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July 11, 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 30 and July 1, 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 30 and July 1, 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-001-13, P-002-13, P-009-13, B-05-02, 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-003-10 – Pore pressure readings indicate a decrease in total head of about 0.5 feet in the piezometer at 190 feet. The remaining piezometers showed virtually no change.

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

B-105-A – Pore pressure readings indicate an increase in total head of about 0.5 feet in the shallow piezometer and no change in the deep piezometer.

B-05-A-11 – Pore pressure readings in both piezometers at this location indicate a decrease of about 0.5 feet in total head.

Inclinometer Readings

Inclinometer readings at I-001-13, I-002-13, I-003-10, I-009-13, B-101, B-102, B-105A, B-05-02, 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.

B-101 – Movement at 42 to 44 feet reported in the last bi-weekly report was apparently due to an anomalous reading(s) as these current readings shown no displacement at that depth.

B-05-A-03 – We abandoned the faulty inclinometer casing at this location by cutting the casing 2 feet below grade and filling it with grout. A replacement inclinometer casing has been installed. We will take baseline readings with the next bi-weekly readings the week of July 11.

B-05-A-11 – Inclinometer readings at this location indicate slight movement in the positive B-axis direction above 40 feet. Movement in the A-axis is negligible.

P-1 – Inclinometer readings at this location show increase in displacement at 132 feet. The cumulative resultant displacement zone plot shows an increase of about 0.3 feet. This displacement is within the range of displacements seen since July 2015.

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

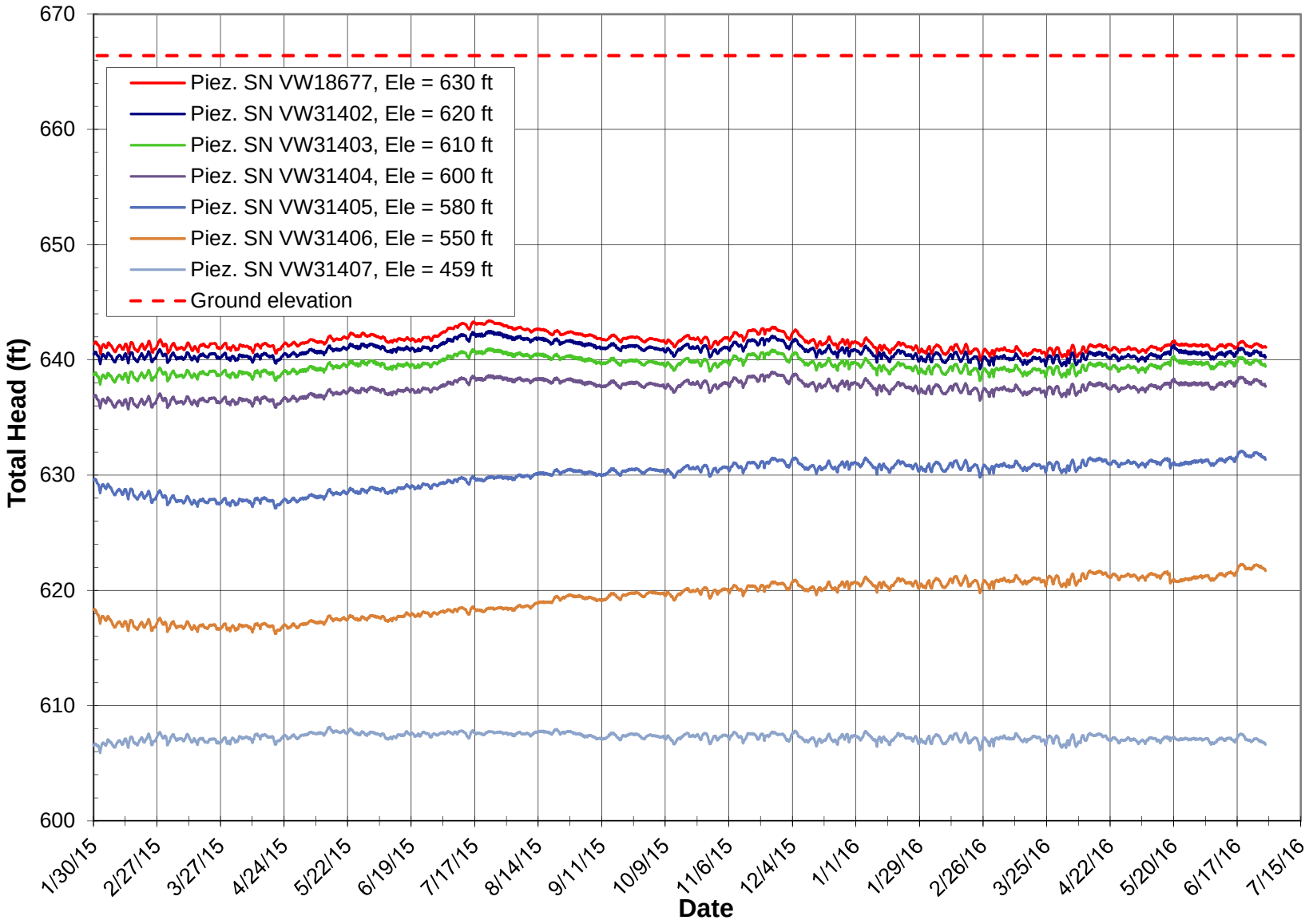
Brendan P. Lieske, P.E.
Senior Staff Engineer

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

Copied to distribution list.

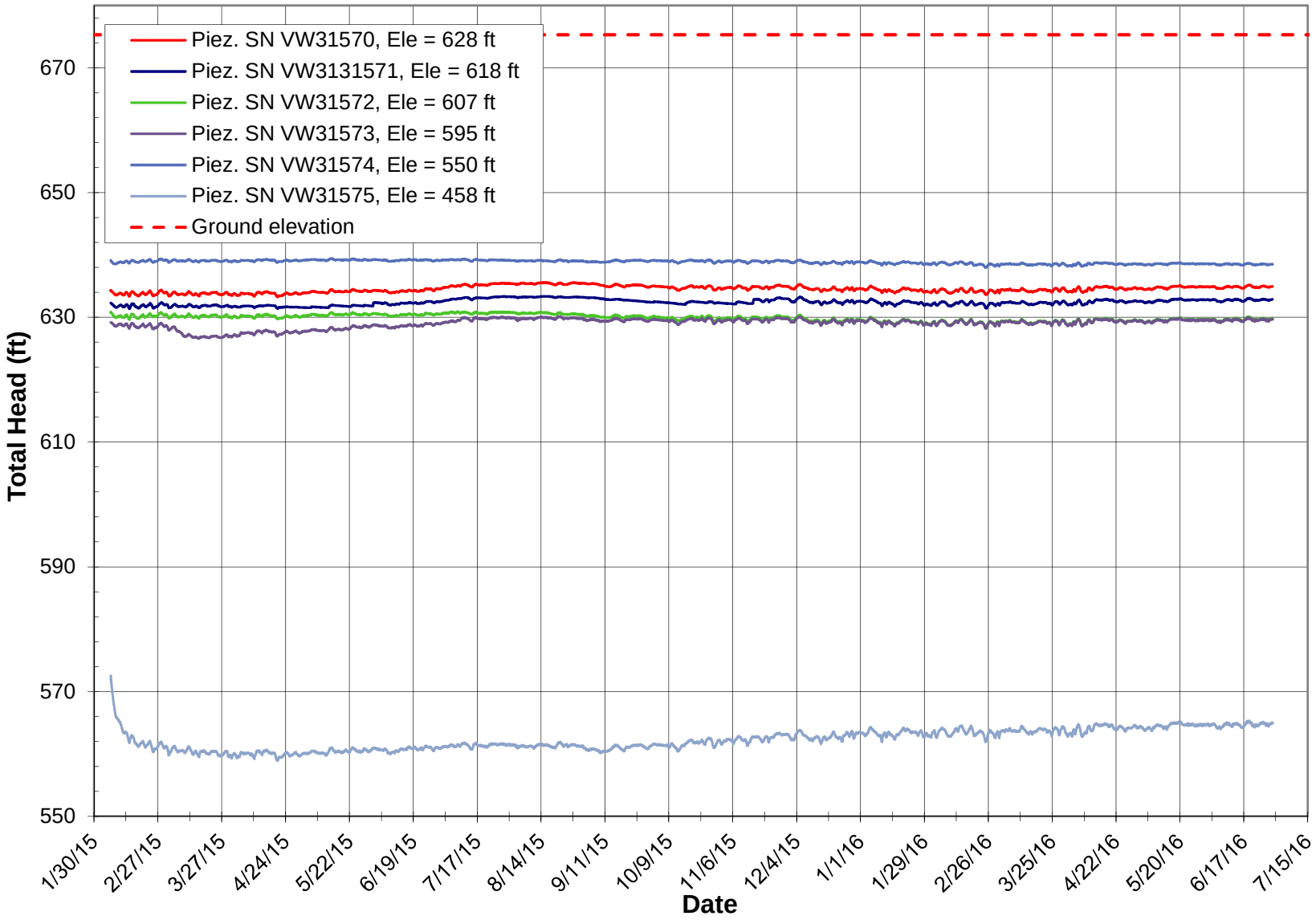
P-001-13 VW Piezometer Readings

Ground surface elevation = 666.4 ft



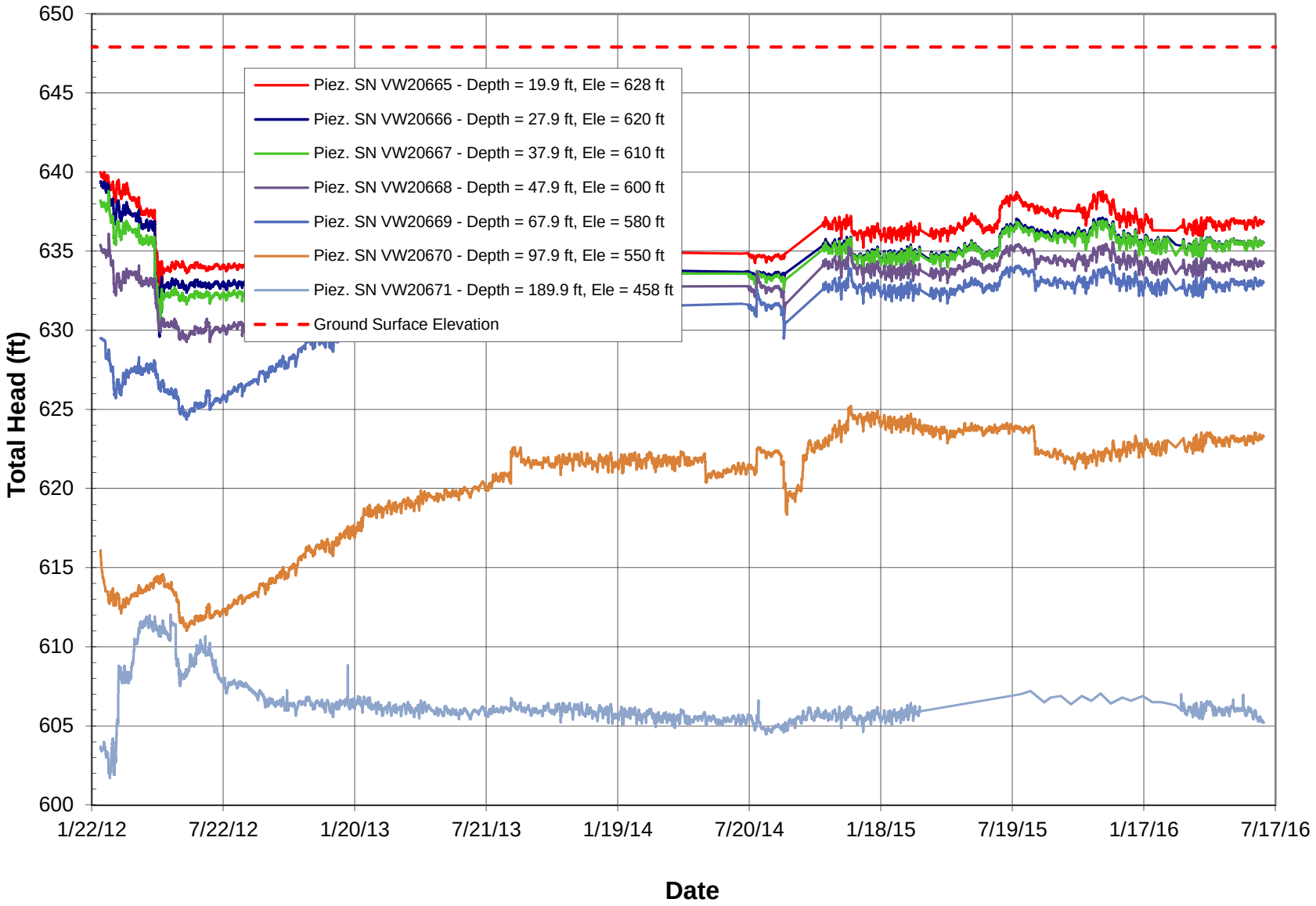
P-002-13 VW Piezometer Readings

Ground surface elevation = 675.29 ft



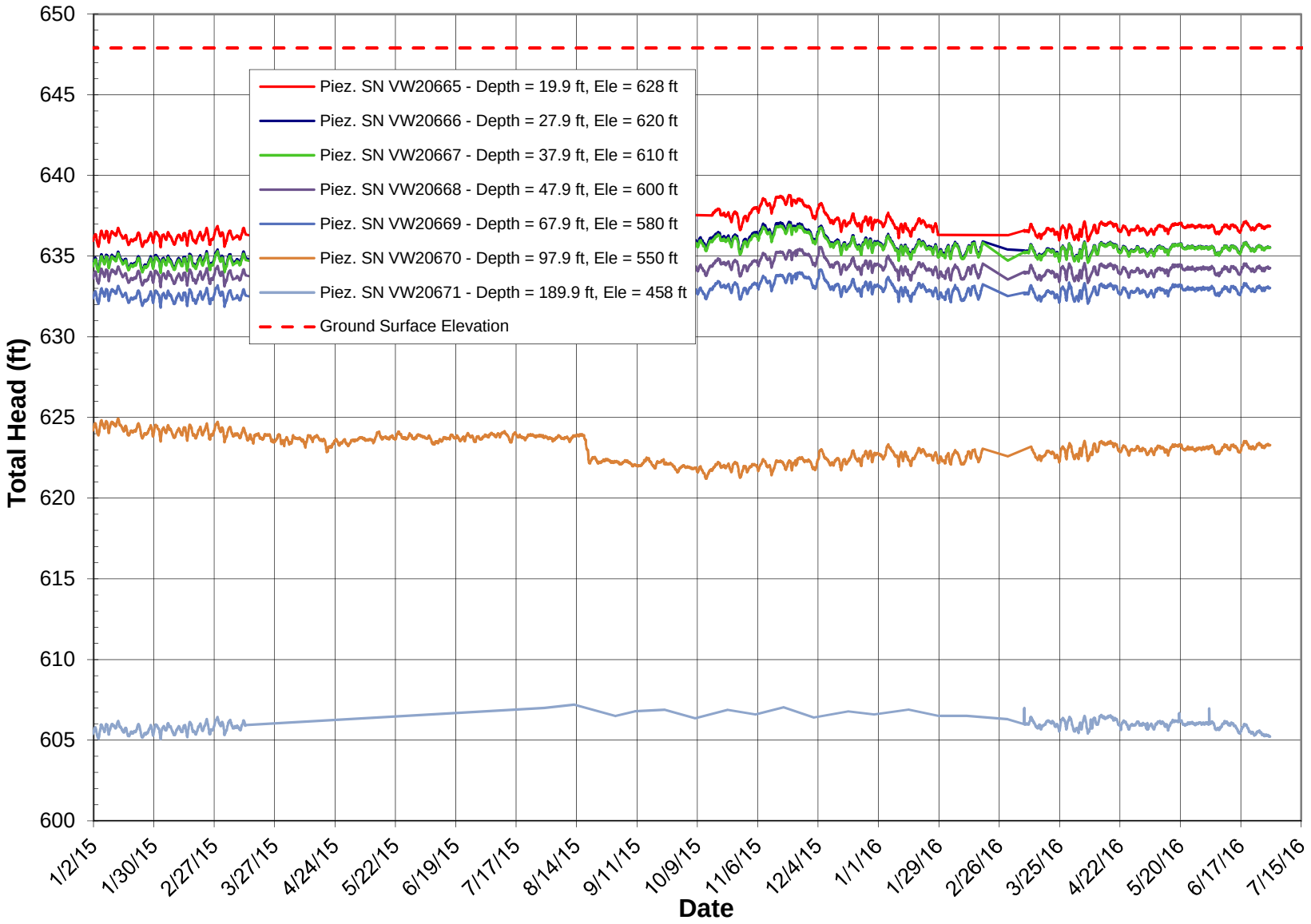
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



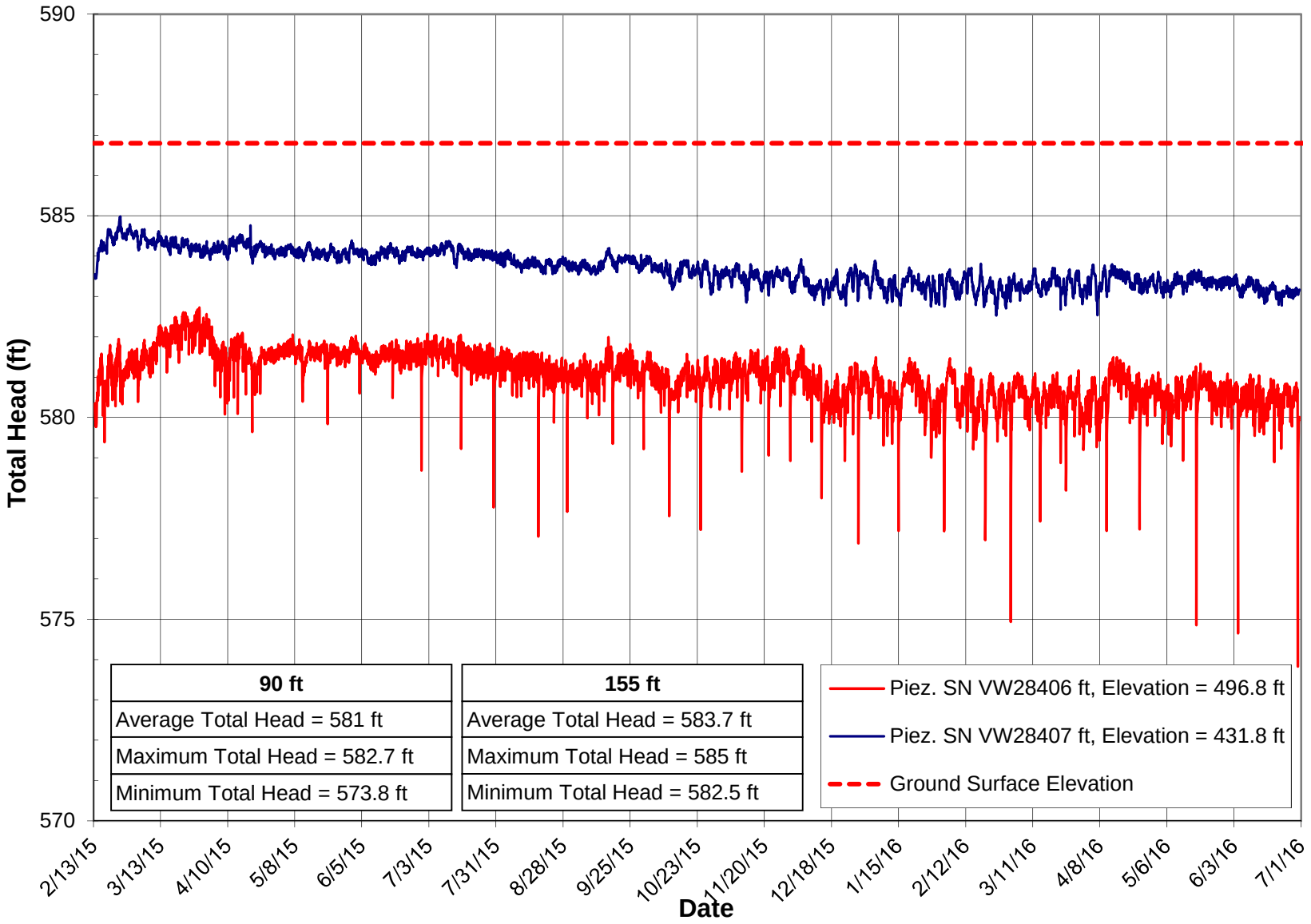
P-003-10 VW Piezometer Readings

Ground surface elevation = 647.9 ft



P-009-13 VW Piezometer Readings

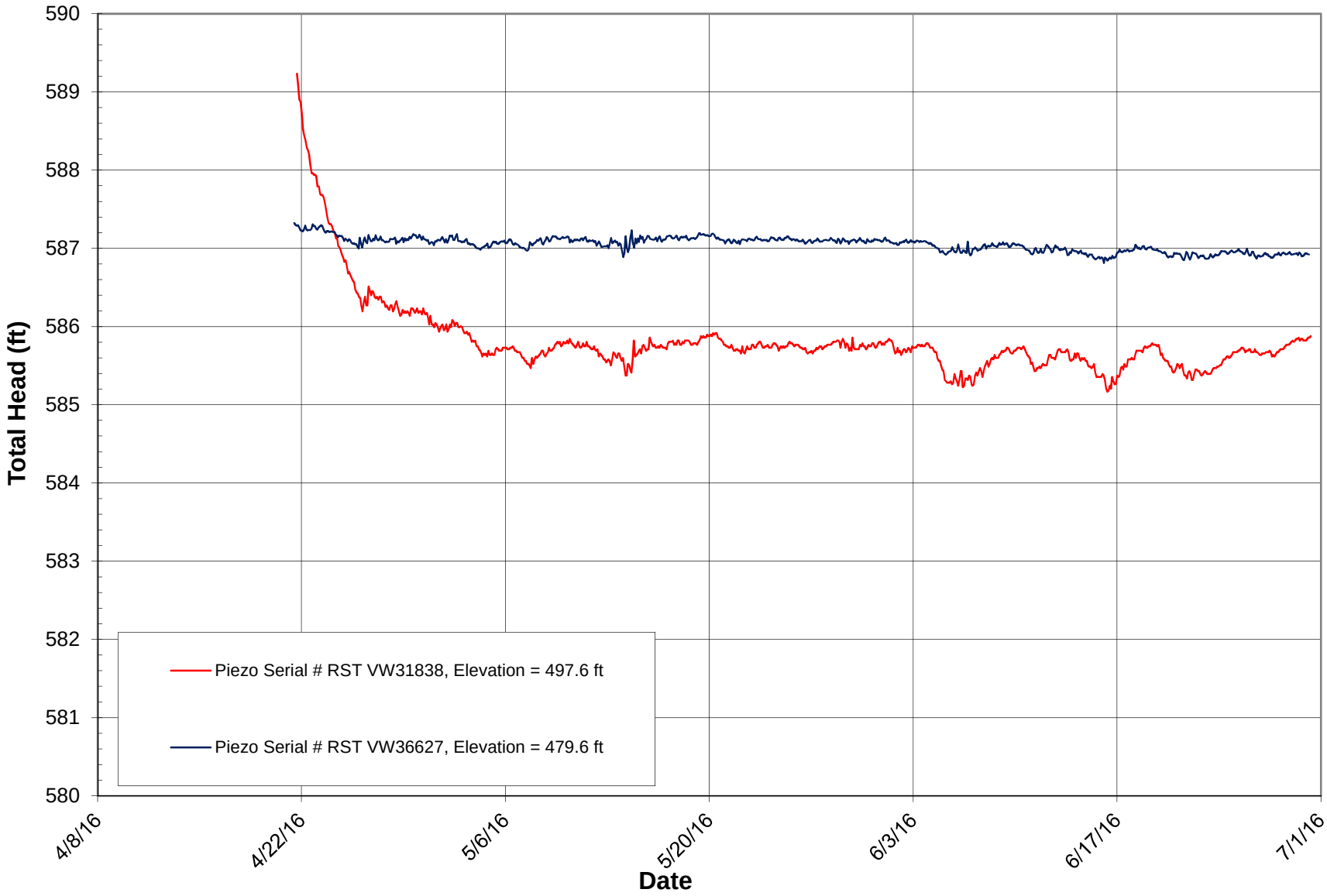
Ground surface elevation = 586.6 ft



90 ft	155 ft
Average Total Head = 581 ft	Average Total Head = 583.7 ft
Maximum Total Head = 582.7 ft	Maximum Total Head = 585 ft
Minimum Total Head = 573.8 ft	Minimum Total Head = 582.5 ft

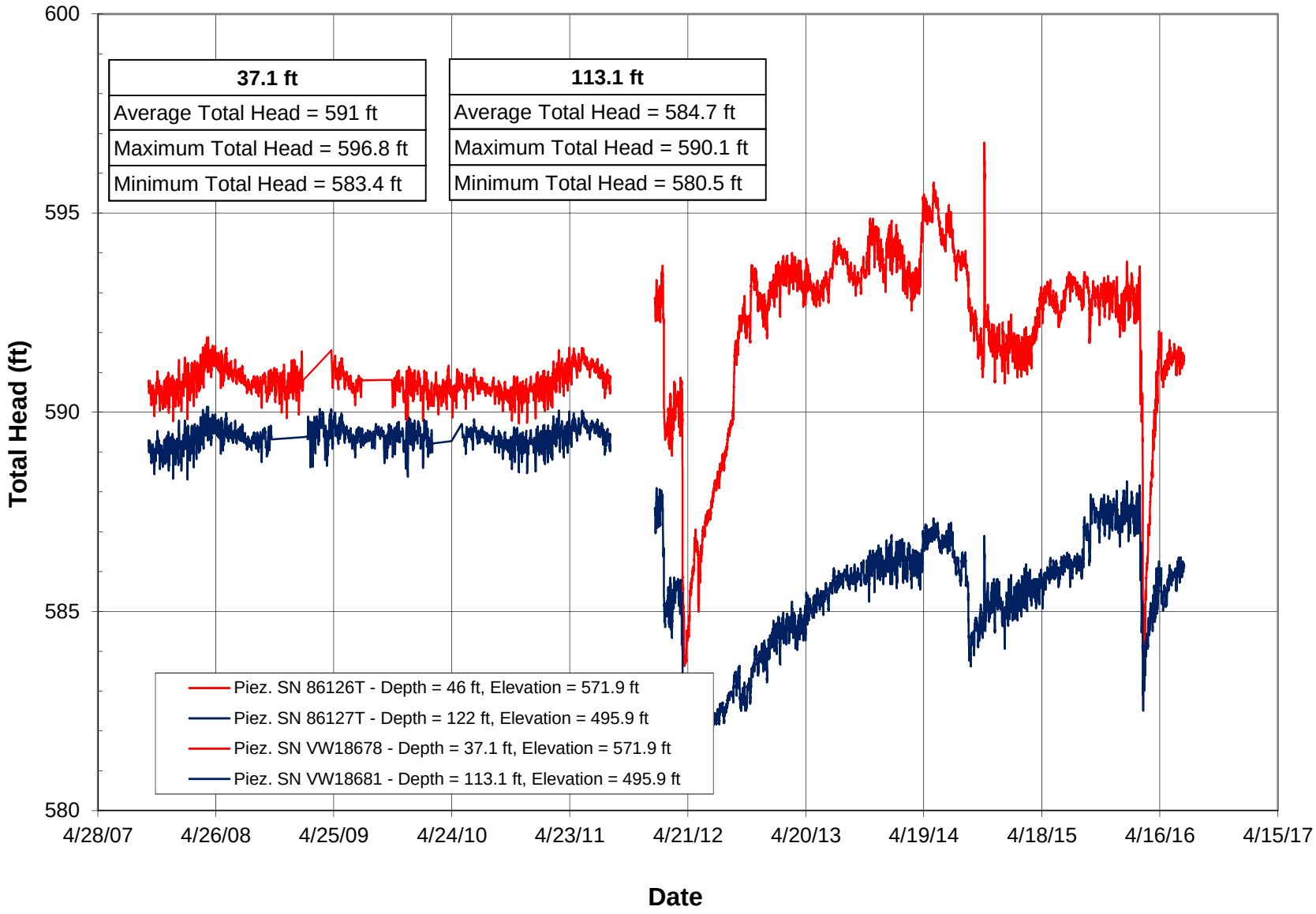
B-105A VW Piezometer Readings

Ground surface elevation = 585.6 ft



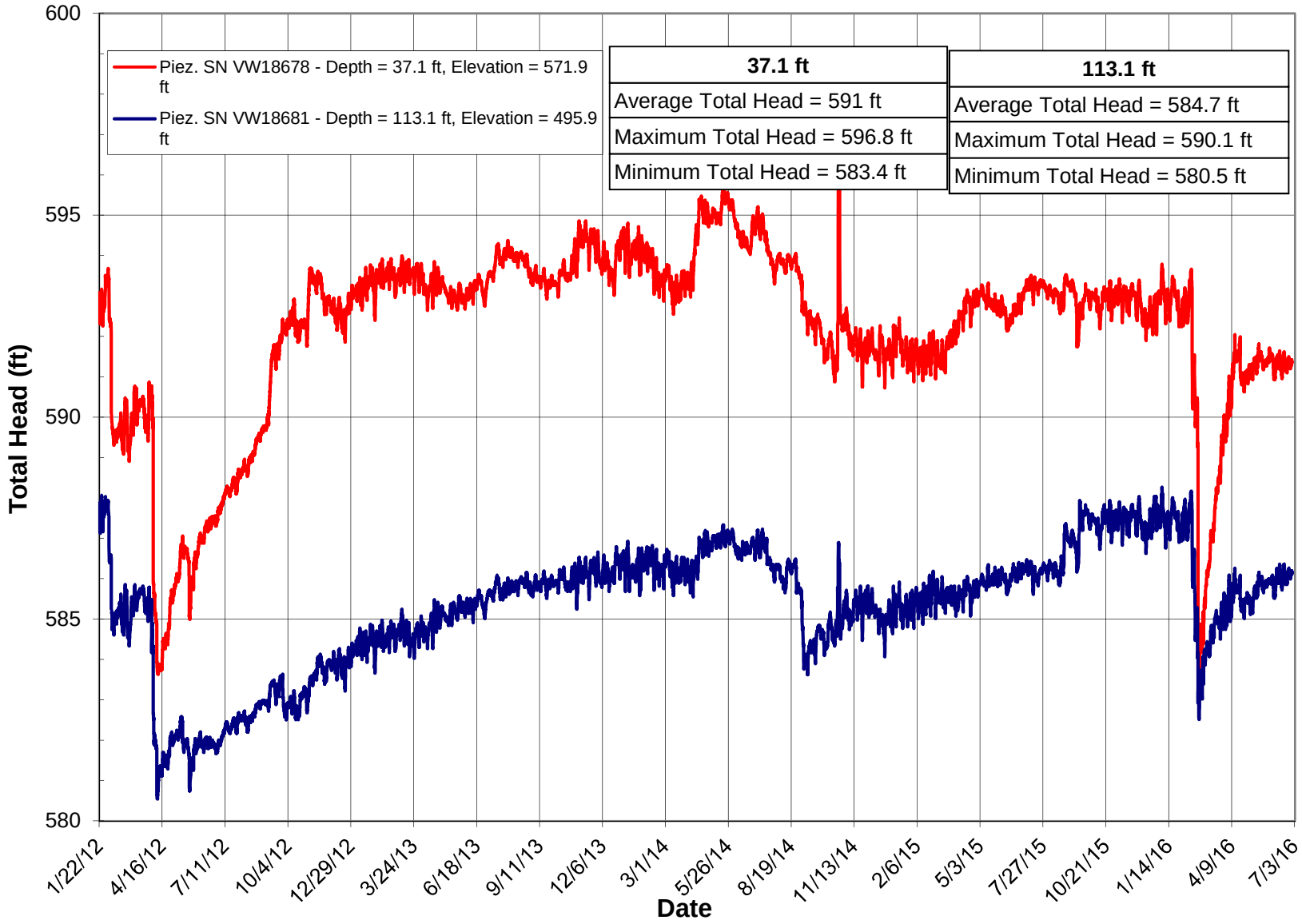
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



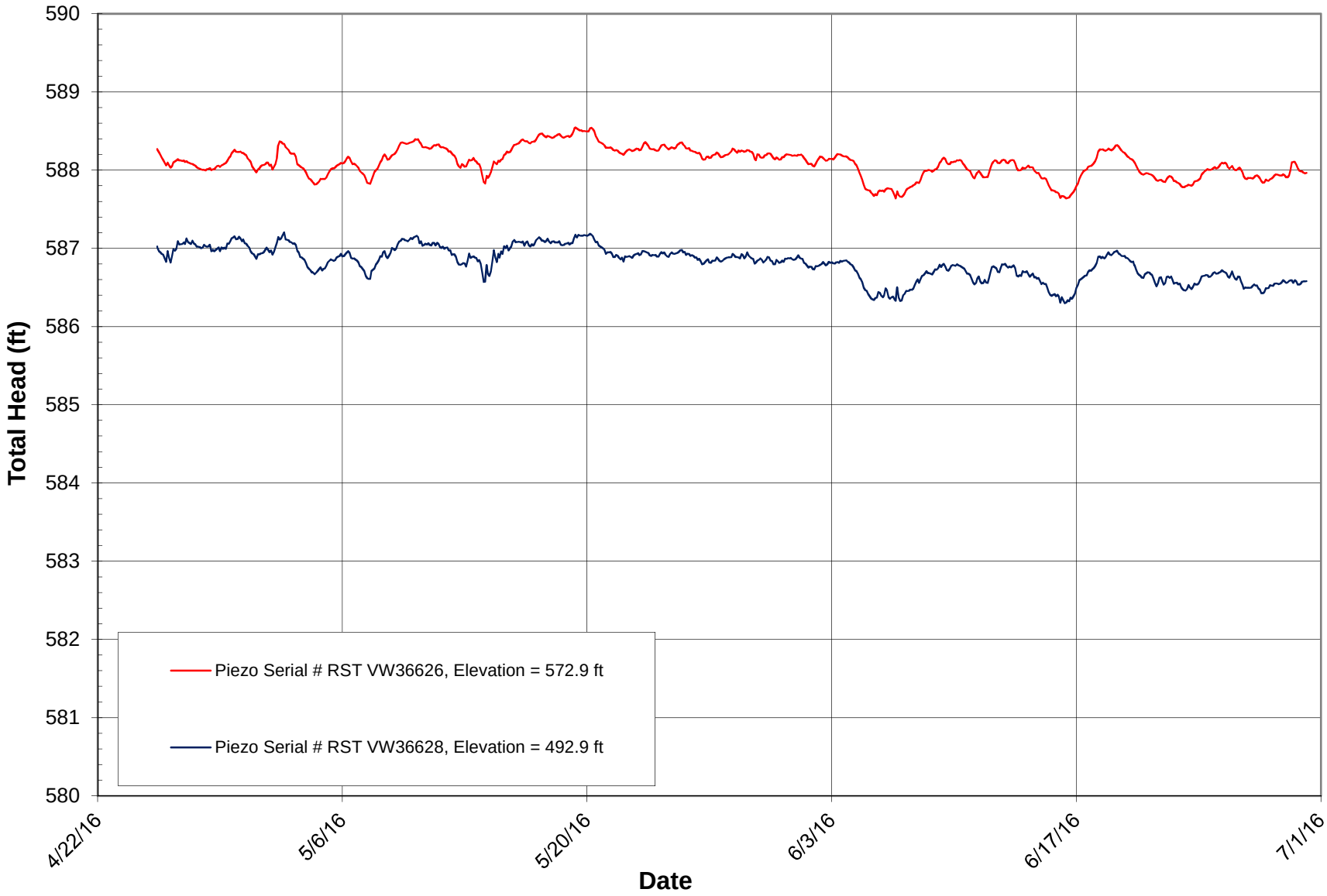
B-05-02 VW Piezometer Readings

Ground surface elevation = approx 609.0 ft



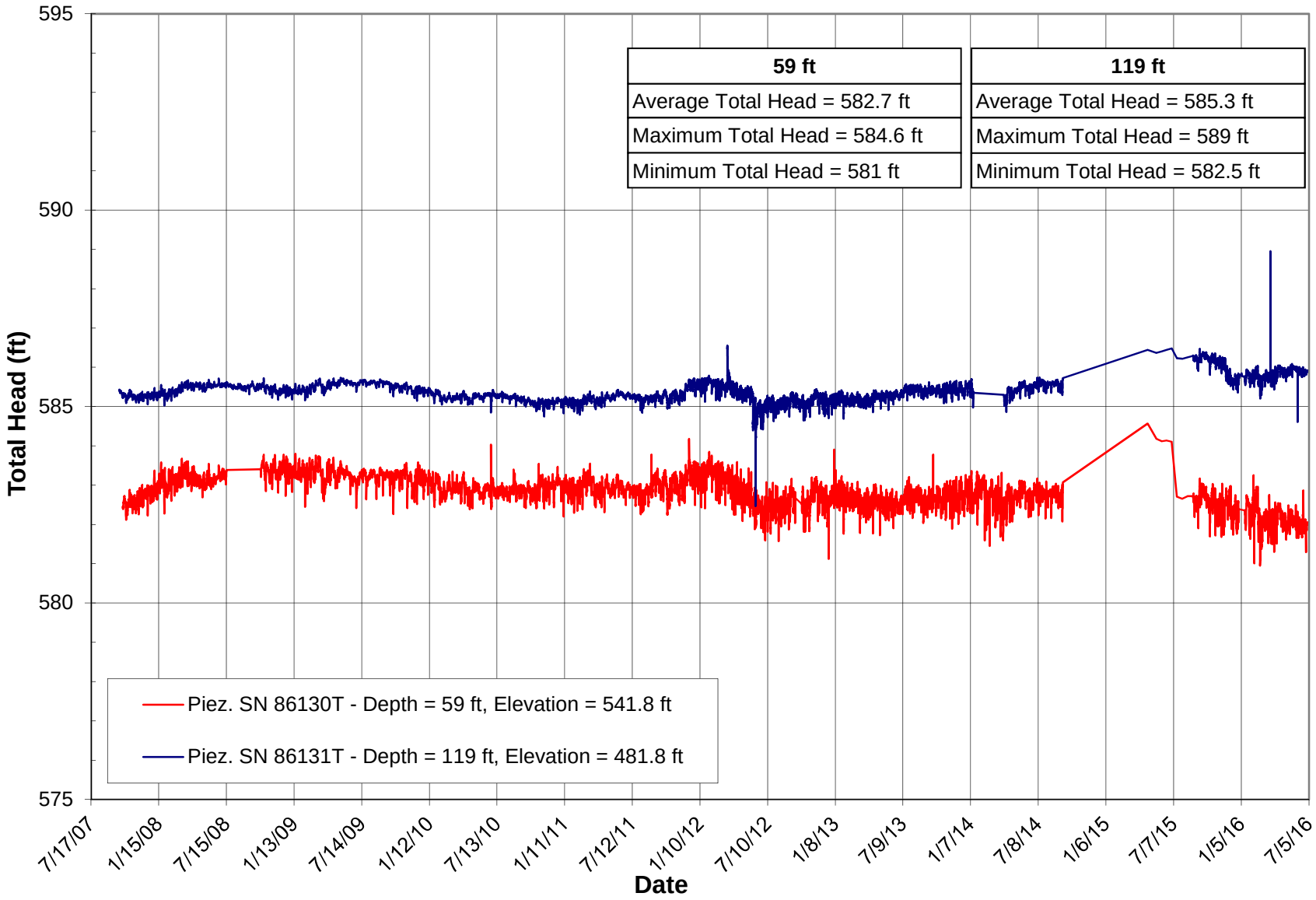
B-05-A-03 VW Piezometer Readings

Ground surface elevation = 599.9 ft



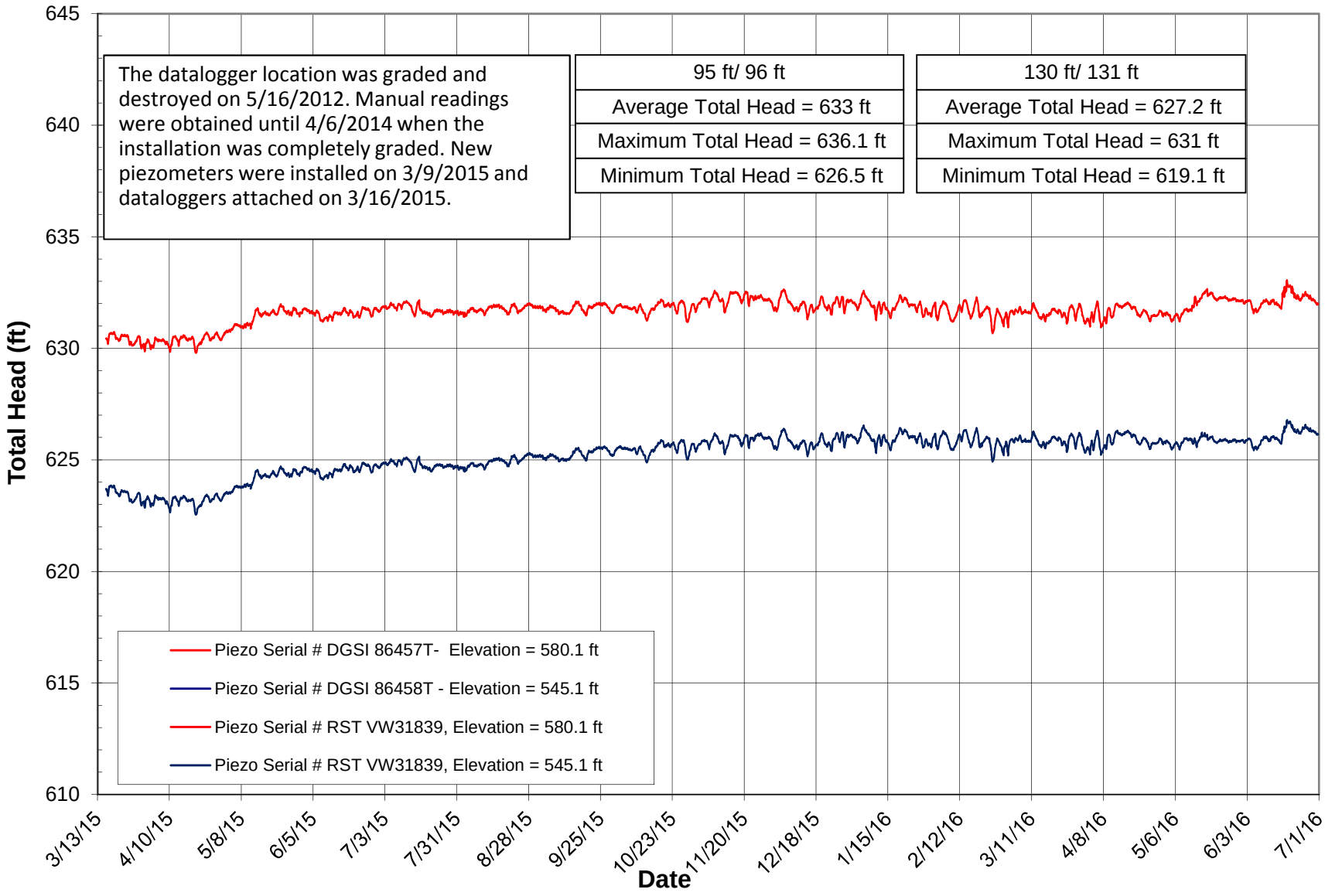
B-05-04 VW Piezometer Readings

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)



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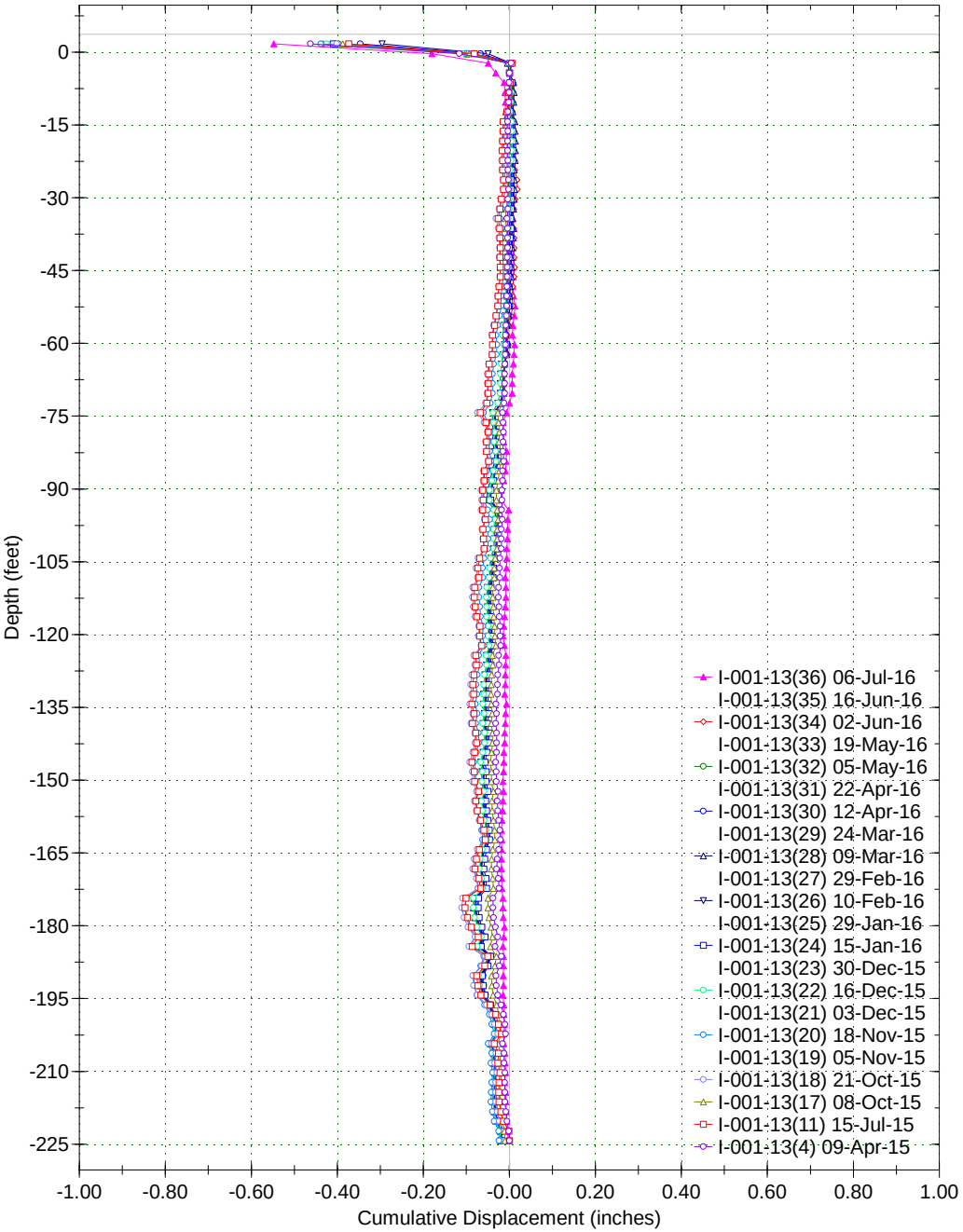
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

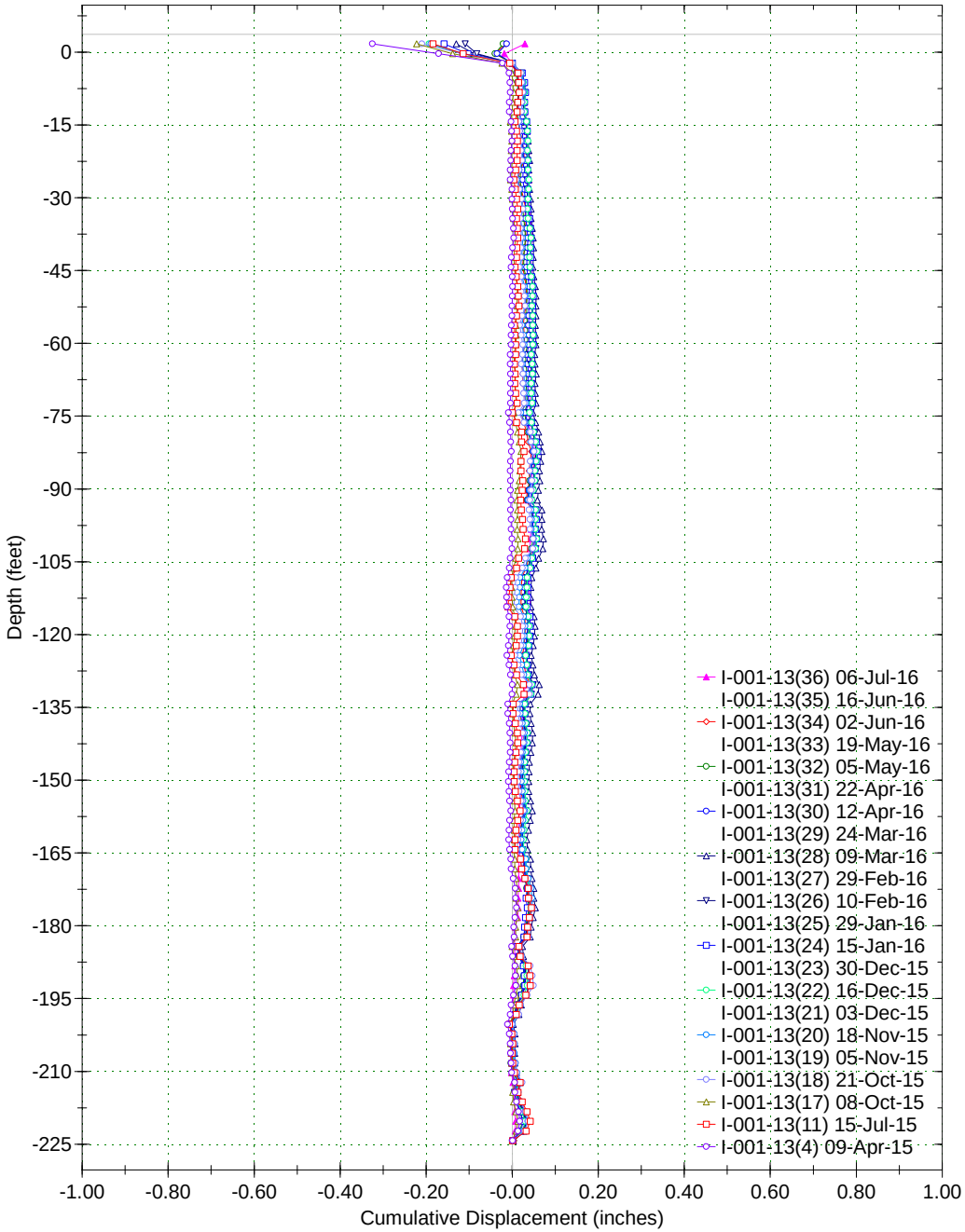
Borehole : I-001-13
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :

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

Axis - A



Axis - B



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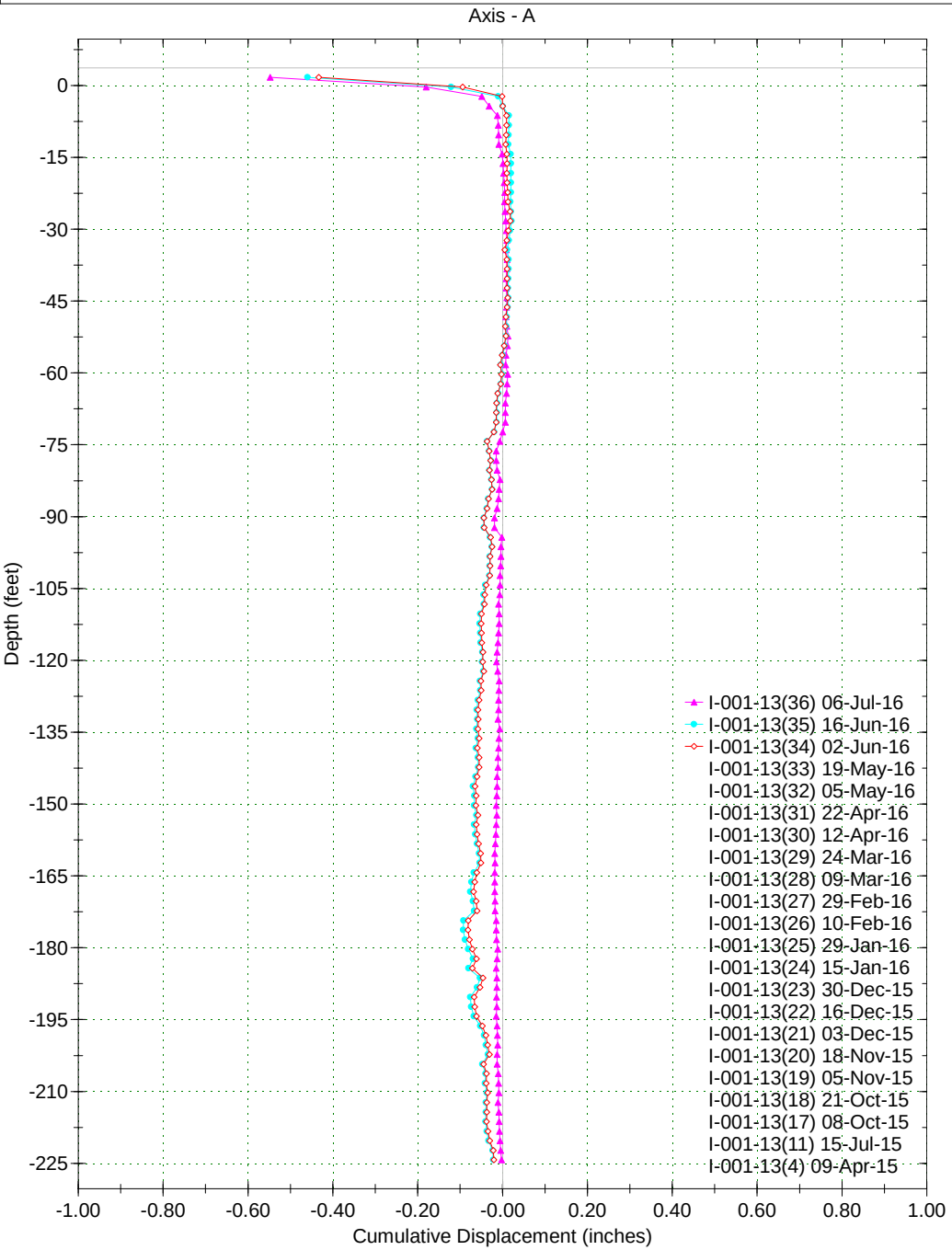
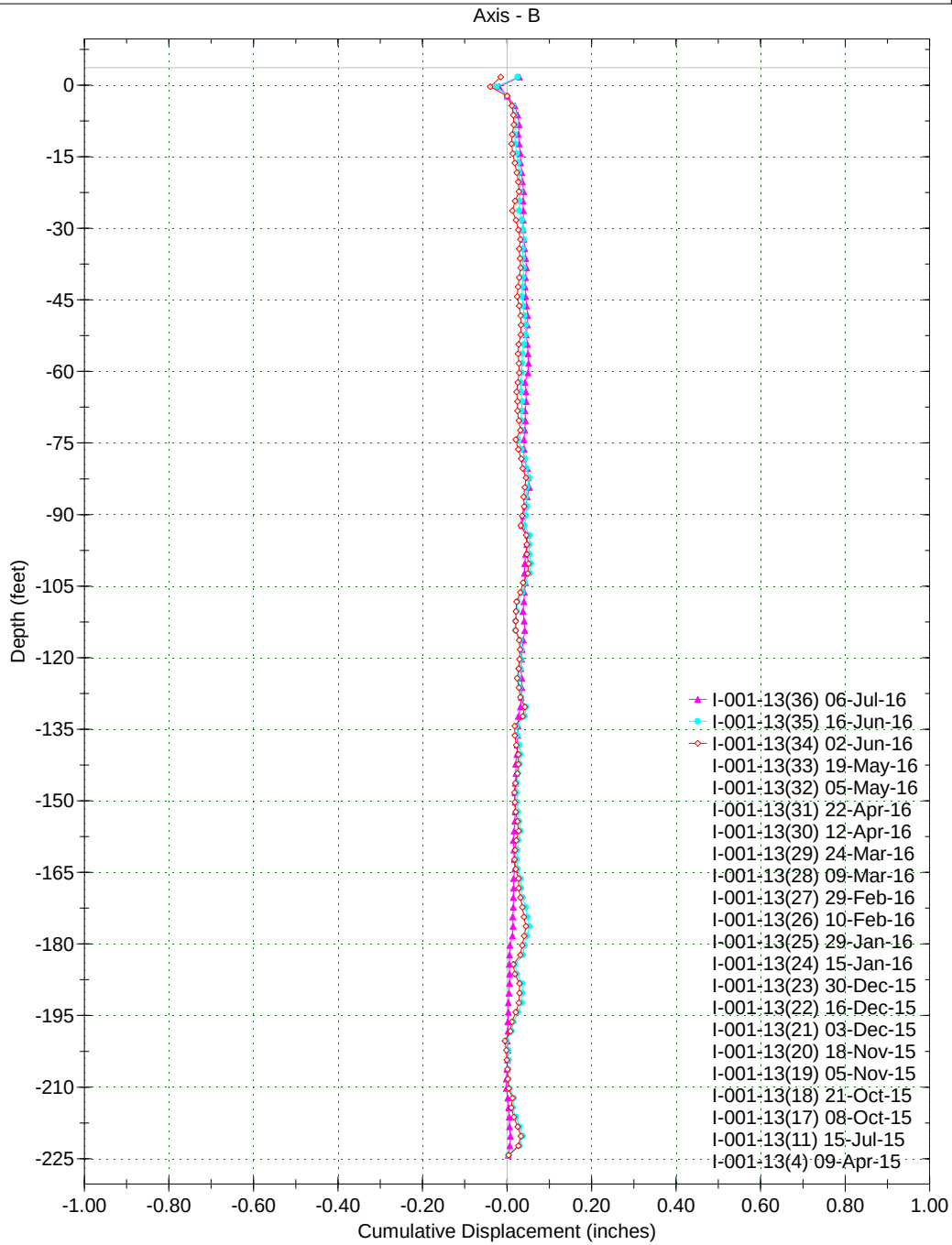
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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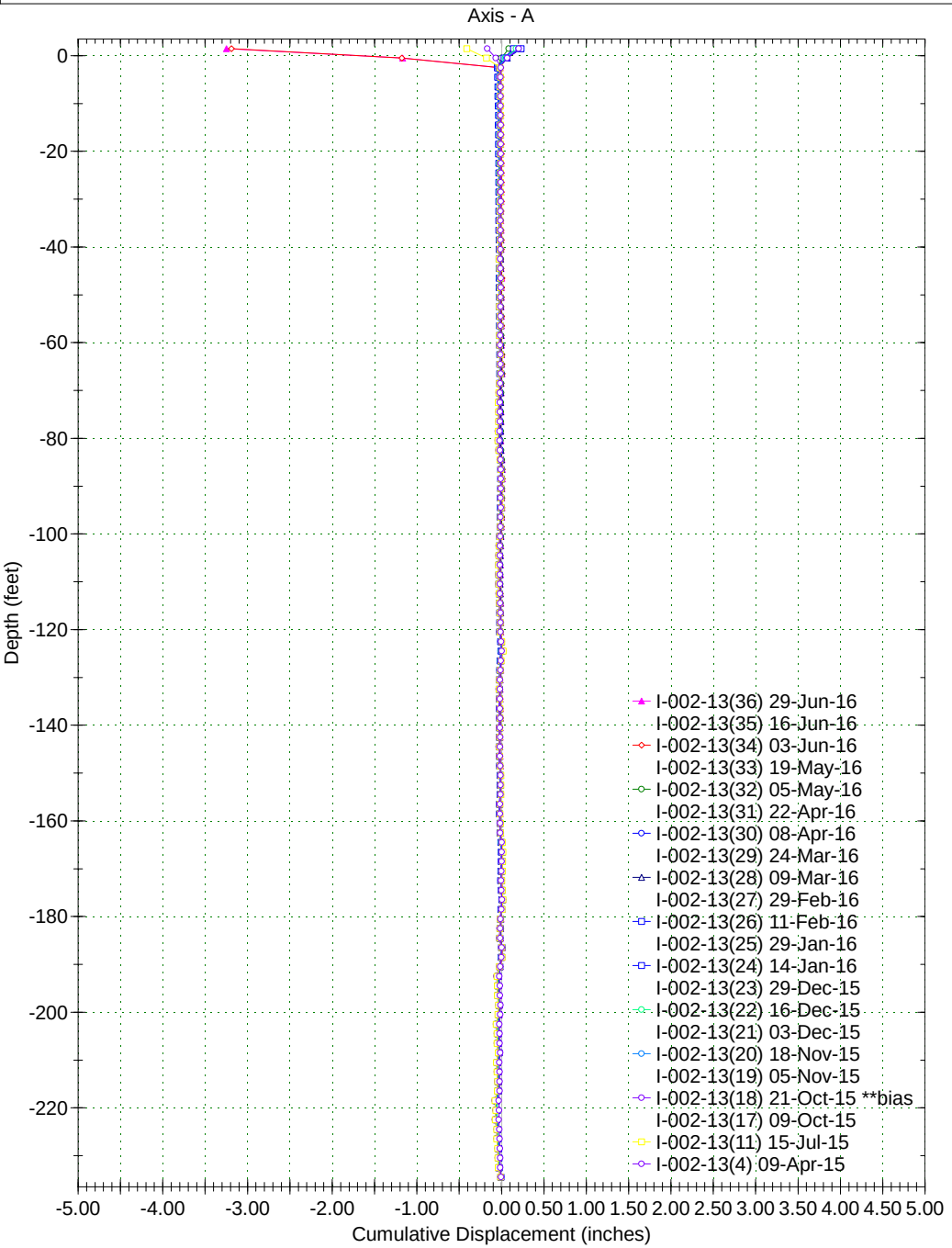
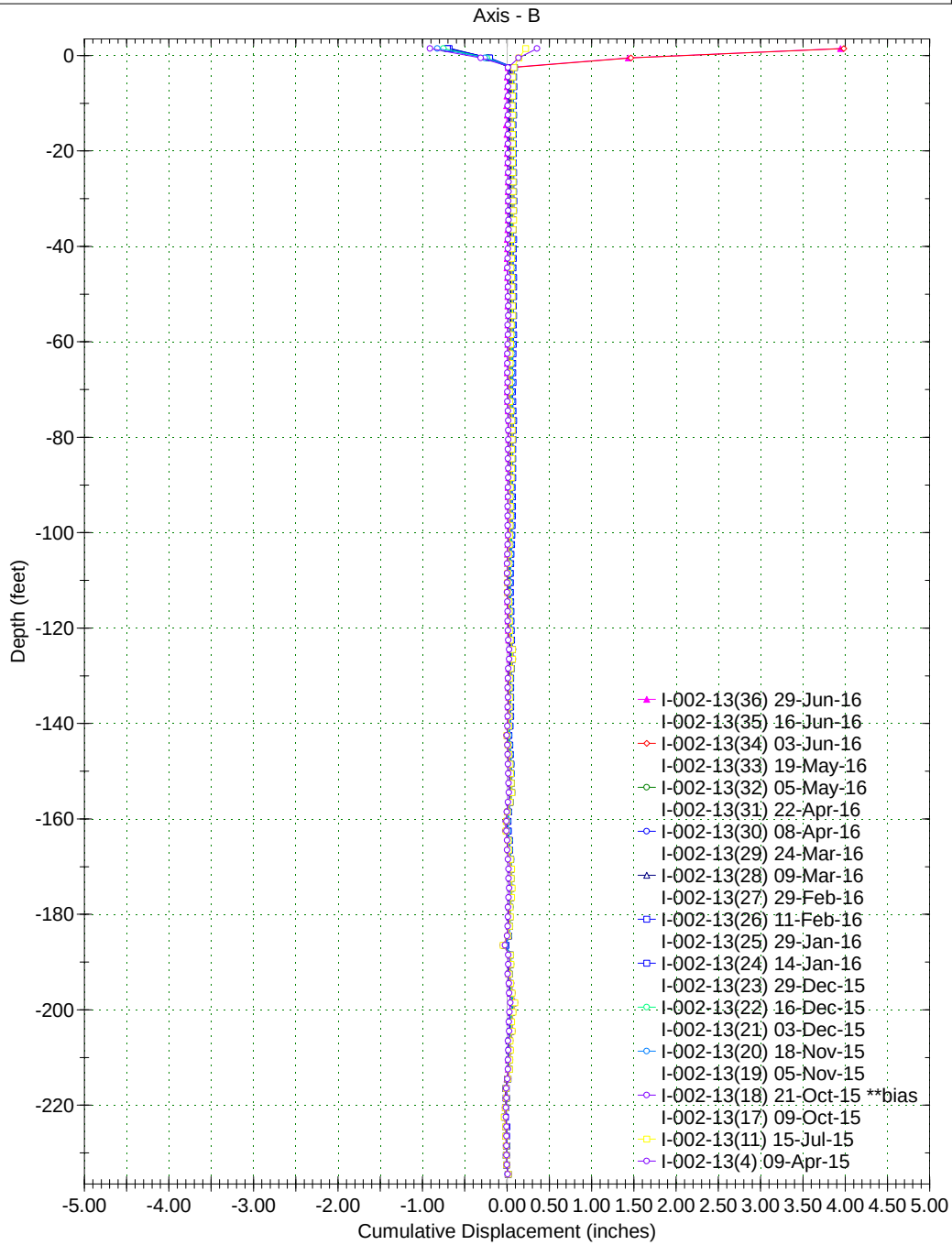
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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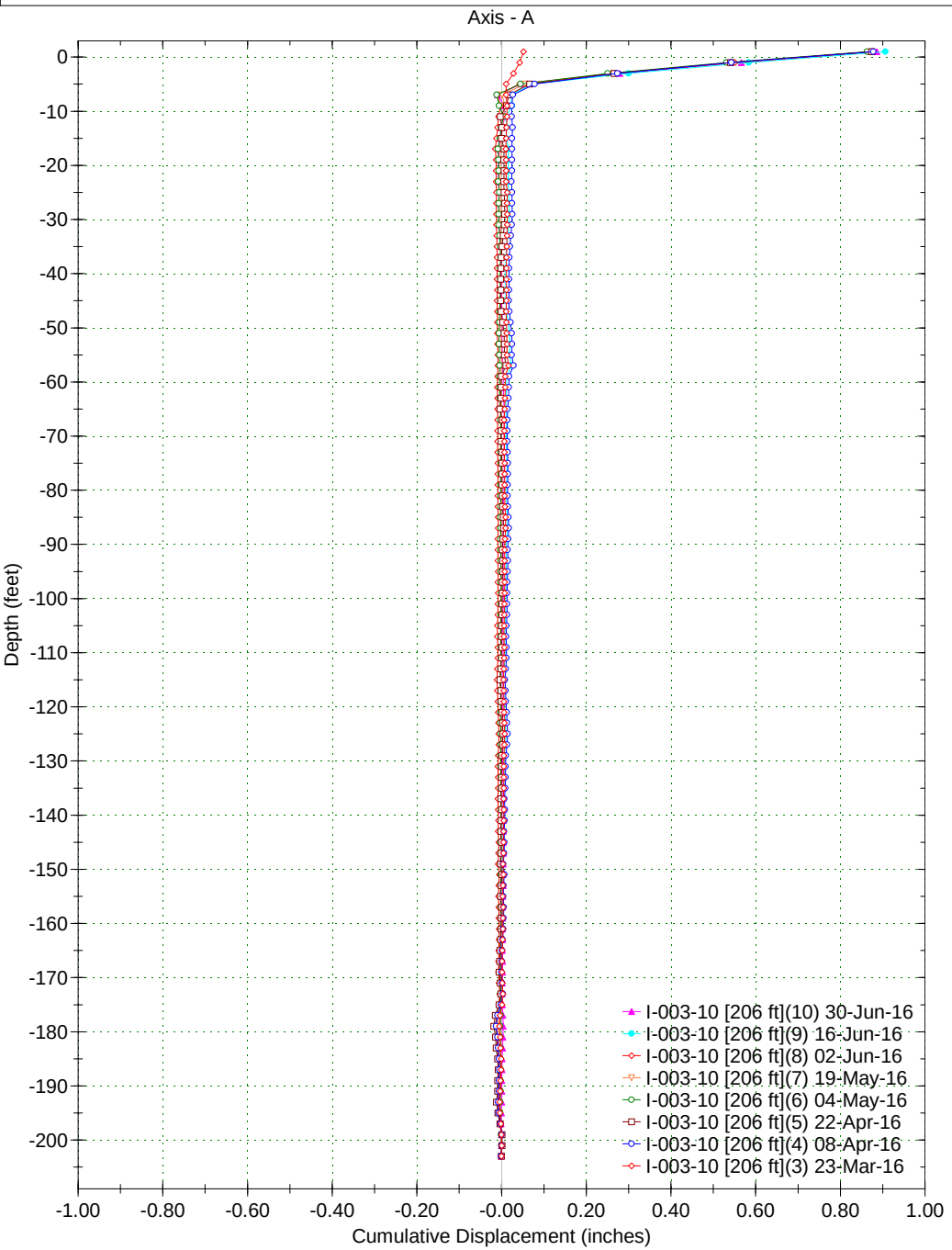
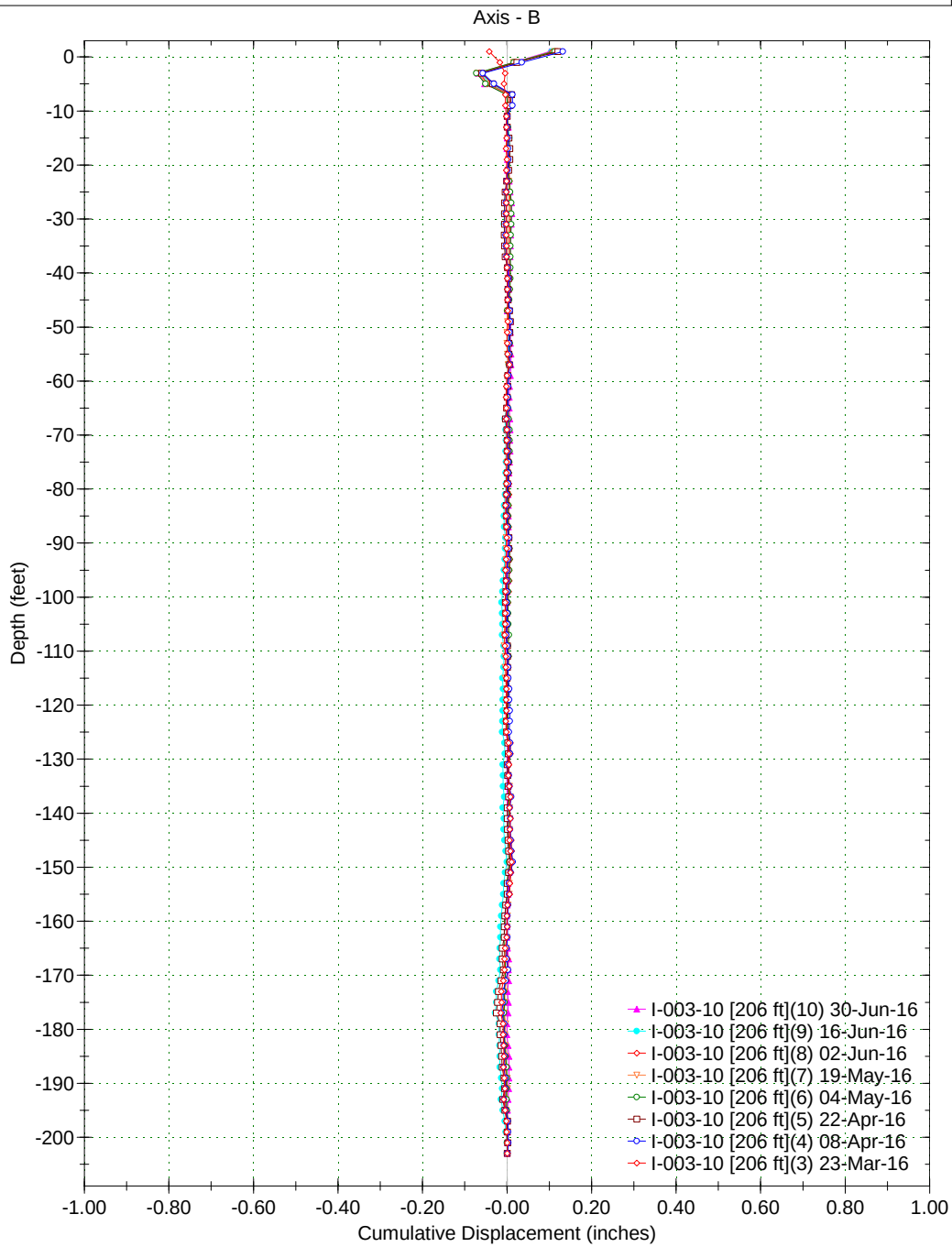
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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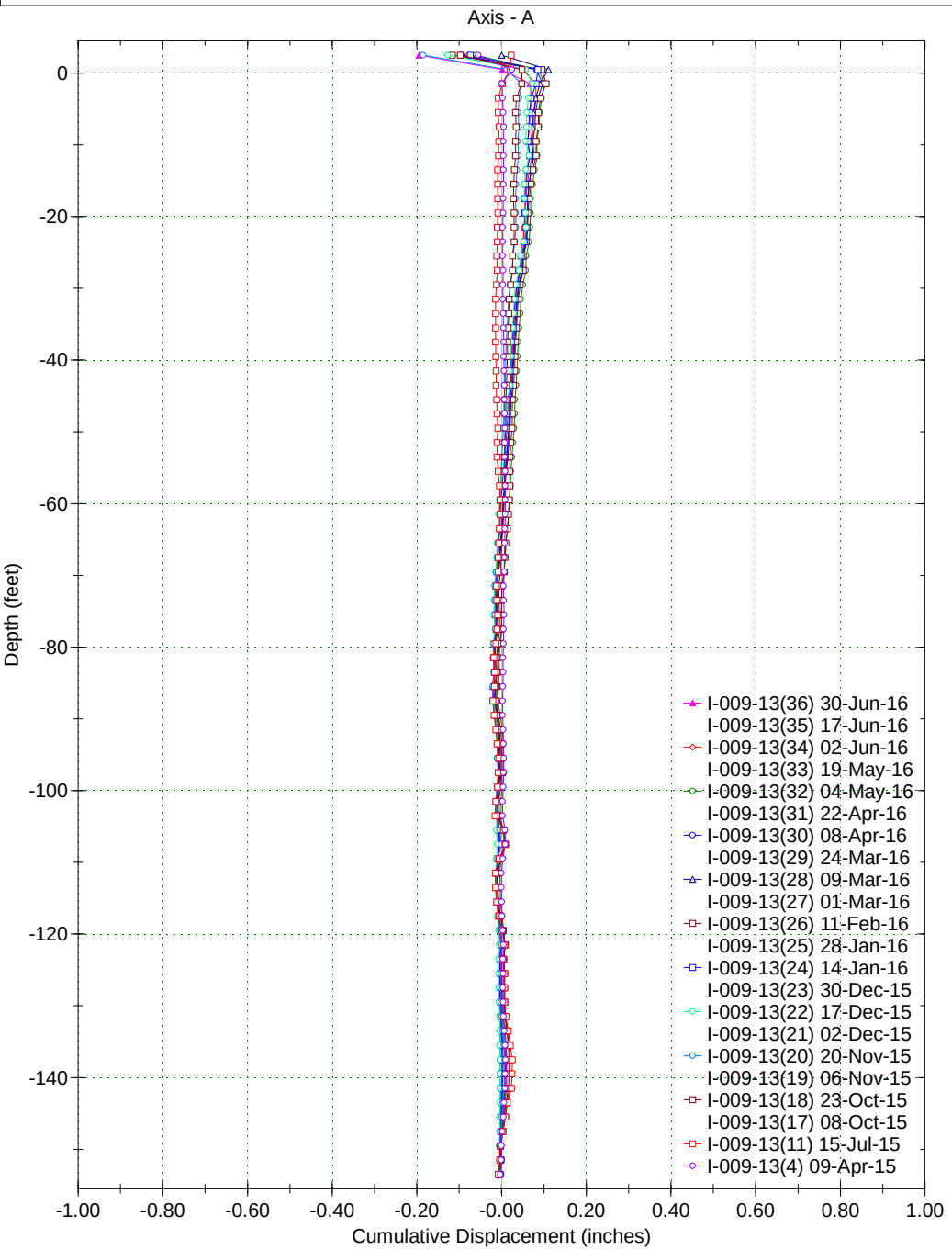
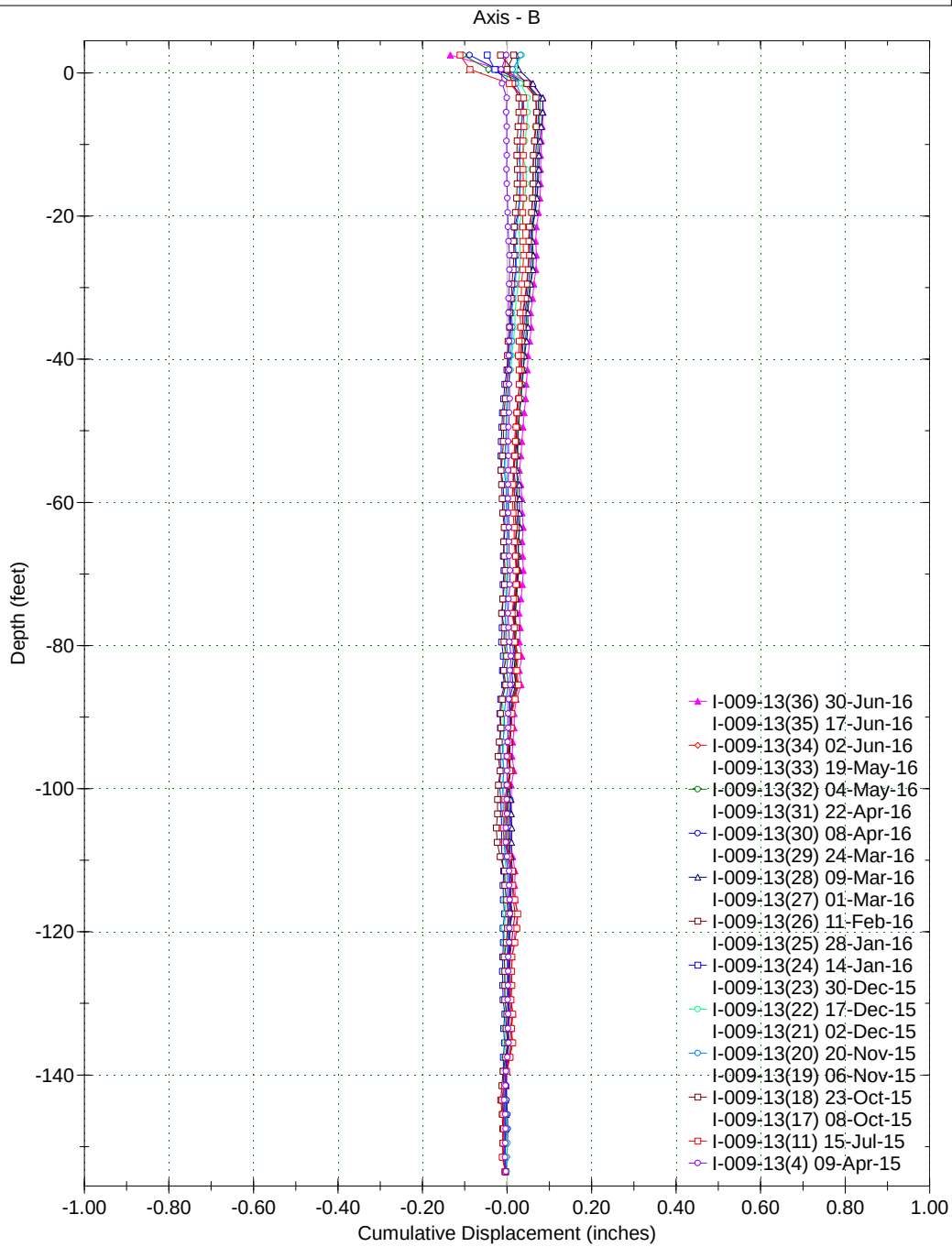
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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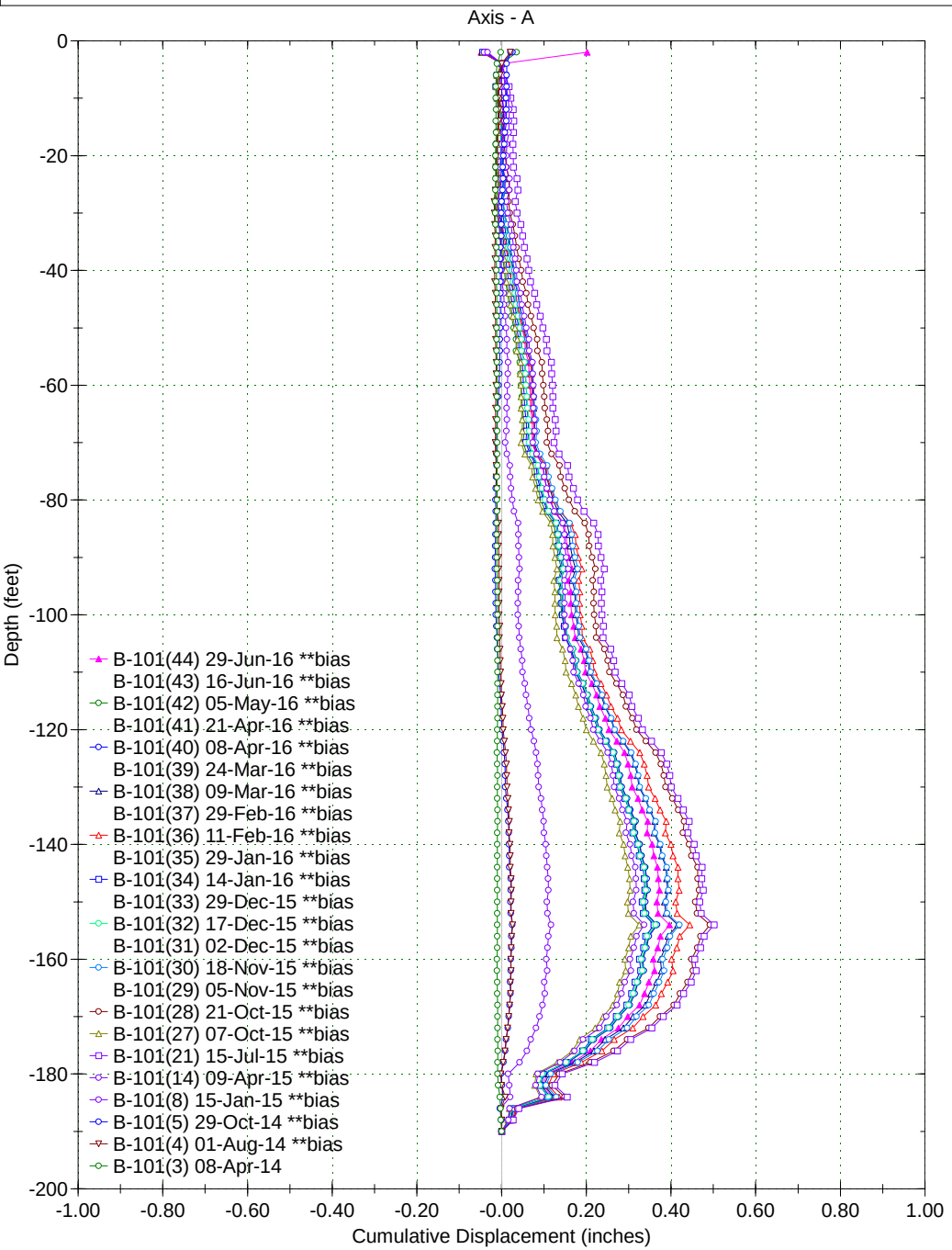
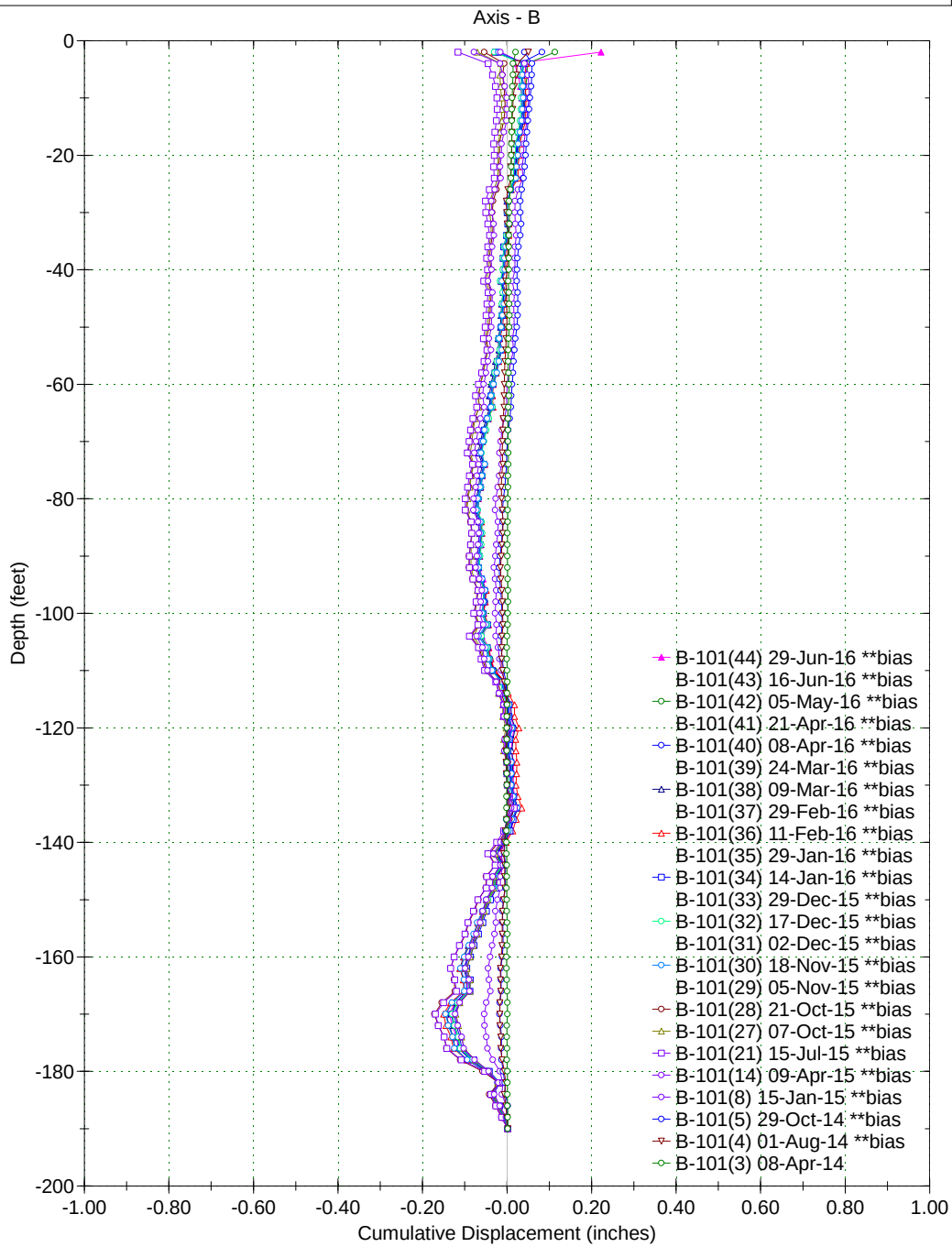
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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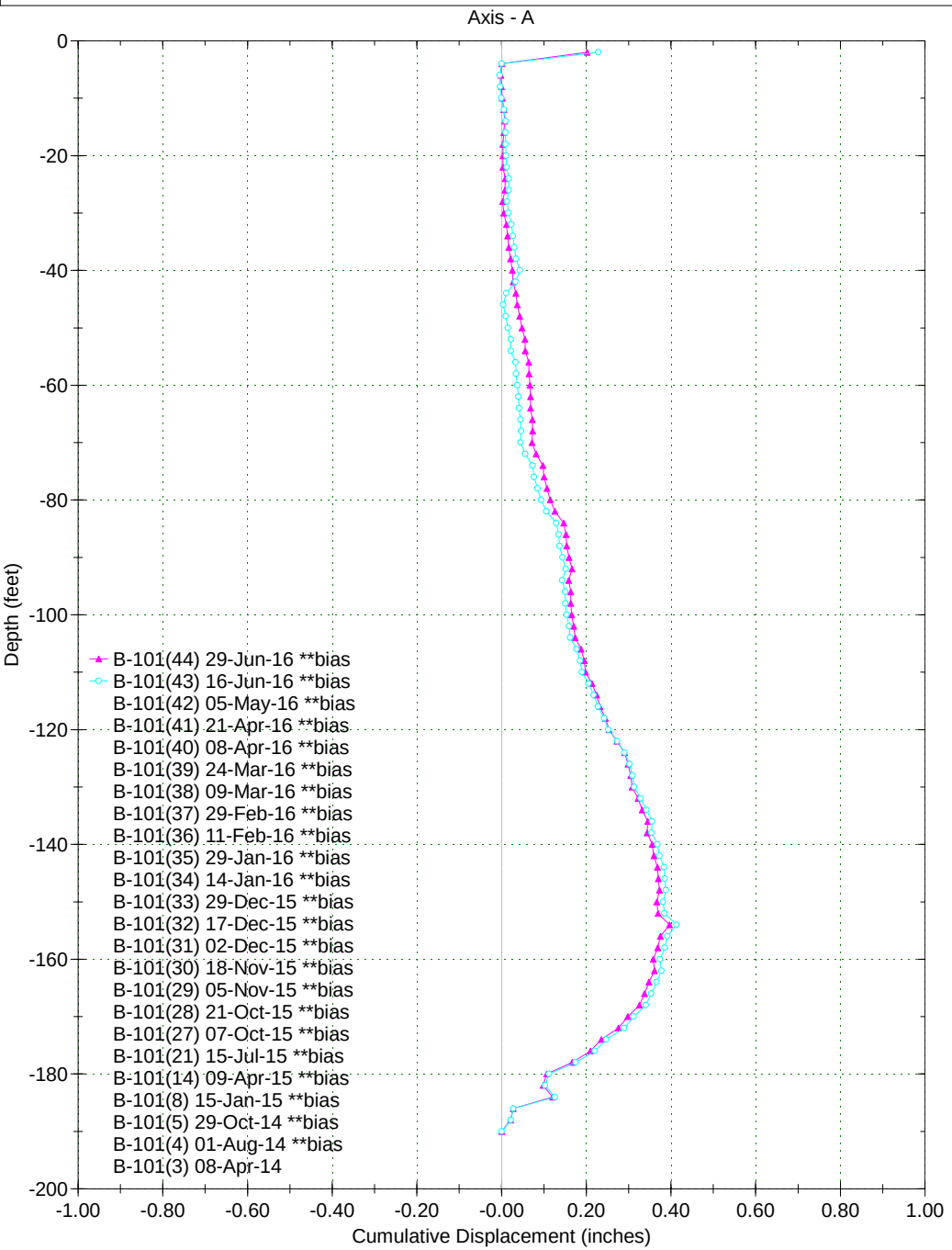
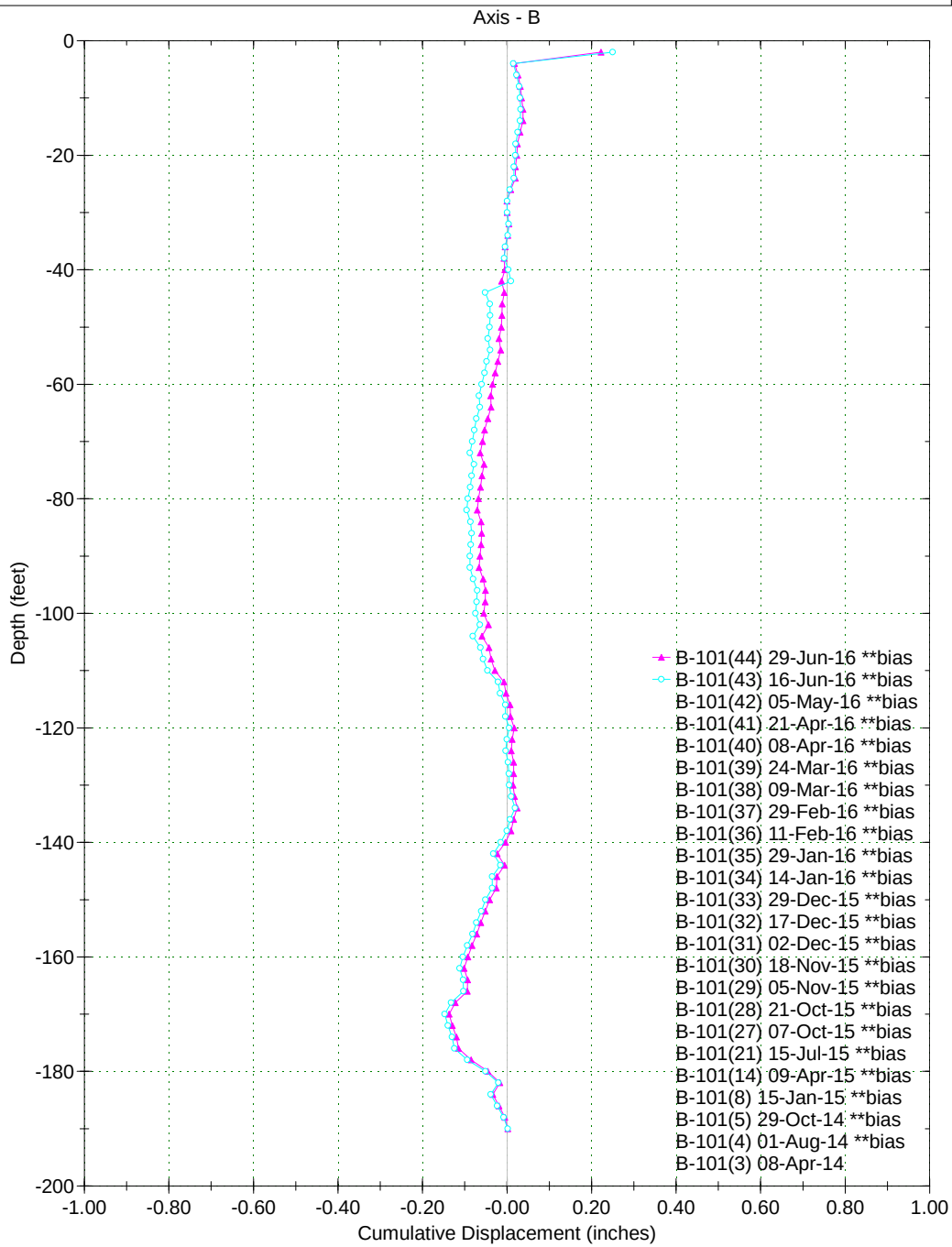
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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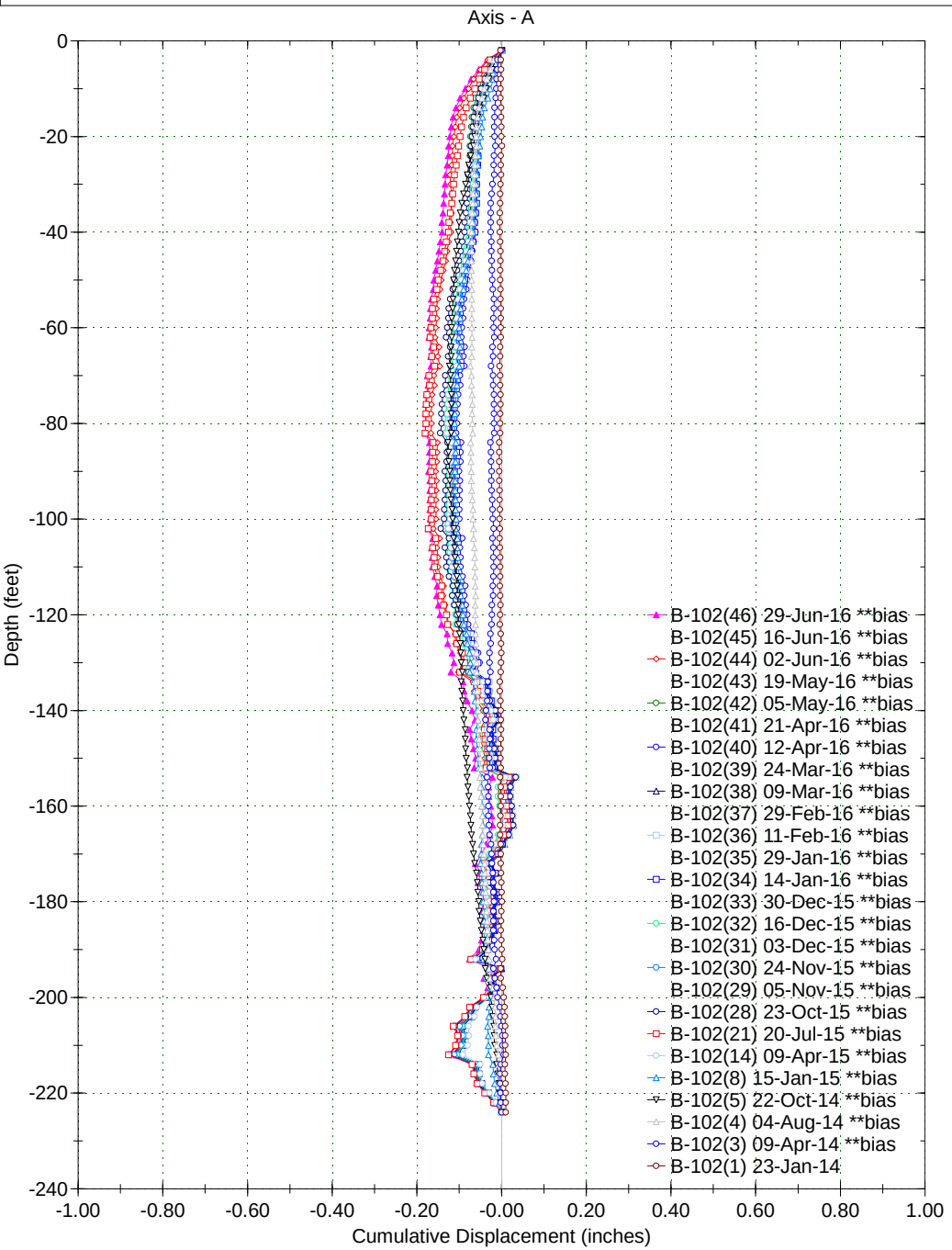
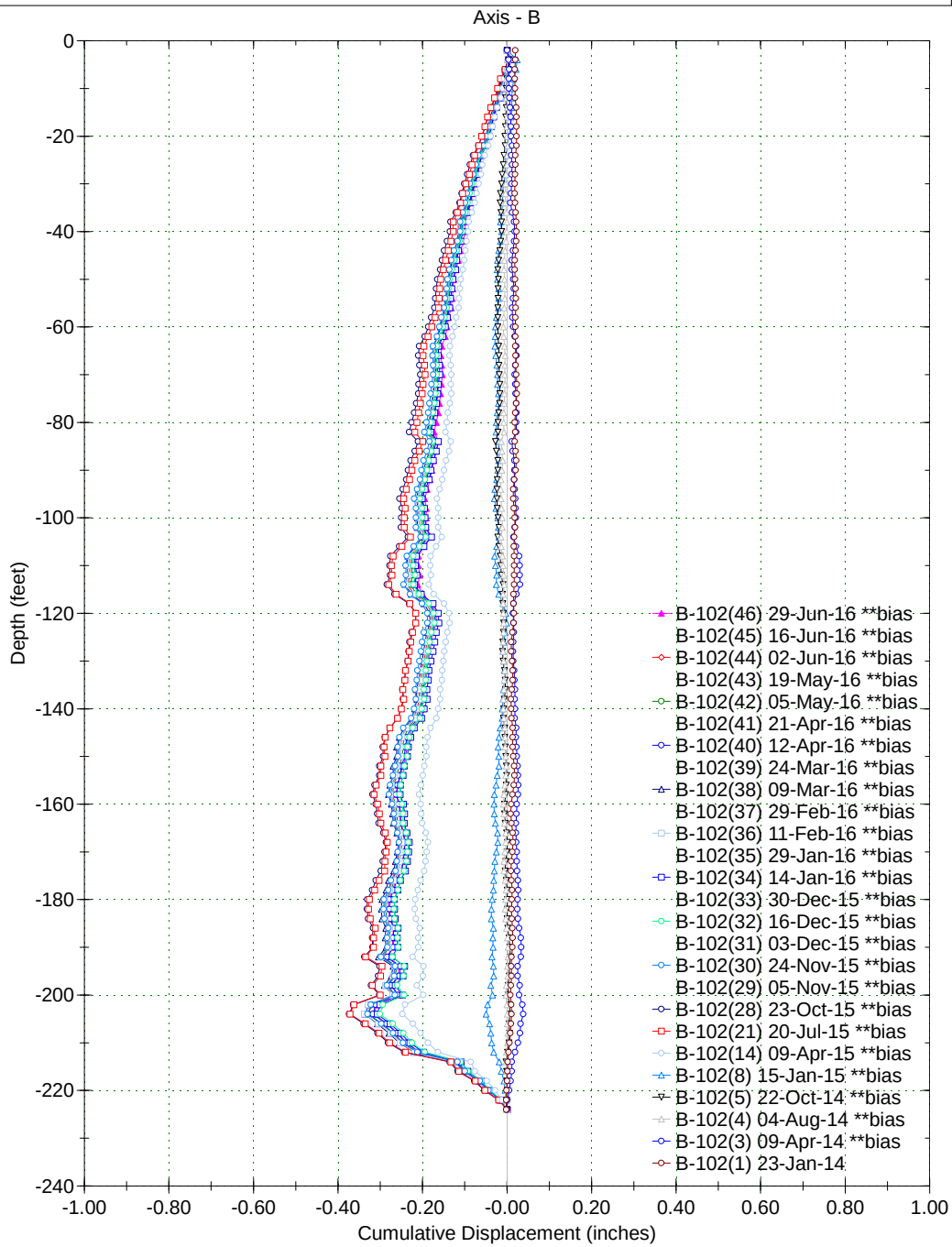
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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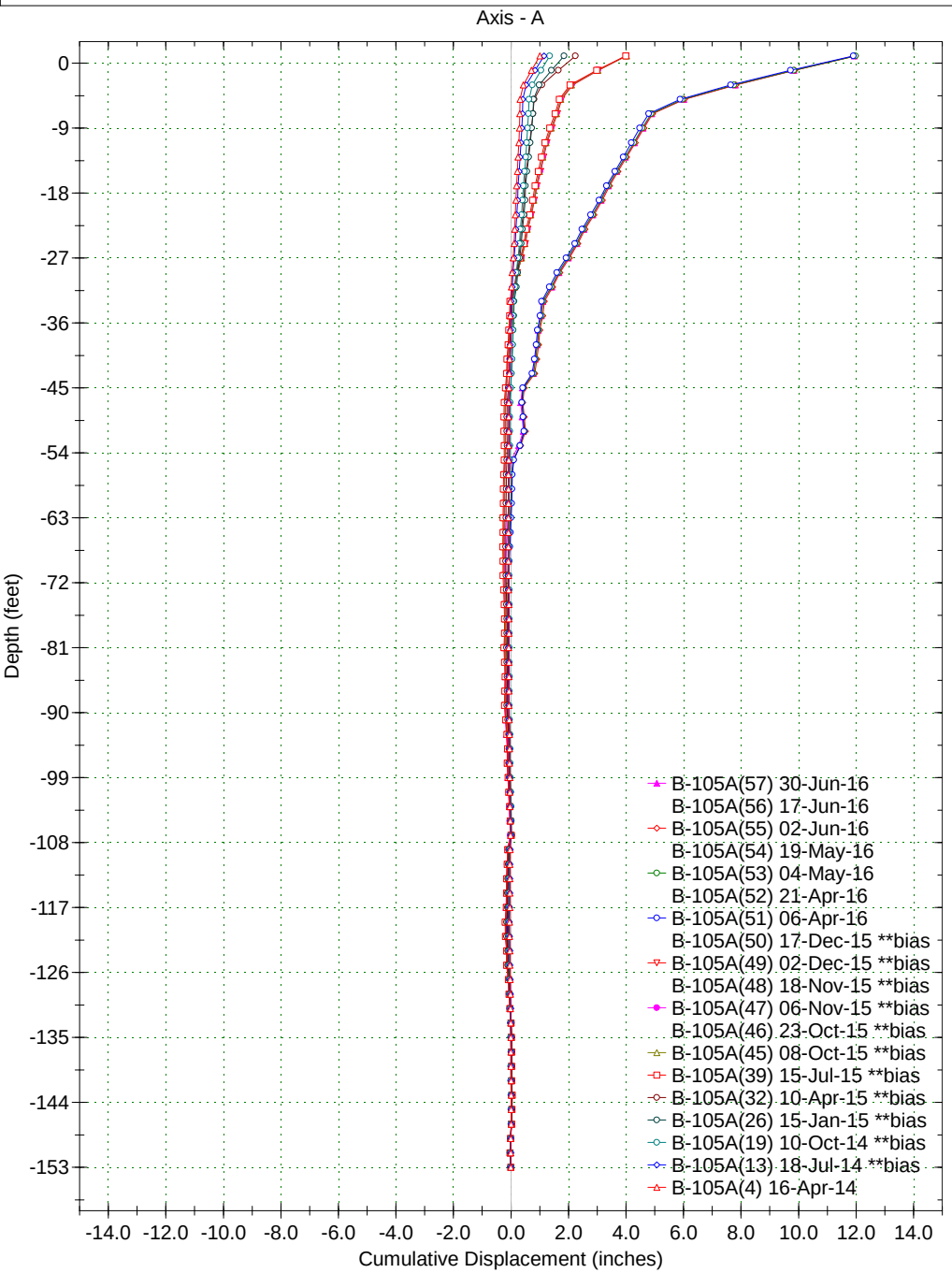
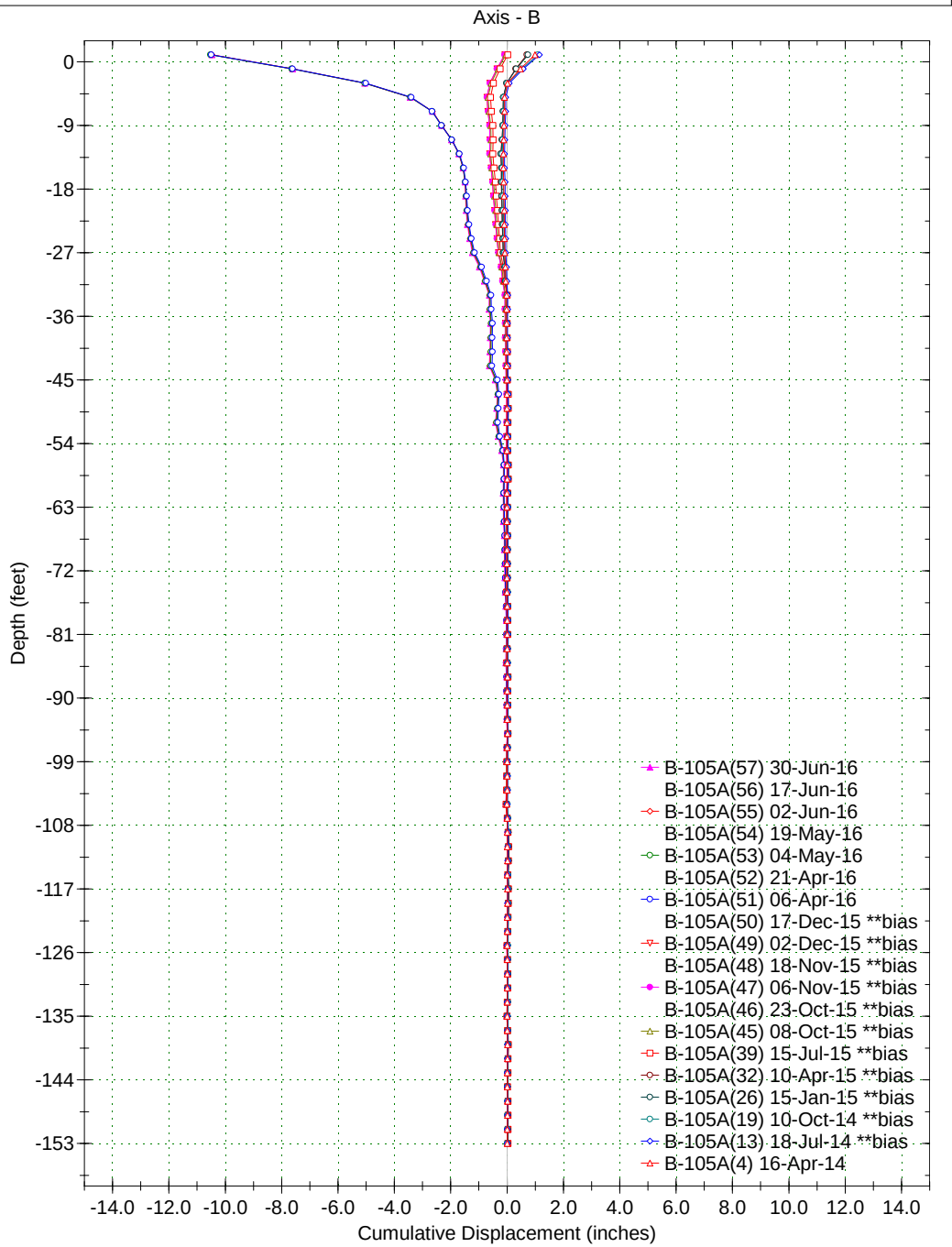
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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

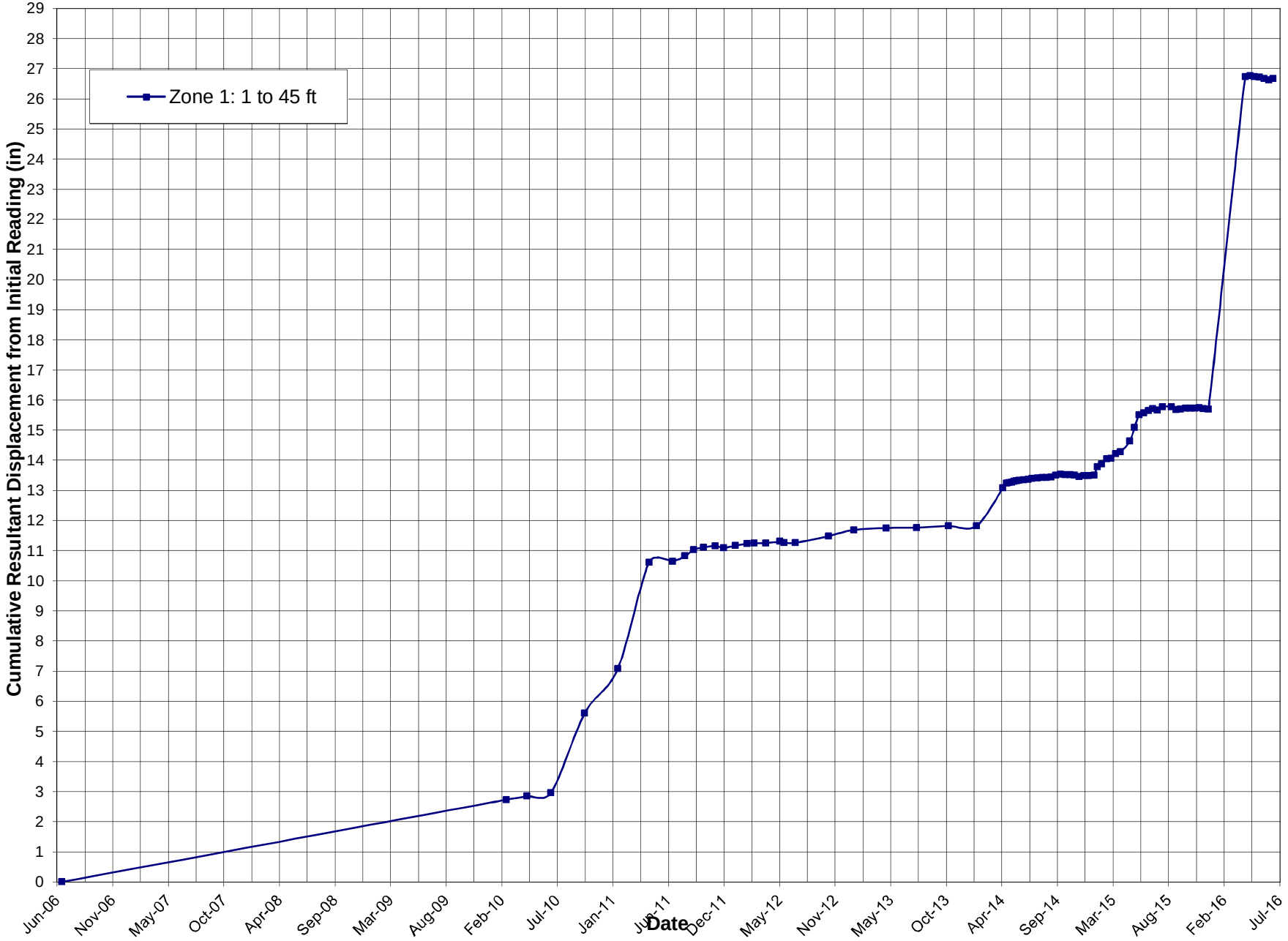
Spiral Correction : N/A
Collar Elevation : 3.0 feet
Borehole Total Depth : 156.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 15 09:19
Applied Azimuth : 0.0 degrees





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

B-105A



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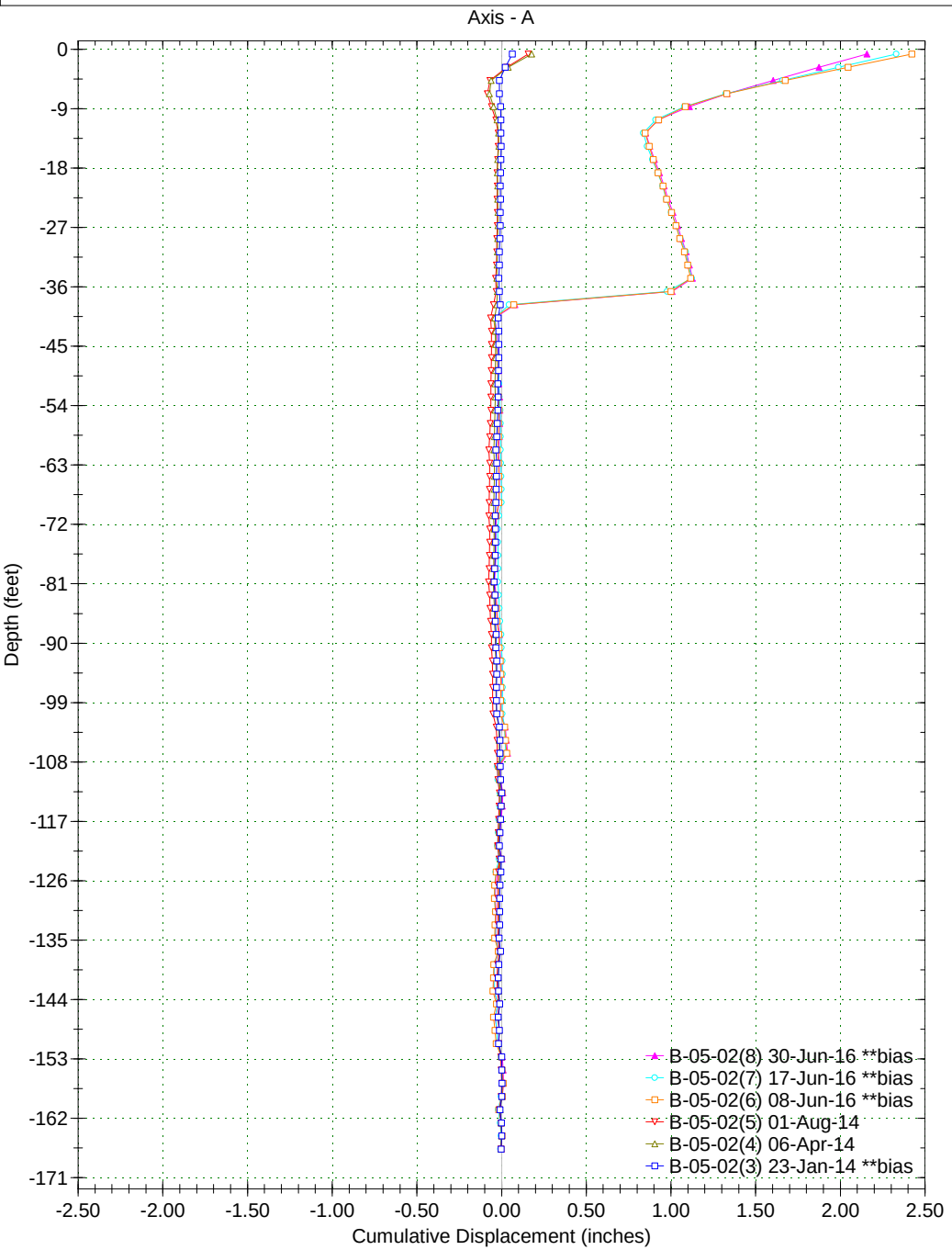
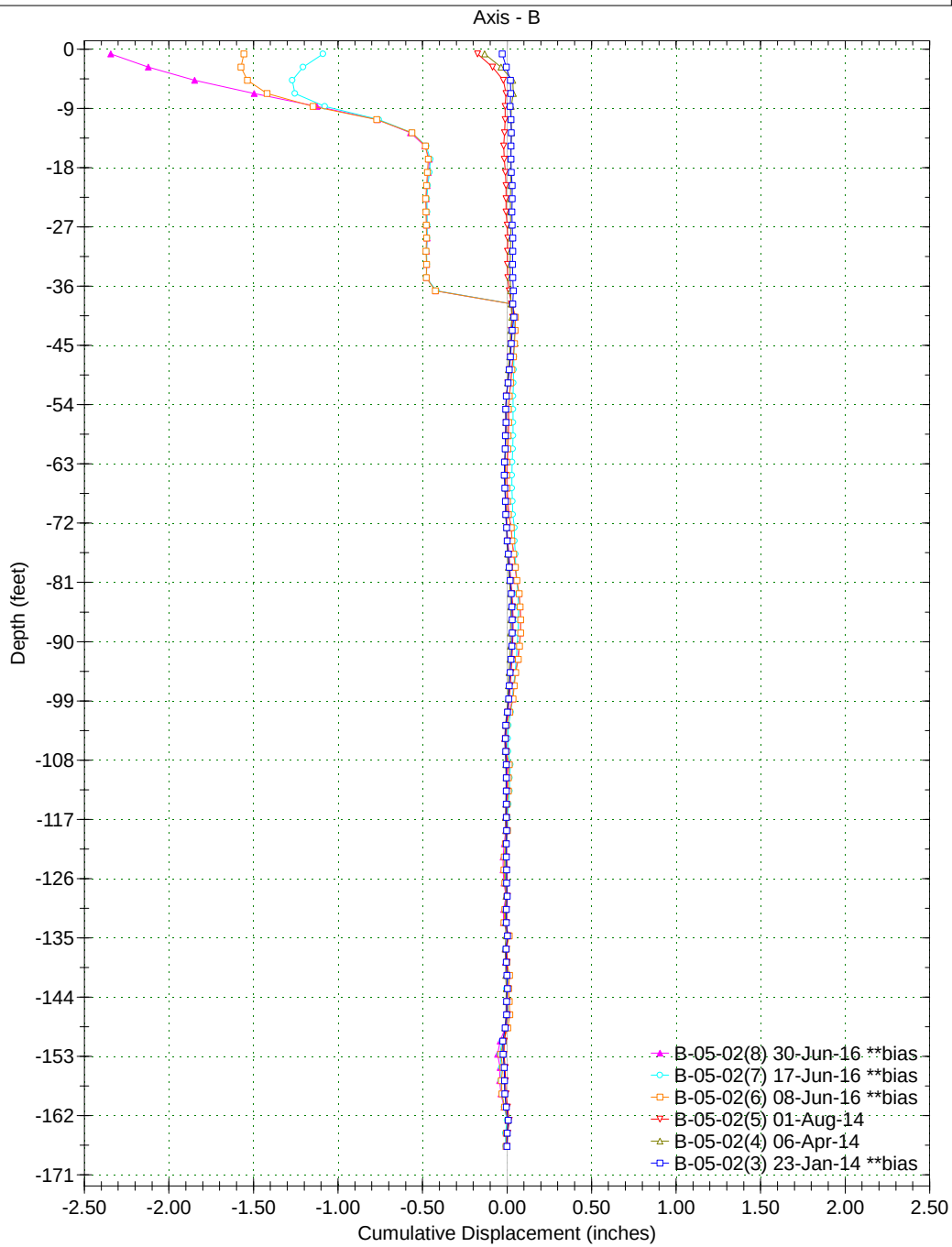
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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

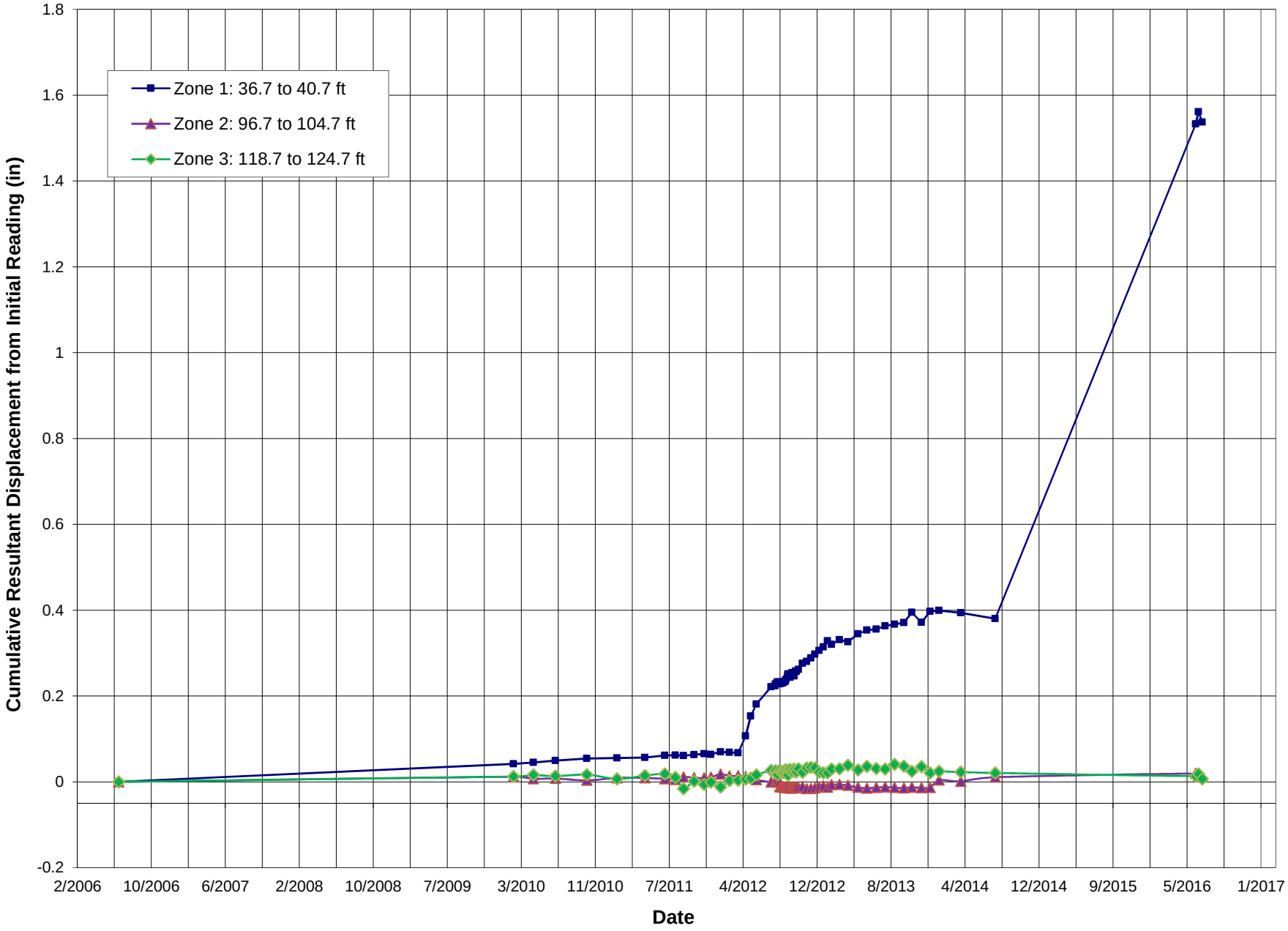
Spiral Correction : N/A
Collar Elevation : 1.3 feet
Borehole Total Depth : 168.0 feet
A+ Groove Azimuth :
Base Reading : 2013 Dec 24 11:12
Applied Azimuth : 0.0 degrees





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

B-05-02



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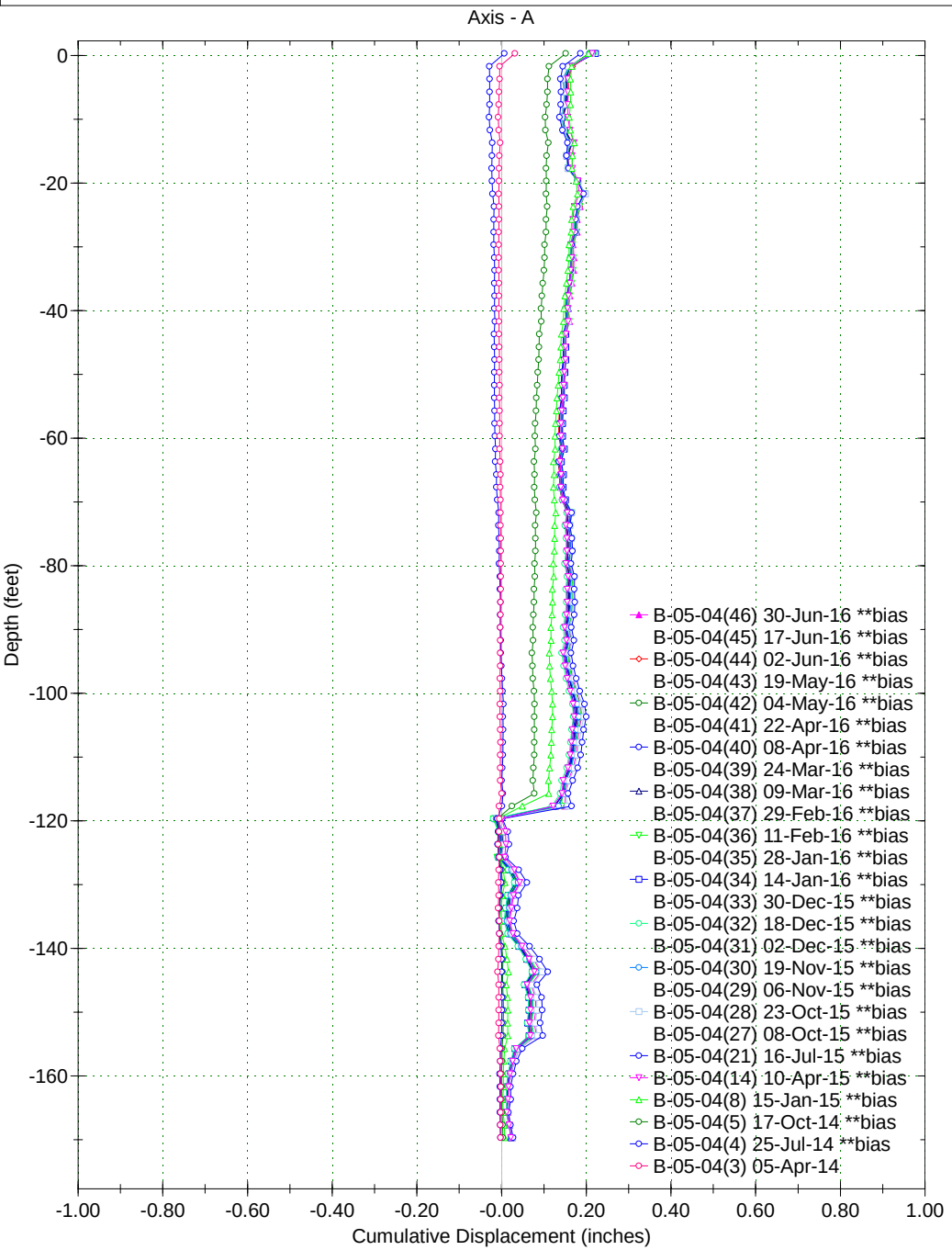
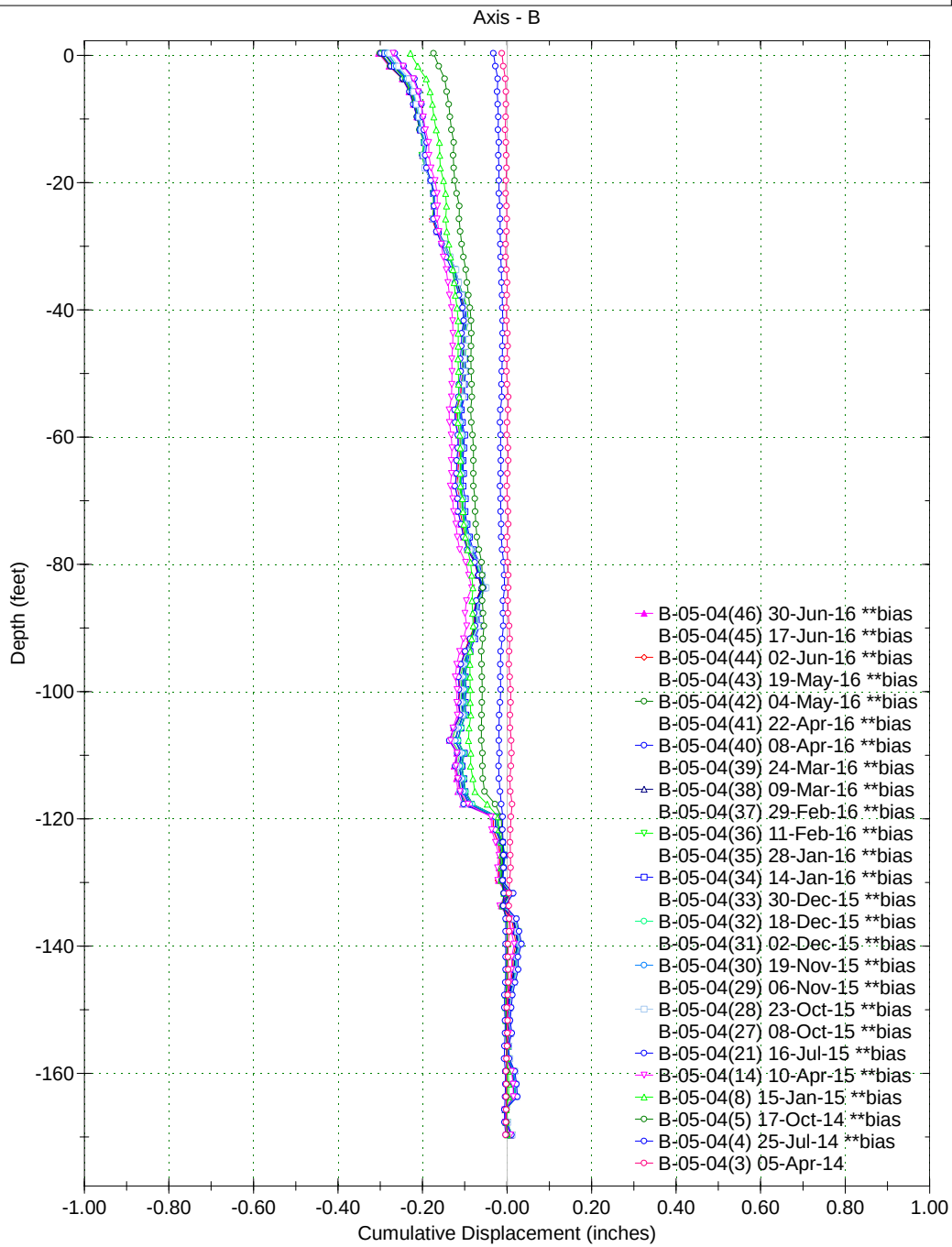
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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

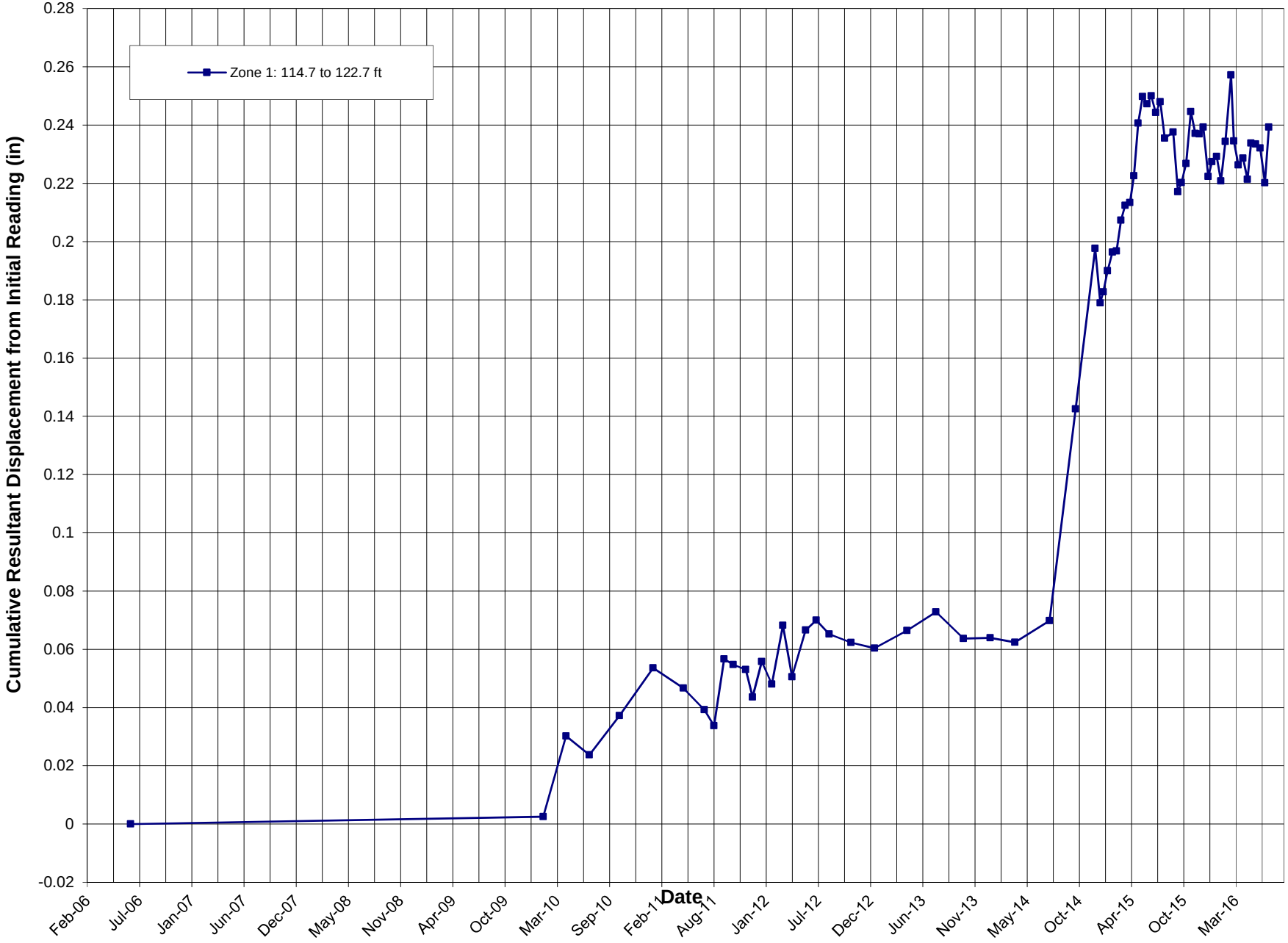
Spiral Correction : N/A
Collar Elevation : 2.3 feet
Borehole Total Depth : 172.0 feet
A+ Groove Azimuth :
Base Reading : 2014 Jan 22 12:30
Applied Azimuth : 0.0 degrees





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

B-05-04



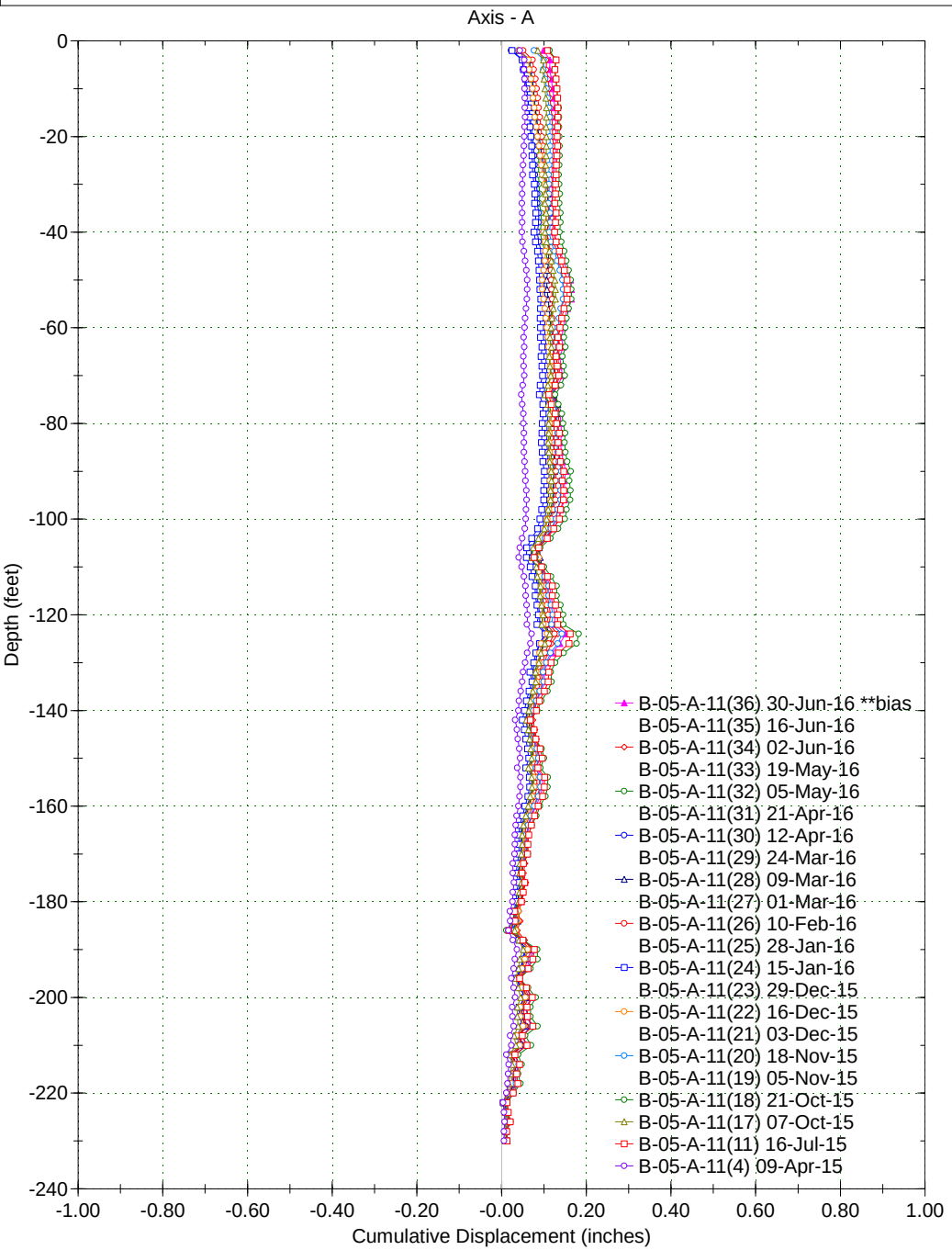
RST Instruments Ltd.

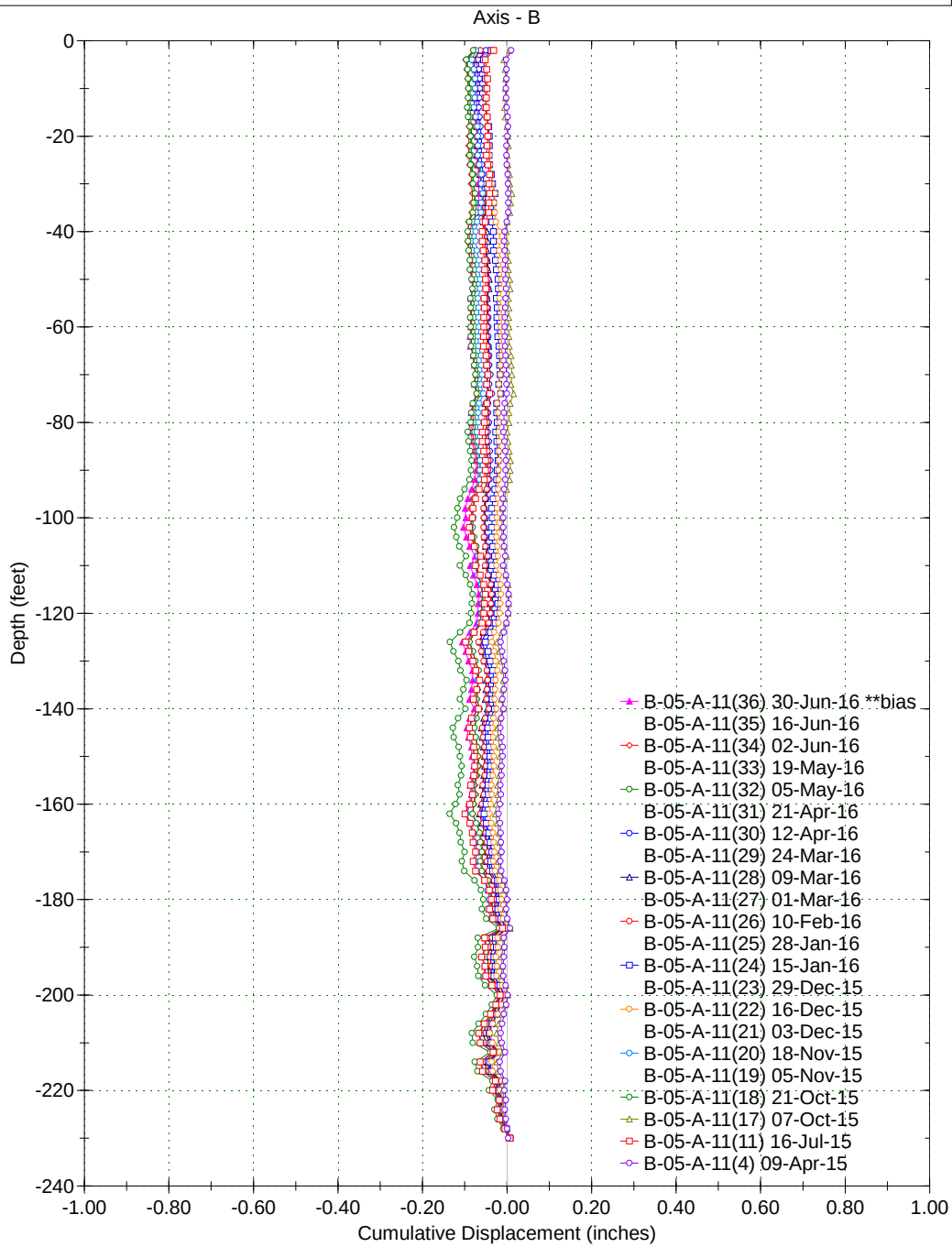
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





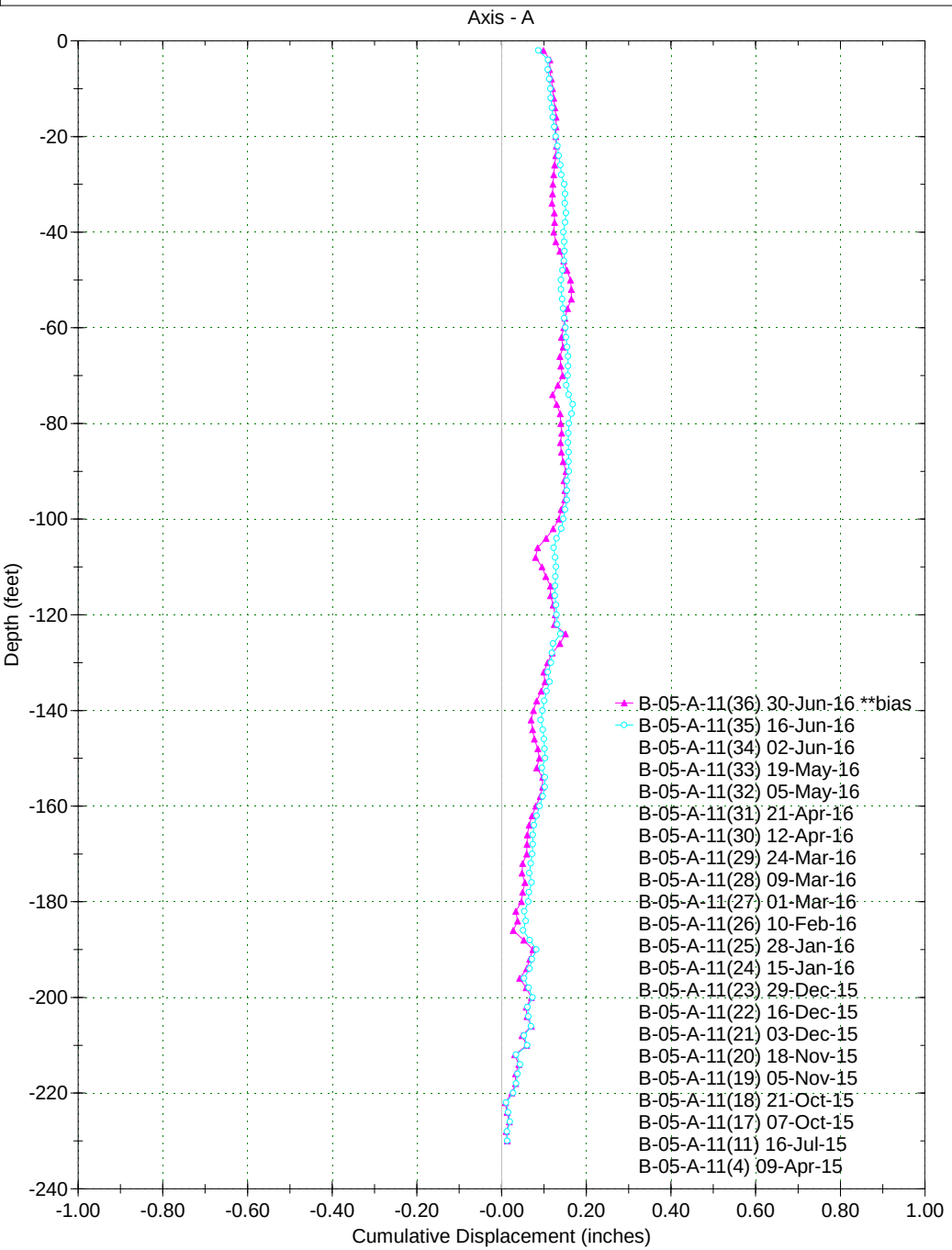
RST Instruments Ltd.

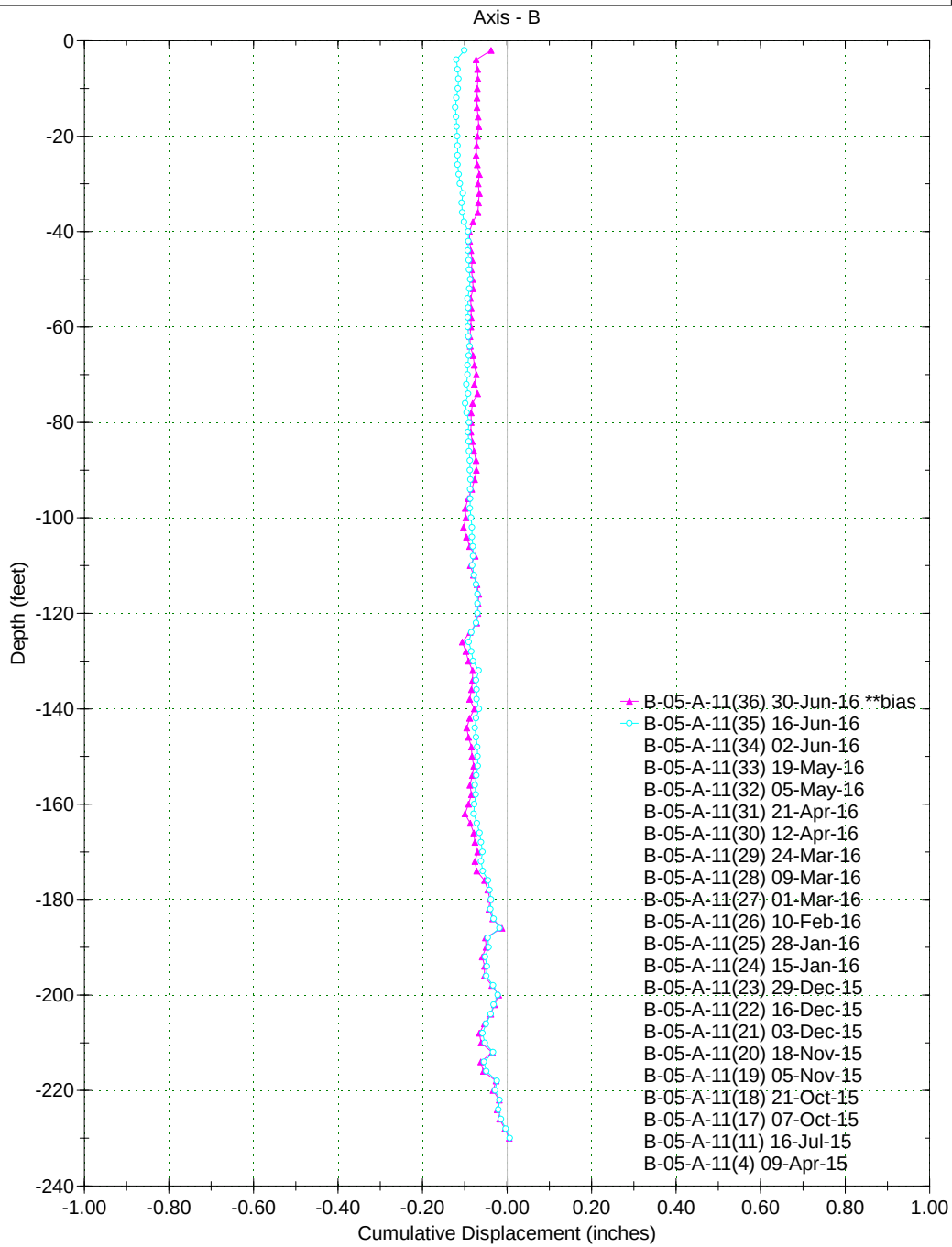
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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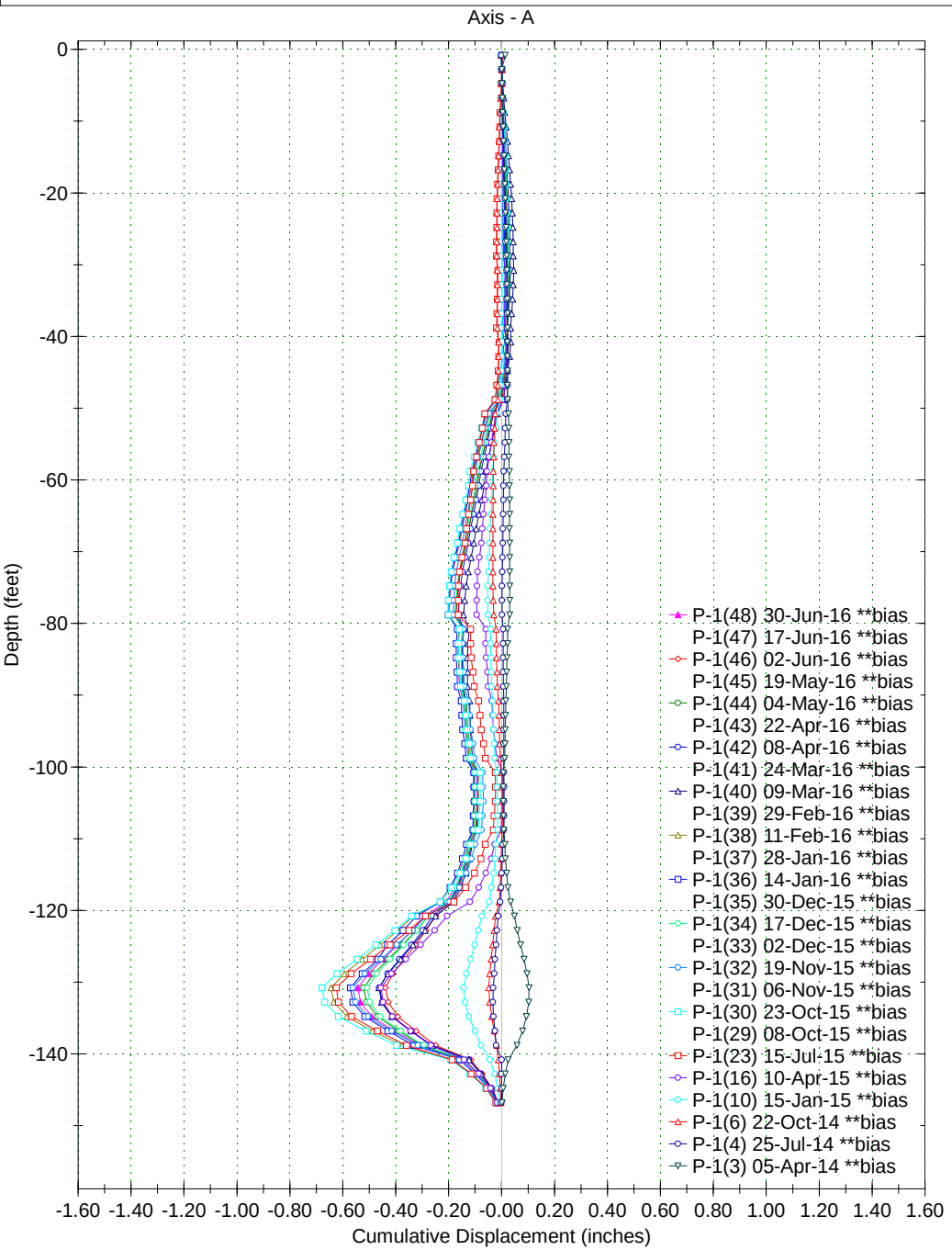
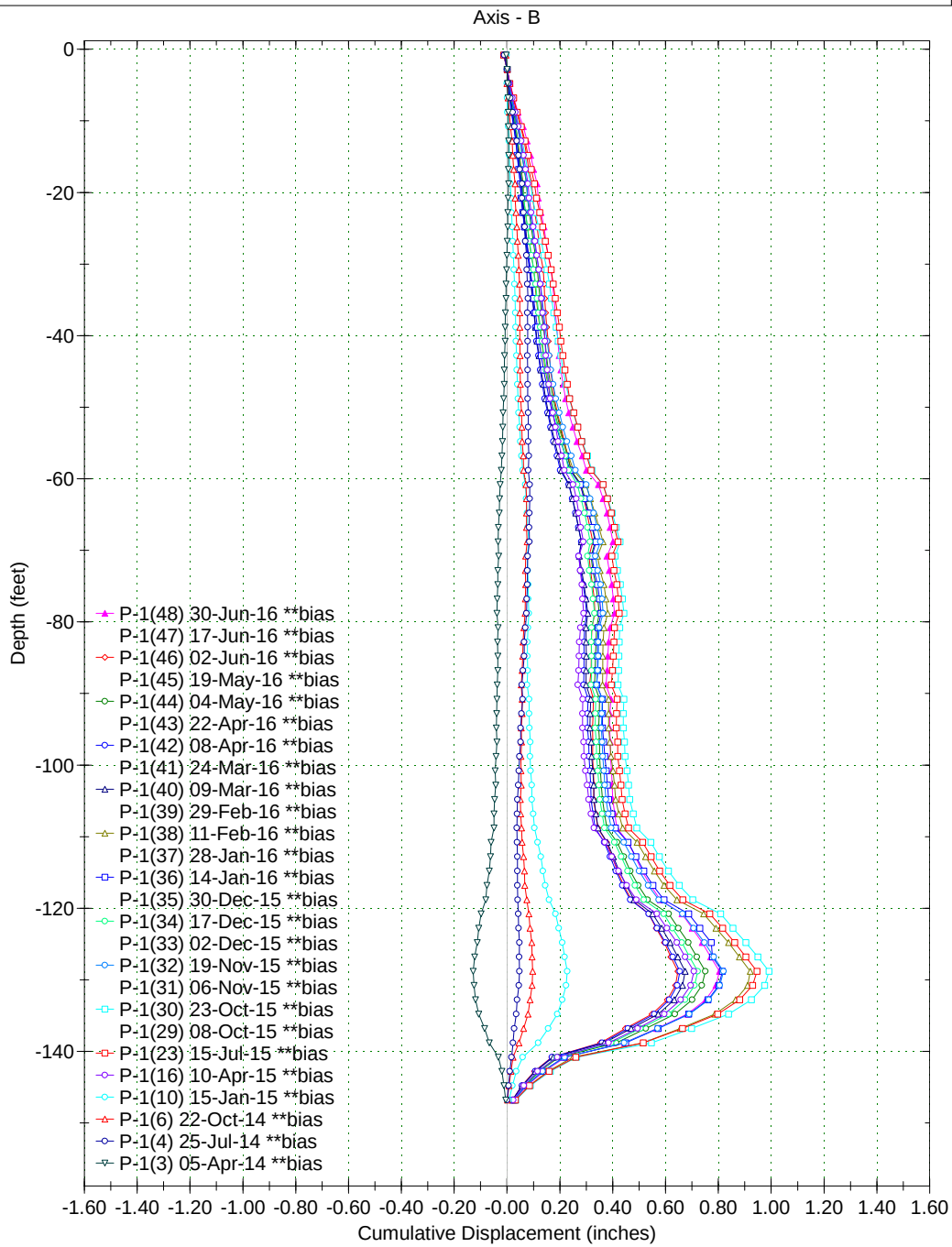
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

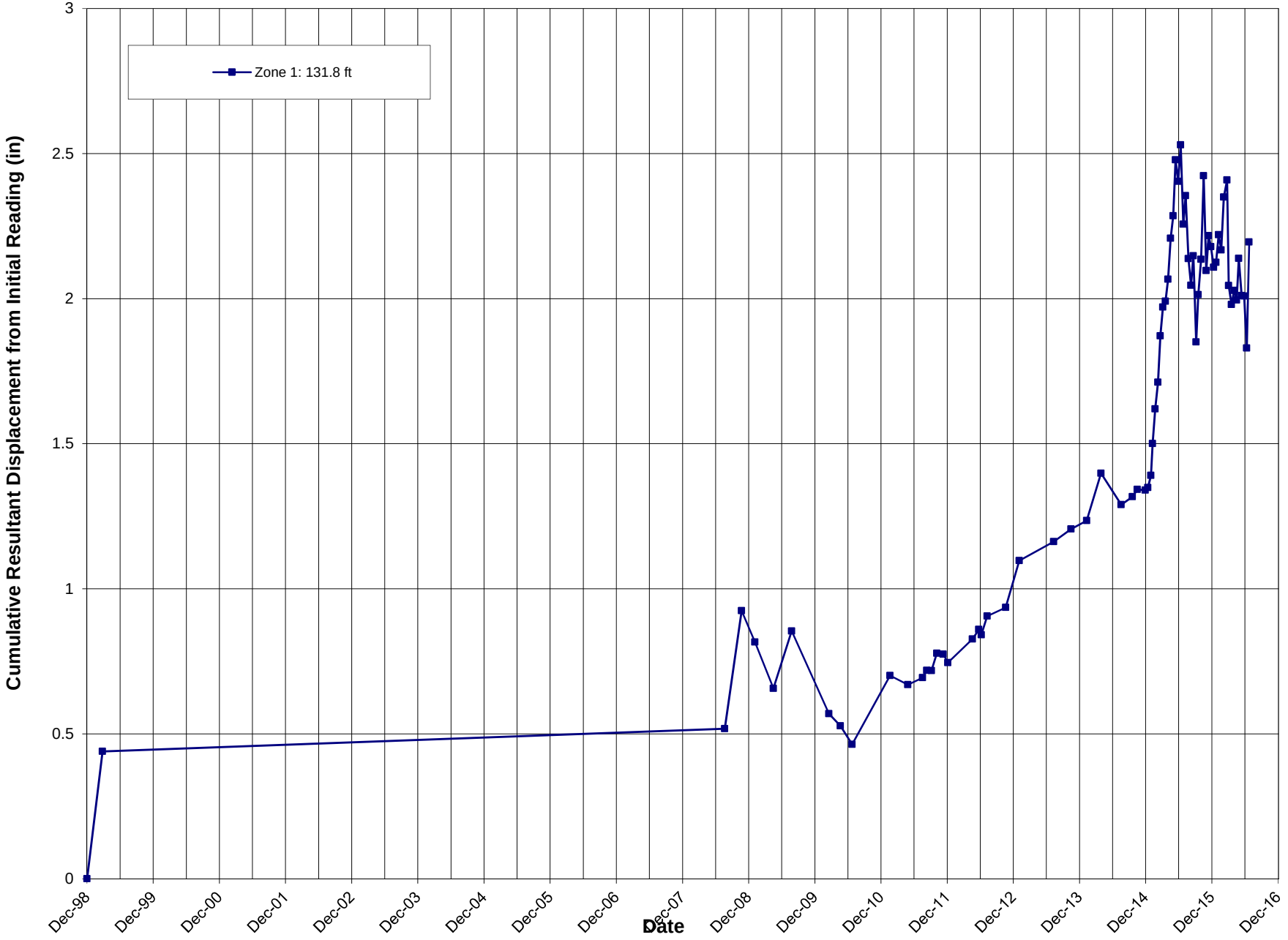
Borehole : P-1
Project : CUY-90-15-24
Location : Cleveland, Ohio
Northing :
Easting :
Collar :

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





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



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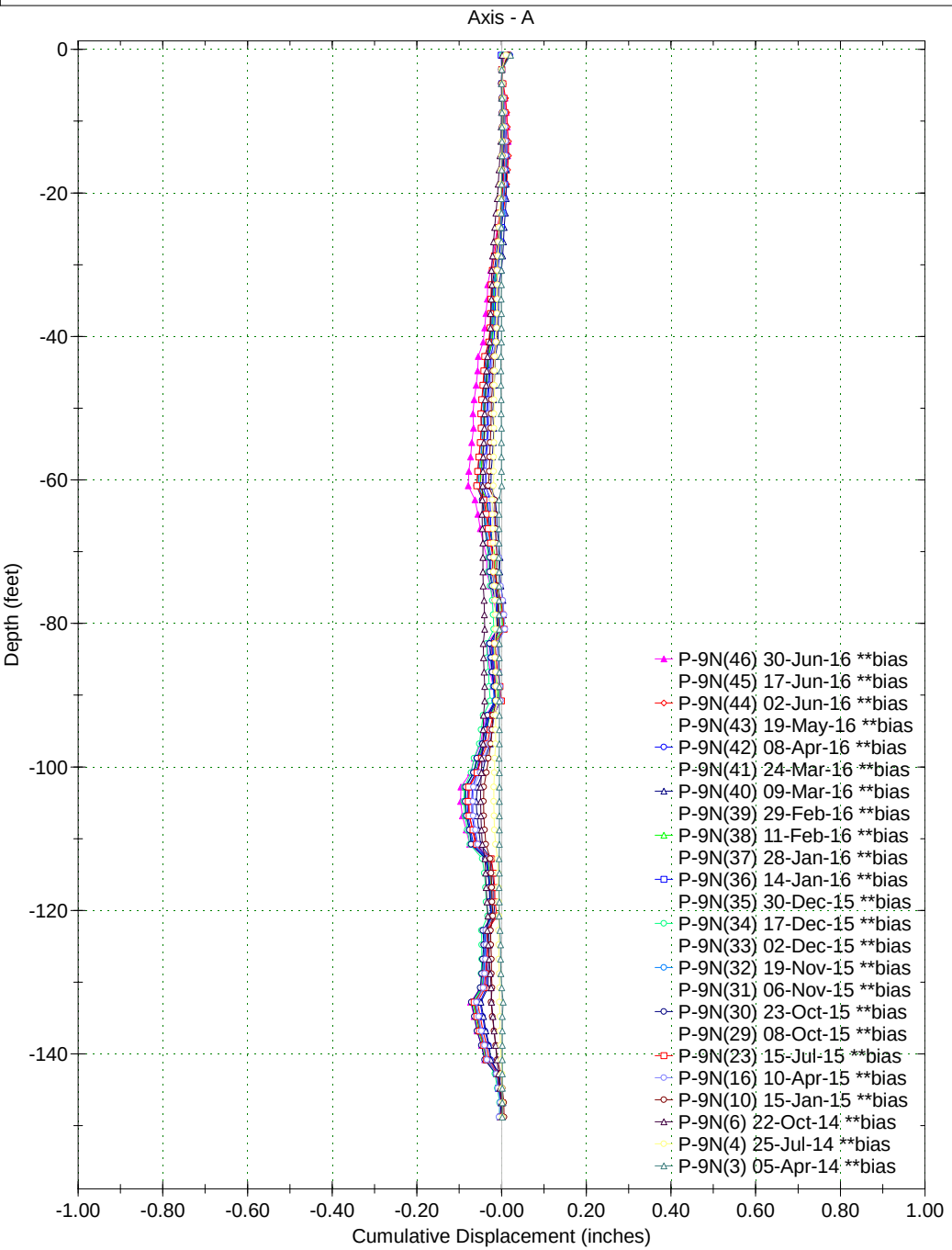
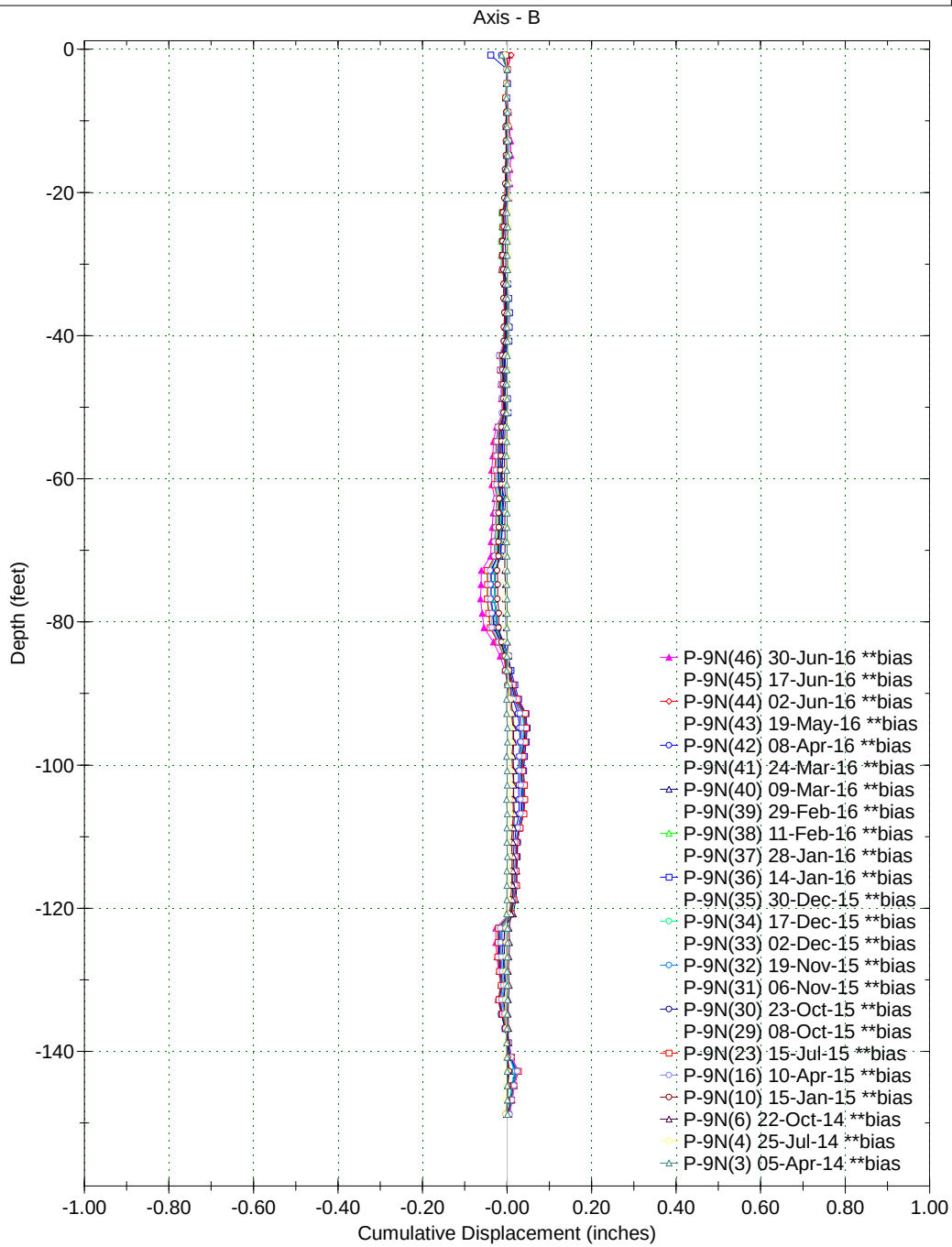
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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





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CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.47.5

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