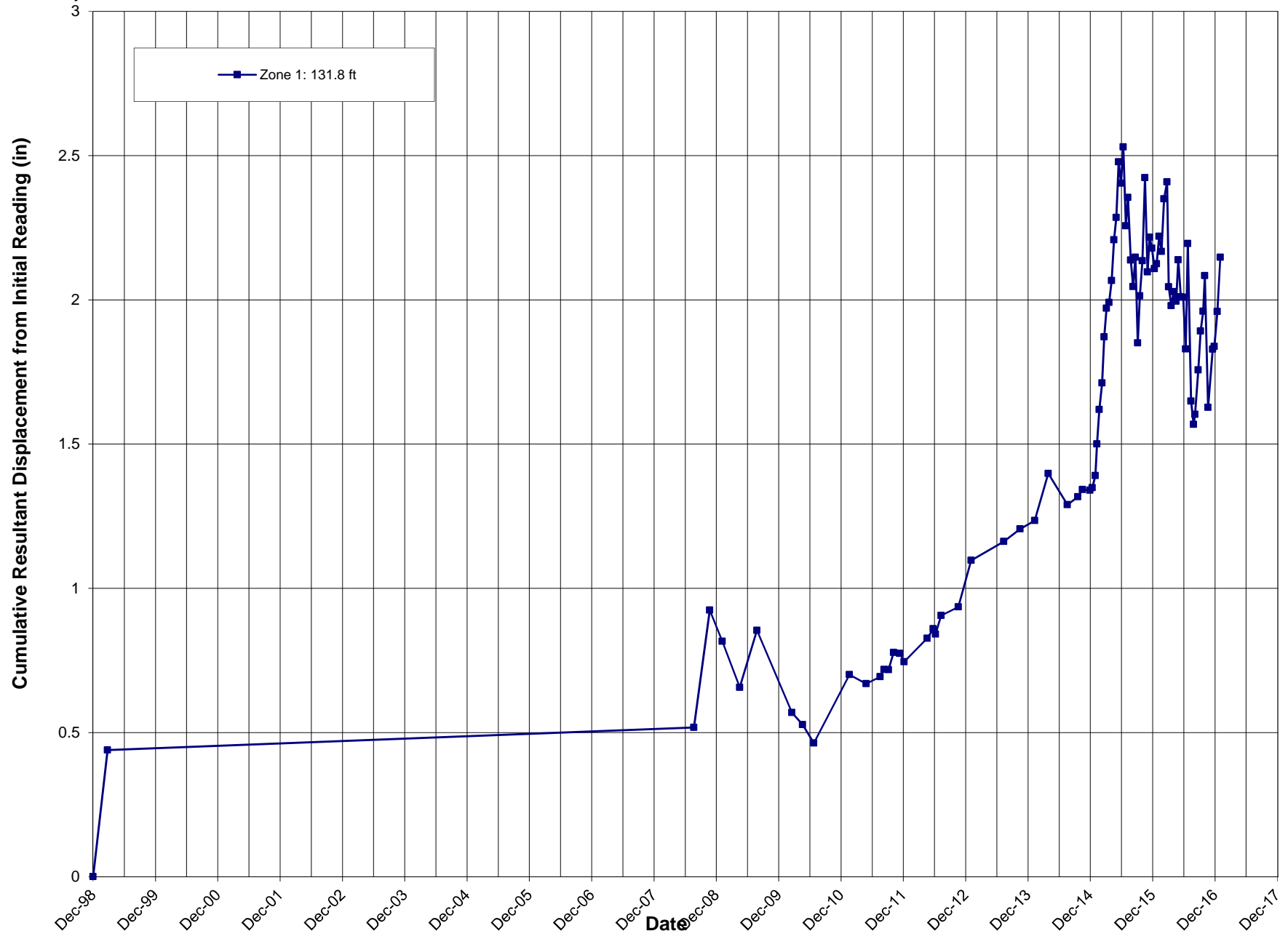
Axis - B





CUY-90-15.24  
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### P-1

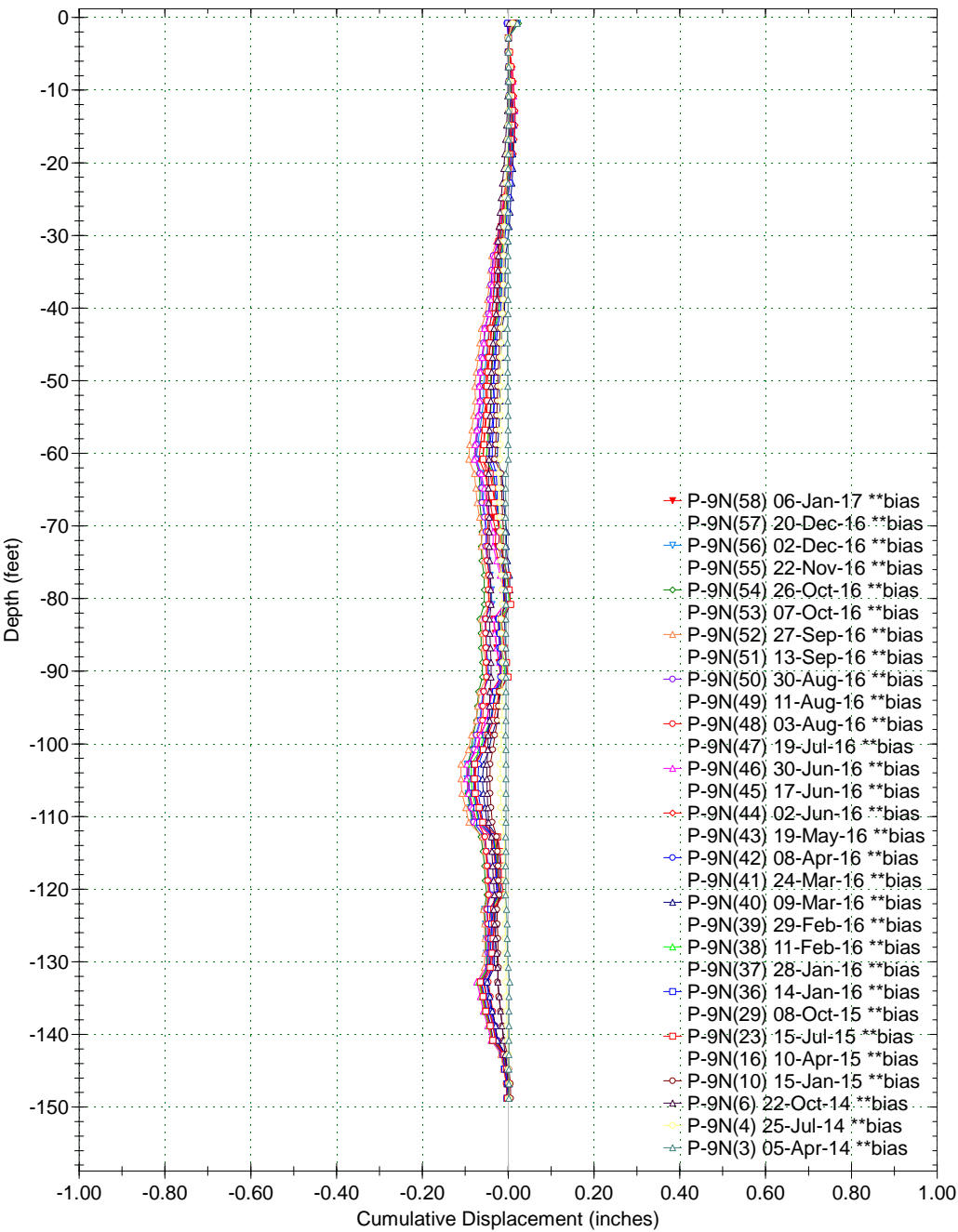


Borehole : P-9N  
Project : CUY-90-15-24  
Location : Cleveland, Ohio  
Northing :  
Easting :  
Collar :

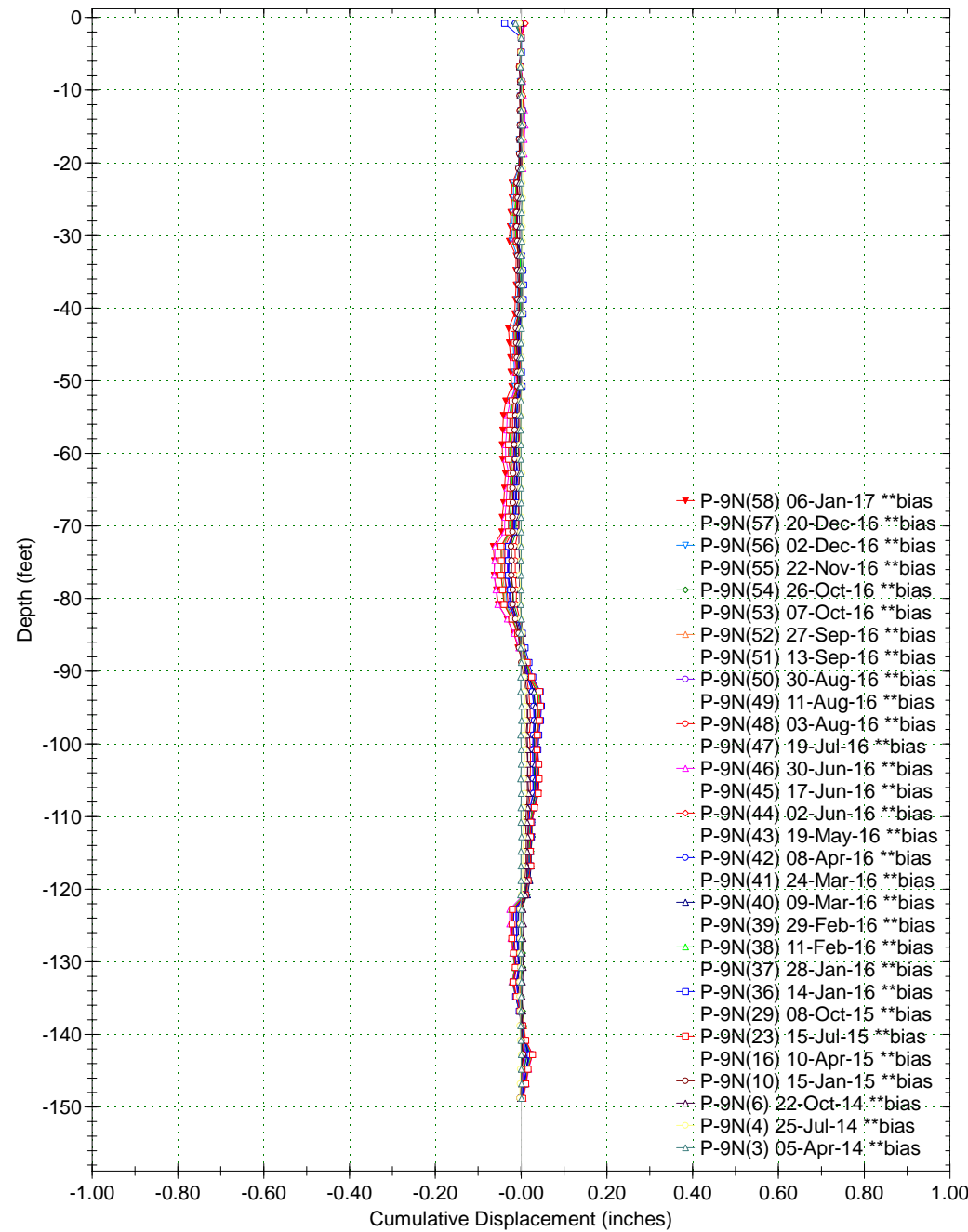


Spiral Correction : N/A  
Collar Elevation : 1.2 feet  
Borehole Total Depth : 150.0 feet  
A+ Groove Azimuth :  
Base Reading : 2014 Jan 16 09:28  
Applied Azimuth : 0.0 degrees

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

