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July 5, 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: June 16, 17, and 20, 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 June 16, 17, and 20, 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, TGR I-2, and TGR I-4. Changes reported for the individual instruments are for the previous two-week period unless noted otherwise.

Piezometer Readings

P-002-13, P-003-10, P-009-13, B-105-A, B-05-A-03, B-05-04 – Pore pressure readings at these locations fluctuated by less than 0.5 feet, but show virtually no net change in total head.

P-001-13 – At this location, pore pressure readings indicate an increase in total head of about 1 foot in the piezometers at 86 feet and 116 feet. The remaining piezometers showed virtually no change.

P-004-13 – Piezometers at this location are still inaccessible.

B-05-02 – Pore pressure readings for the deep piezometer at this location show that total head increased by about 0.5 feet. Pore pressure readings in the shallow piezometer have remained virtually constant since mid-May 2016.

B-05-A-11 – Pore pressure readings in both piezometers at this location indicate a 1 foot increase in total head just before the end of this two-week period. A temporary crane pad has been constructed on Abbey road near these instruments. This added load is likely the cause of the pore pressure increase.

Inclinometer Readings

Inclinometer readings at I-001-13, I-002-13, I-003-10, B-102, B-105A, B-05-A-03, B-05-04, P-9N, and TGR I-4 showed virtually no movement. Displacement at the top of some slope tubes is due to construction disturbance or flexing of the inclinometer tube as readings were taken where the protective covers have not been concreted in place because of the ongoing construction activity.

I-004-13 – The inclinometer casing at this location is still inaccessible.

I-009-13 – Inclinometer readings at this location indicate slight negative A- and B-axis movement at the top of the casing.

B-101 – The inclinometer casing at this location has been uncovered and is now again readable. Readings this week indicate slight movement in the positive A-axis and positive B-axis directions at 42 to 44 feet.

B-05-02 – The excavating contractor tore 10 feet off the casing at this location. We added 6 feet to the casing to bring the top of casing to an elevation that should be compatible with final grades. Because of the ongoing earthwork we have not installed a protective cover. The cumulative resultant zone plot for this location shows a slight increase in displacement between 37 and 41 feet. B-axis movement shown at the top 8 feet of the casing occurs as we are taking readings. We take three readings at the top of the casing which allows us to match the current readings with the historical readings.

B-05-A-11 – Inclinometer readings at this location indicate movement in the negative A- and negative B-axis direction from the surface to 40 feet.

P-1 – Inclinometer readings at this location show another reversal in the direction of movement. At 132 feet, there has been about 0.2 inches and 0.3 inches of displacement in the positive A-axis and negative B-axis direction, respectively, since the May 4, 2016 reading.

TGR I-2 – This location is still inaccessible.

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

Very truly yours,

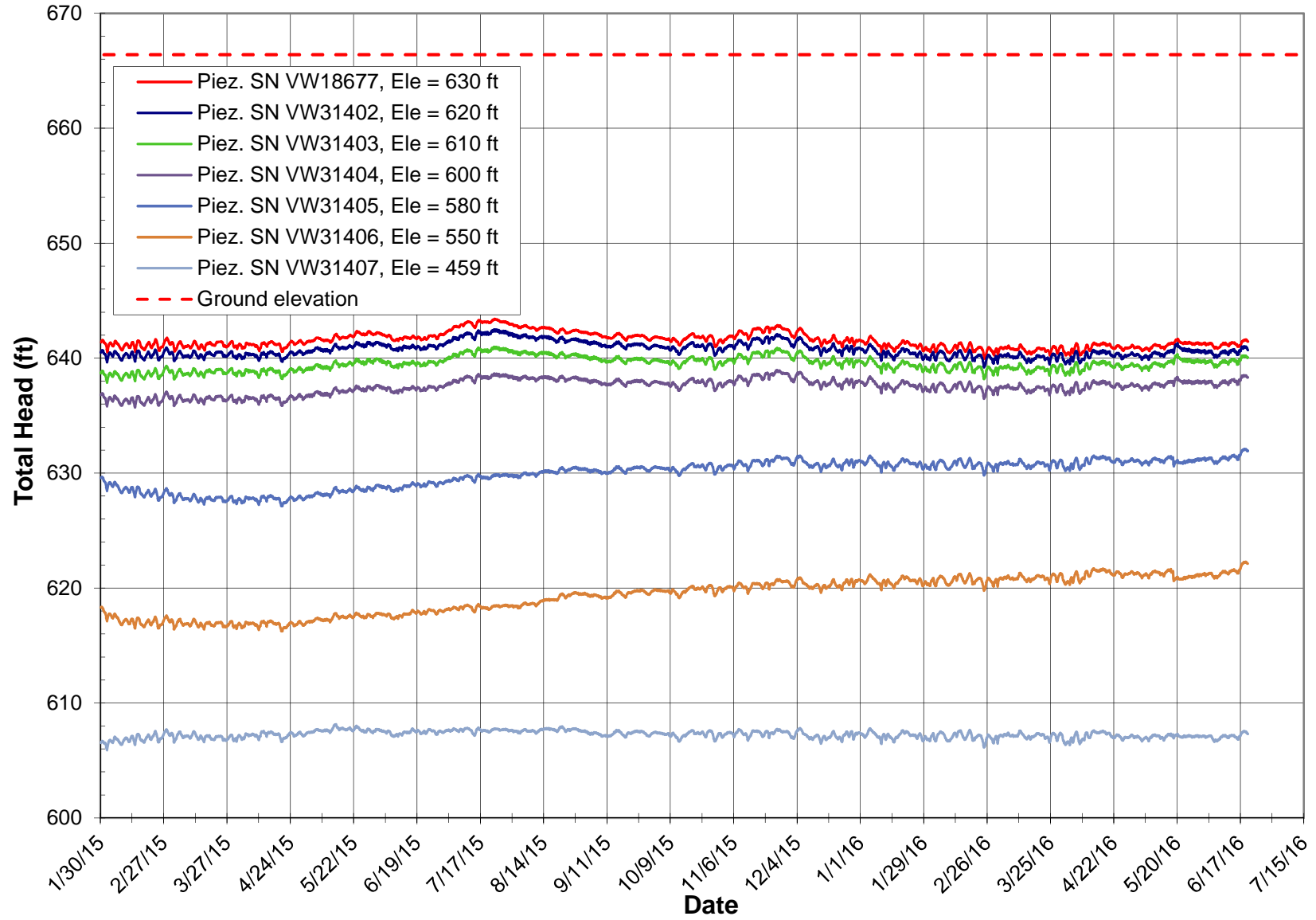
SME

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

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

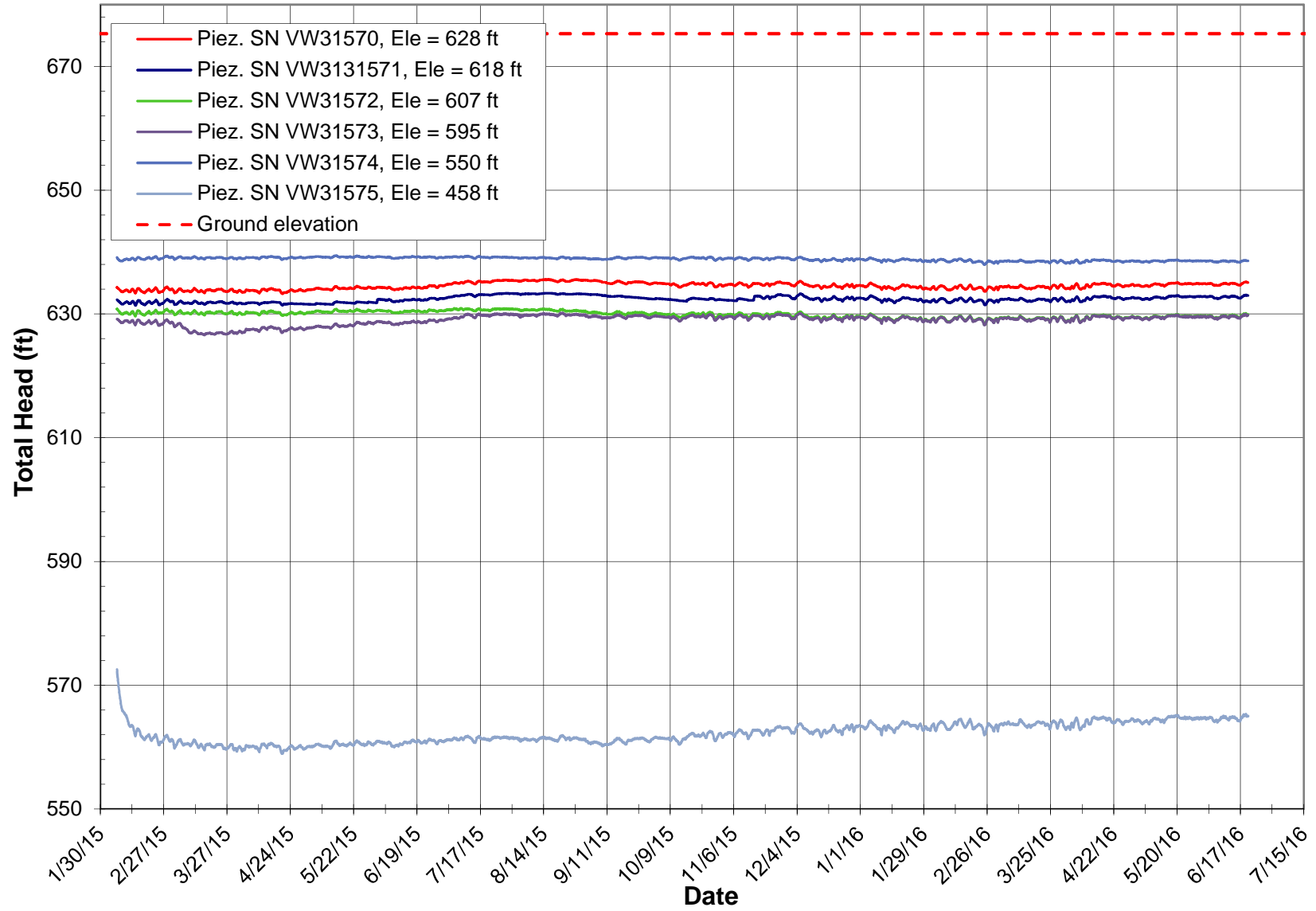
P-001-13 VW Piezometer Readings

Ground surface elevation = 666.4 ft



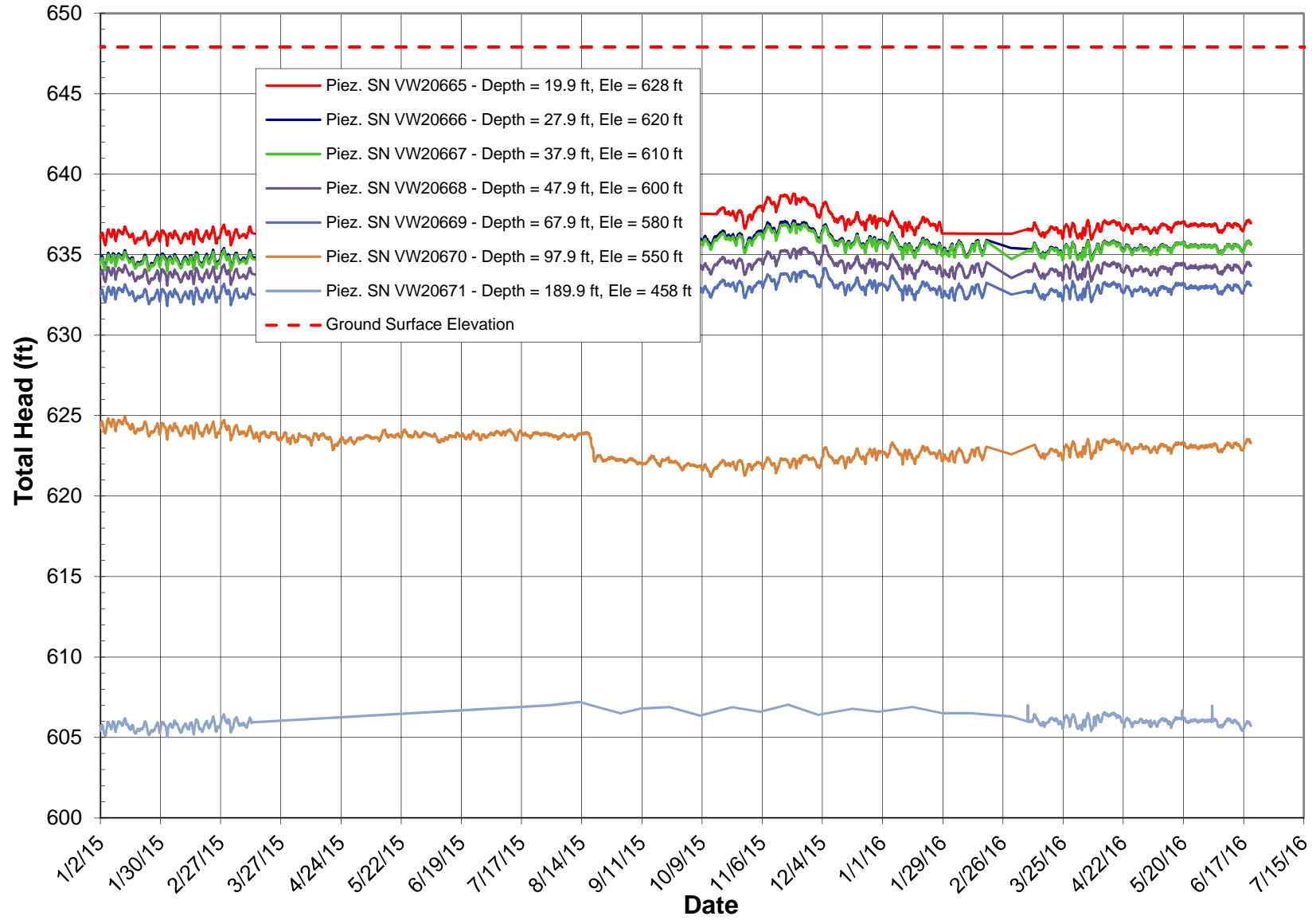
P-002-13 VW Piezometer Readings

Ground surface elevation = 675.29 ft



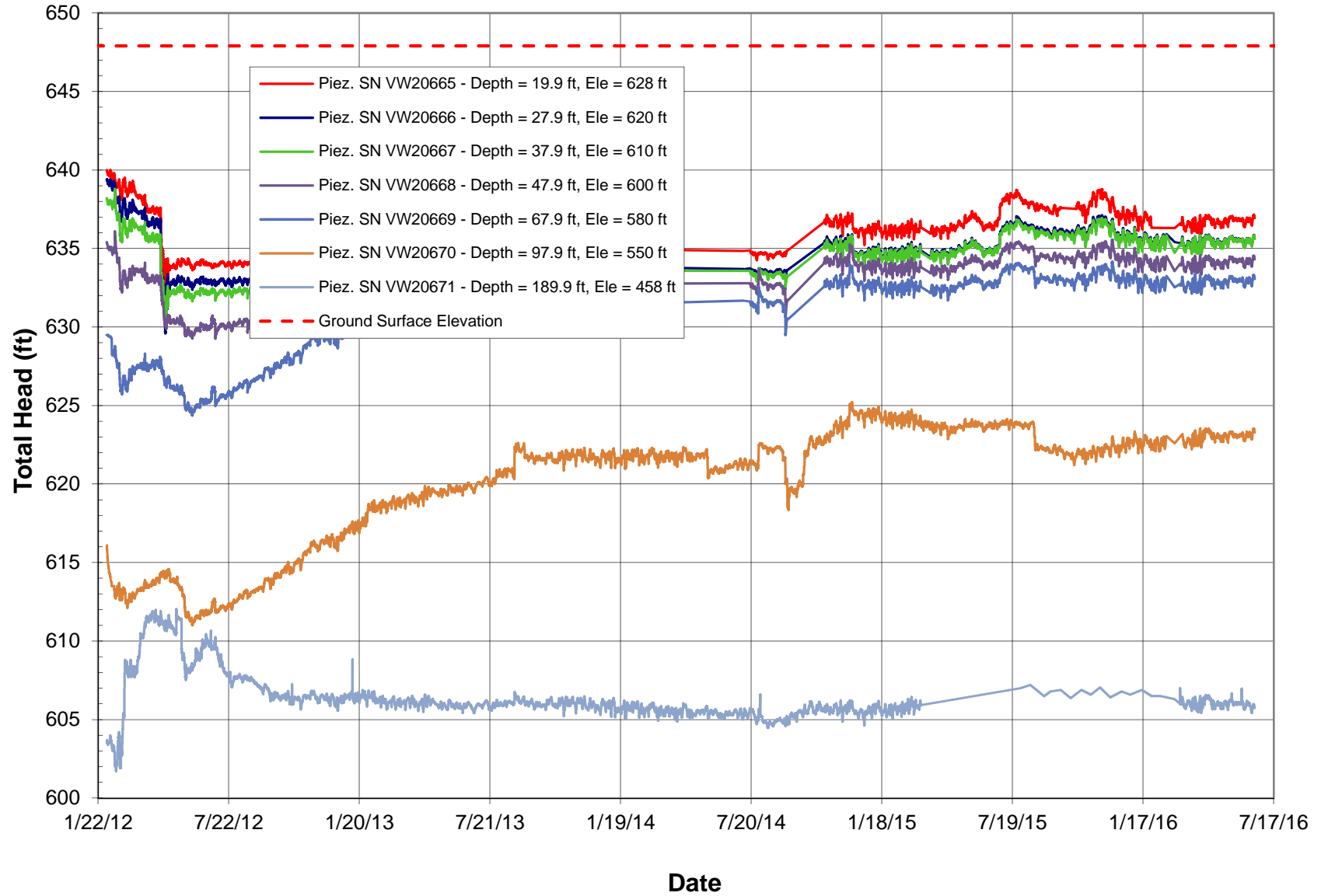
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



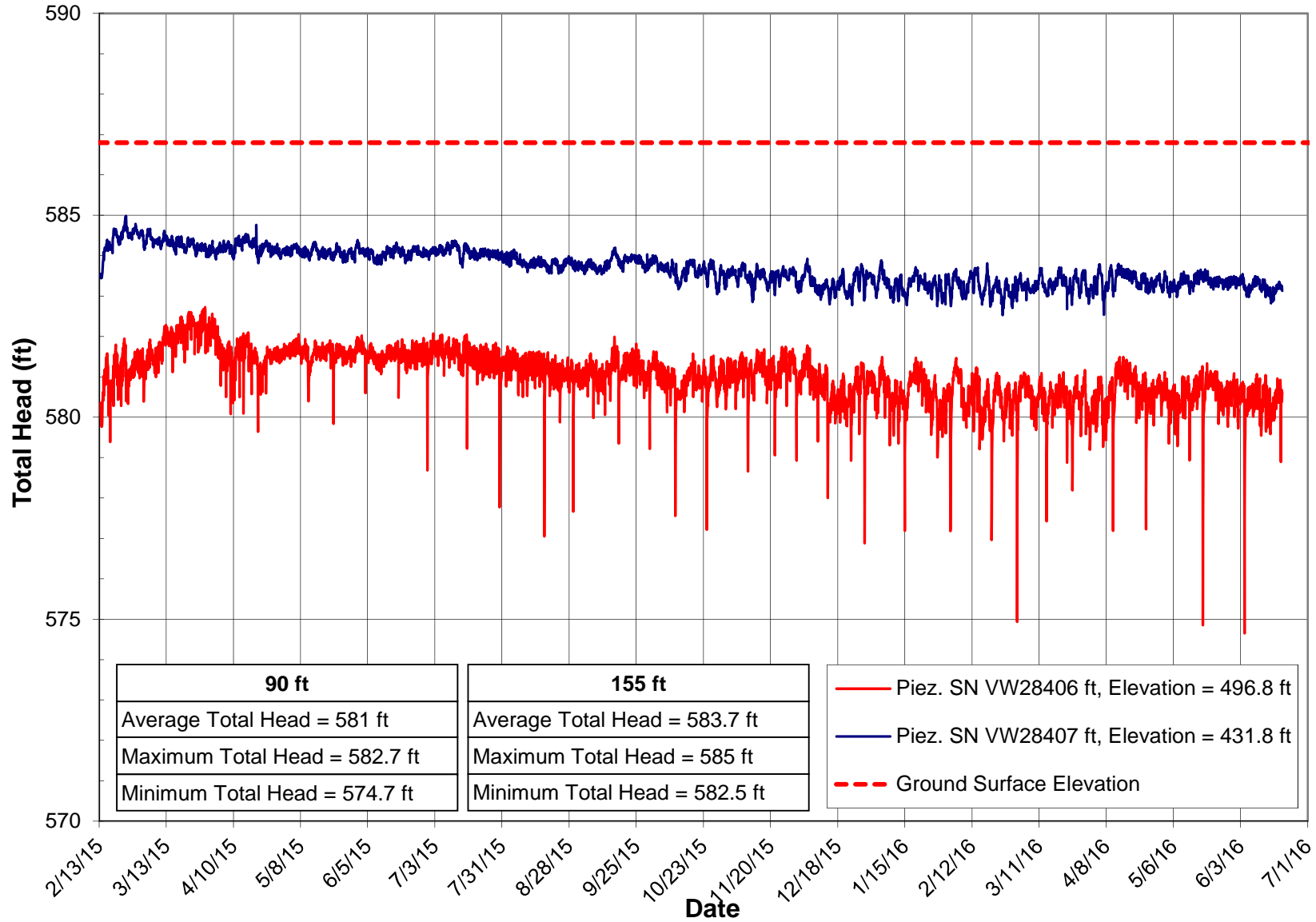
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



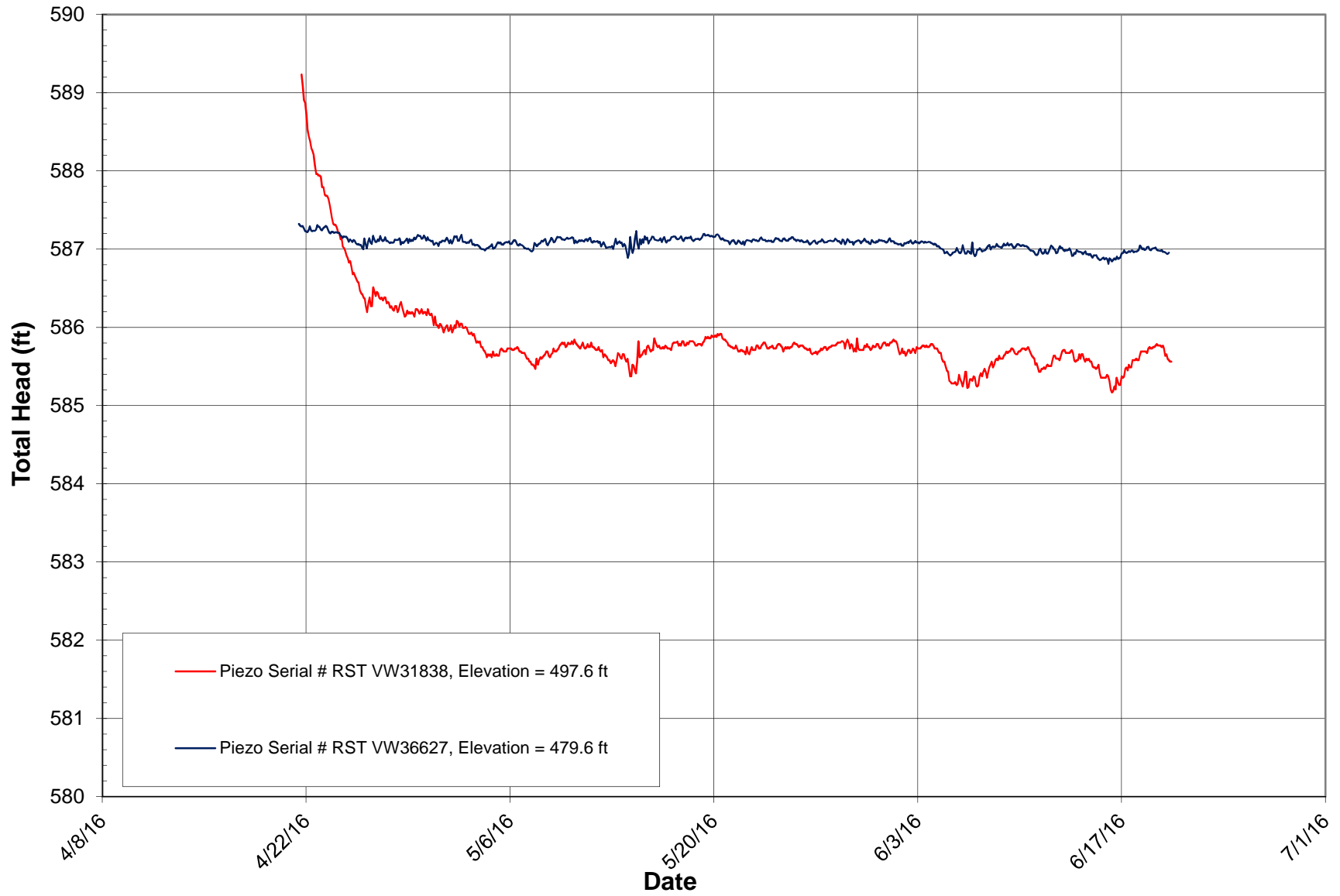
P-009-13 VW Piezometer Readings

Ground surface elevation = 586.6 ft



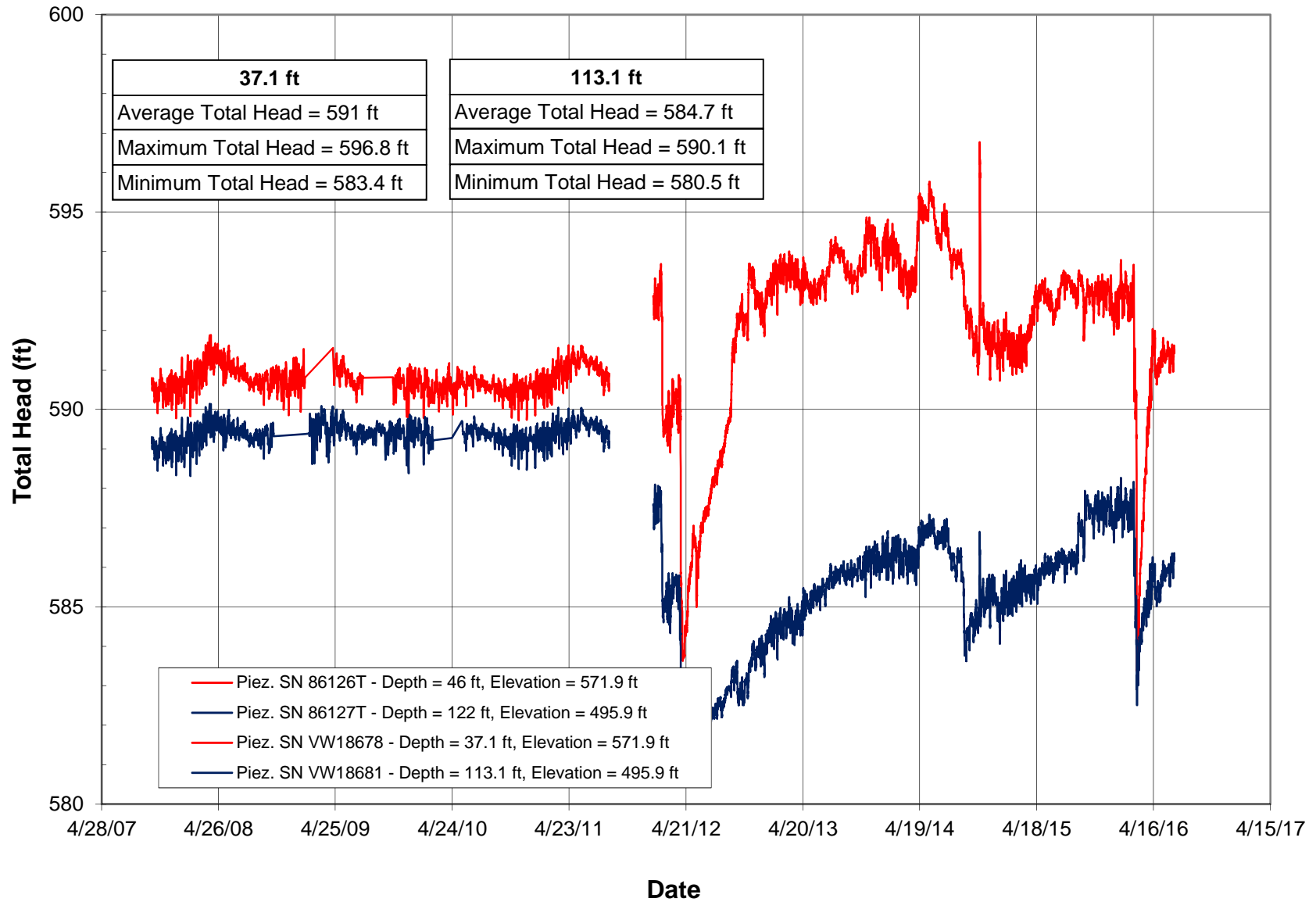
B-105A VW Piezometer Readings

Ground surface elevation = 585.6 ft



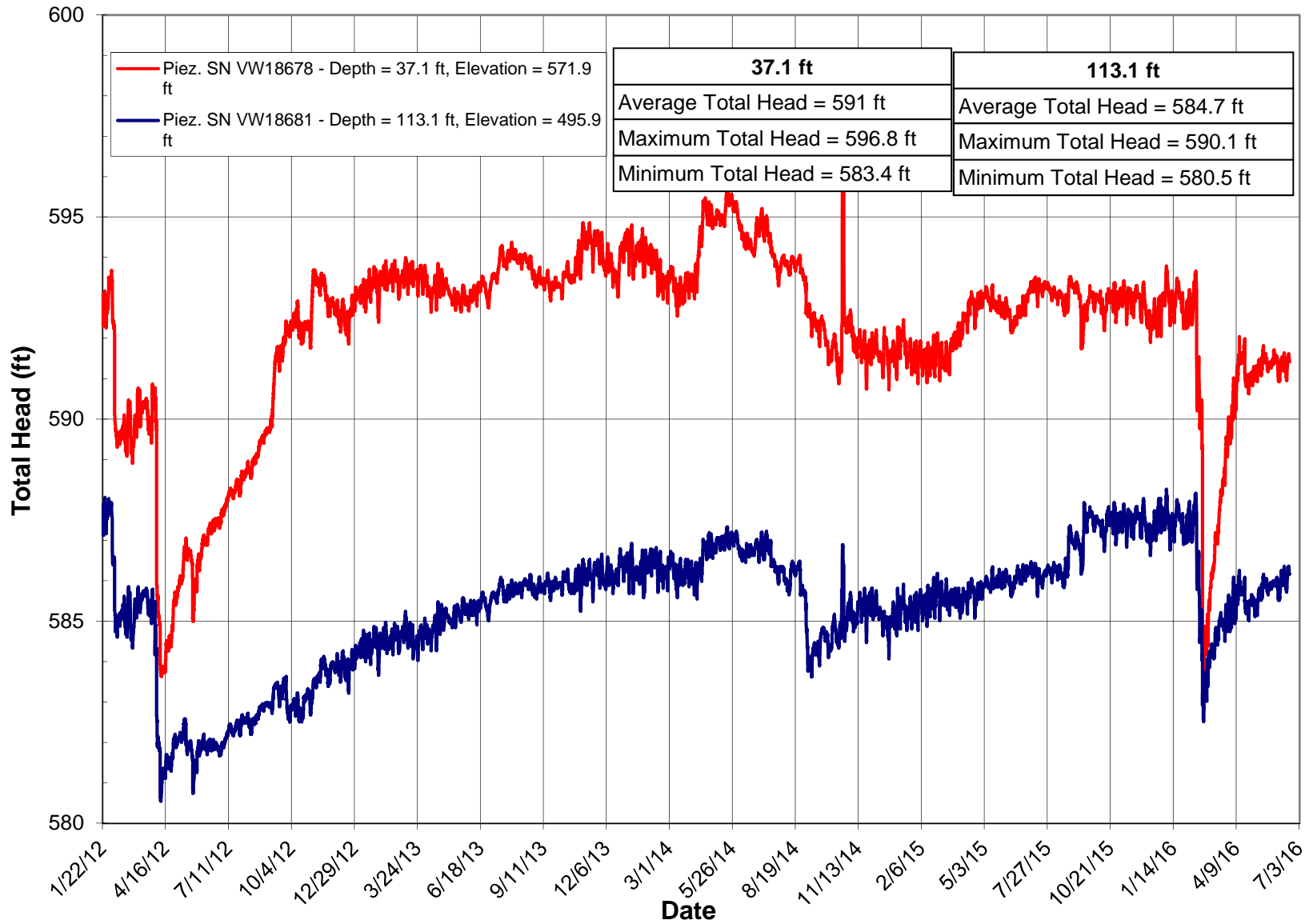
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



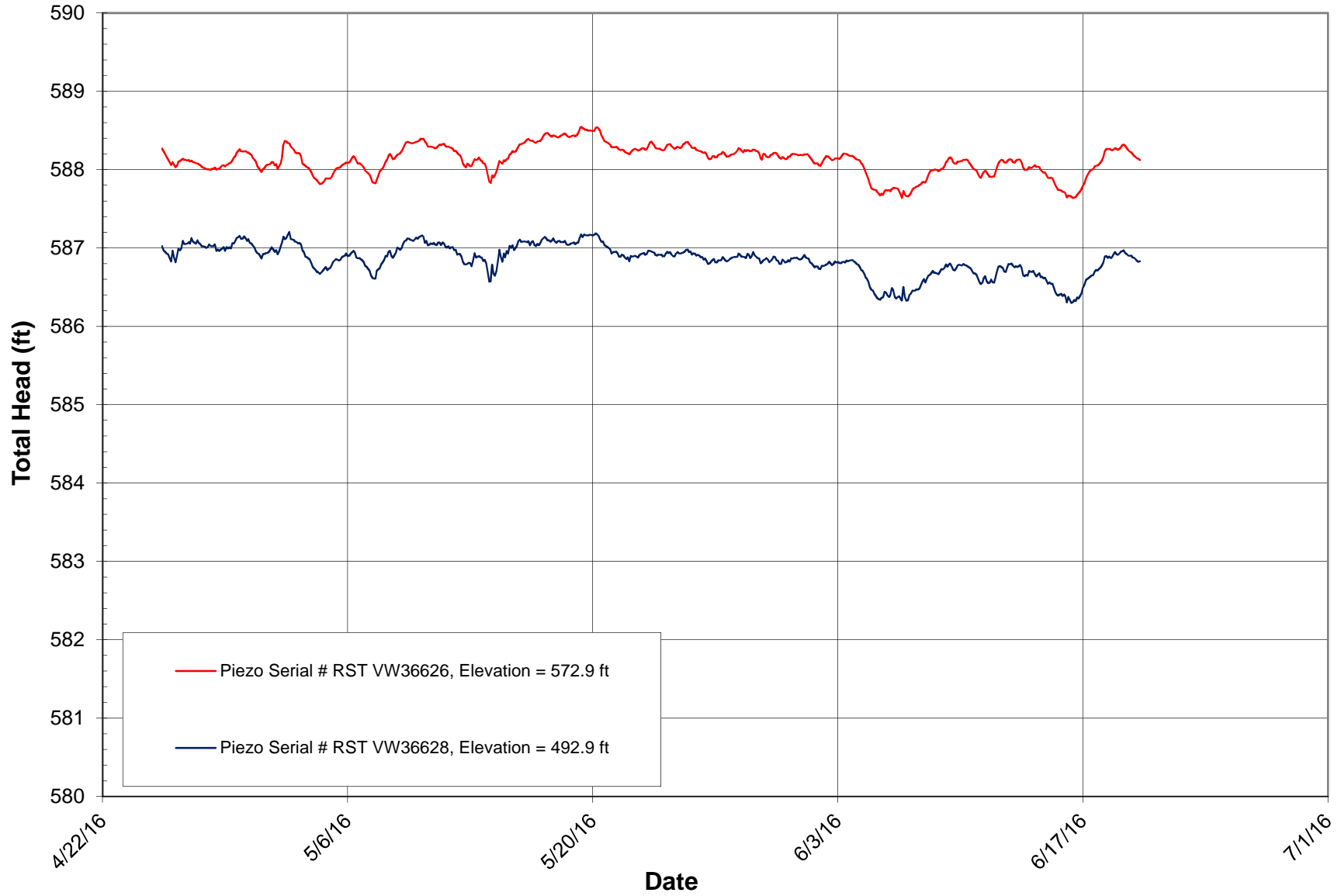
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



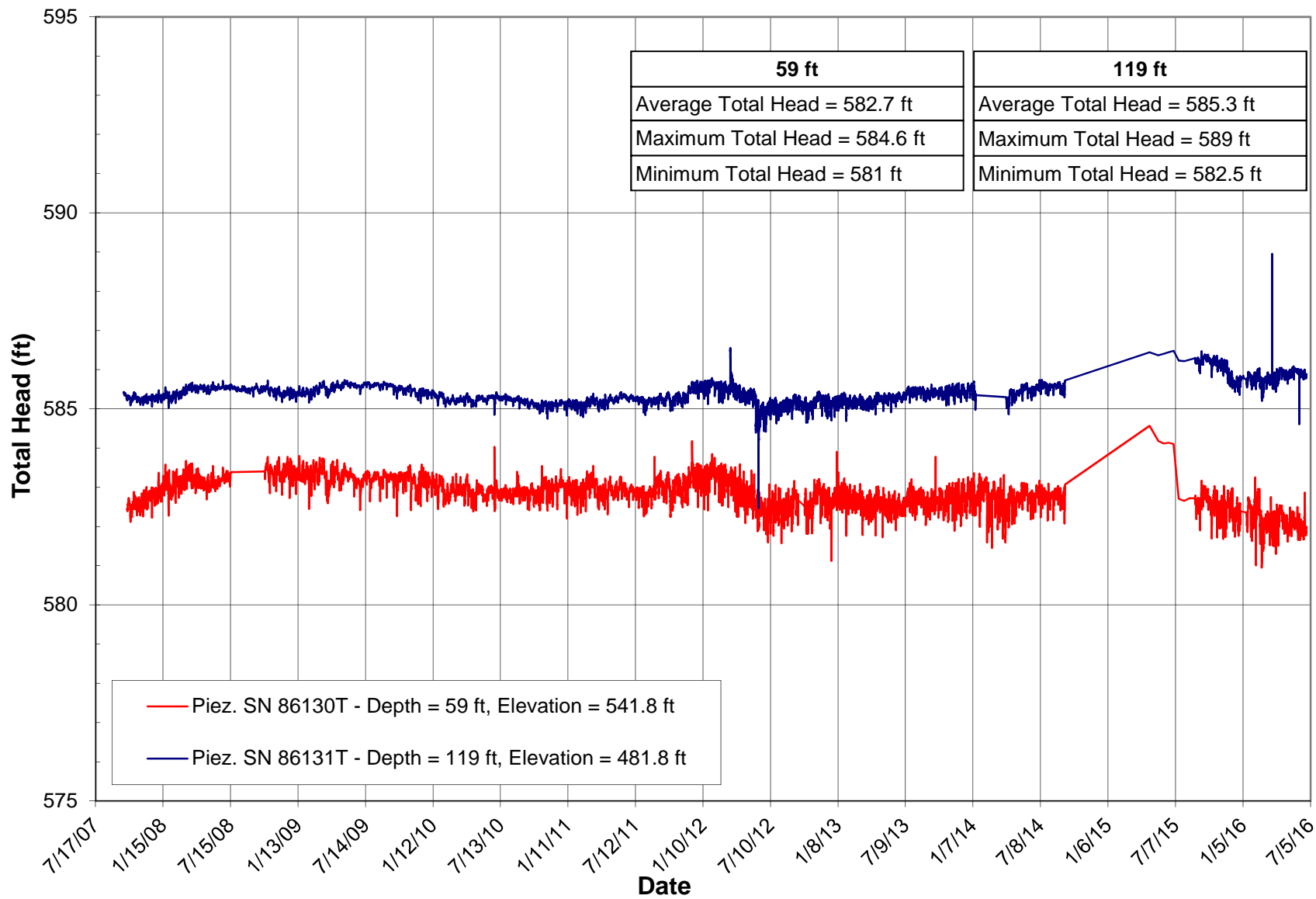
B-05-A-03 VW Piezometer Readings

Ground surface elevation = 599.9 ft



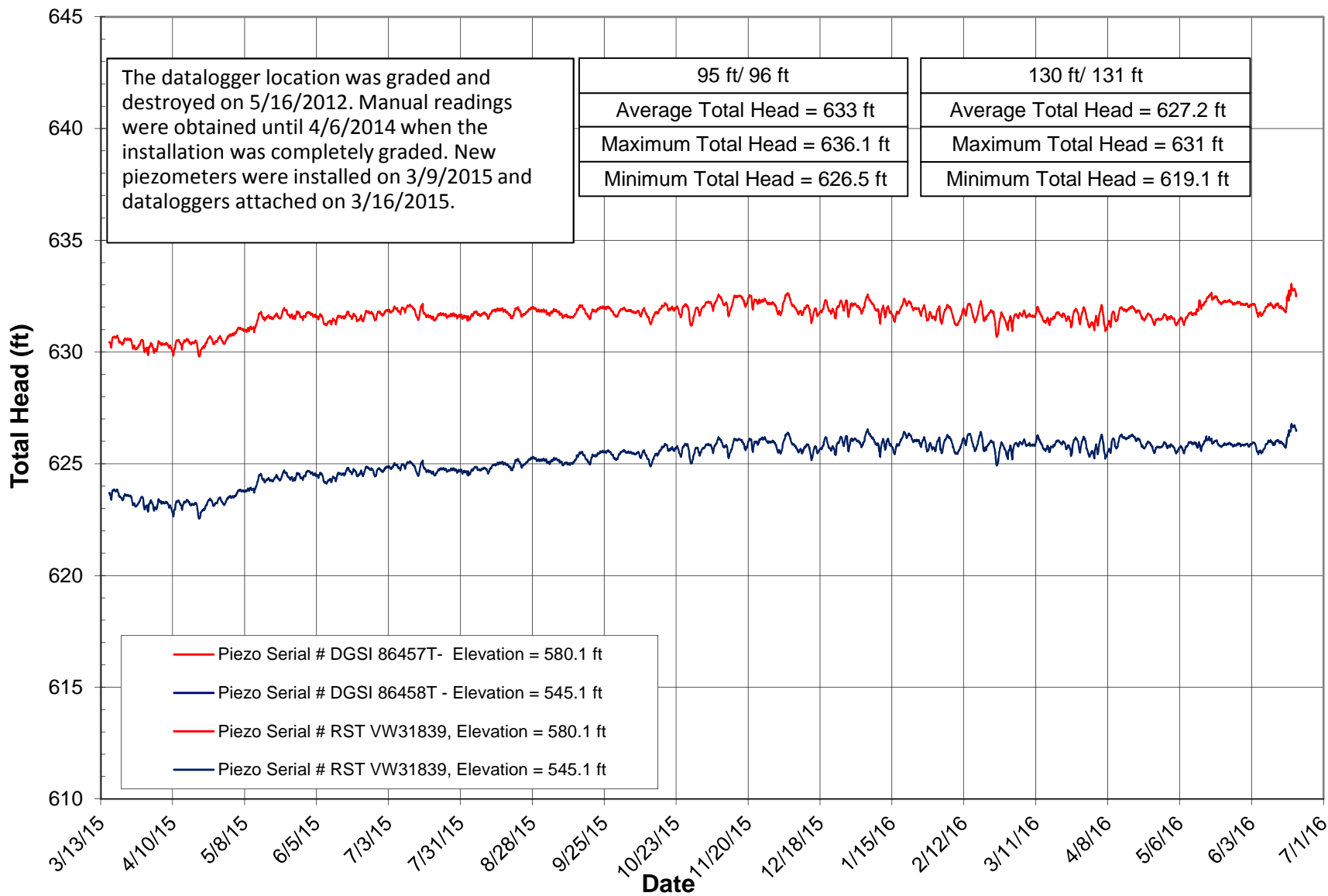
B-05-04 VW Piezometer Readings

Ground surface elevation = 600.8 ft



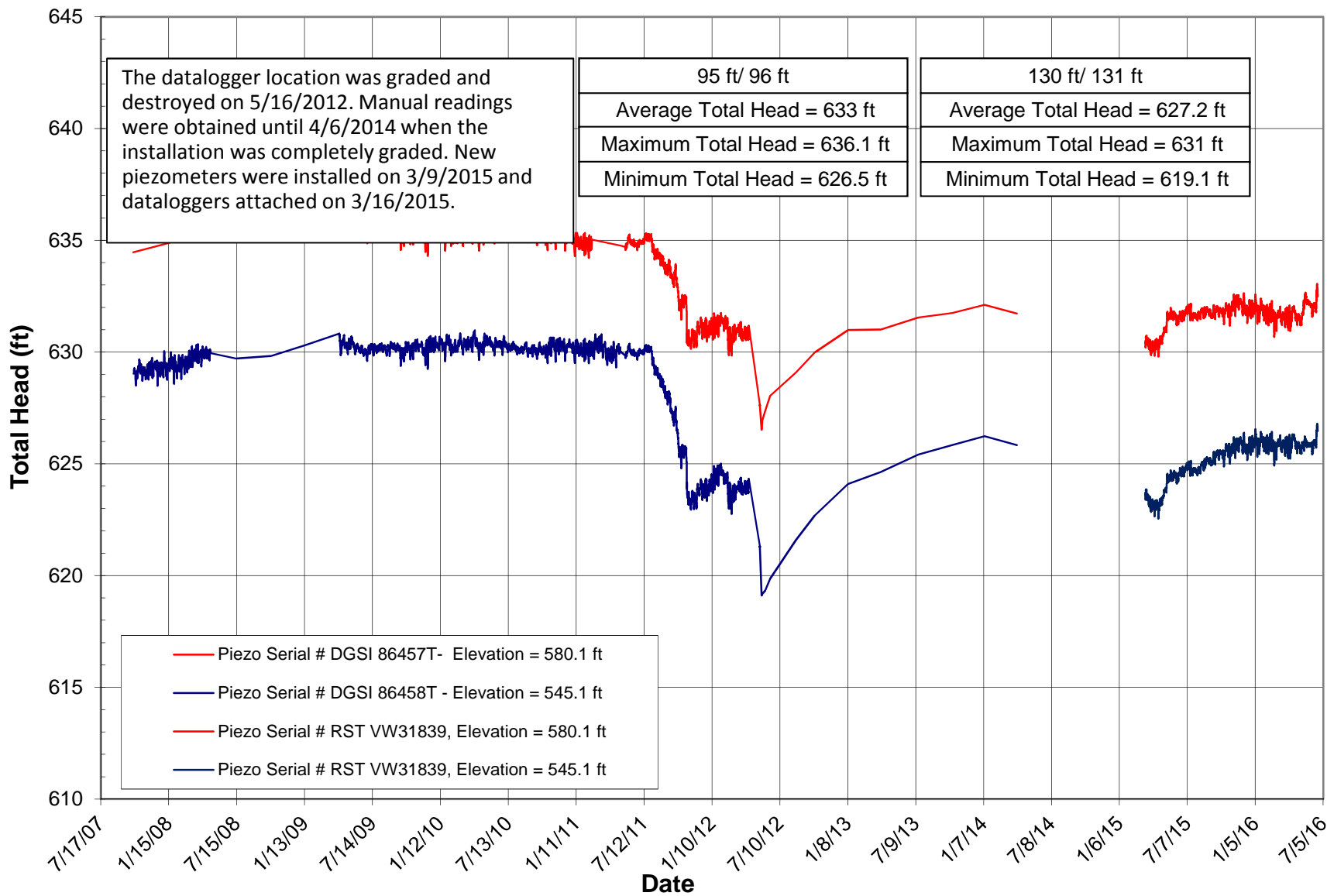
B-05-11/B-05-A-11 VW Piezometer Readings

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



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

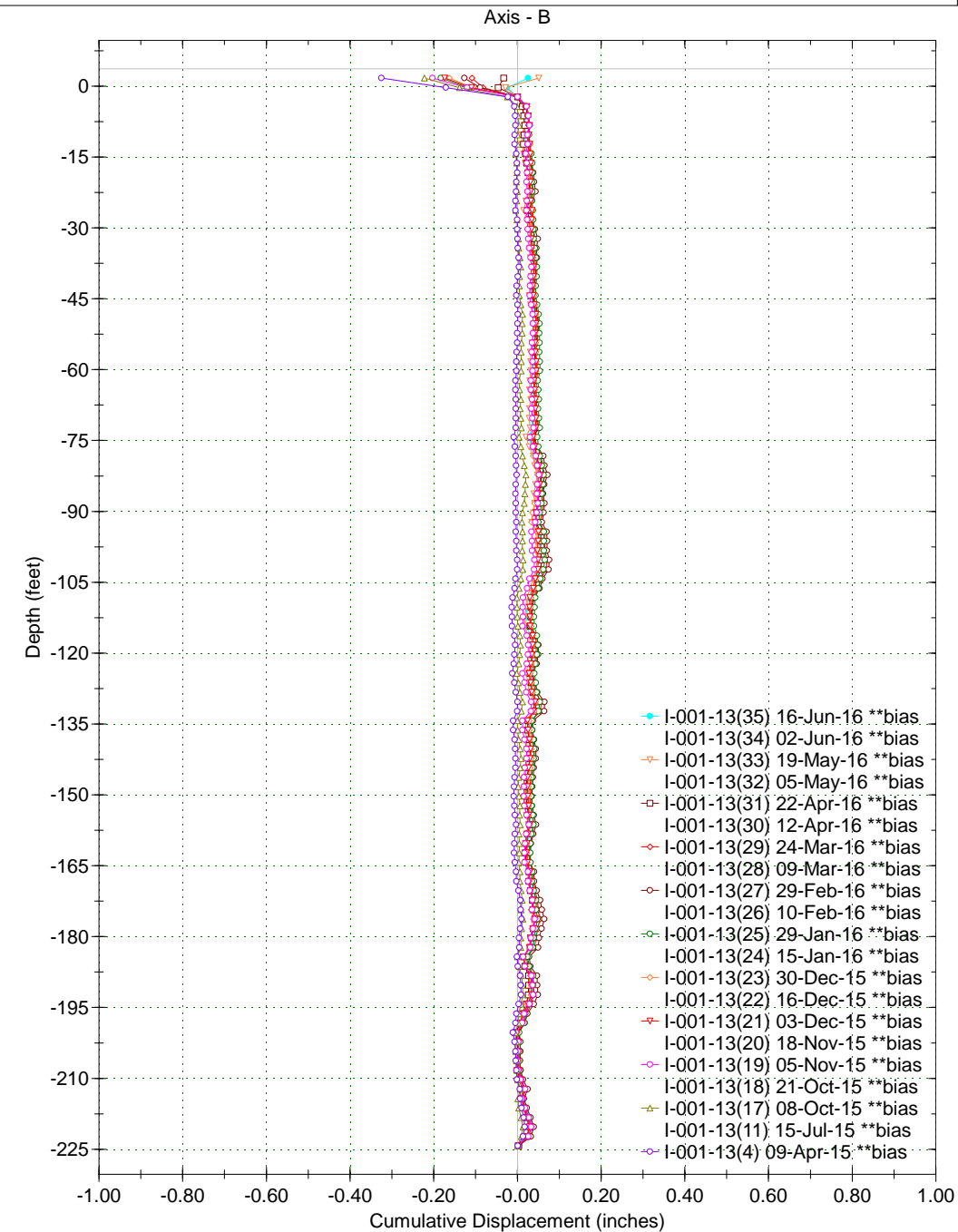
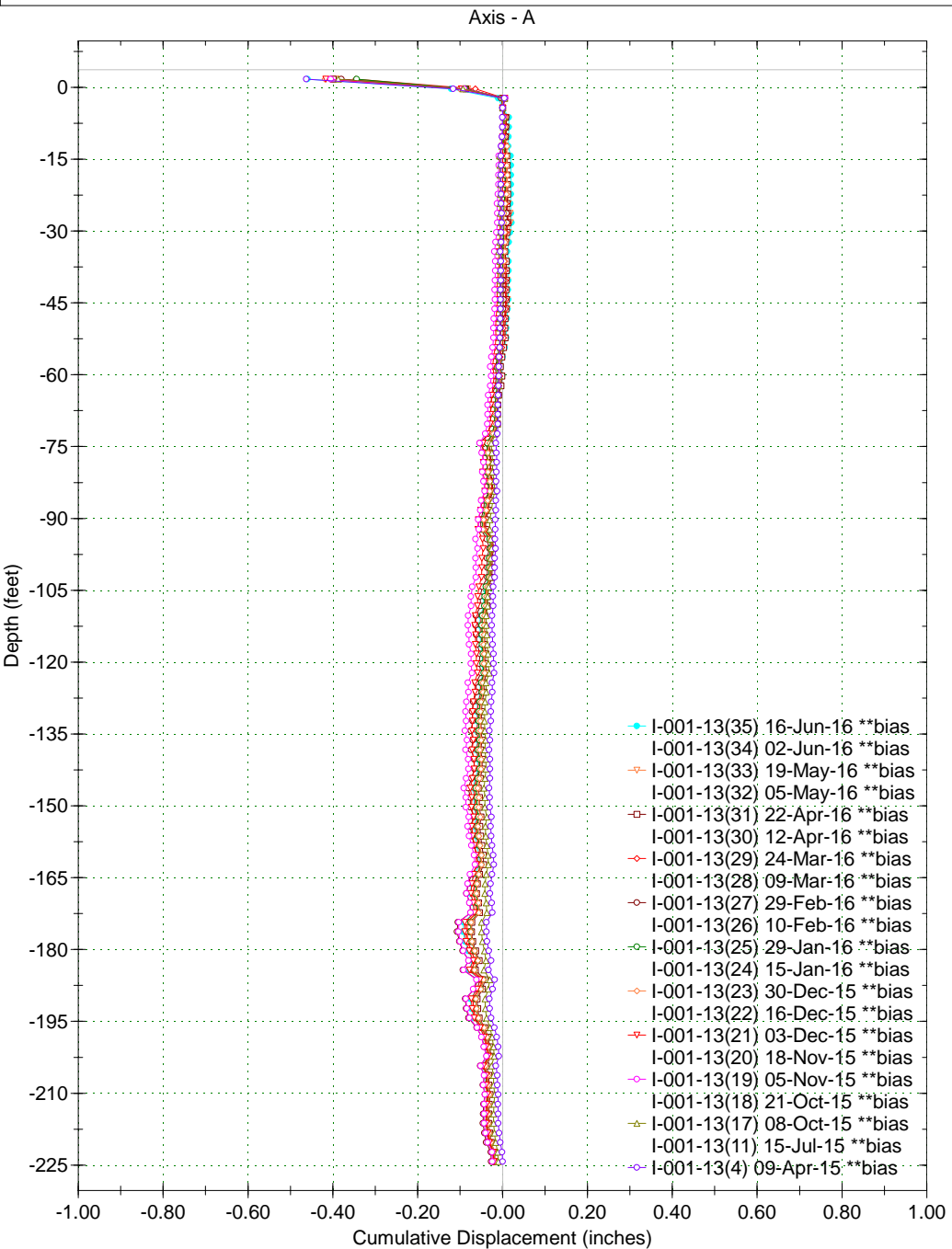
Ground surface elevation = 675.1 ft (B-05-11) / 676.1 ft (B-05-A-11)



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



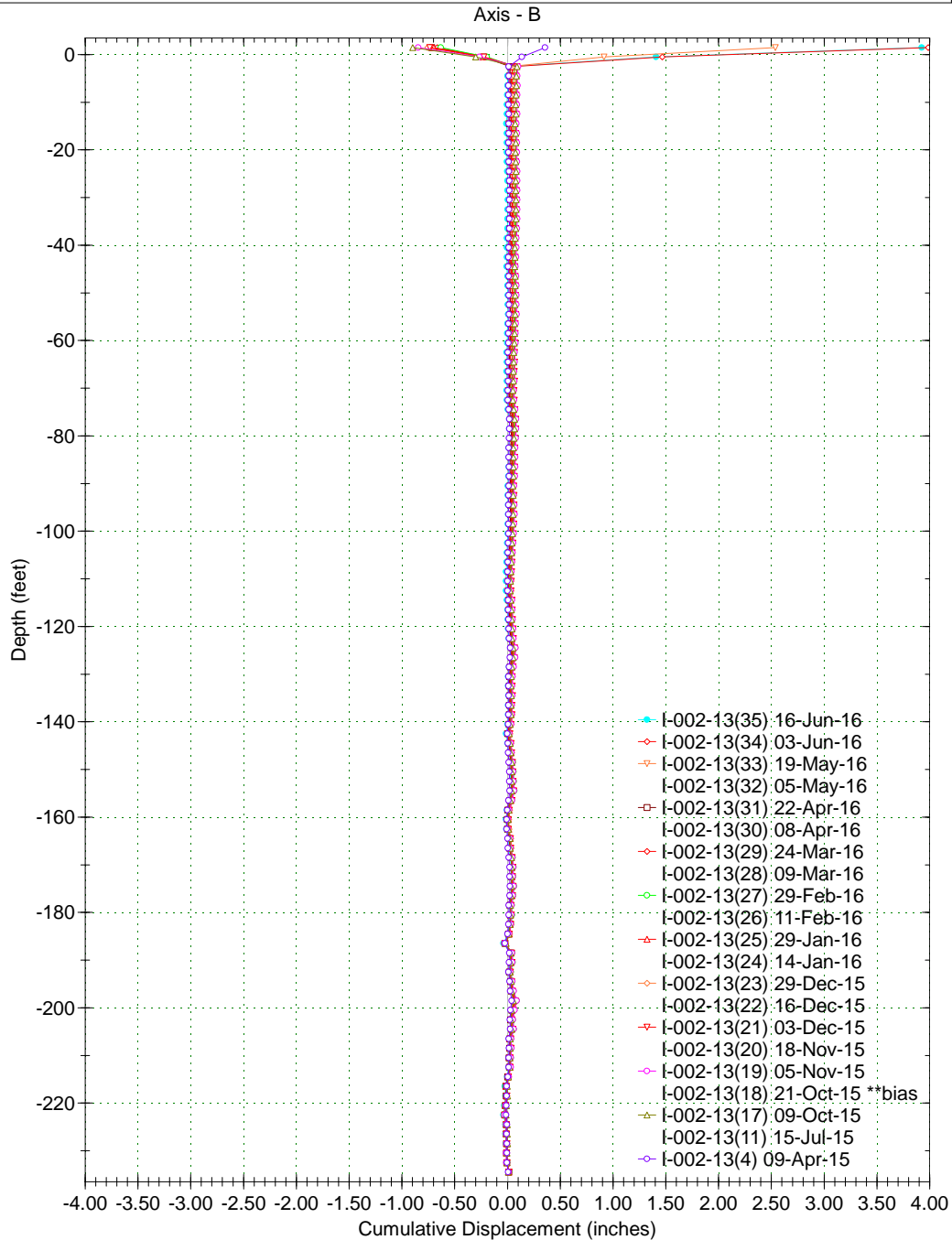
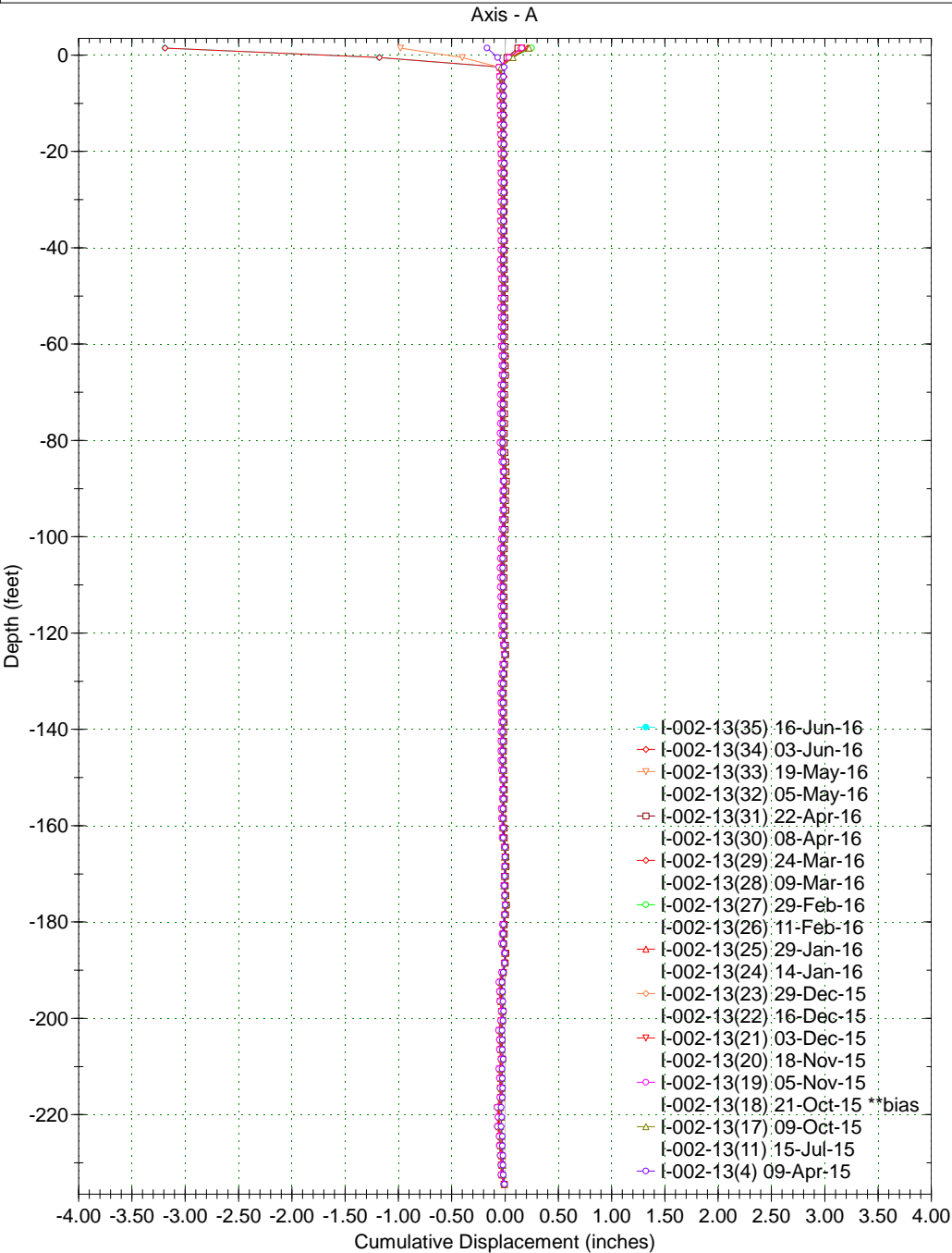
Spiral Correction : N/A
Collar Elevation : 3.7 feet
Borehole Total Depth : 228.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Mar 03 11:14
Applied Azimuth : 0.0 degrees



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



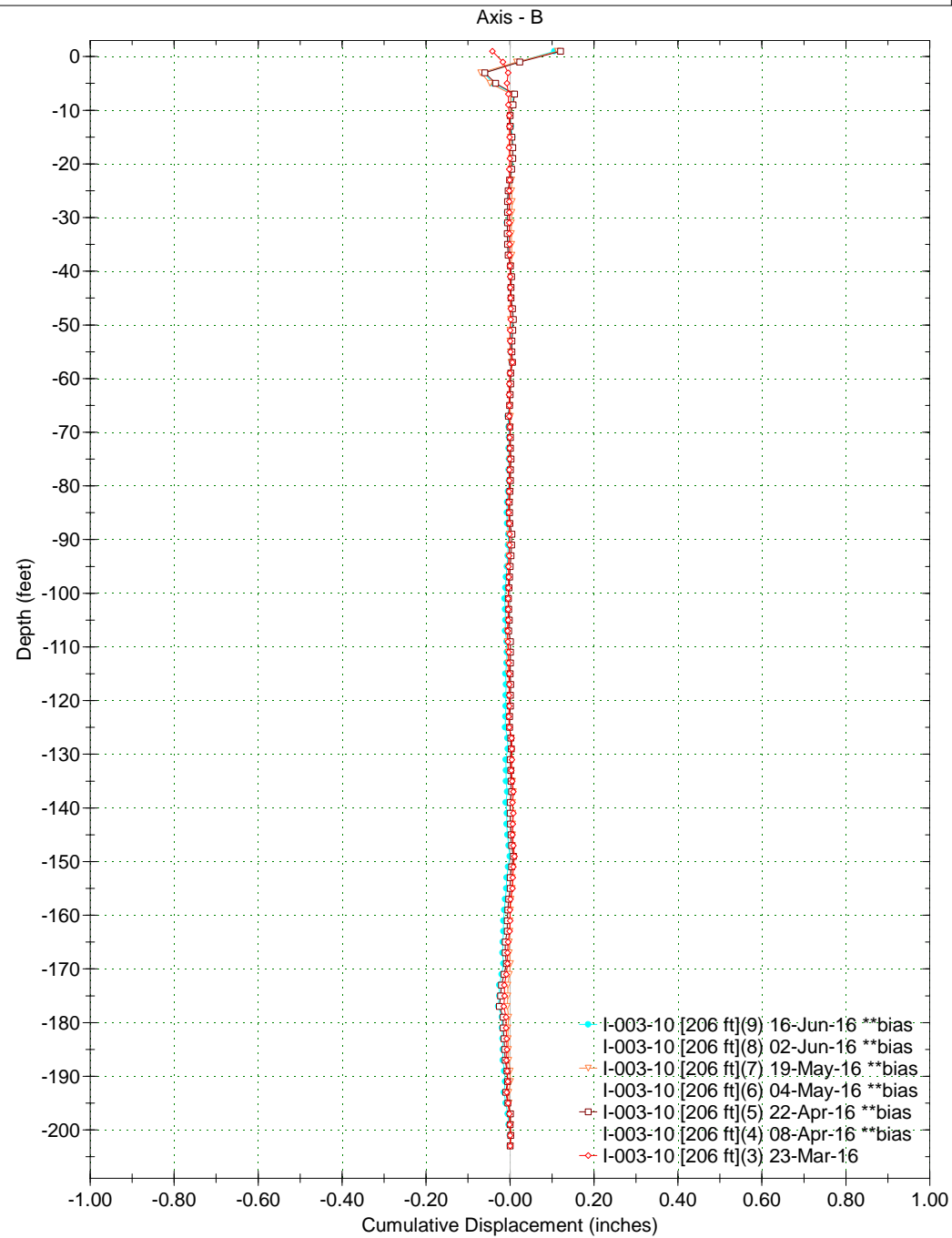
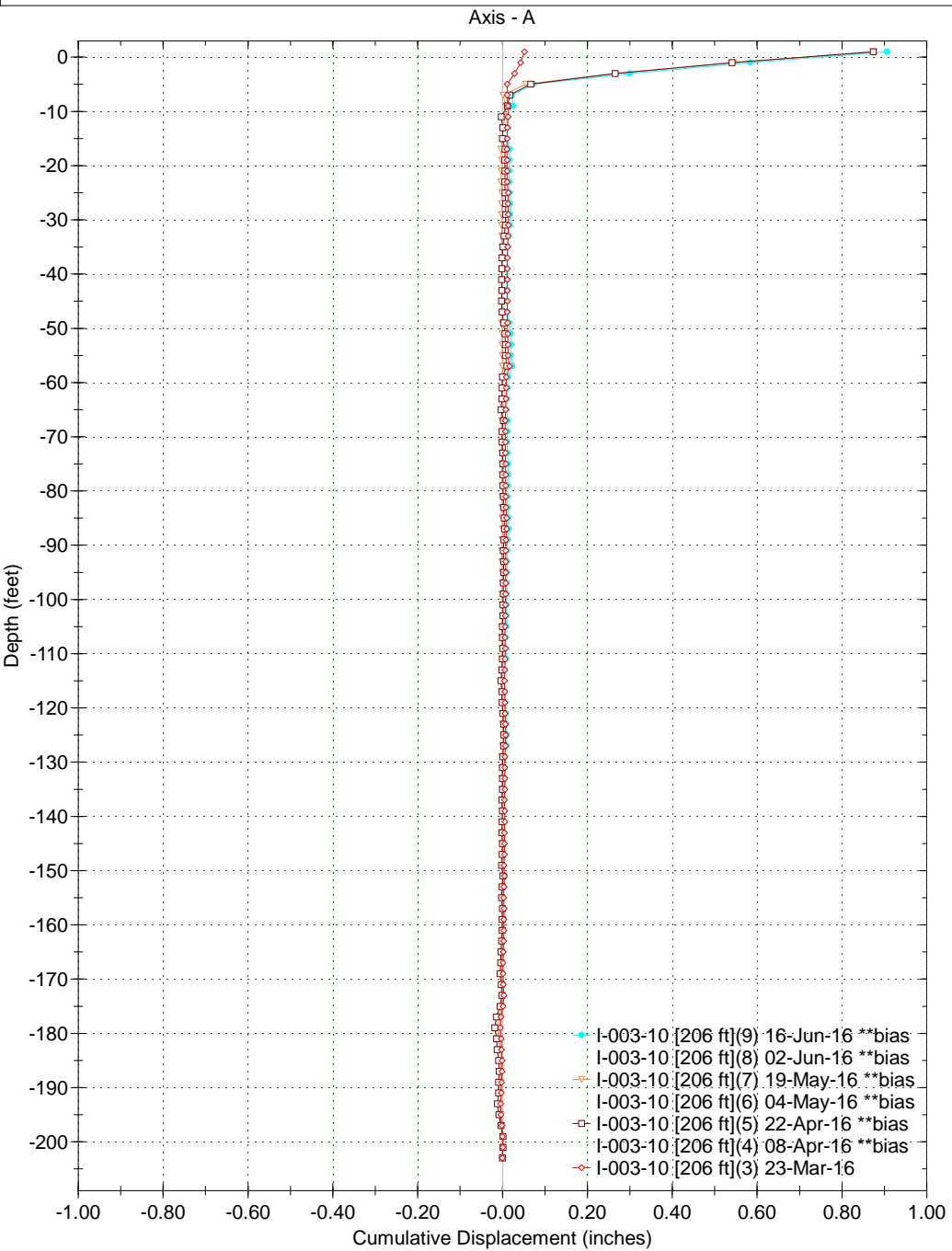
Spiral Correction : N/A
 Collar Elevation : 3.5 feet
 Borehole Total Depth : 238.0 feet
 A+ Groove Azimuth :
 Base Reading : 2015 Mar 03 10:04
 Applied Azimuth : 0.0 degrees



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



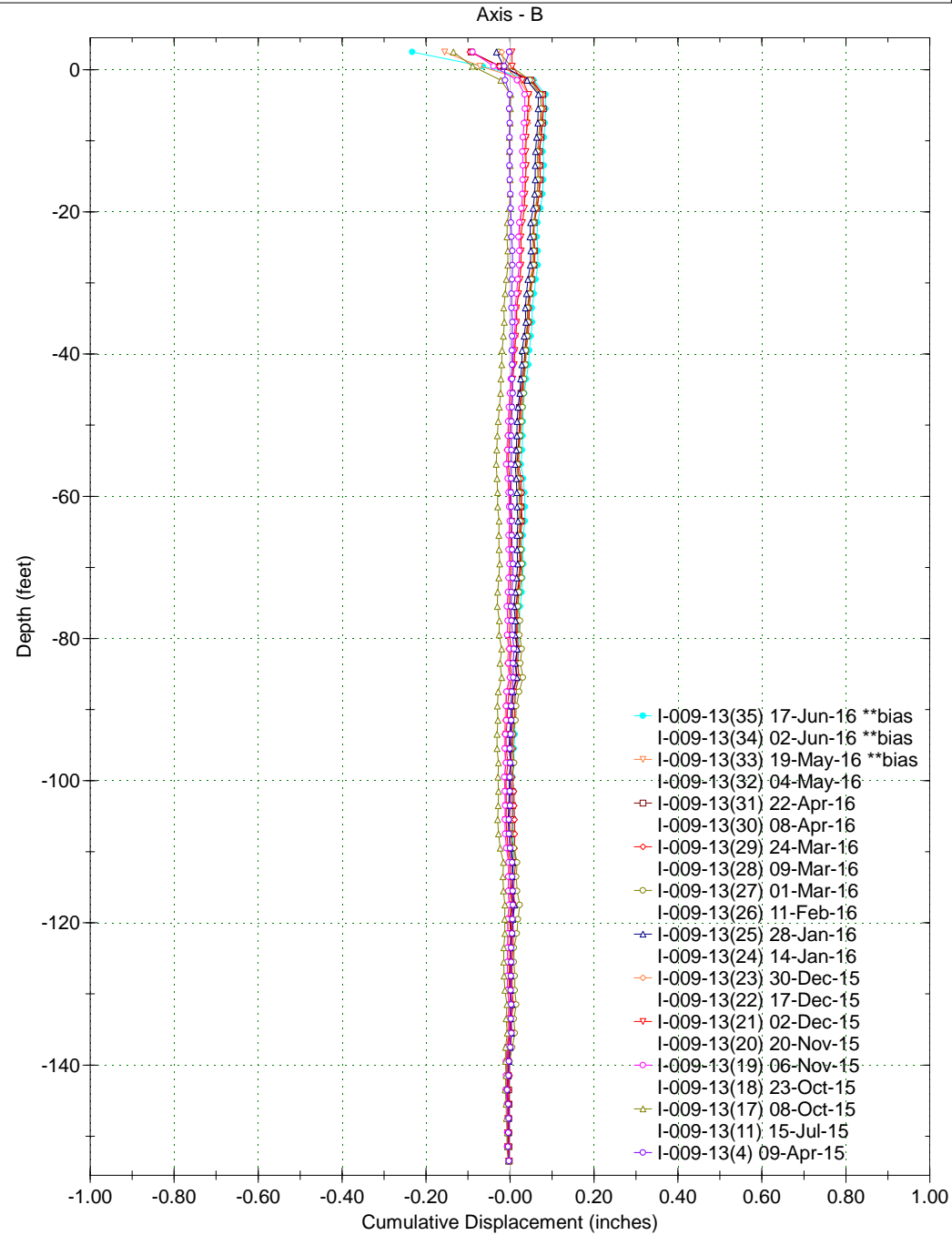
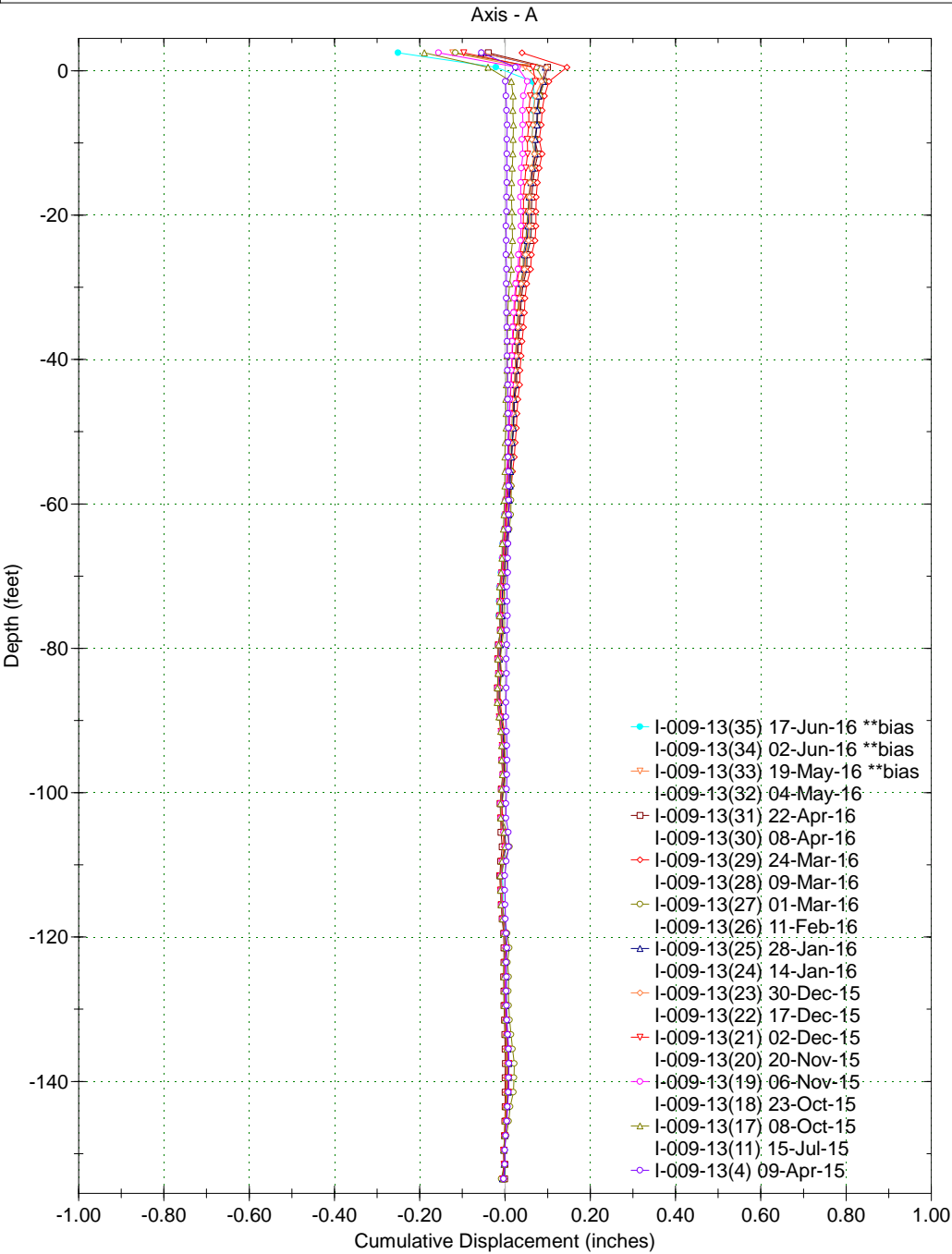
Spiral Correction : N/A
Collar Elevation : 3.0 feet
Borehole Total Depth : 206.0 feet
A+ Groove Azimuth :
Base Reading : 2016 Mar 08 15:42
Applied Azimuth : 0.0 degrees



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



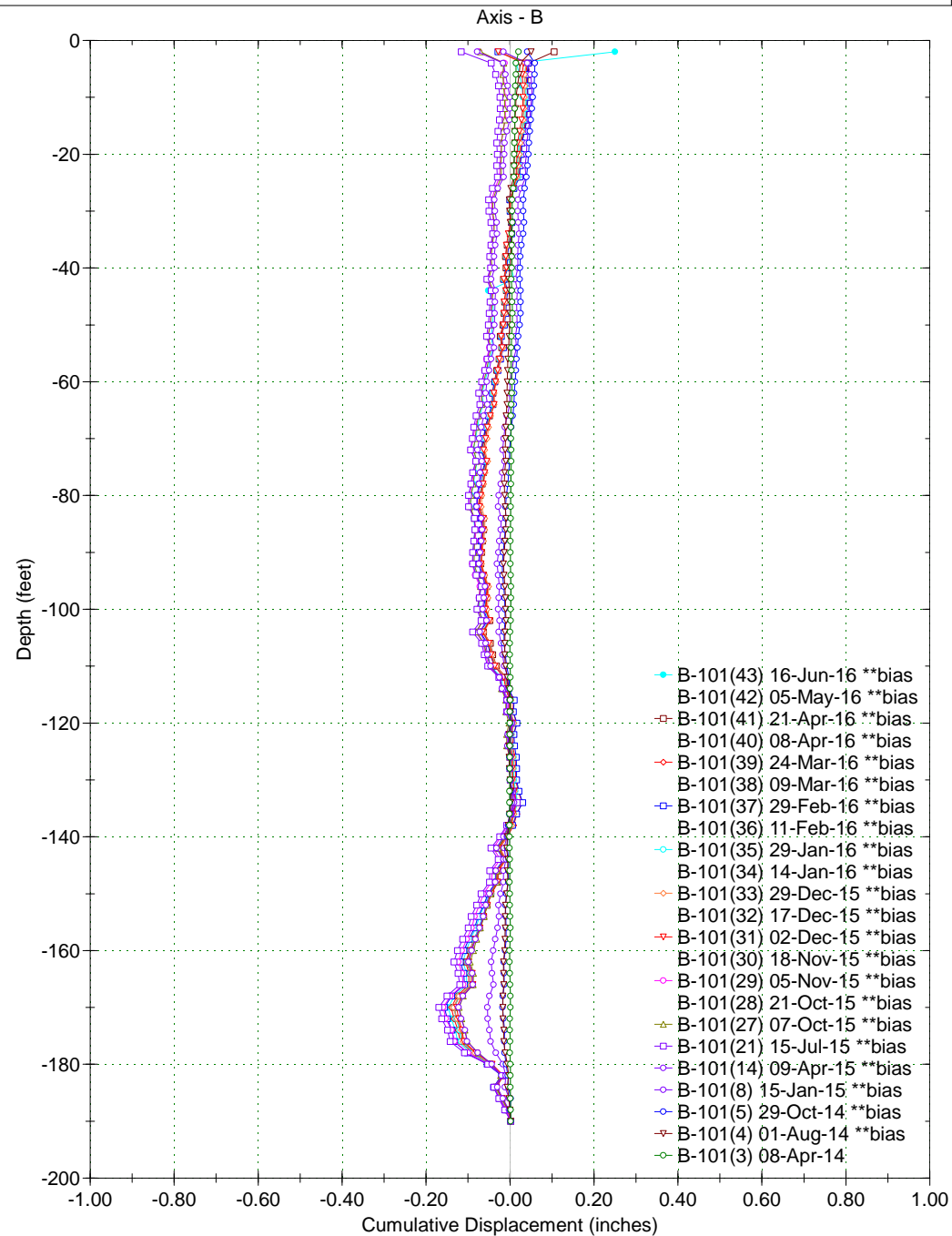
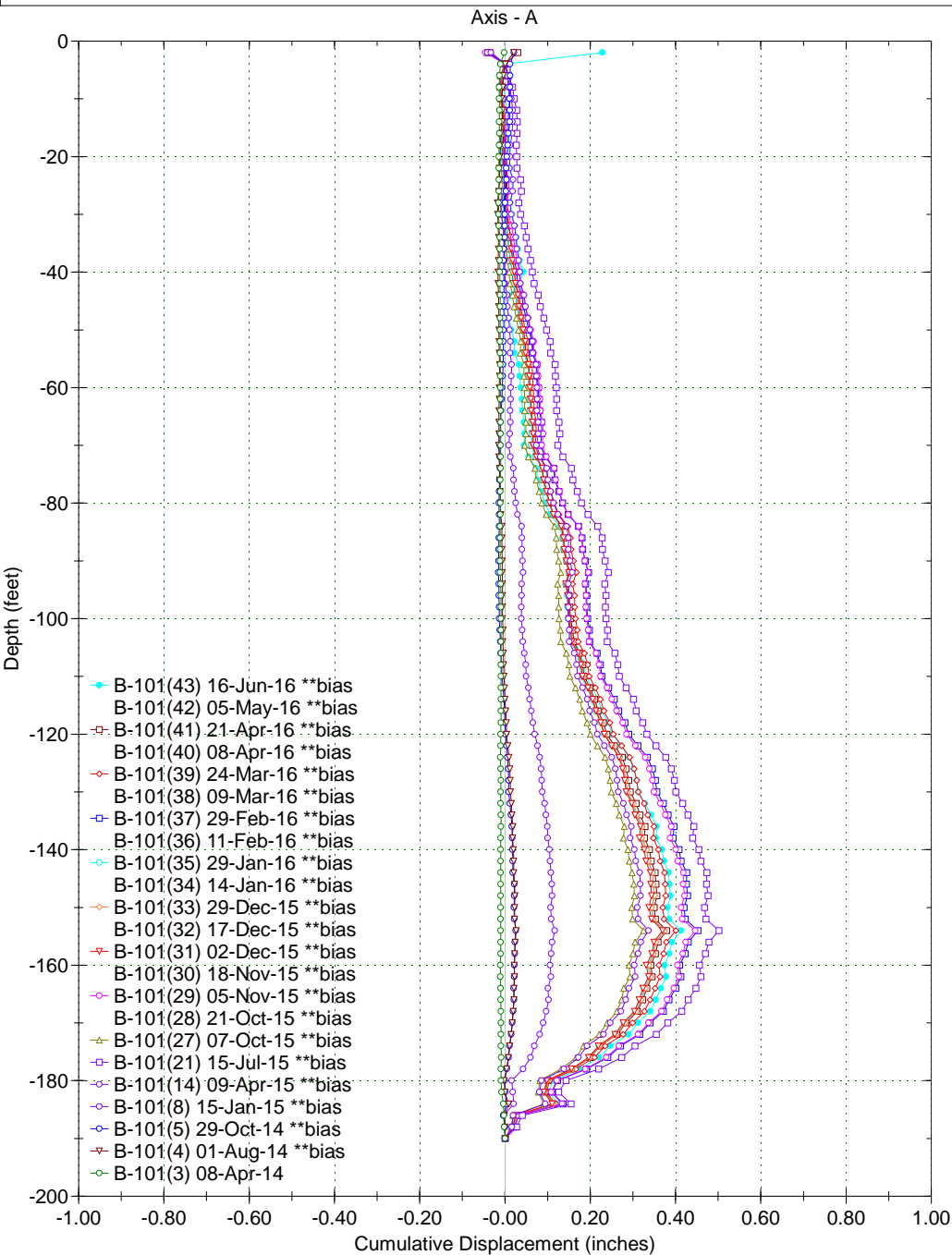
Spiral Correction : N/A
 Collar Elevation : 4.5 feet
 Borehole Total Depth : 158.0 feet
 A+ Groove Azimuth :
 Base Reading : 2015 Mar 18 15:56
 Applied Azimuth : 0.0 degrees



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



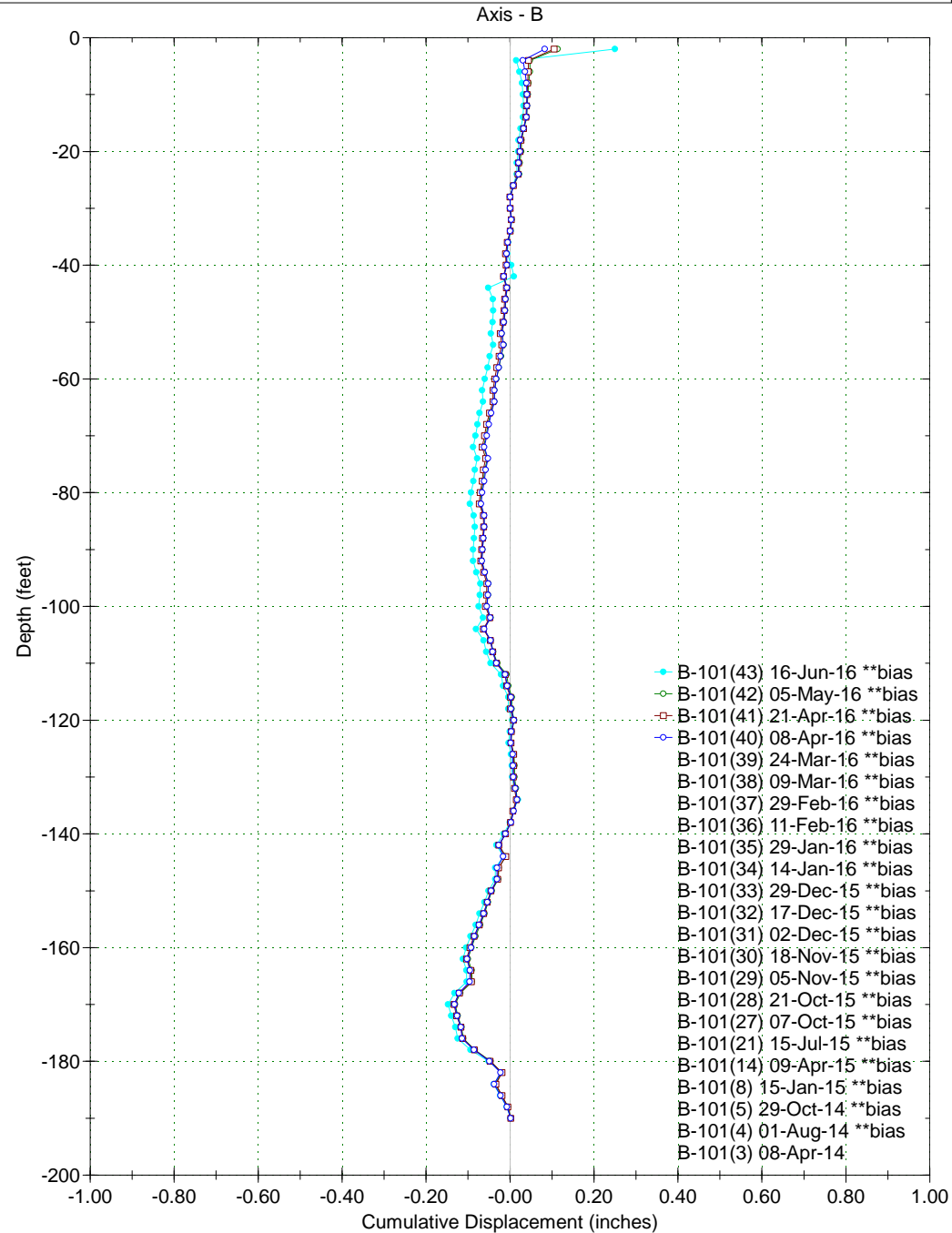
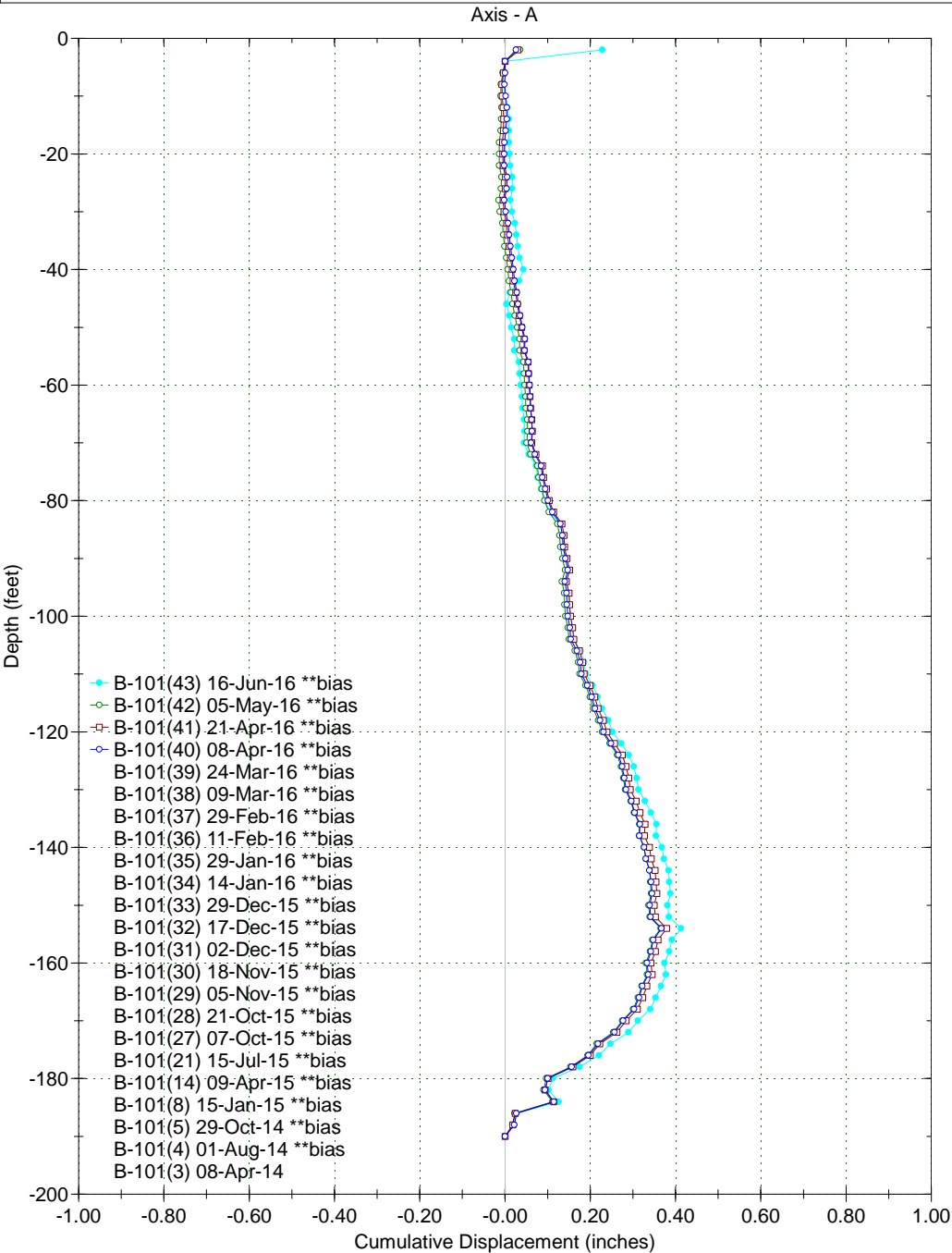
Spiral Correction : N/A
 Collar Elevation : 0.0 feet
 Borehole Total Depth : 190.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 22 09:01
 Applied Azimuth : 0.0 degrees



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



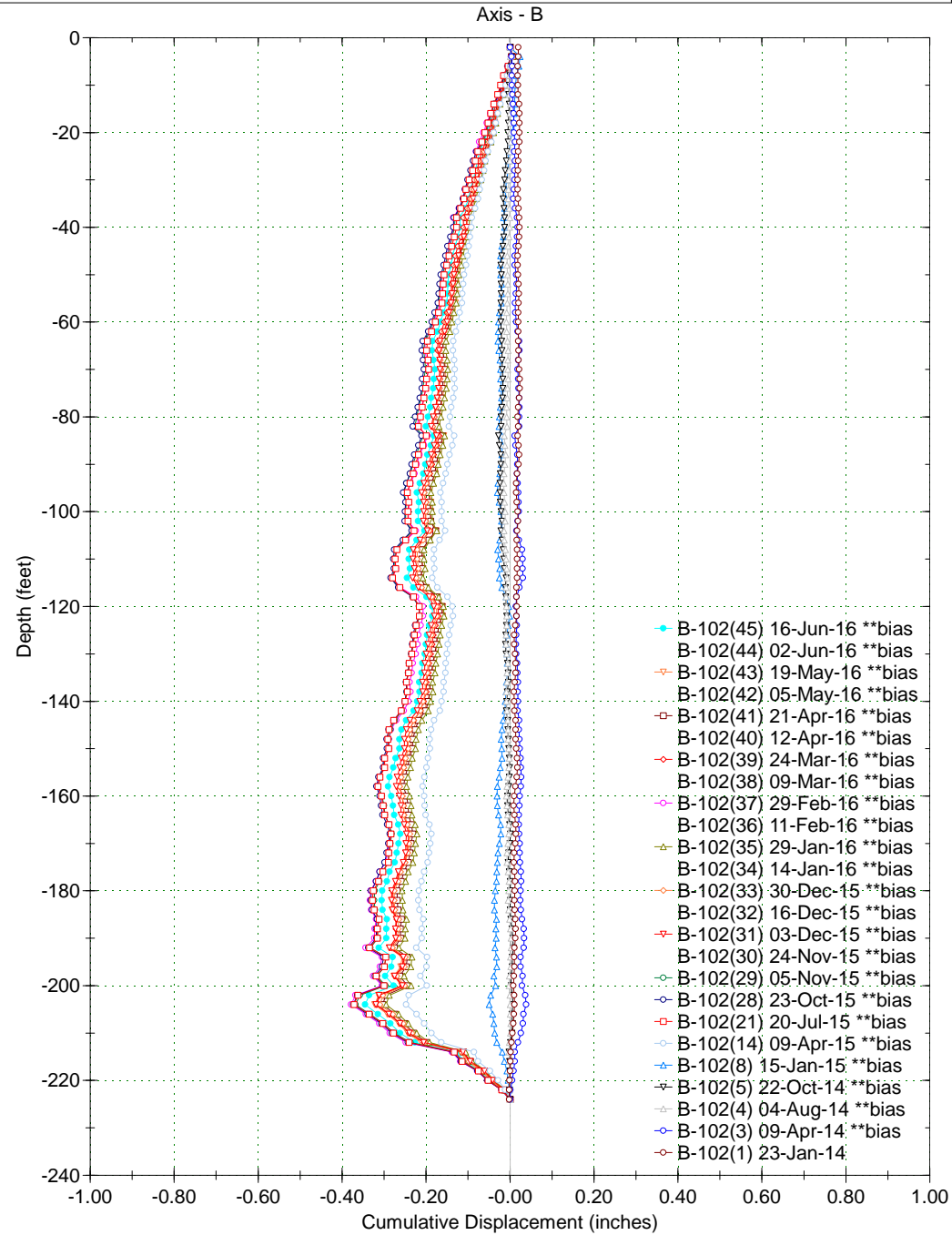
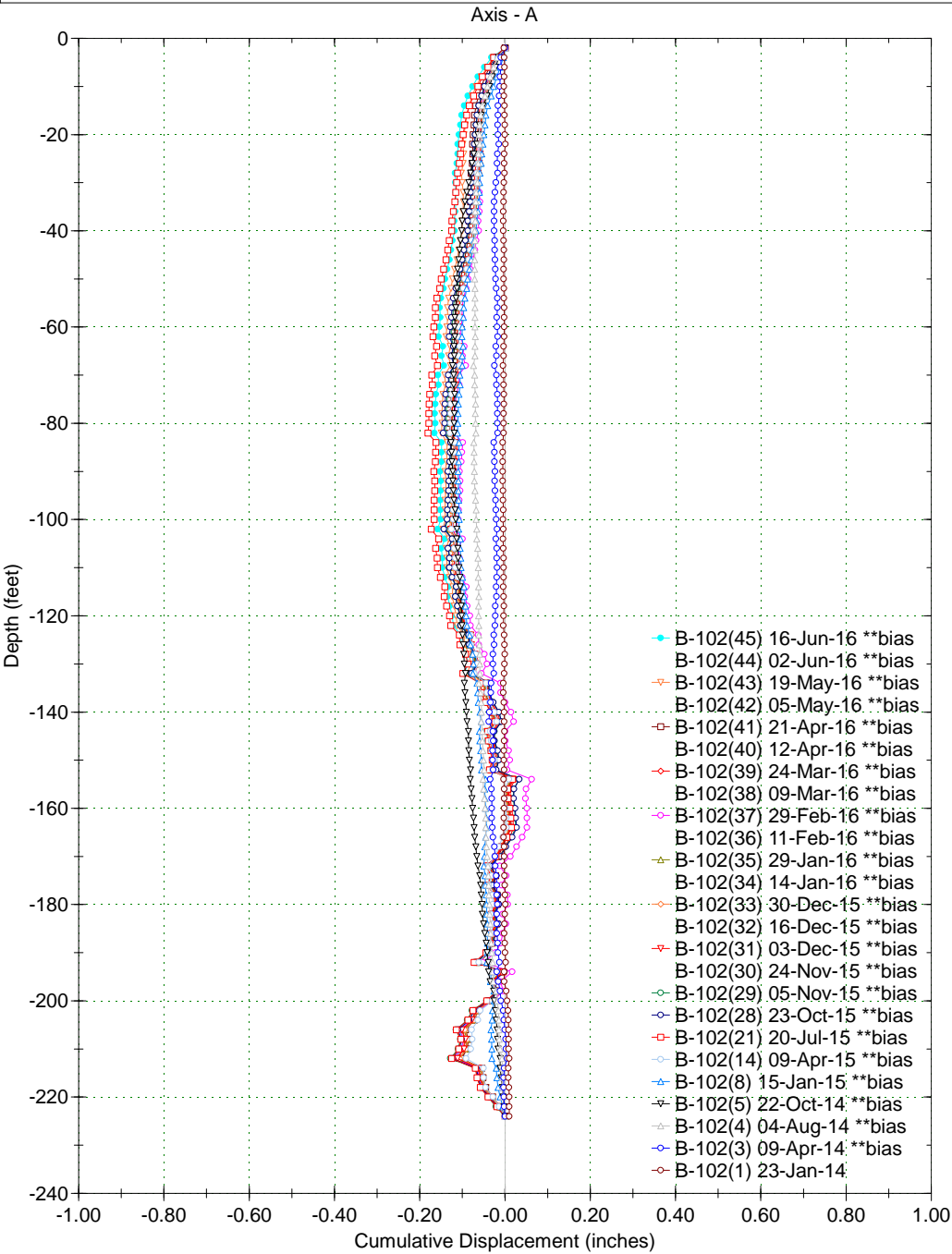
Spiral Correction : N/A
 Collar Elevation : 0.0 feet
 Borehole Total Depth : 190.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 22 09:01
 Applied Azimuth : 0.0 degrees



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



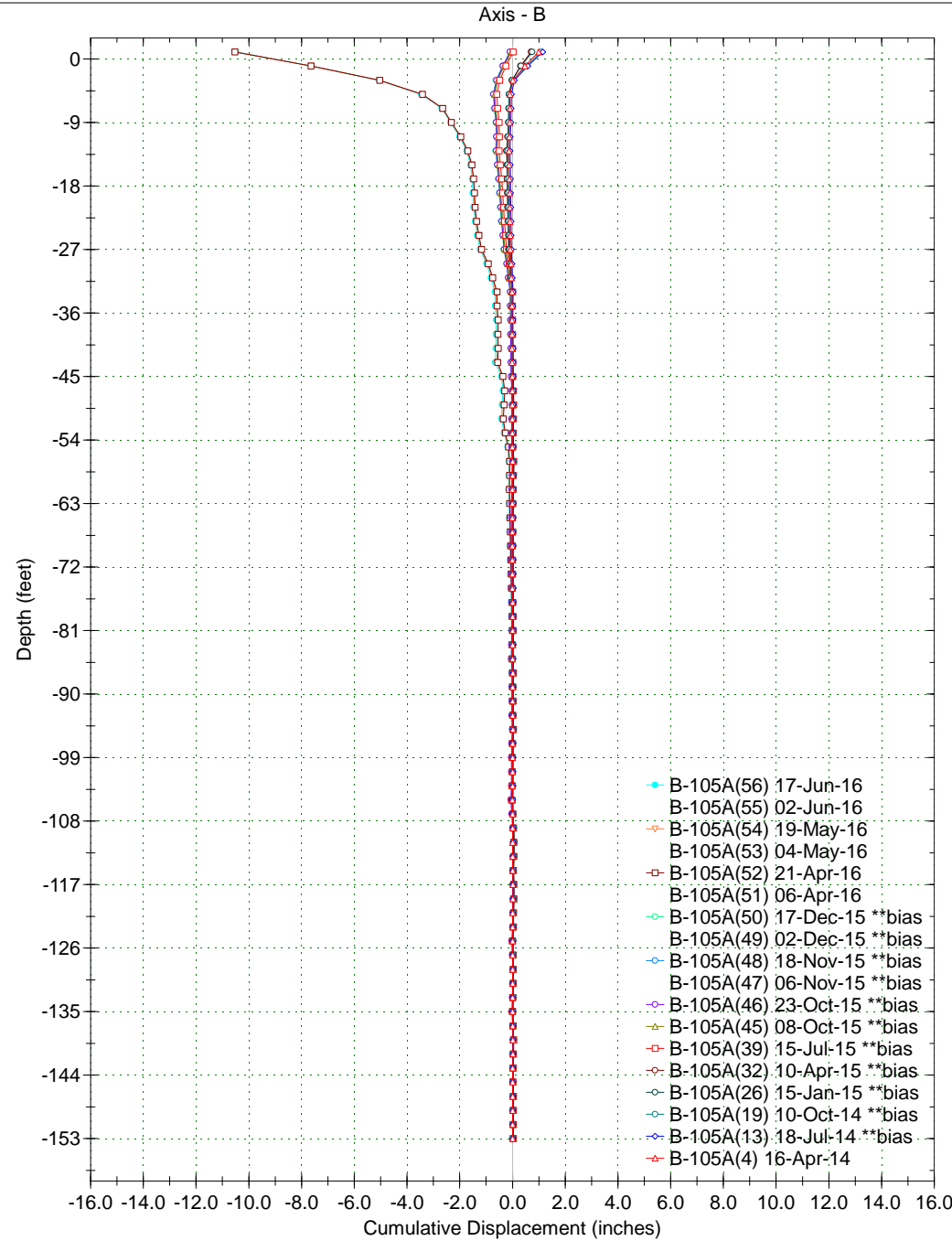
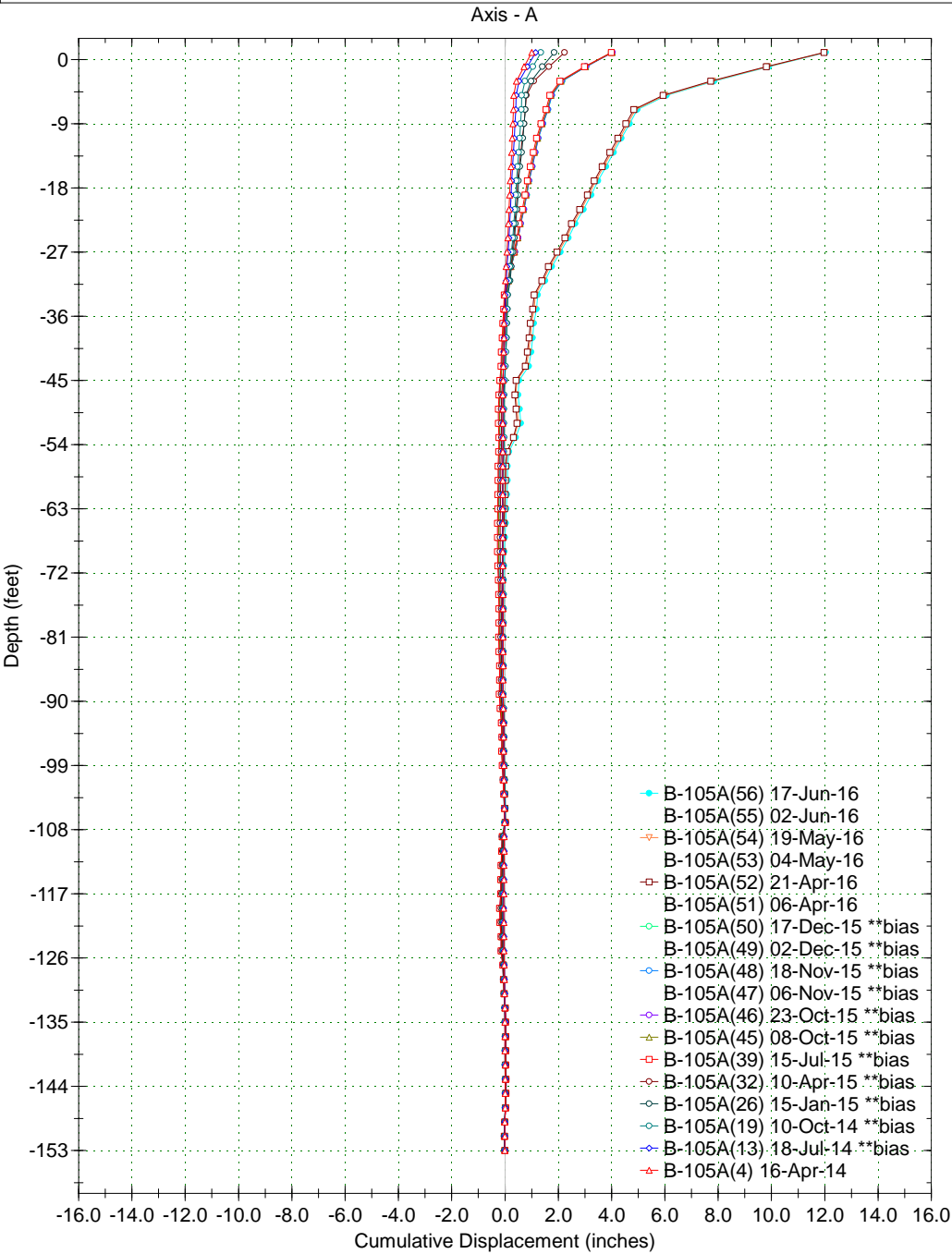
Spiral Correction : N/A
Collar Elevation : 0.0 feet
Borehole Total Depth : 224.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 23 08:21
Applied Azimuth : 0.0 degrees



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

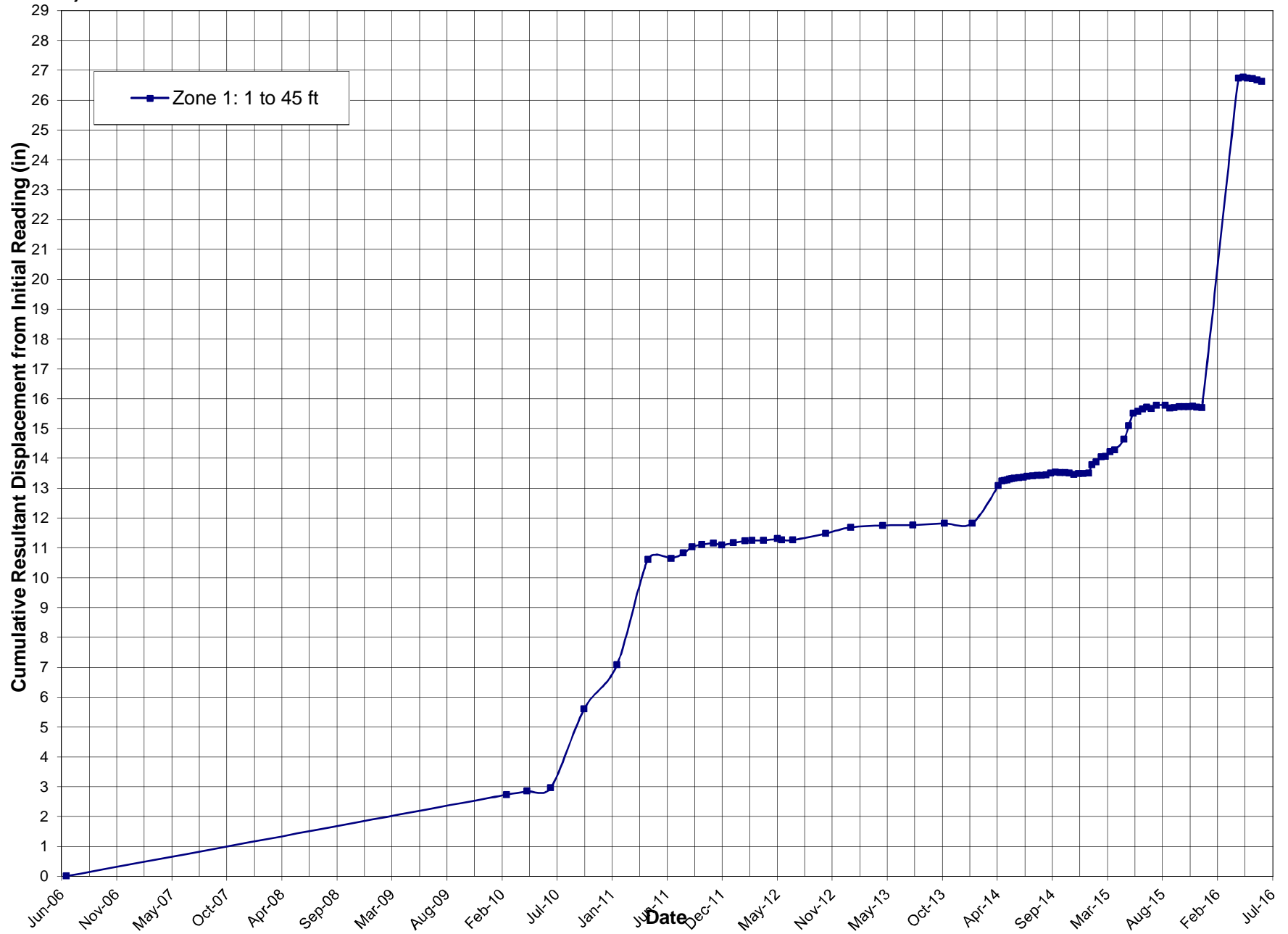


Spiral Correction : N/A
 Collar Elevation : 3.0 feet
 Borehole Total Depth : 156.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 15 09:19
 Applied Azimuth : 0.0 degrees



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

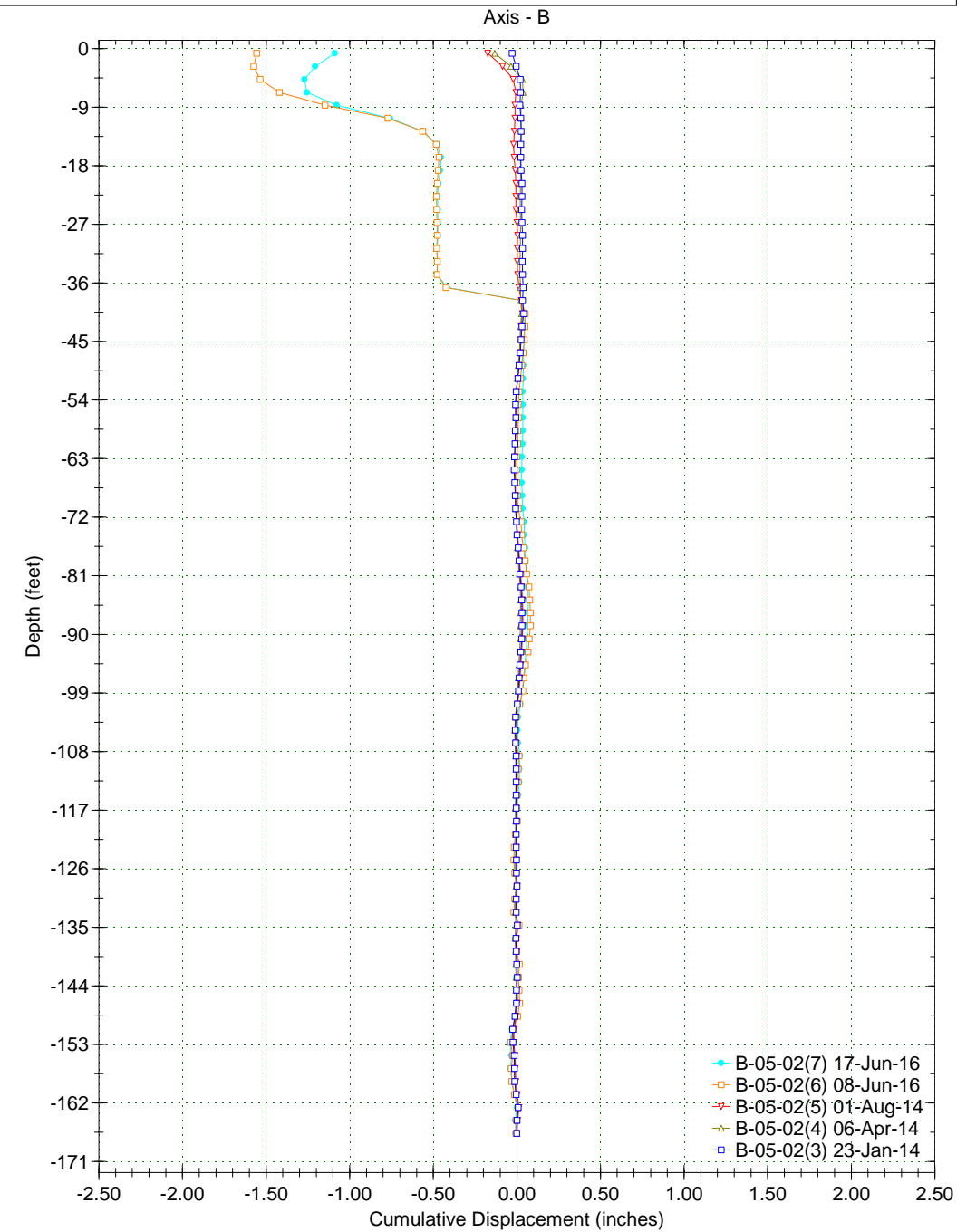
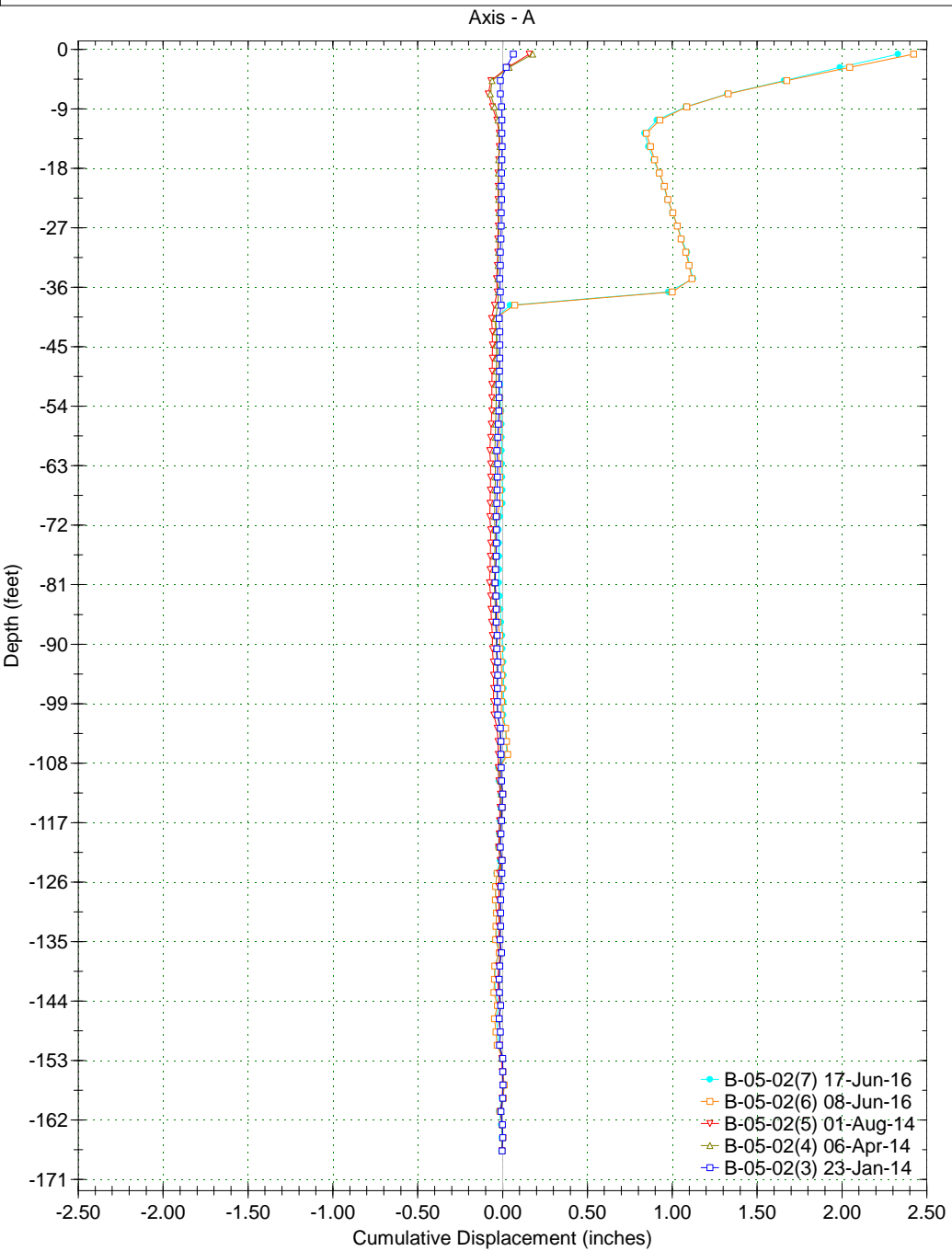
B-105A



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

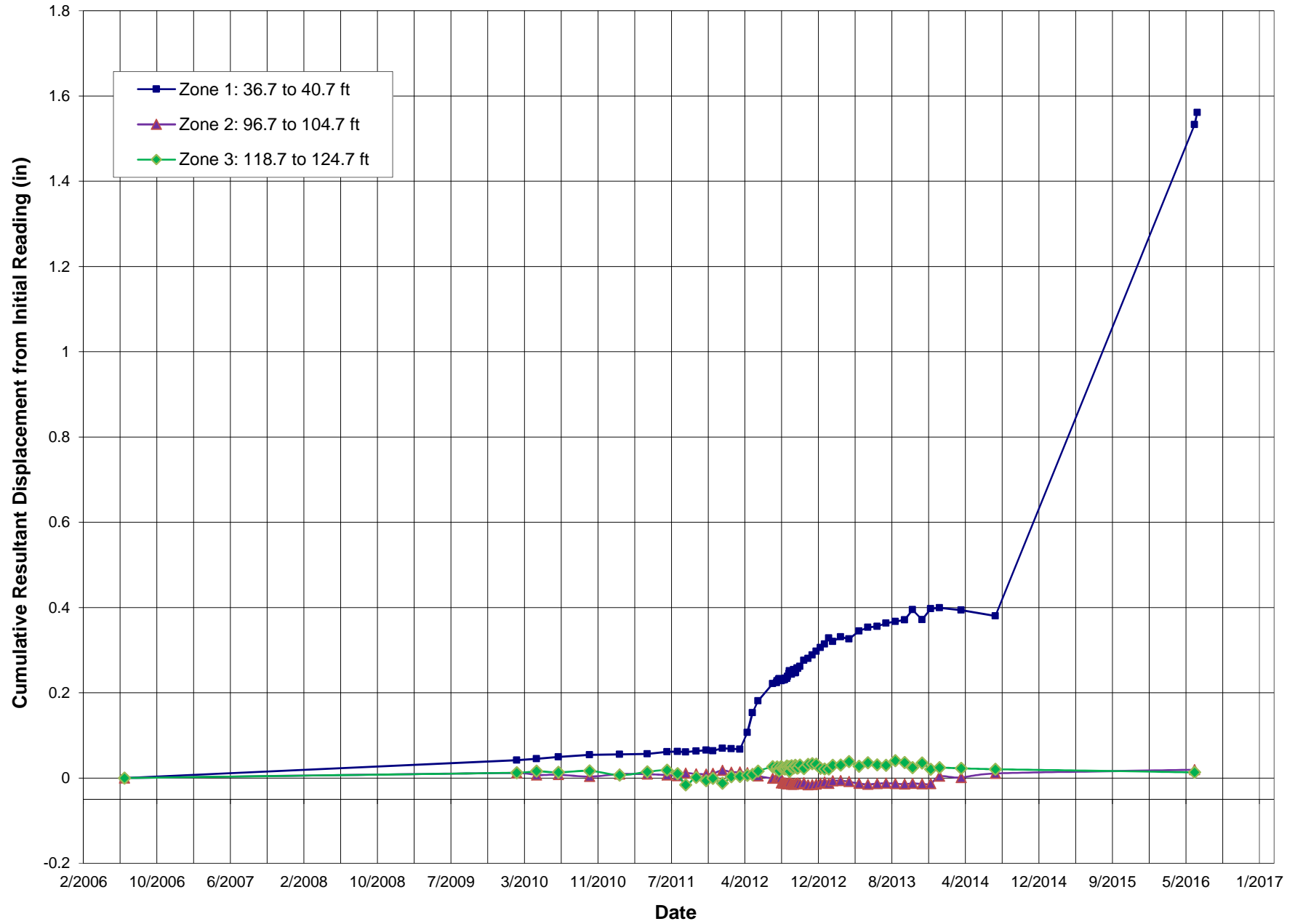


Spiral Correction : N/A
Collar Elevation : 1.3 feet
Borehole Total Depth : 168.0 feet
A+ Groove Azimuth :
Base Reading : 2013 Dec 24 11:12
Applied Azimuth : 0.0 degrees



CUY-90-15.24
PID 63504
SME Project#: 069032.00

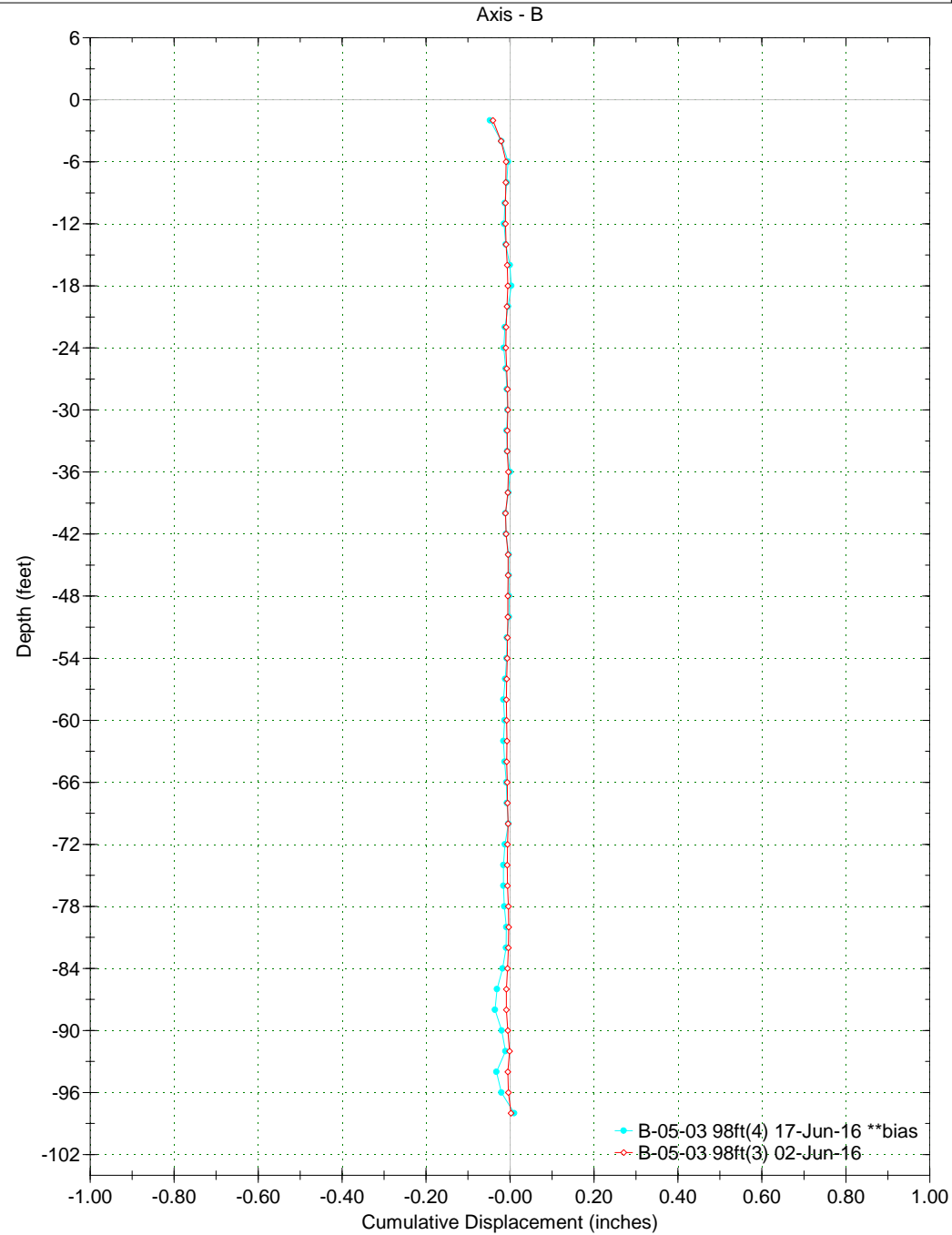
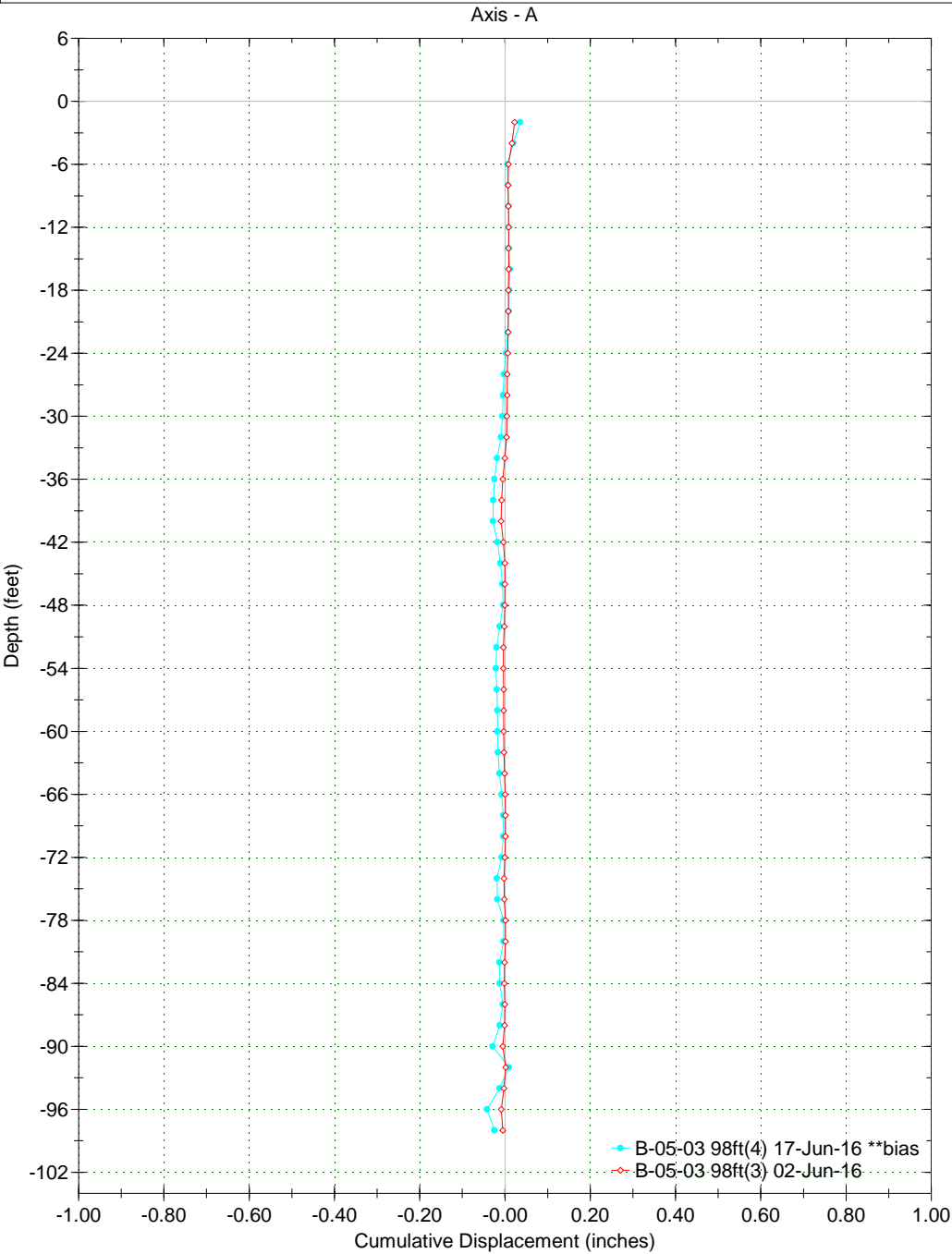
B-05-02



Borehole : B-05-A-03 [98 ft]
Project : CUY-90-15-24
Location :
Northing :
Easting :
Collar :



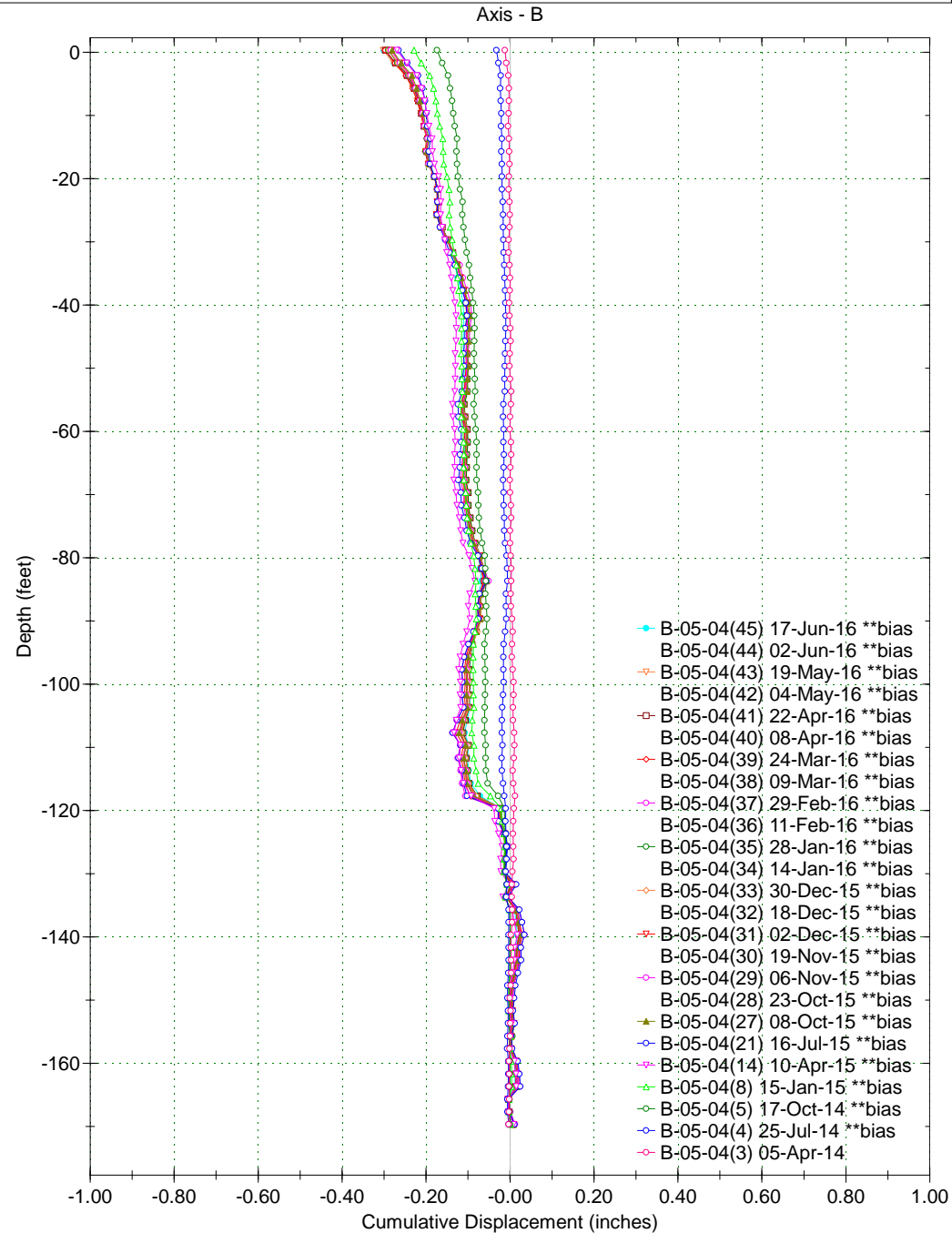
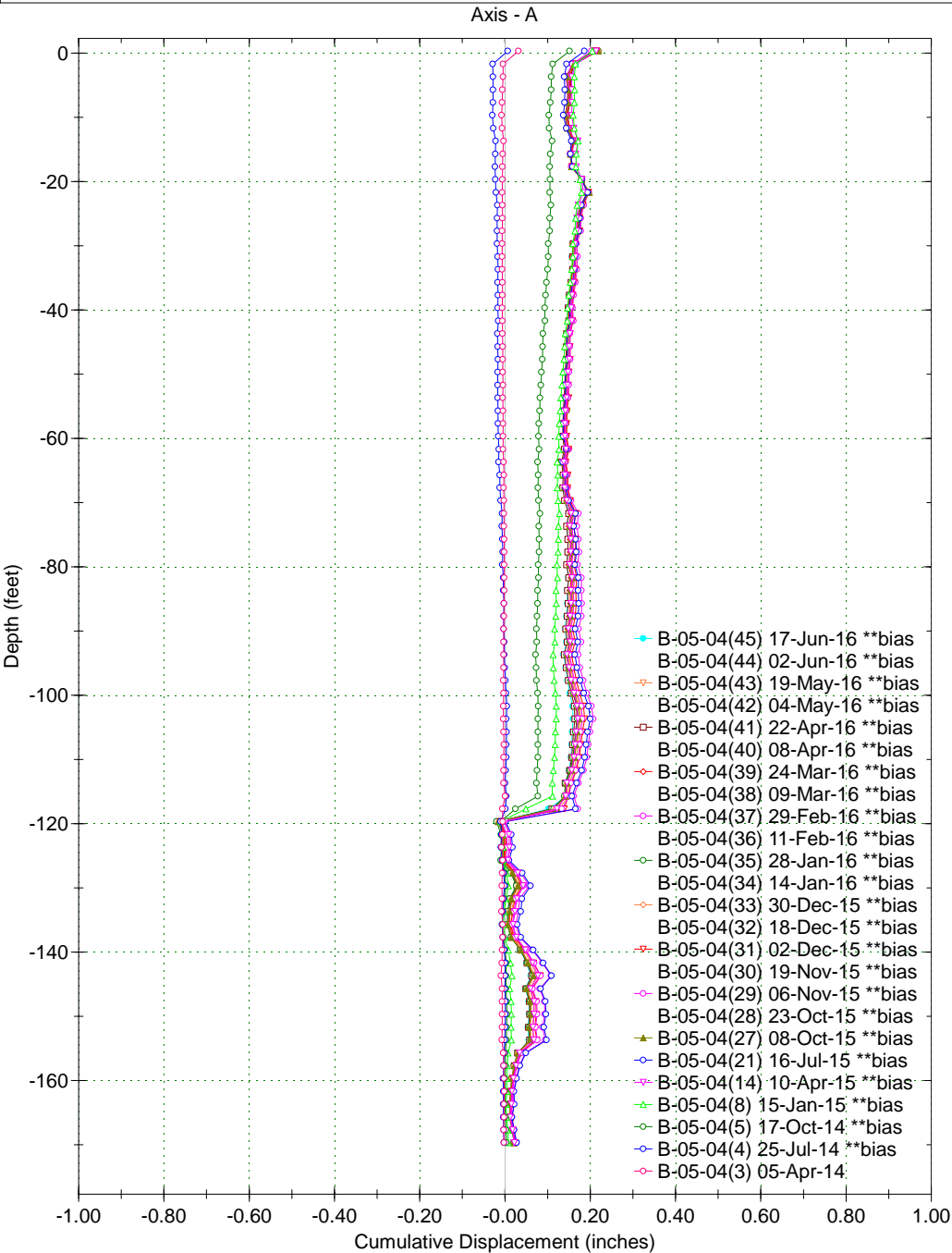
Spiral Correction : N/A
Collar Elevation : 0.0 feet
Borehole Total Depth : 98.0 feet
A+ Groove Azimuth :
Base Reading : 2016 May 19 17:14
Applied Azimuth : 0.0 degrees



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

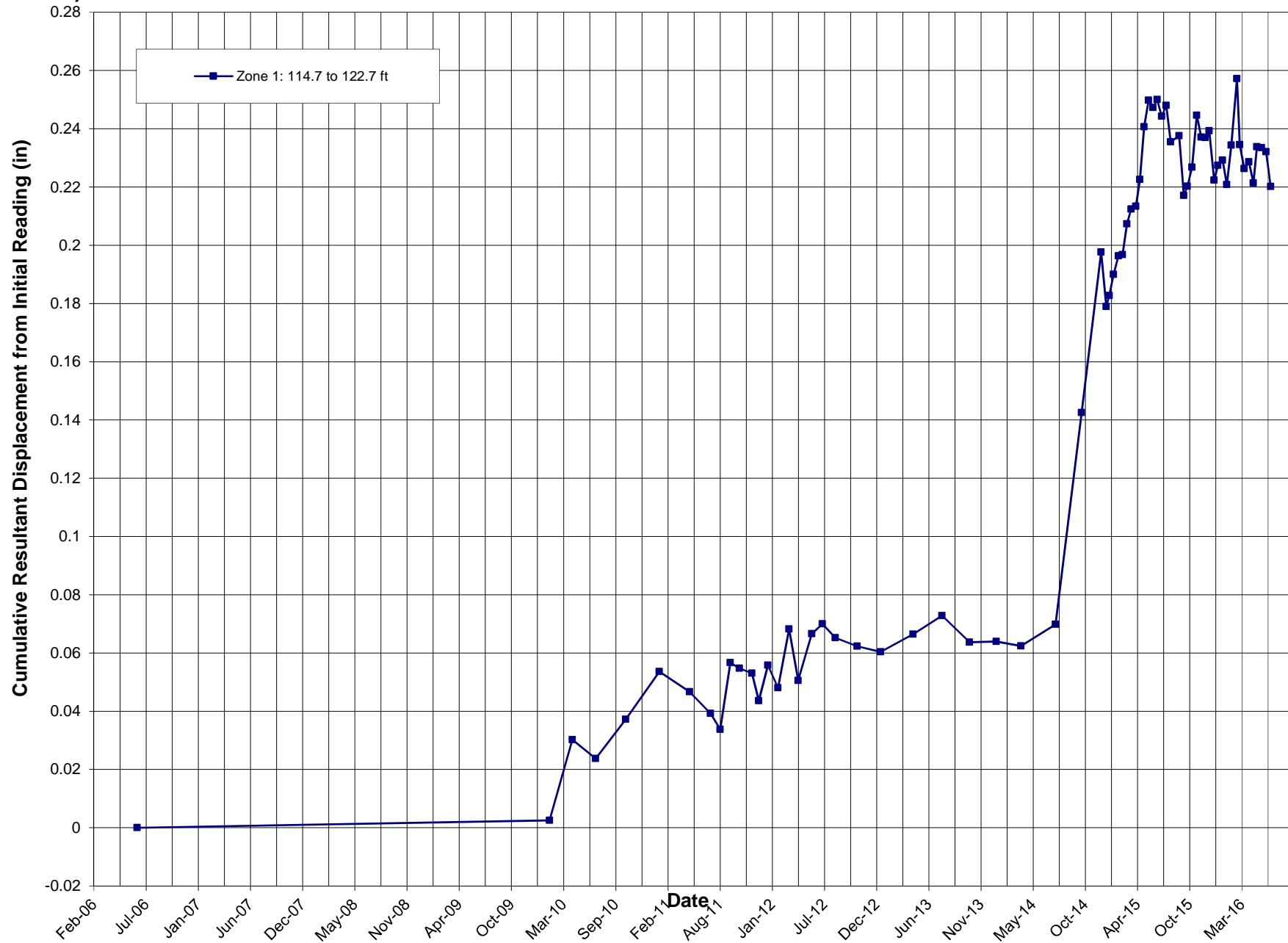


Spiral Correction : N/A
Collar Elevation : 2.3 feet
Borehole Total Depth : 172.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 22 12:30
Applied Azimuth : 0.0 degrees



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

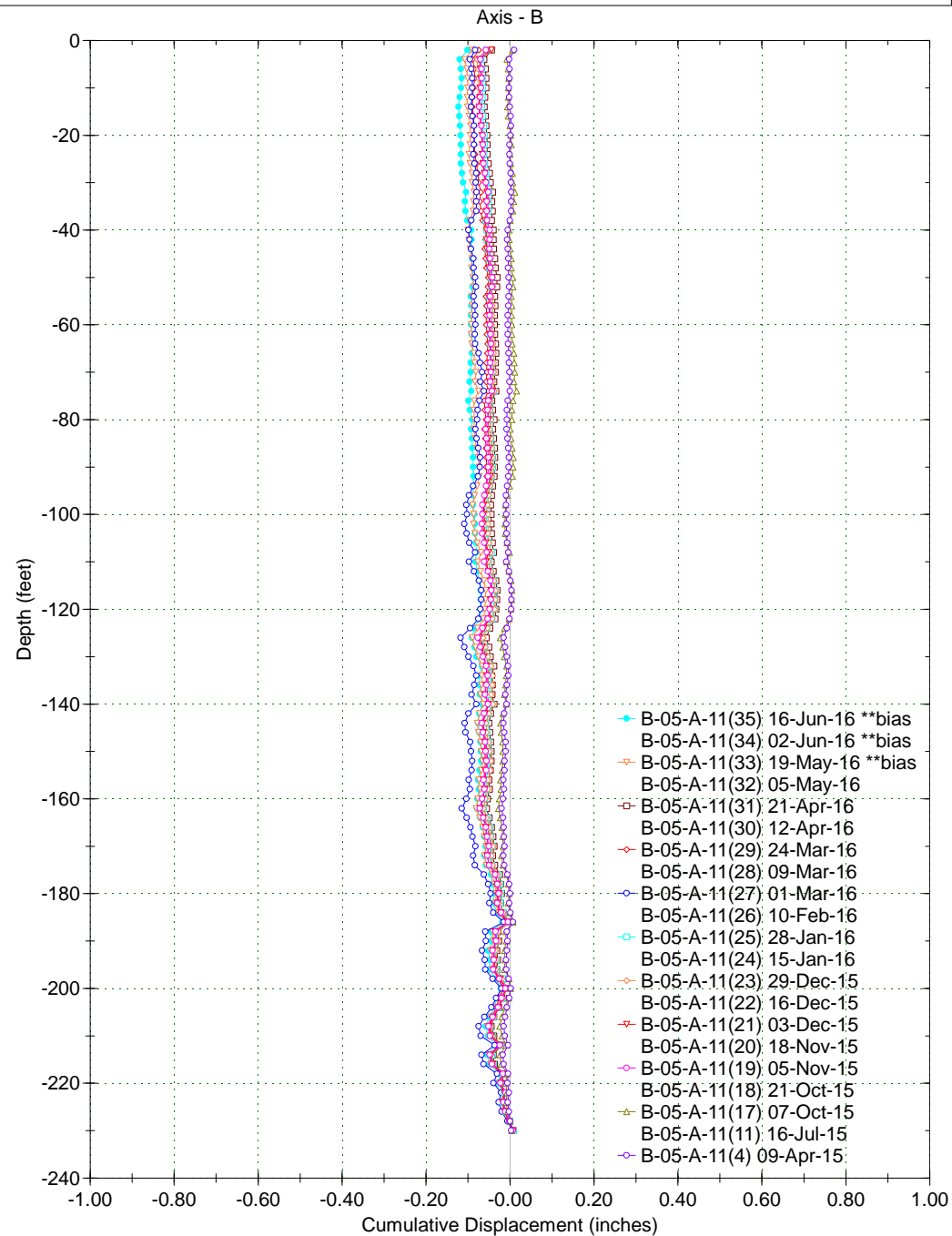
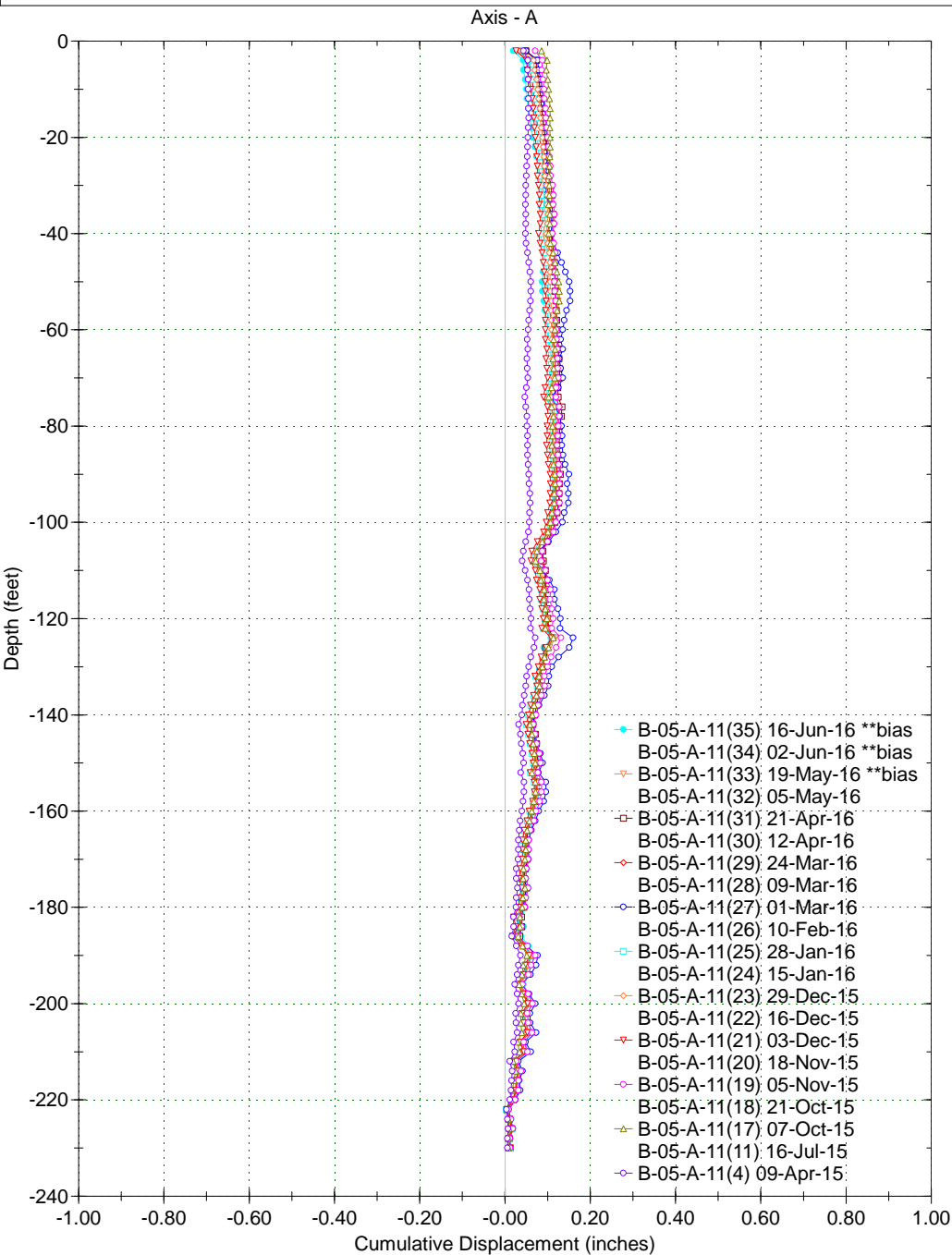
B-05-04



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



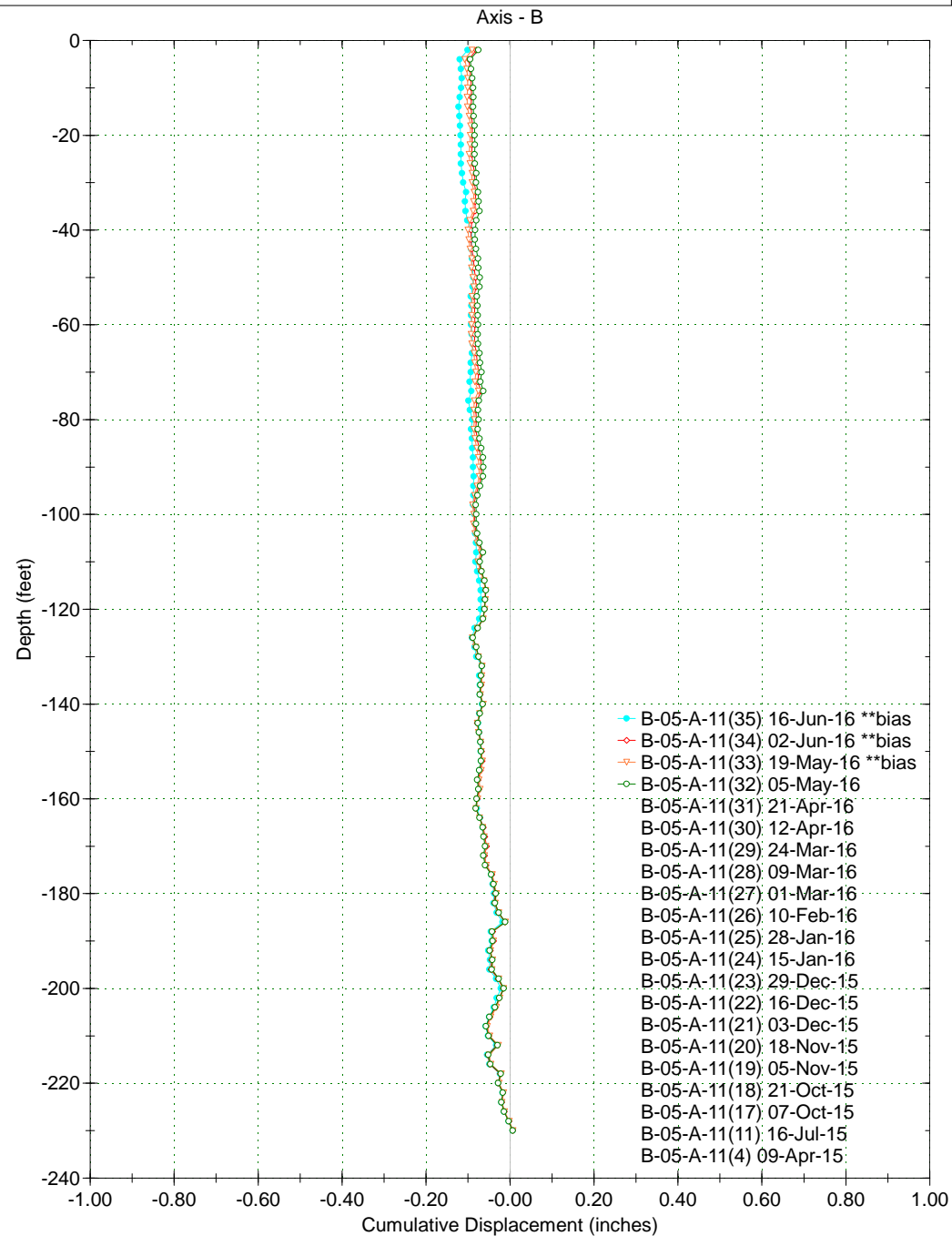
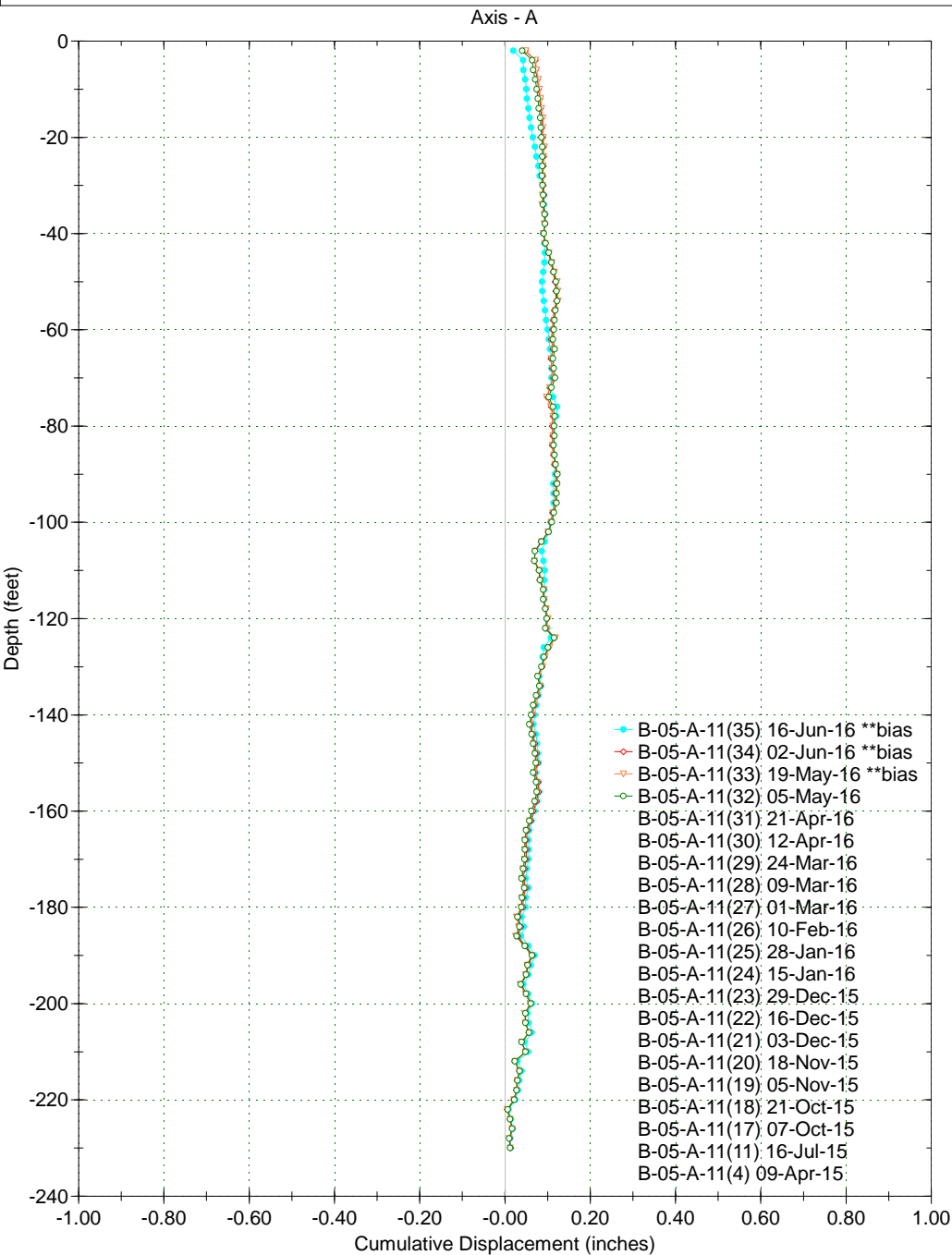
Spiral Correction : N/A
Collar Elevation : 0.0 feet
Borehole Total Depth : 230.0 feet
A+ Groove Azimuth :
Base Reading : 2015 Mar 19 09:08
Applied Azimuth : 0.0 degrees



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



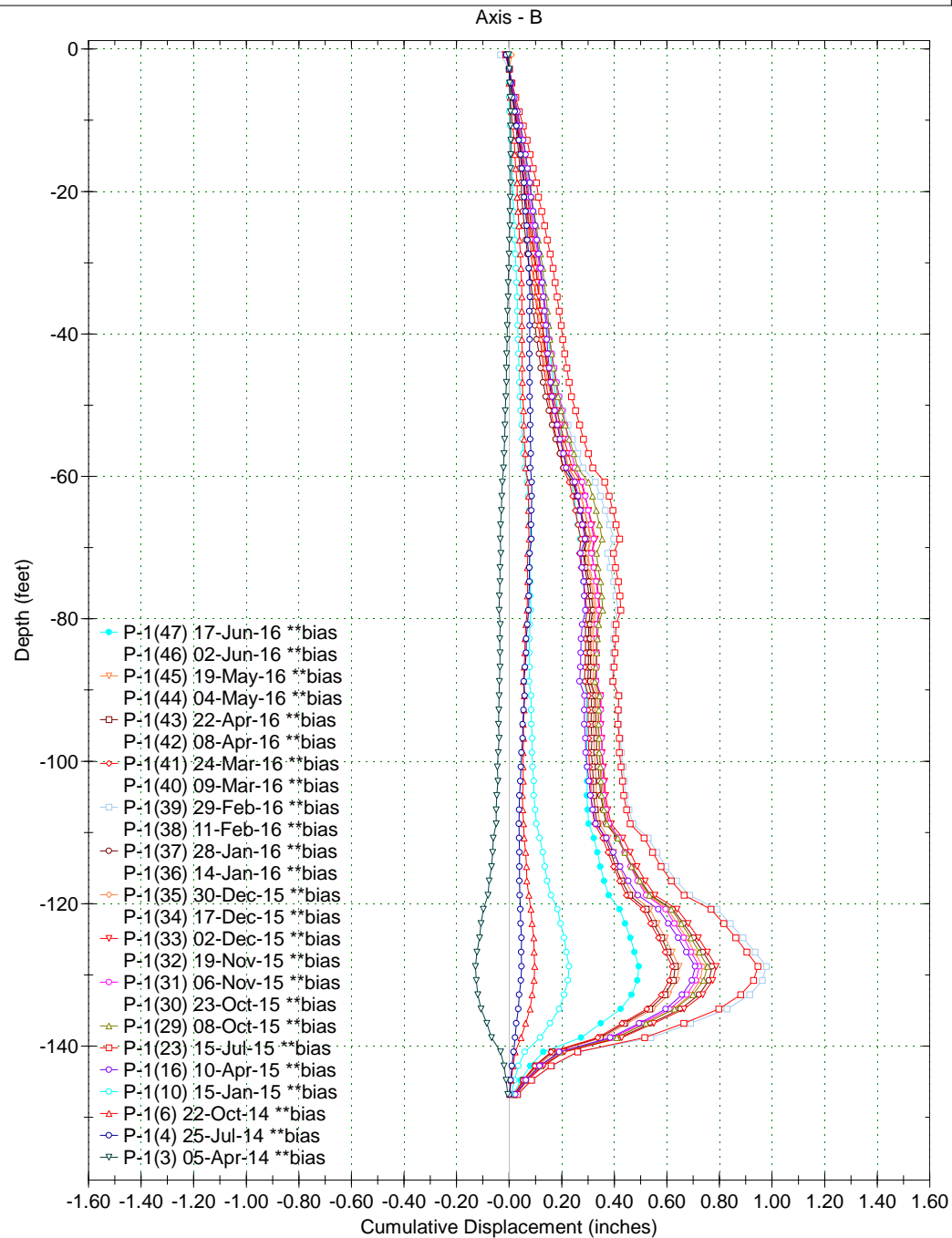
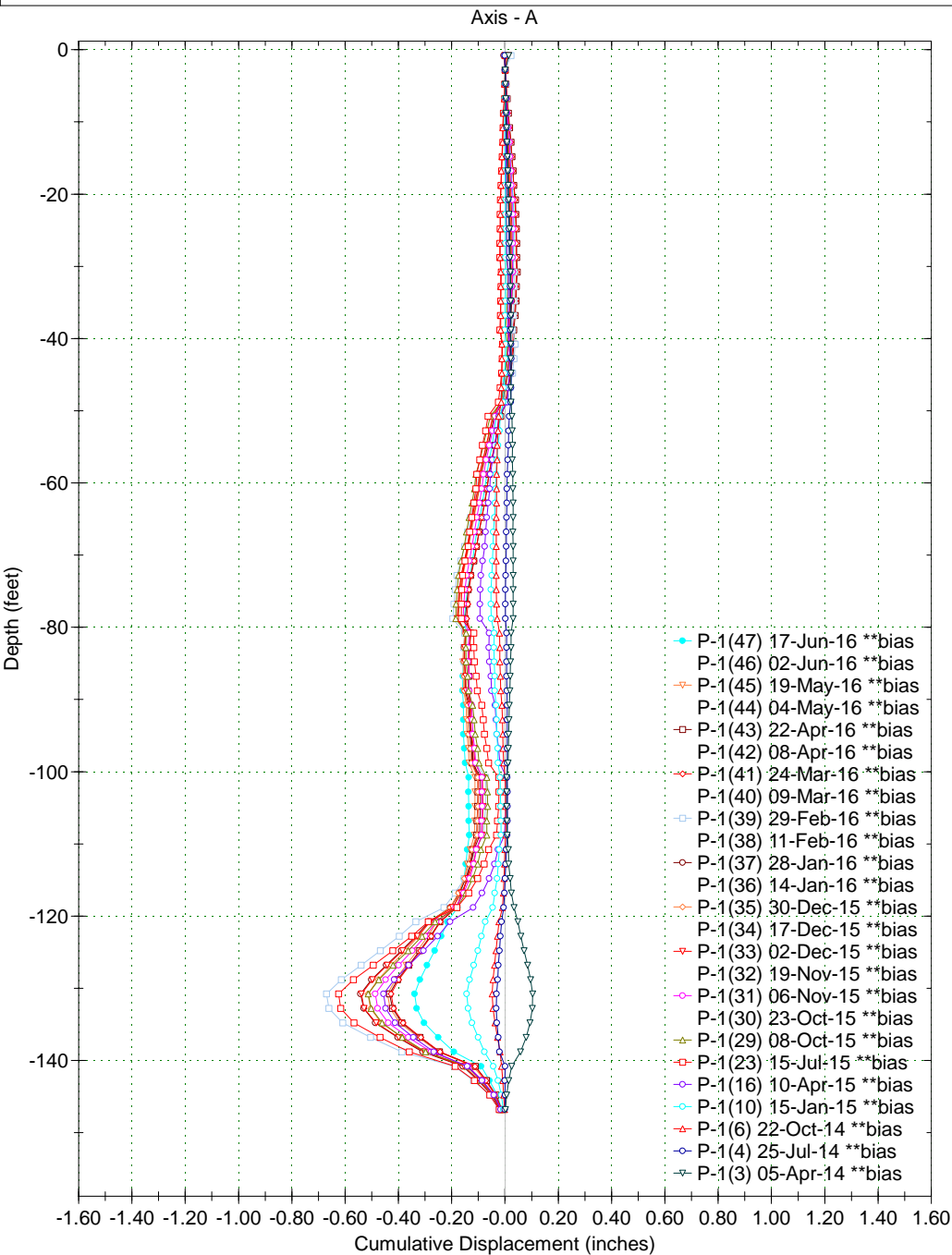
Spiral Correction : N/A
 Collar Elevation : 0.0 feet
 Borehole Total Depth : 230.0 feet
 A+ Groove Azimuth :
 Base Reading : 2015 Mar 19 09:08
 Applied Azimuth : 0.0 degrees



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



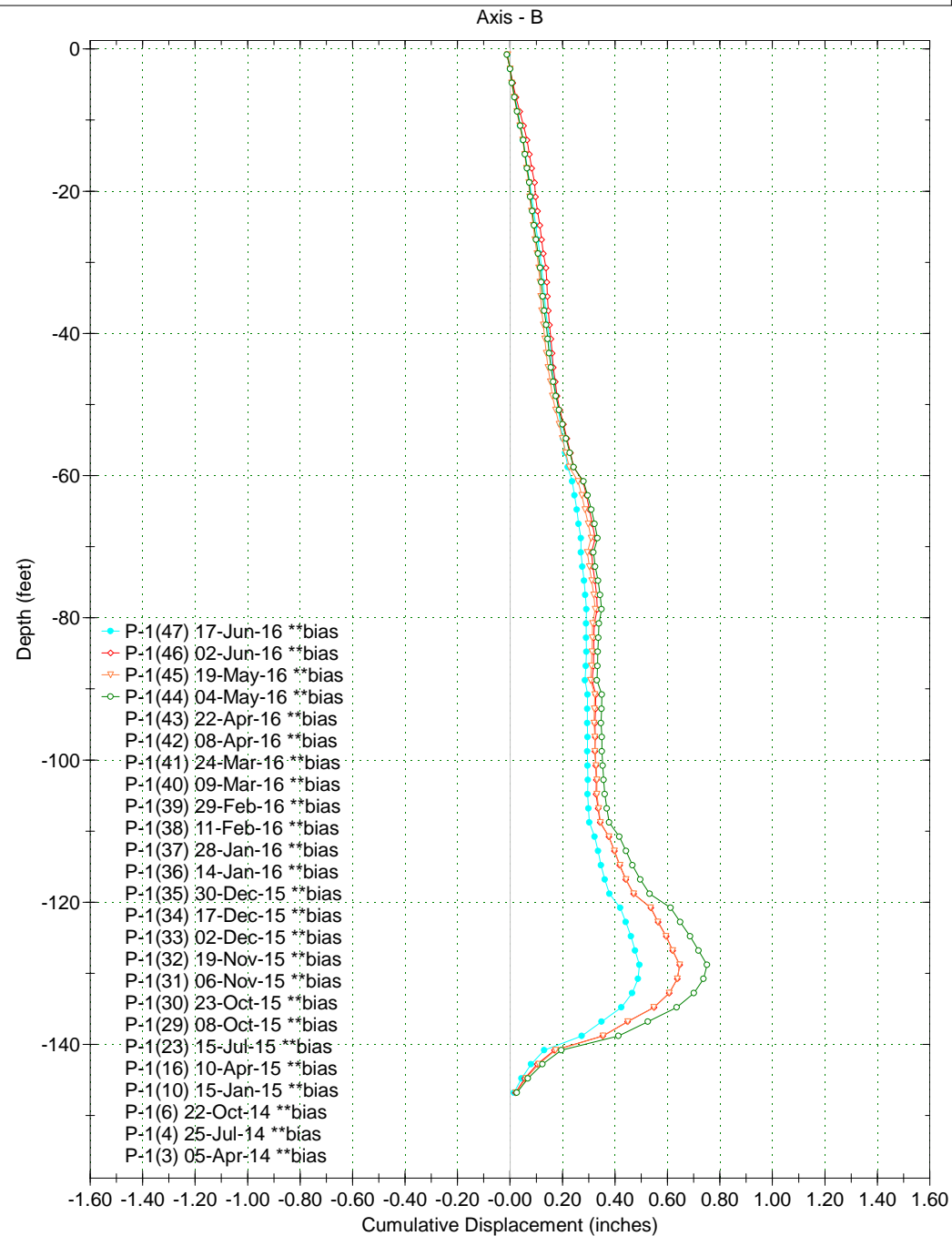
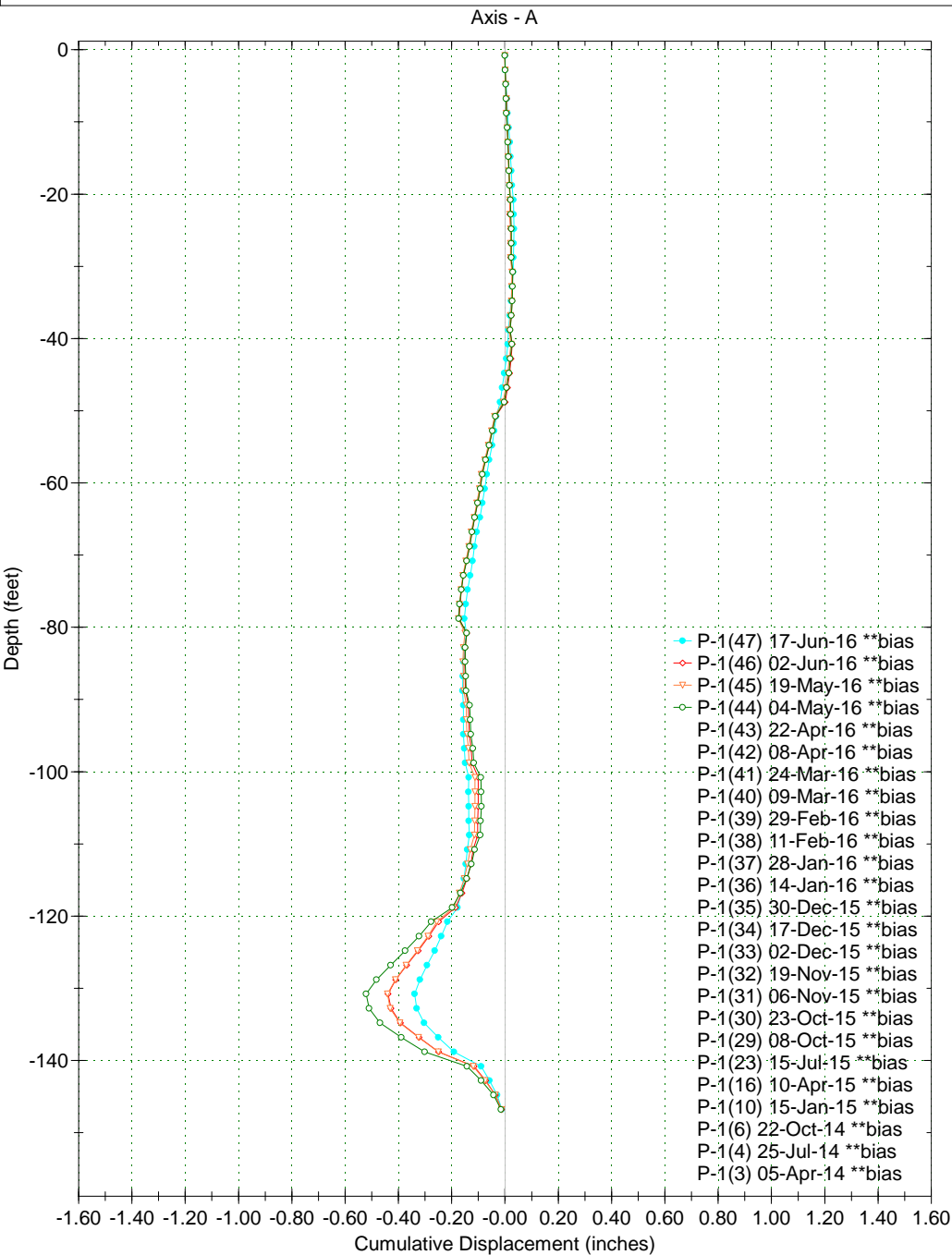
Spiral Correction : N/A
 Collar Elevation : 1.2 feet
 Borehole Total Depth : 148.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 22 10:47
 Applied Azimuth : 0.0 degrees



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

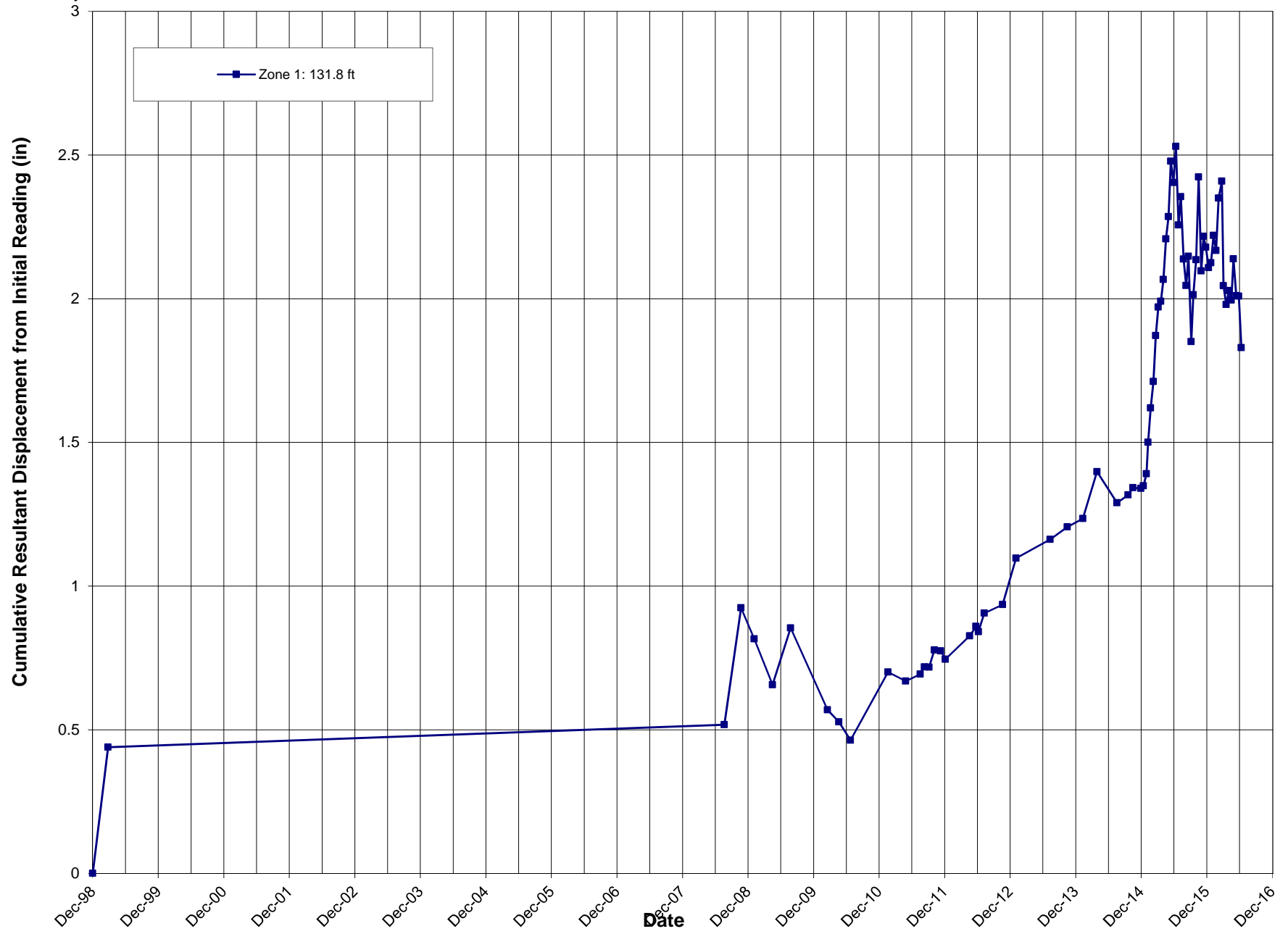


Spiral Correction : N/A
 Collar Elevation : 1.2 feet
 Borehole Total Depth : 148.0 feet
 A+ Groove Azimuth :
 Base Reading : 2014 Jan 22 10:47
 Applied Azimuth : 0.0 degrees



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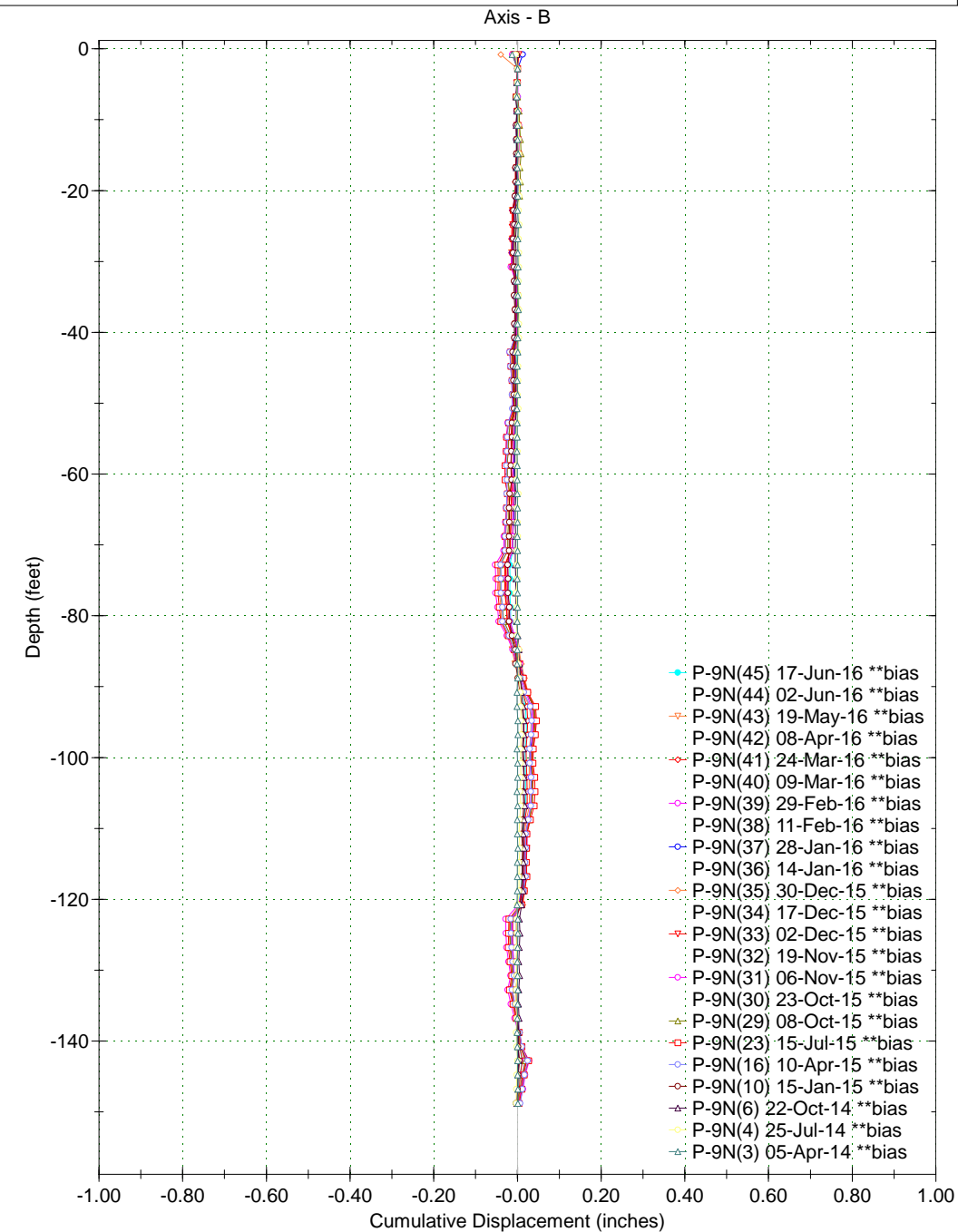
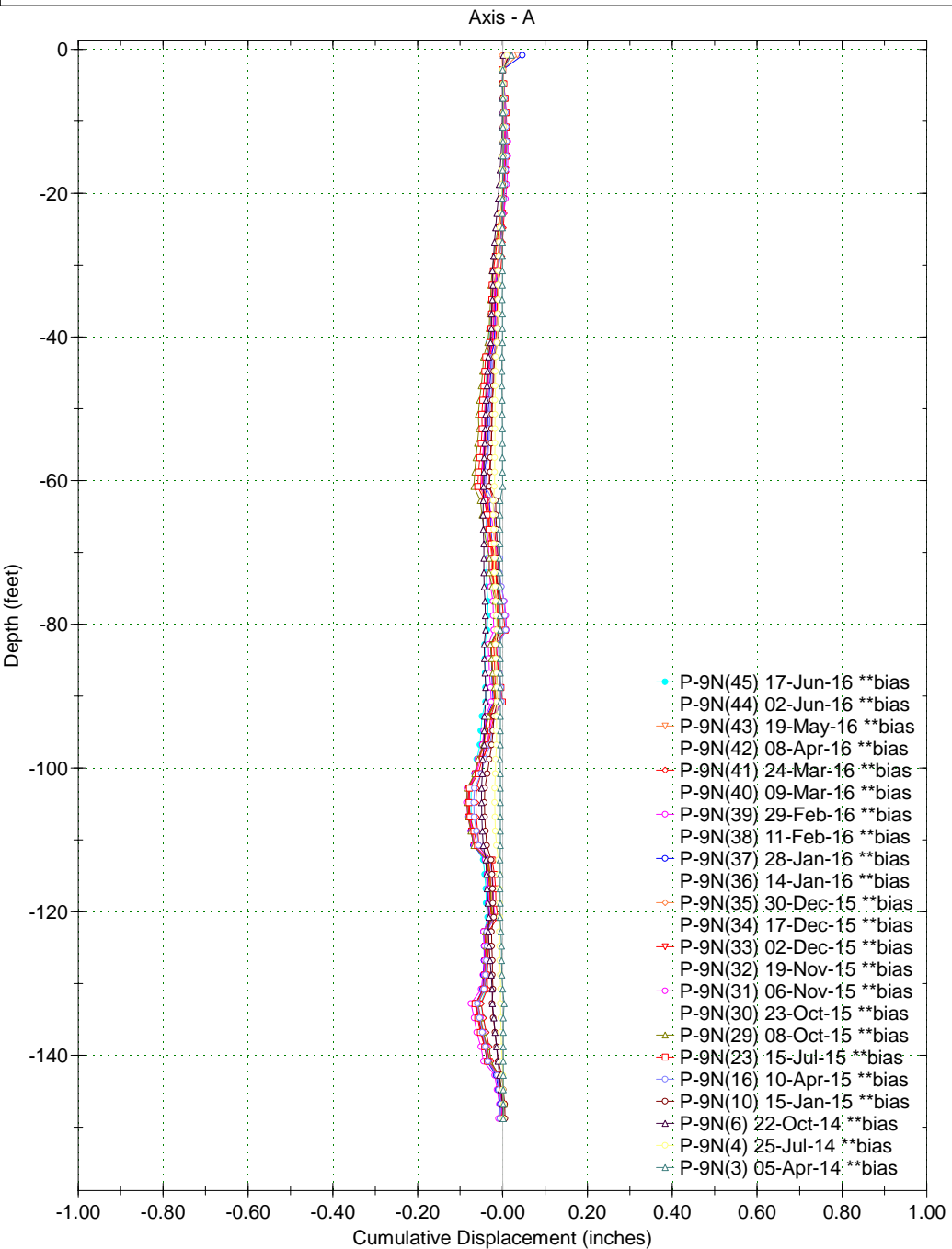
P-1



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

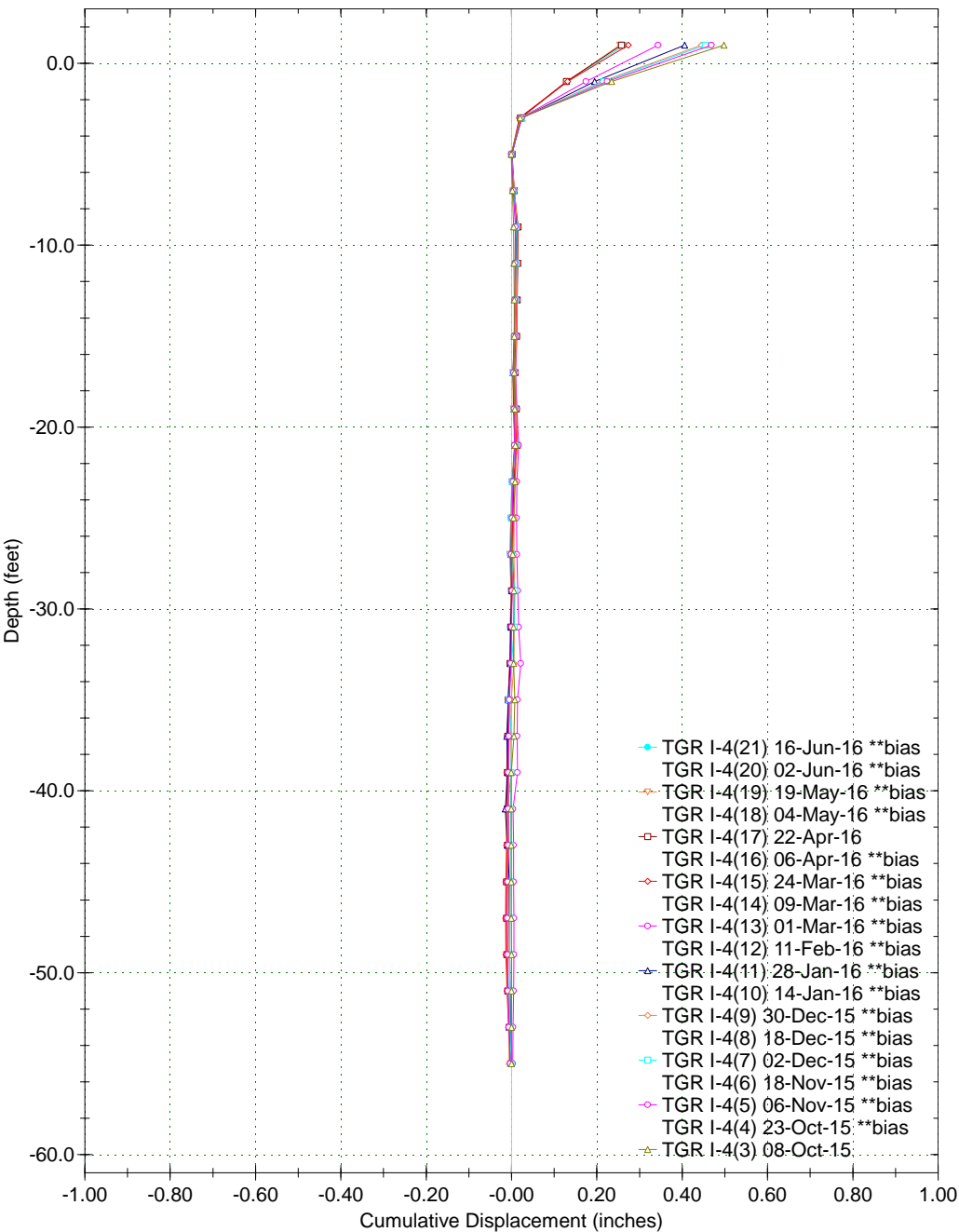


Borehole : TGR I-4
Project : CUY-90-15-24
Location :
Northing :
Easting :
Collar :



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

Axis - A



Axis - B

