Bridgeton Landfill, LLC

Weekly Data Submittal

Week of December 10, 2017 – December 16, 2017

Required by Section 52.F of Agreed Order, Case No. 13SL-CC01088
Effective May 13, 2013

Contents:

Provided Separately:

- **– Leachate Level in Leachate Collection Sump Raw Data Excel Spreadsheet**
- **– Temperature Monitoring Probe Raw Data Excel Spreadsheet**
- **– Heat Extraction System TMP Raw Data Excel Spreadsheet**
- **– Gas Interceptor Well Reading Raw Data Excel Spreadsheet**
- **– Neck-Area Gas Extraction Well Data Excel Spreadsheet**

December 22, 2017

Commentary on Data

December 22, 2017

Attachment A – Leachate Levels in Leachate Collection Sumps

The downhole discharge piping for LCS-1D requires replacement. Pump and level sensor replacement was postponed due to windy conditions.

The pump in LCS-2D was non-operational during the weekly reporting period.

The Blackhawk pneumatic pumps in LCS-3D were non-operational during the weekly reporting period. The casing on LCS-3D will be extended and the line sets for the Blackhawk pumps will be replaced as part of the east fill project. Liquid level was measured manually.

The level sensor in LCS-4B is currently operational and responsive. Liquid level was not recorded by the level sensor during the weekly reporting period. LCS-4B is equipped with a flow meter that displayed no flow during the weekly reporting period. Therefore, it can be concluded that the liquid level was below the bottom of the pump and level sensor in LCS-4B.

LCS-5B and LCS-6B were fully operational during the weekly reporting period.

Attachment B - Temperature Monitoring Probe Analytical Charts

The following Temperature Monitoring Probes (TMPs) indicated generally consistent profiles to previous observations: TMP-1, -2R, -3, -3R, -4, -4R, -6, -9, -11R, -14R, -16, -16R, -17, -18, -21, -22, -23, -24, -25, -25R, -26, -27, -28, -28R, -29, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, and -49.

TMP readings for evaluation of the Heat Extraction System (HES) are provided as attachment "Heat Extraction System TMP Raw Data Excel Spreadsheet," but are not discussed in this report.

Attachment C - Gas Interceptor Wellhead Temperature Graphs

As part of the HES, there are currently cooling water circulation loops installed in twelve Gas Interceptor Wells (GIWs) (GIW-02 through GIW-13). The remaining well (GIW-01) had a measured gas temperature within its historical operating limits.

Attachment D – Neck Area Gas Extraction Well Data

Weekly gas temperature data is collected for select Gas Extraction Wells (GEWs) located in the neck area of the landfill. These wells include GEW-008, -009, -010, -038, -039, -040, 041R, -043R, -053, -054, -055, -056R, -109, and -110.

North Quarry Oxygen Levels

GEW-1A is noted as having an oxygen concentration greater than 2.0% since its installation in December 2015.

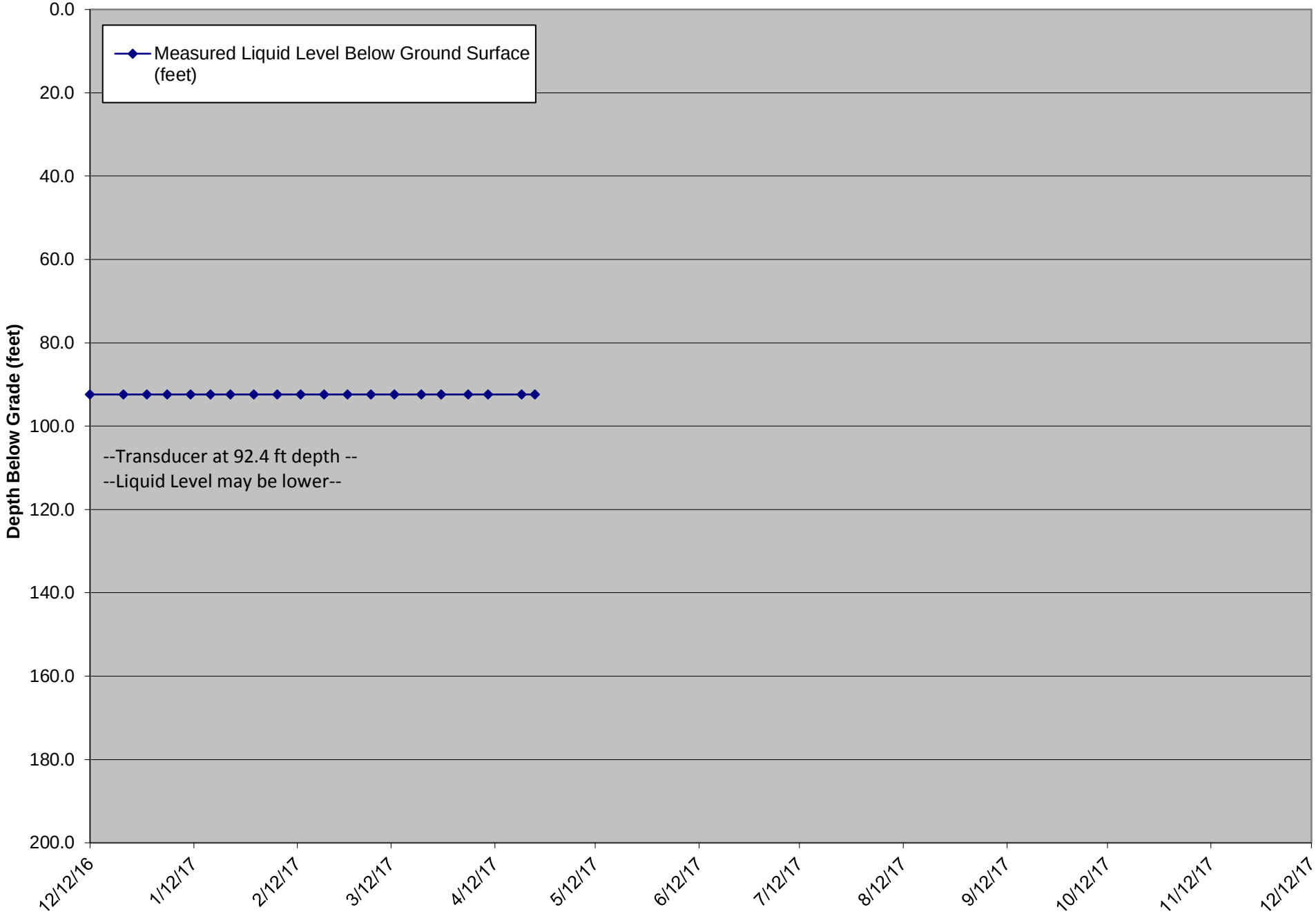
The area in which GEW-1A is installed is very saturated. Bridgeton has installed a sump near GEW-1A and increased the force main capacity during the North Quarry capping projects in an effort to lower the

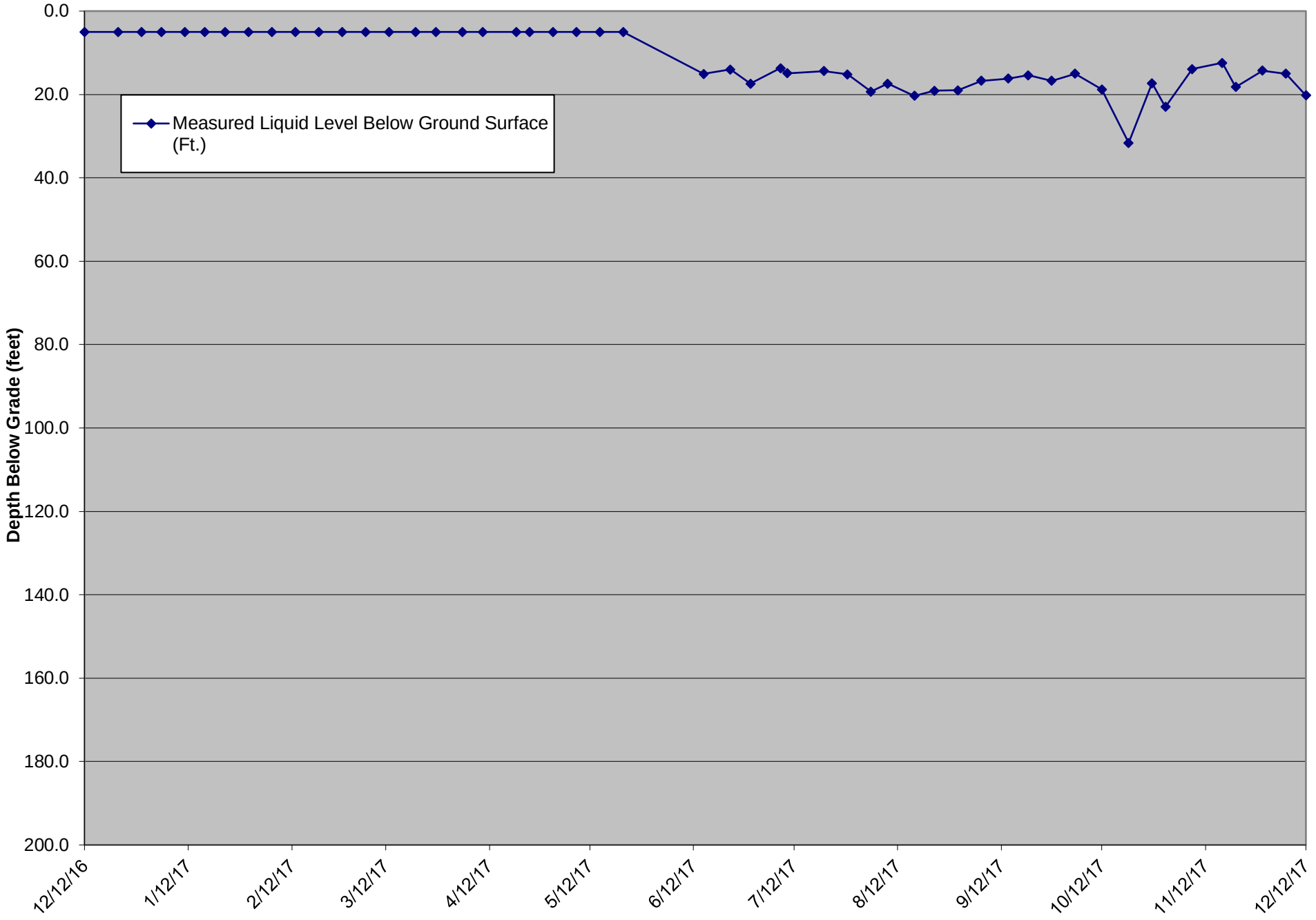
potentiometric surface in the area to improve gas quality and reduce ambient air intrusion at the well. Neither effort has successfully dewatered the gas well. Bridgeton will now be focusing on the type of pumps available and ensuring that existing pumps in the well and adjacent sump are performing optimally for the environment.

ATTACHMENT A

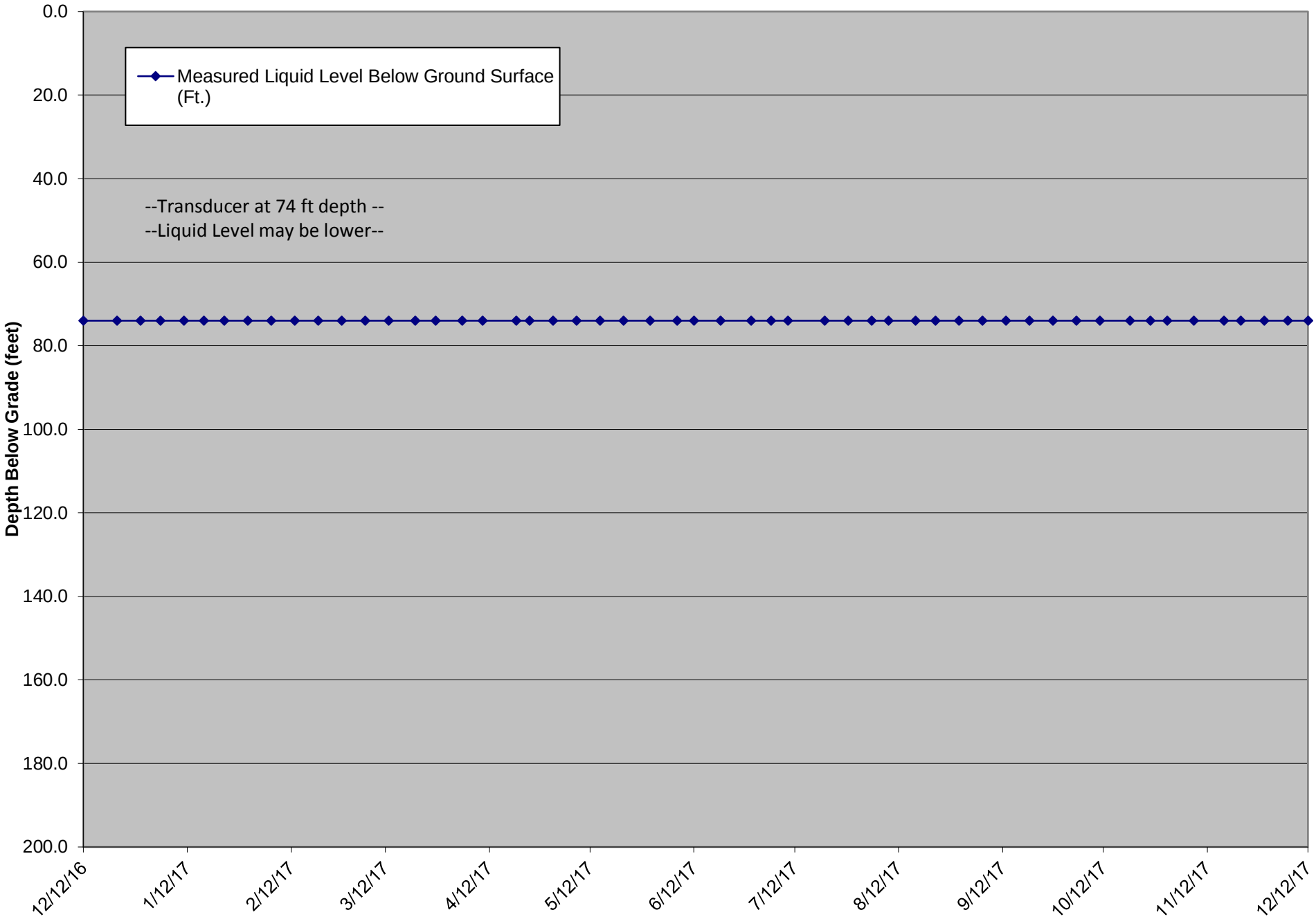
LEACHATE LEVELS IN LEACHATE COLLECTION SUMPS

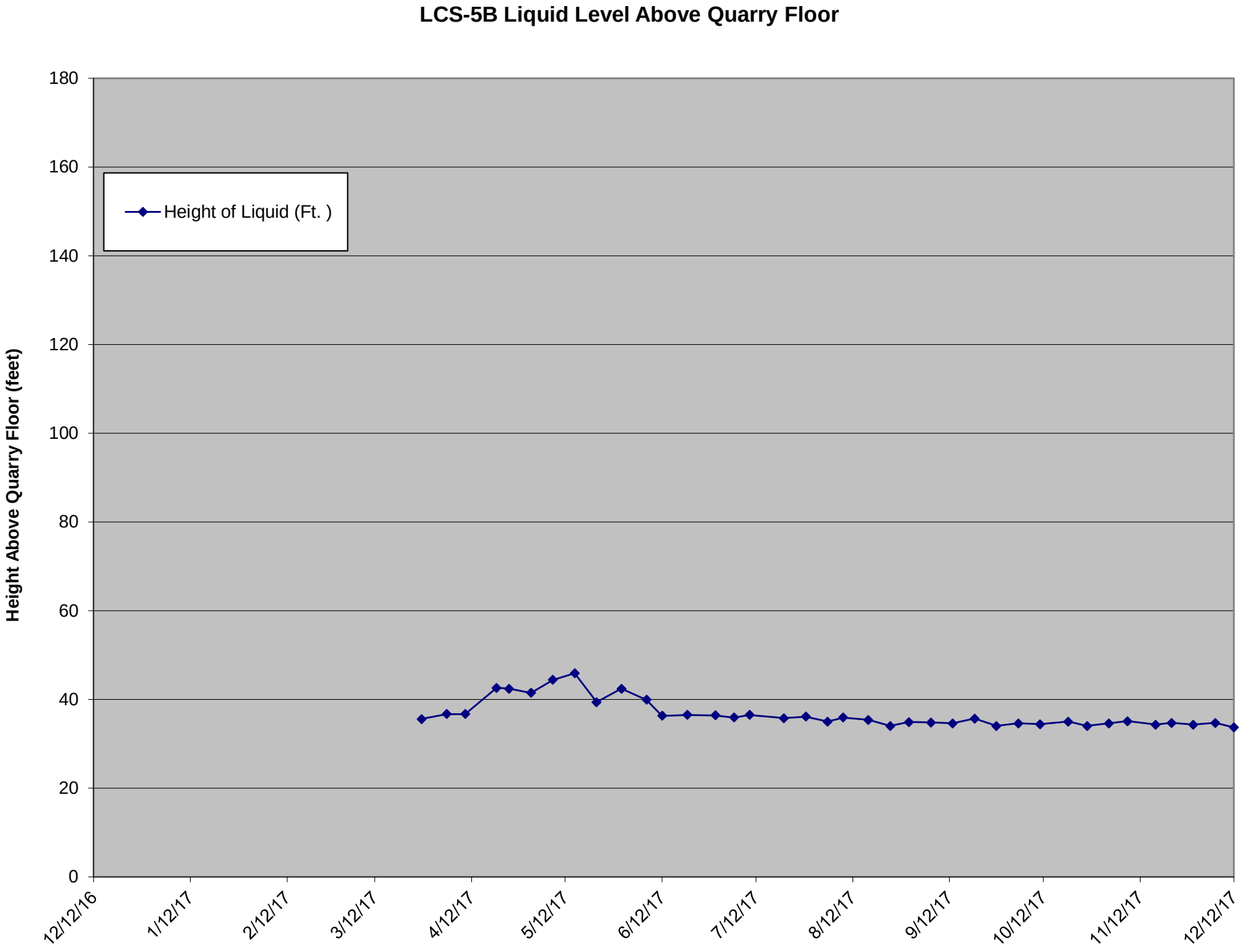
LCS-1D Liquid Level Below Ground Surface



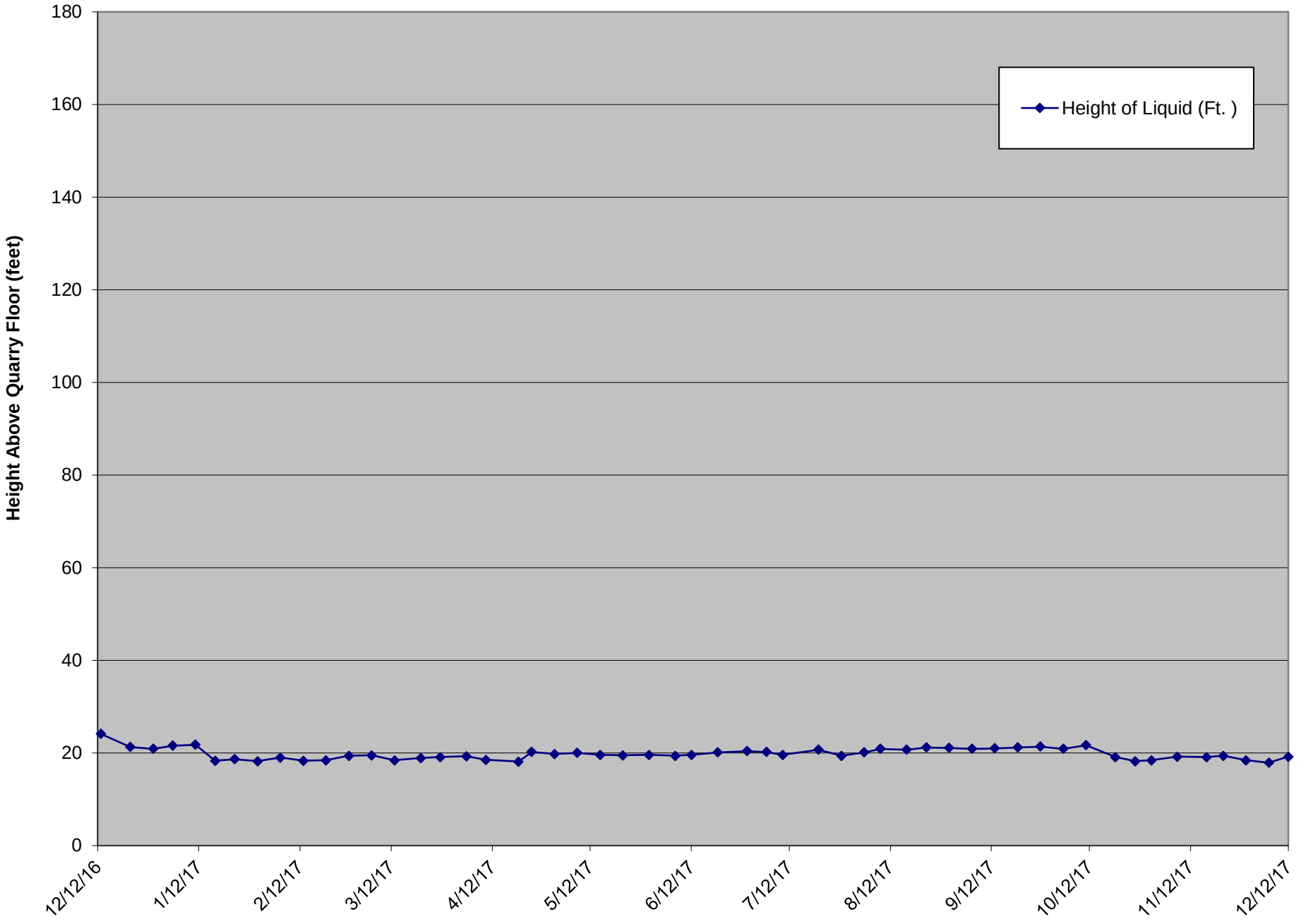

LCS-3D Liquid Level Below Ground Surface
Depth Below Grade (feet)
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
Measured Liquid Level Below Ground Surface (Ft.)
12/12/16
1/12/17
2/12/17
3/12/17
4/12/17
5/12/17
6/12/17
7/12/17
8/12/17
9/12/17
10/12/17
11/12/17
12/12/17

LCS-4B Liquid Level Below Ground Surface



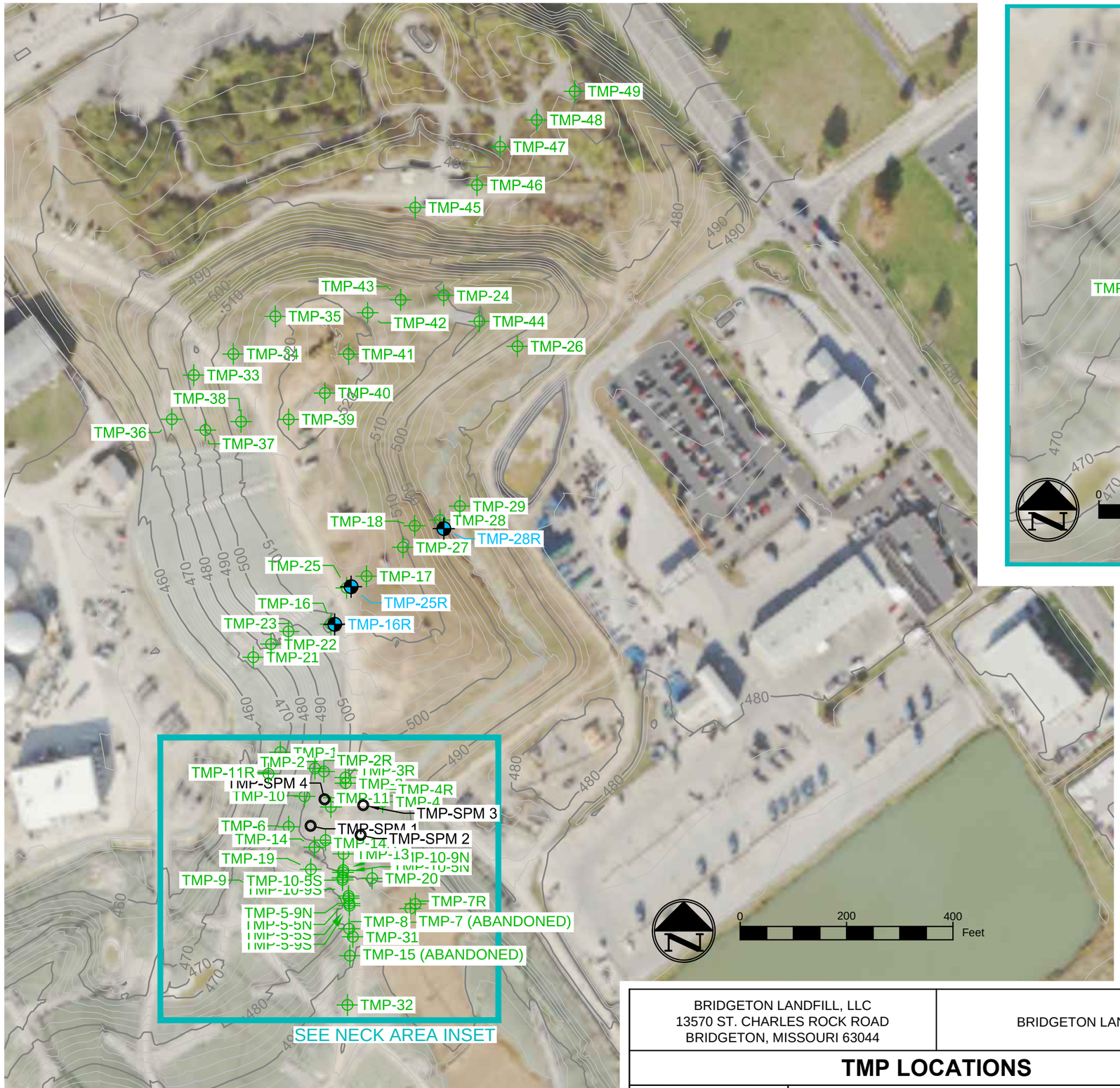

LCS-5B Liquid Level Above Quarry Floor
Height Above Quarry Floor (feet)
180
160
140
120
100
80
60
40
20
0
Height of Liquid (Ft.)
12/12/16
1/12/17
2/12/17
3/12/17
4/12/17
5/12/17
6/12/17
7/12/17
8/12/17
9/12/17
10/12/17
11/12/17
12/12/17

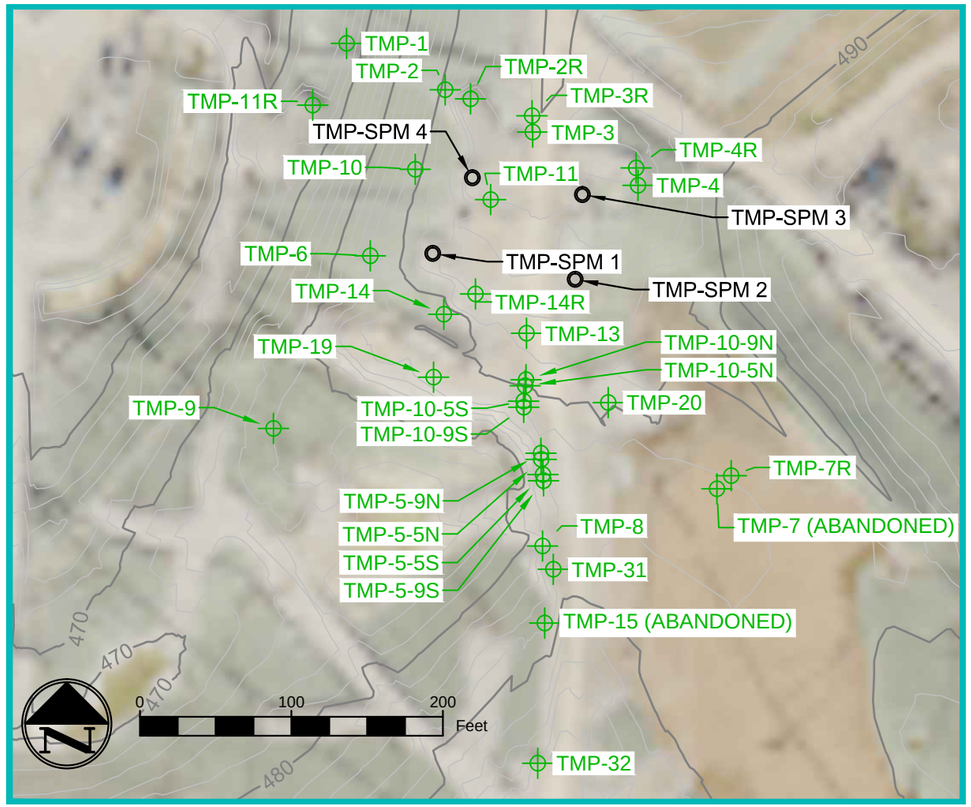
LCS-6B Liquid Level Above Quarry Floor



ATTACHMENT B

TEMPERATURE MONITORING PROBE ANALYTICAL CHARTS





NECK AREA INSET

LEGEND

	2017 AERIAL TOPOGRAPHY (2' CONTOUR)
500	2017 AERIAL TOPOGRAPHY (10' CONTOUR)
TMP-13	INSTALLED TMP LOCATION
TMP-SPM 1	TMP-SPM (ASBUILT OCTOBER 13, 2016)
TMP-16R	REPLACEMENT TMP INSTALLED IN 2017

NOTE:

1.) 2017 AERIAL TOPOGRAPHY PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 2, 2016

BRIDGETON LANDFILL, LLC
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL

TMP LOCATIONS

PROJECT NUMBER: BT-124

E:\Dropbox (Feezor Engineering)\Bridgeton\BT-113 Task - Action Plan Figure 1\Weekly Report Updated TMP Drawing

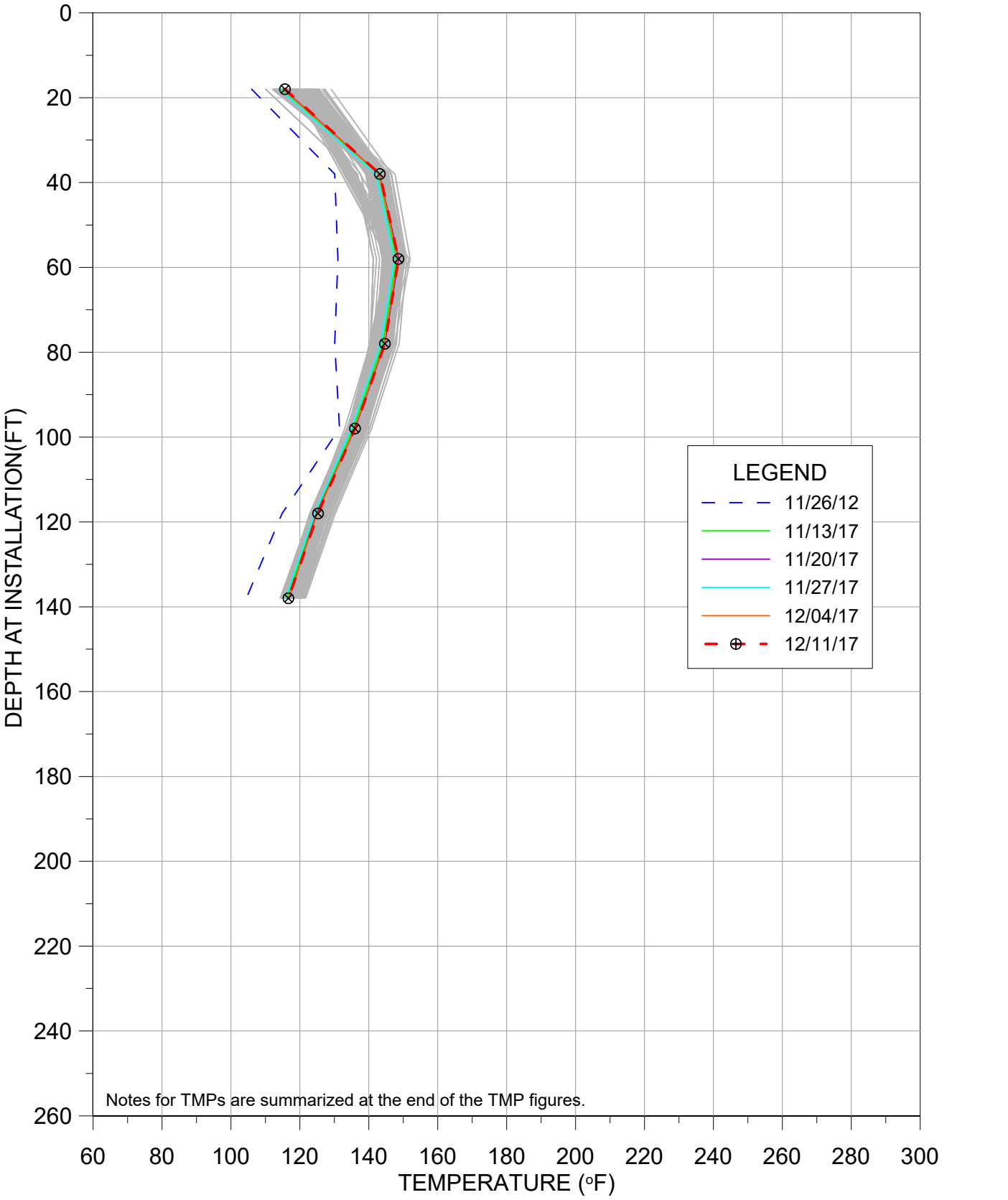
Engineering for a Better World
FEEZOR ENGINEERING, INC.

AUGUST 2017
DESIGNED BY: PML
APPROVED BY: ---

REVISION	DATE

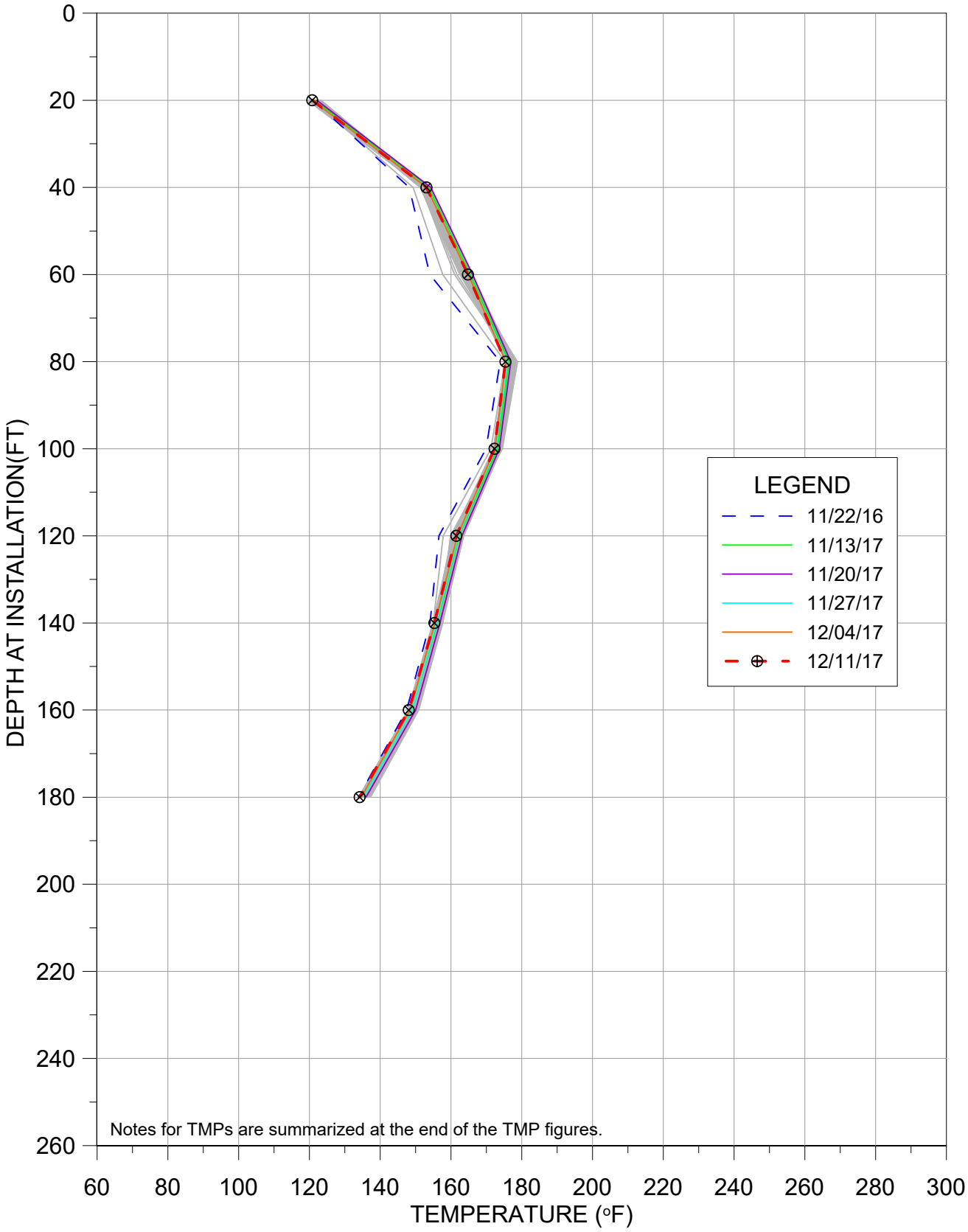
DRAWING NO.:

TMP-1



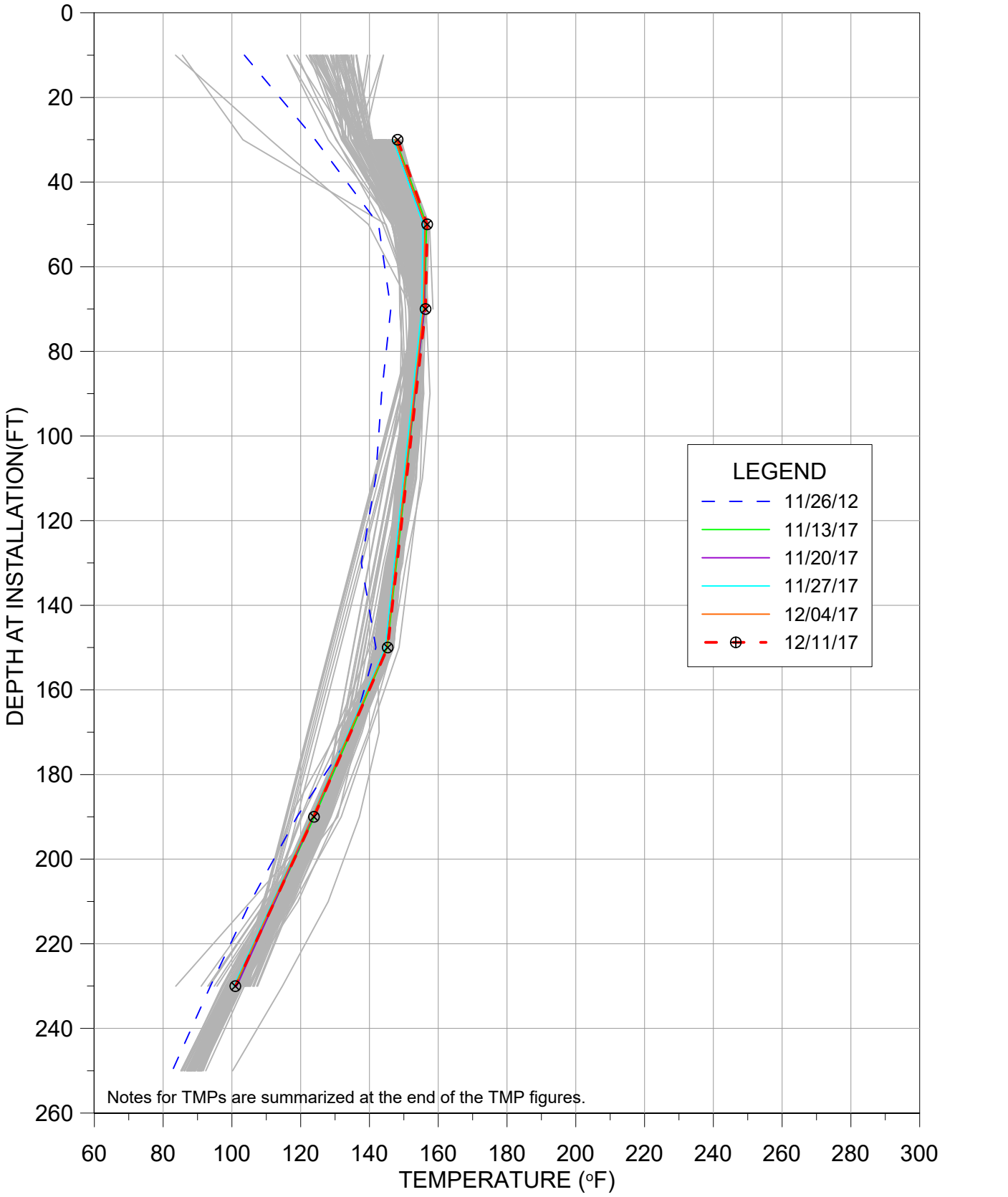
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-2R



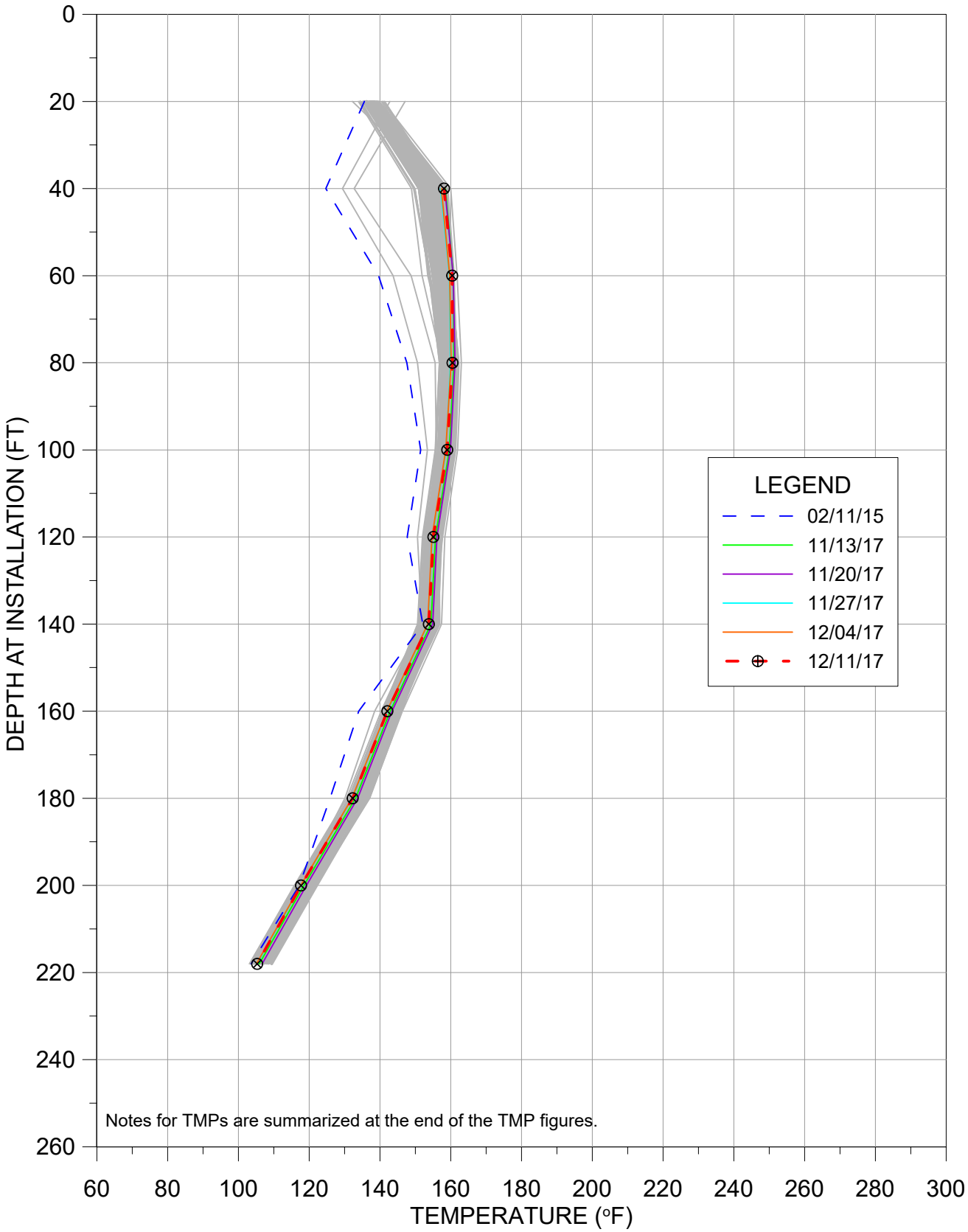
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-3



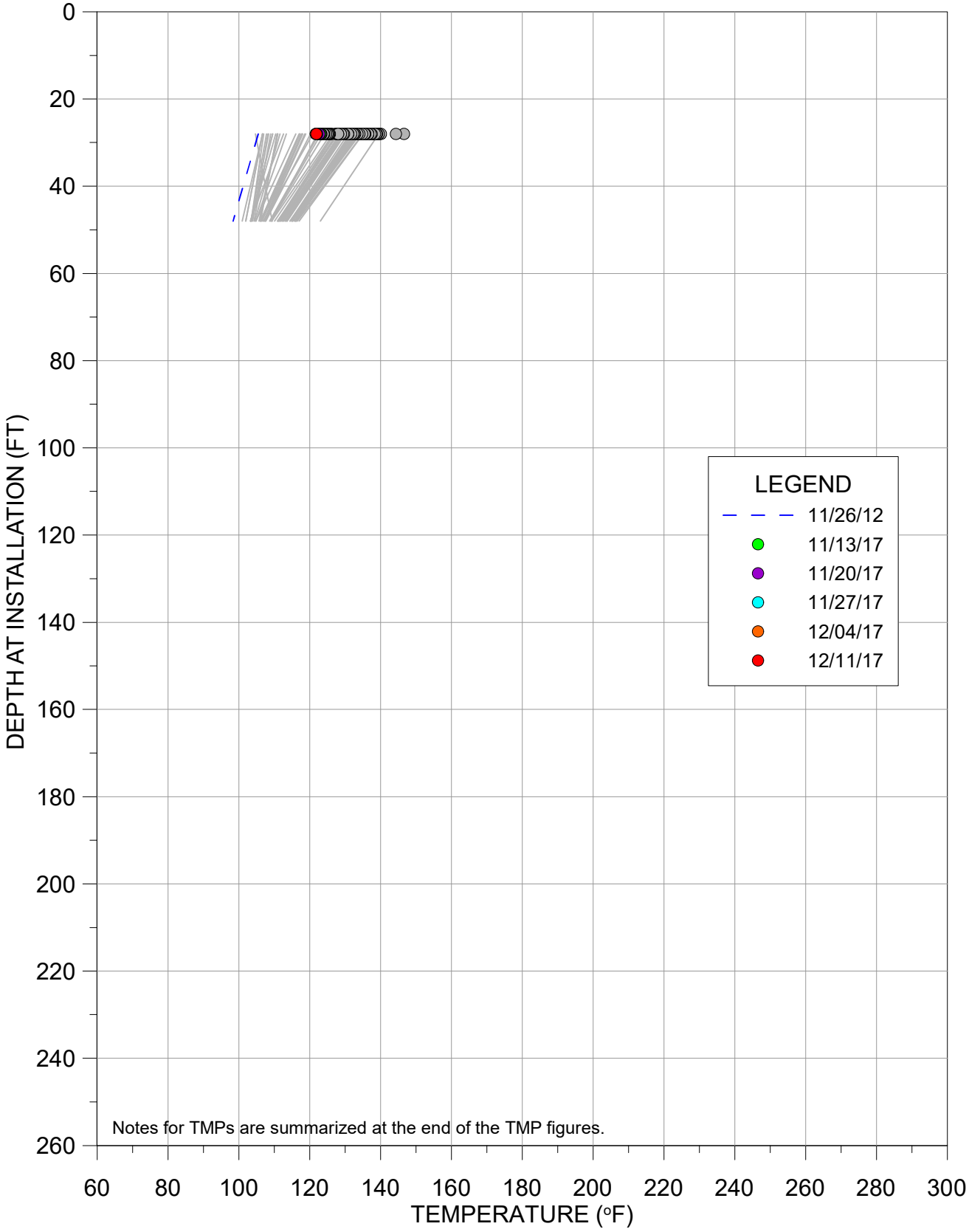
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-3R



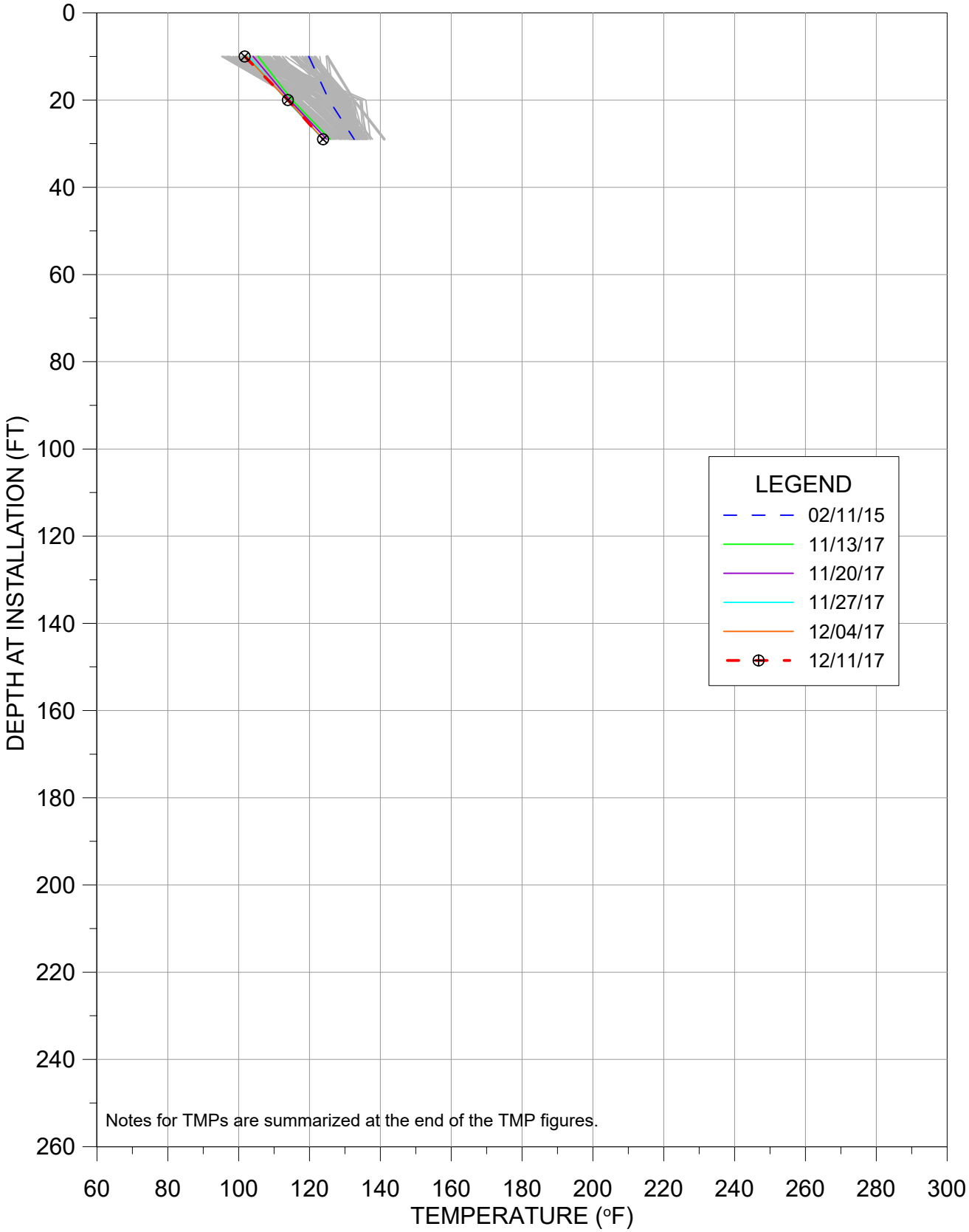
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-4



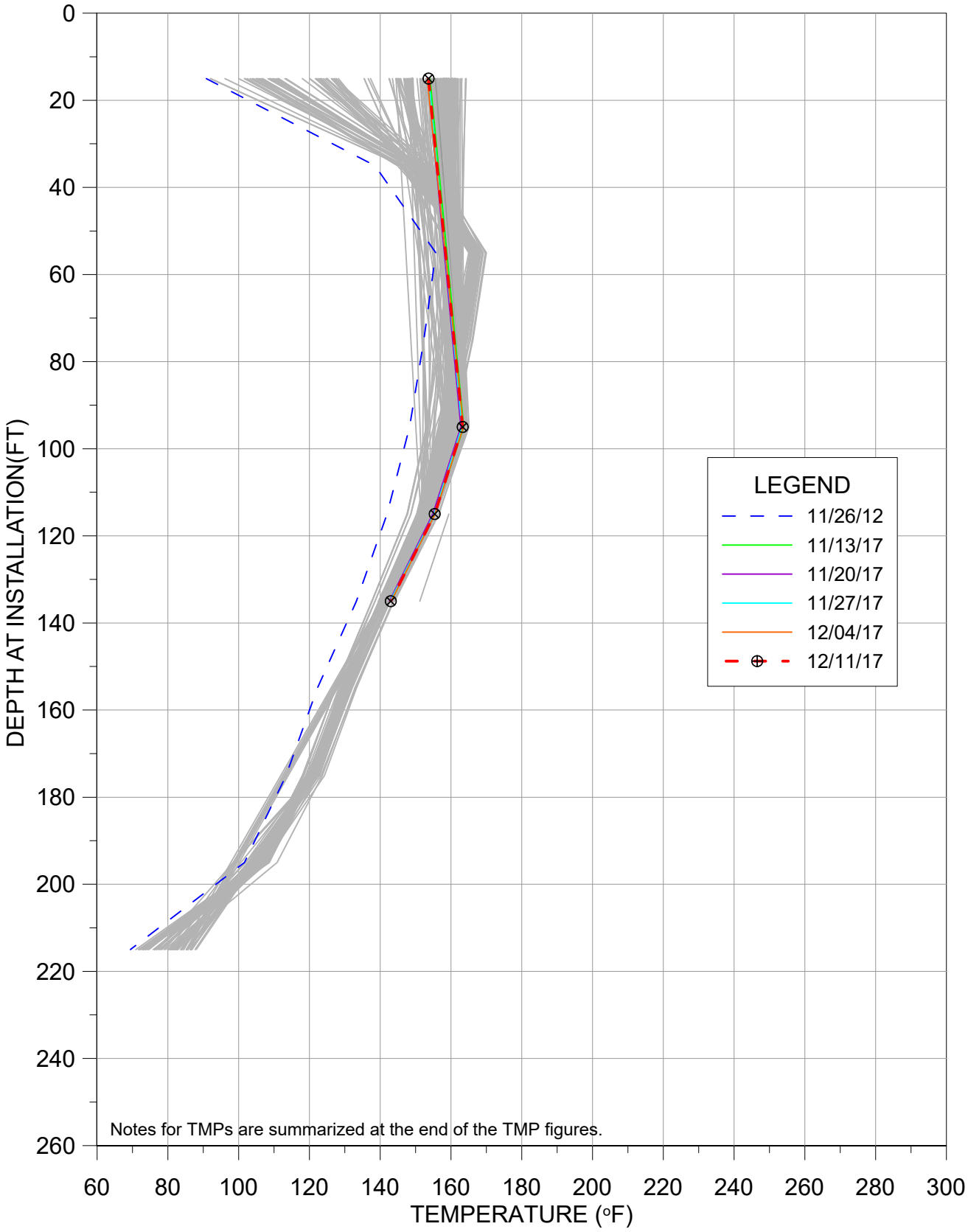
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-4R



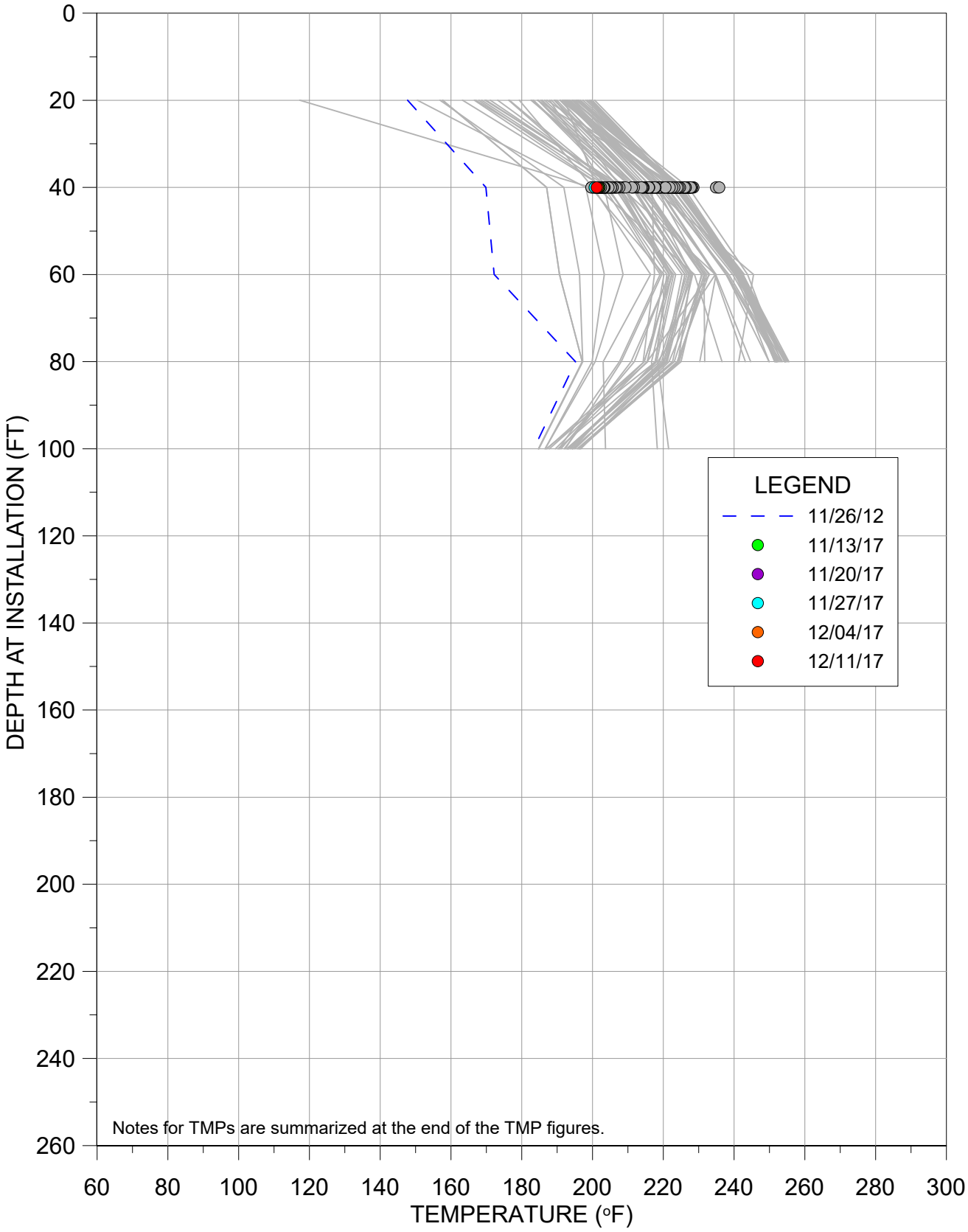
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-6



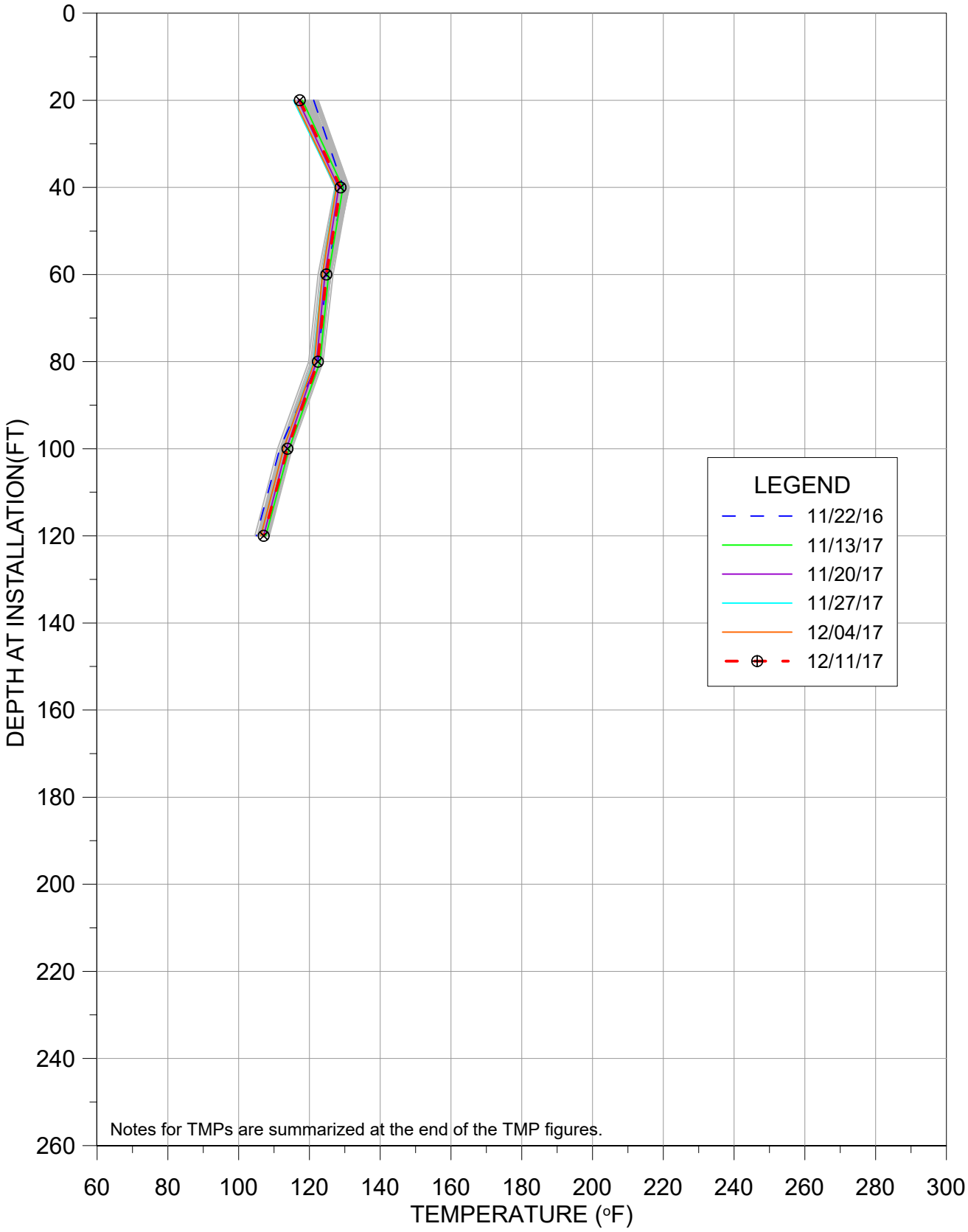
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-9



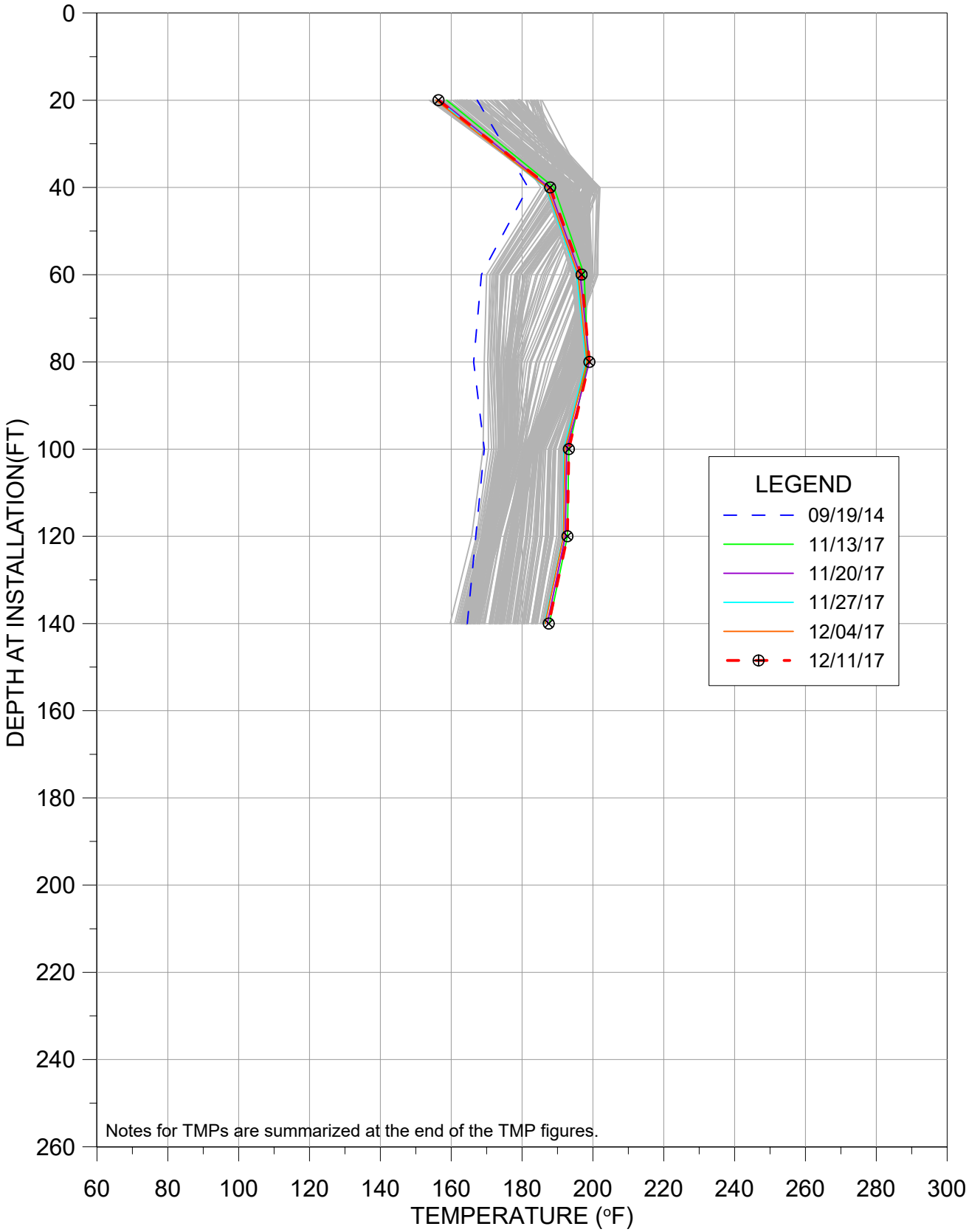
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-11R



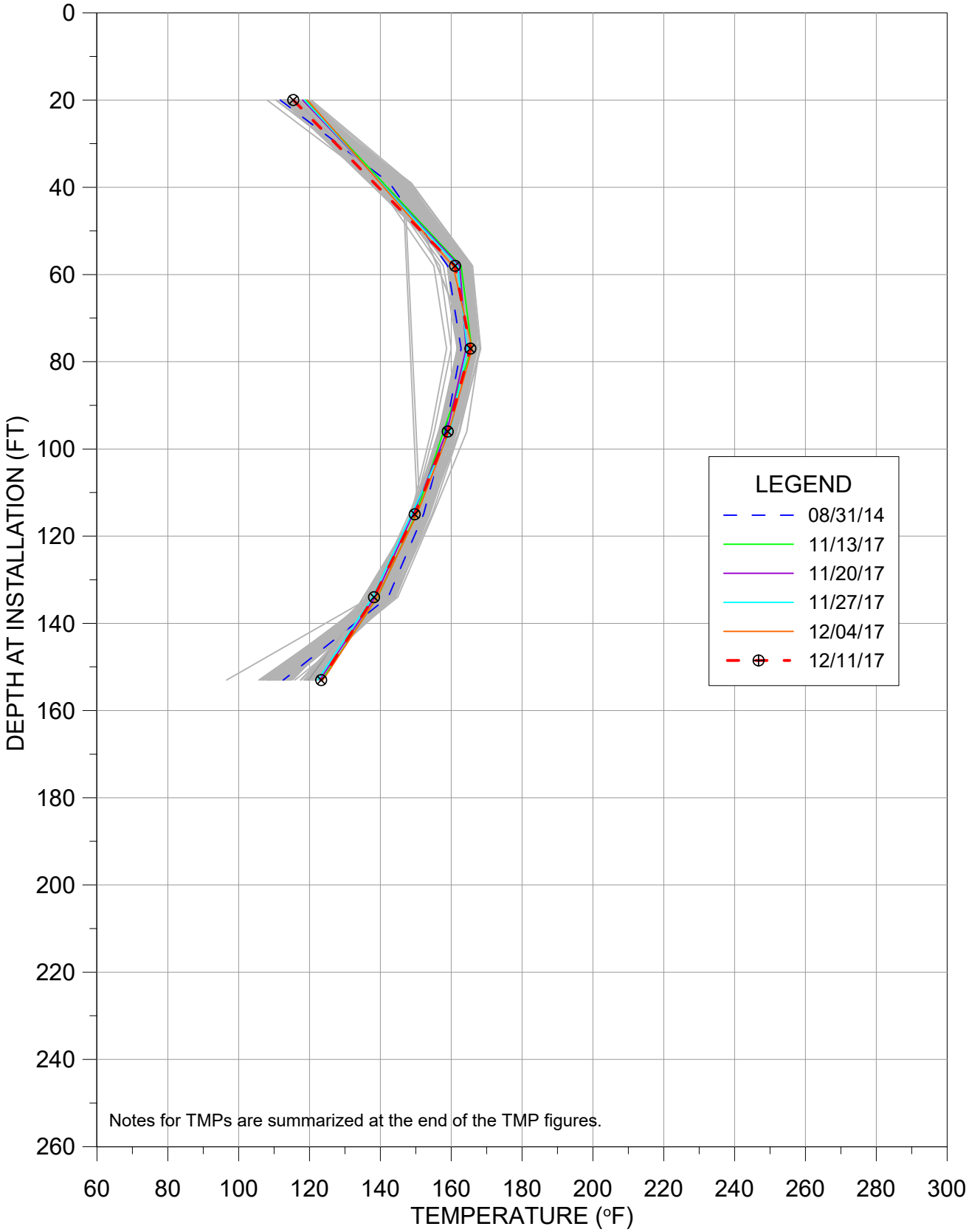
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-14R



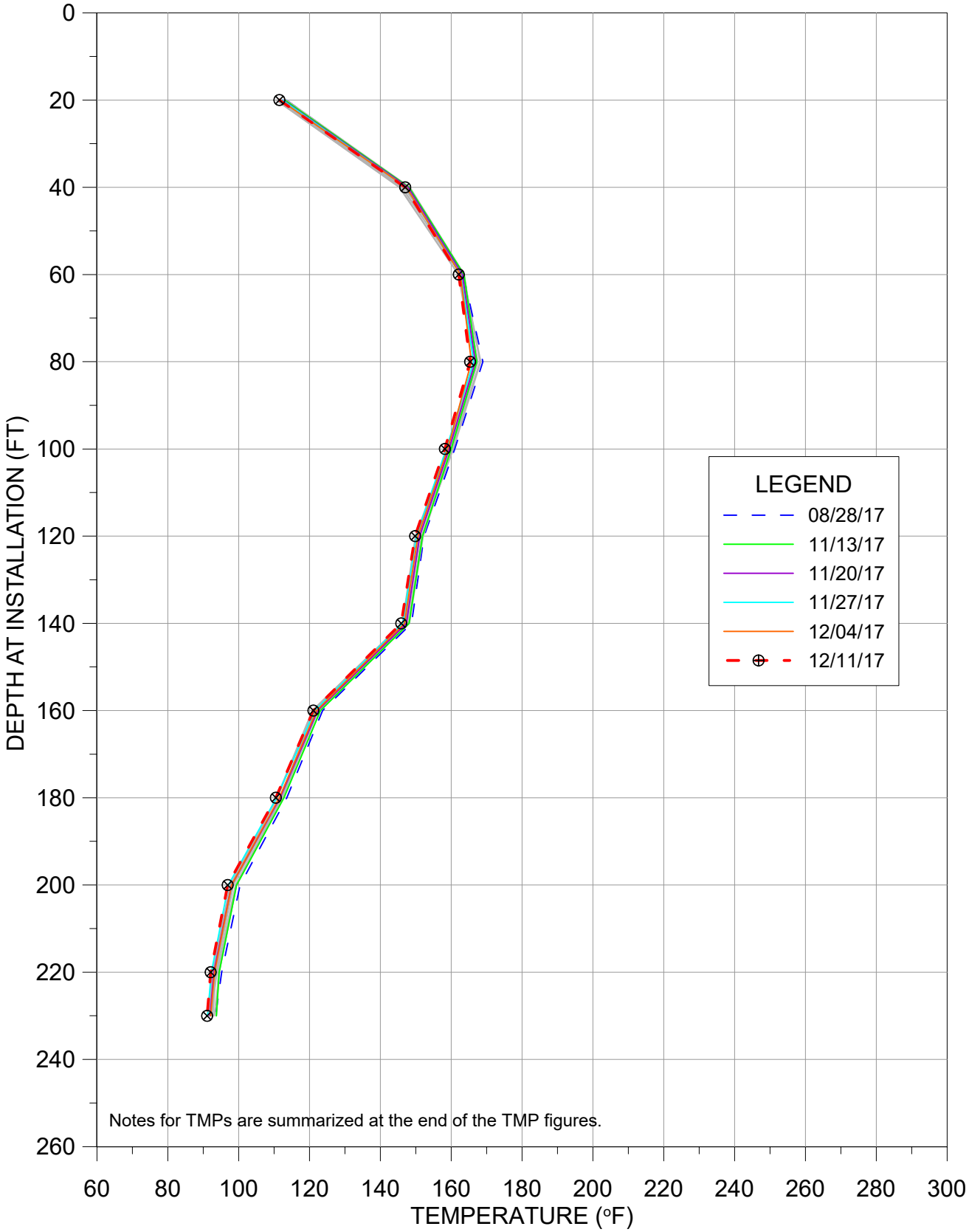
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-16



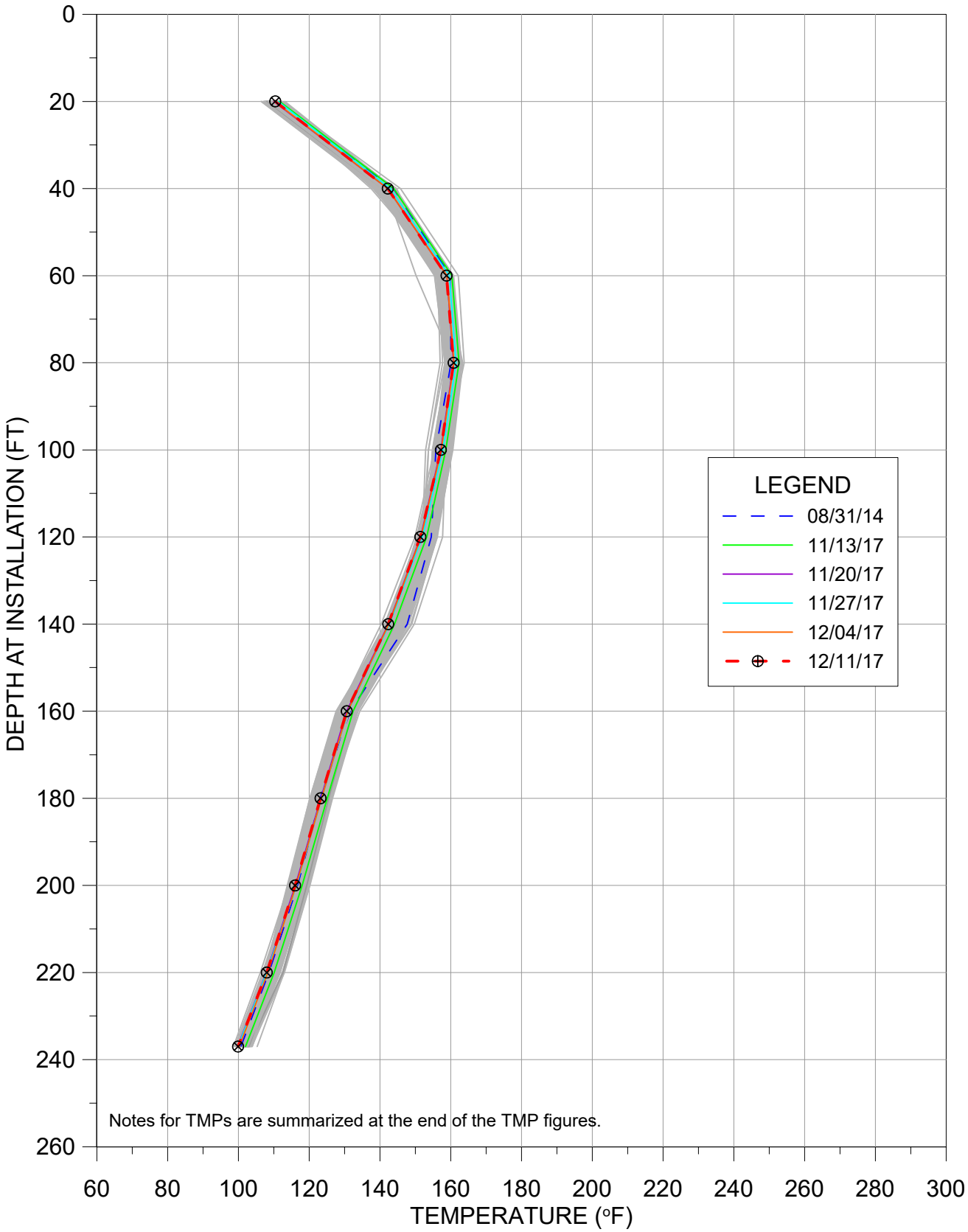
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-16R



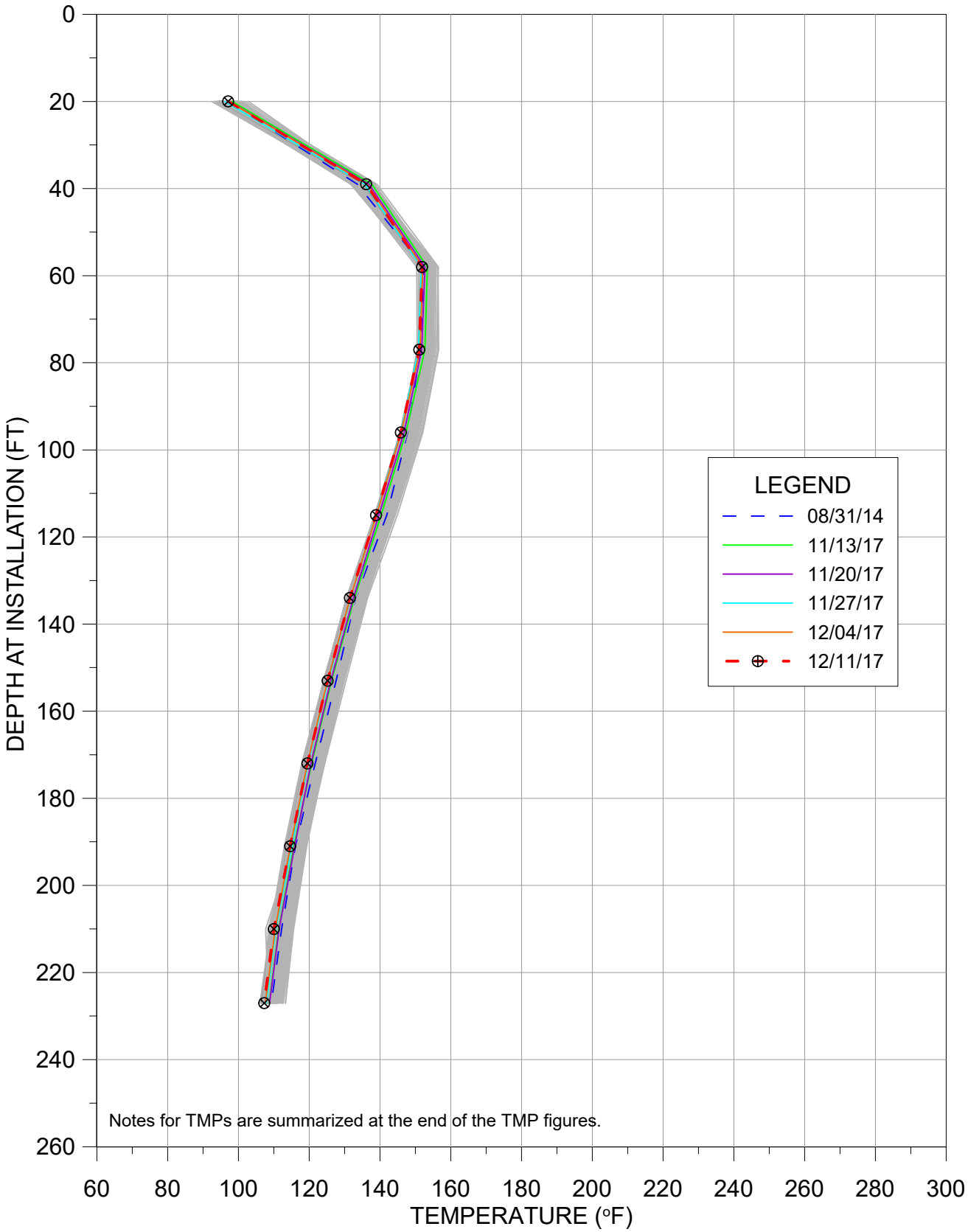
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-17



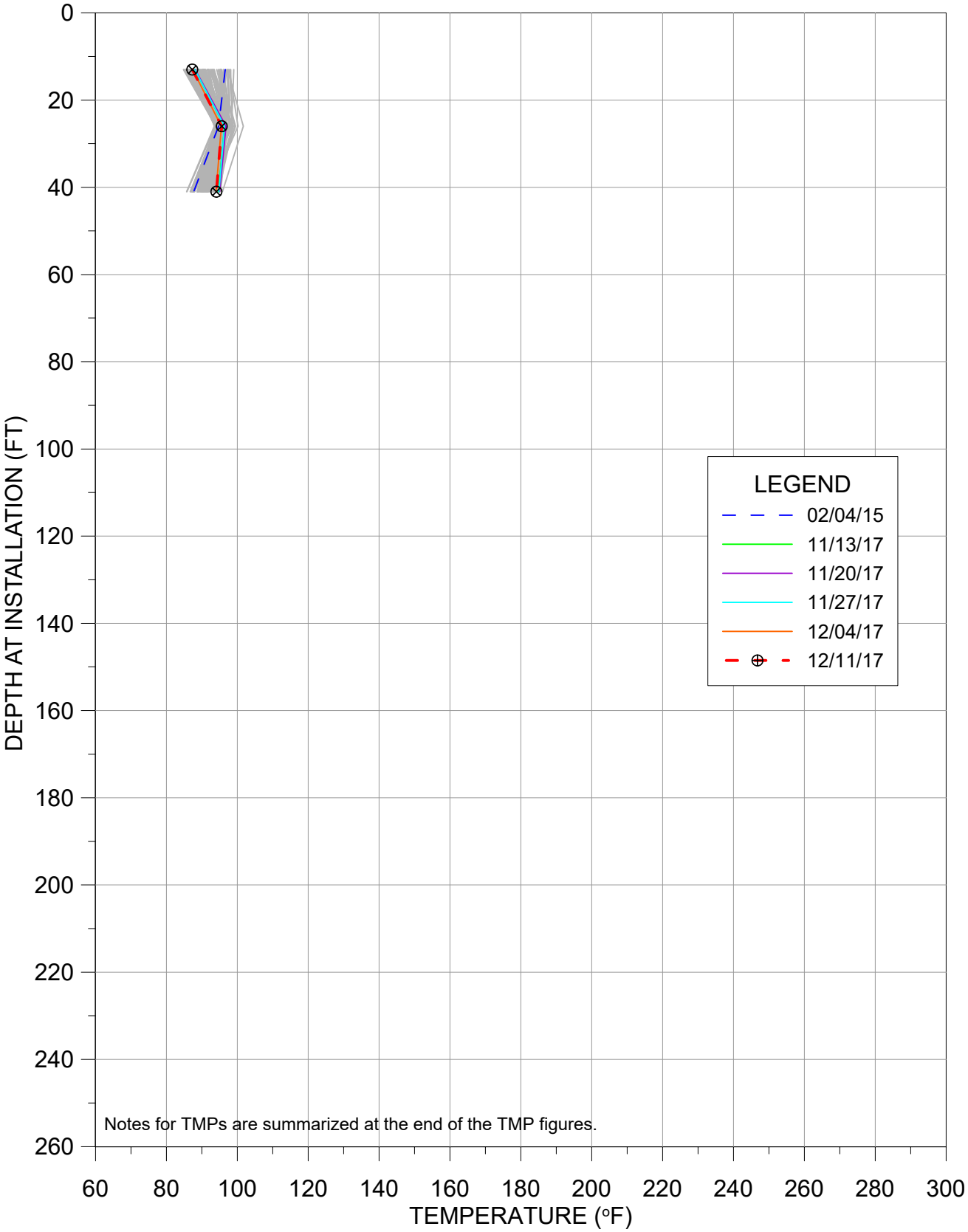
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-18



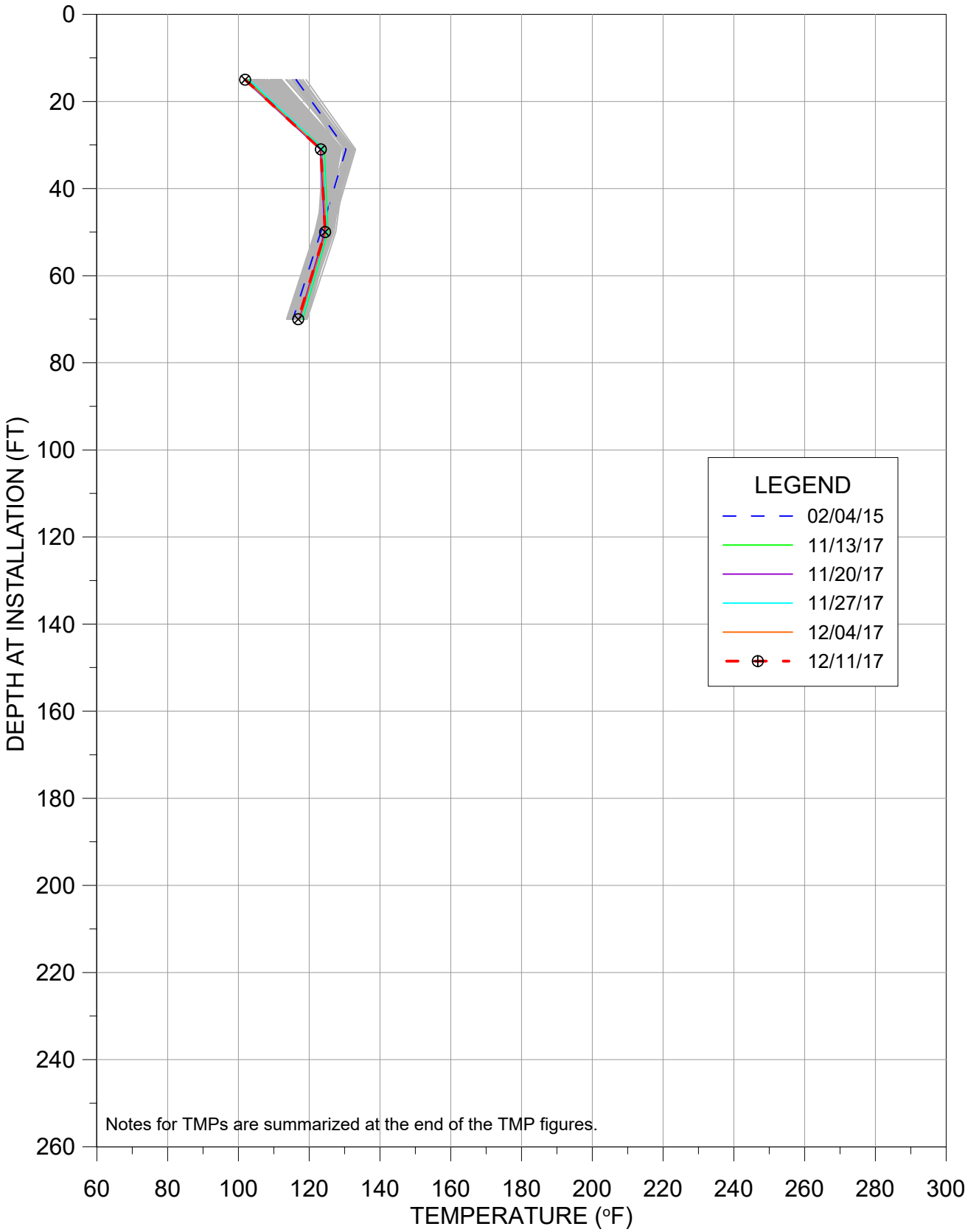
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-21



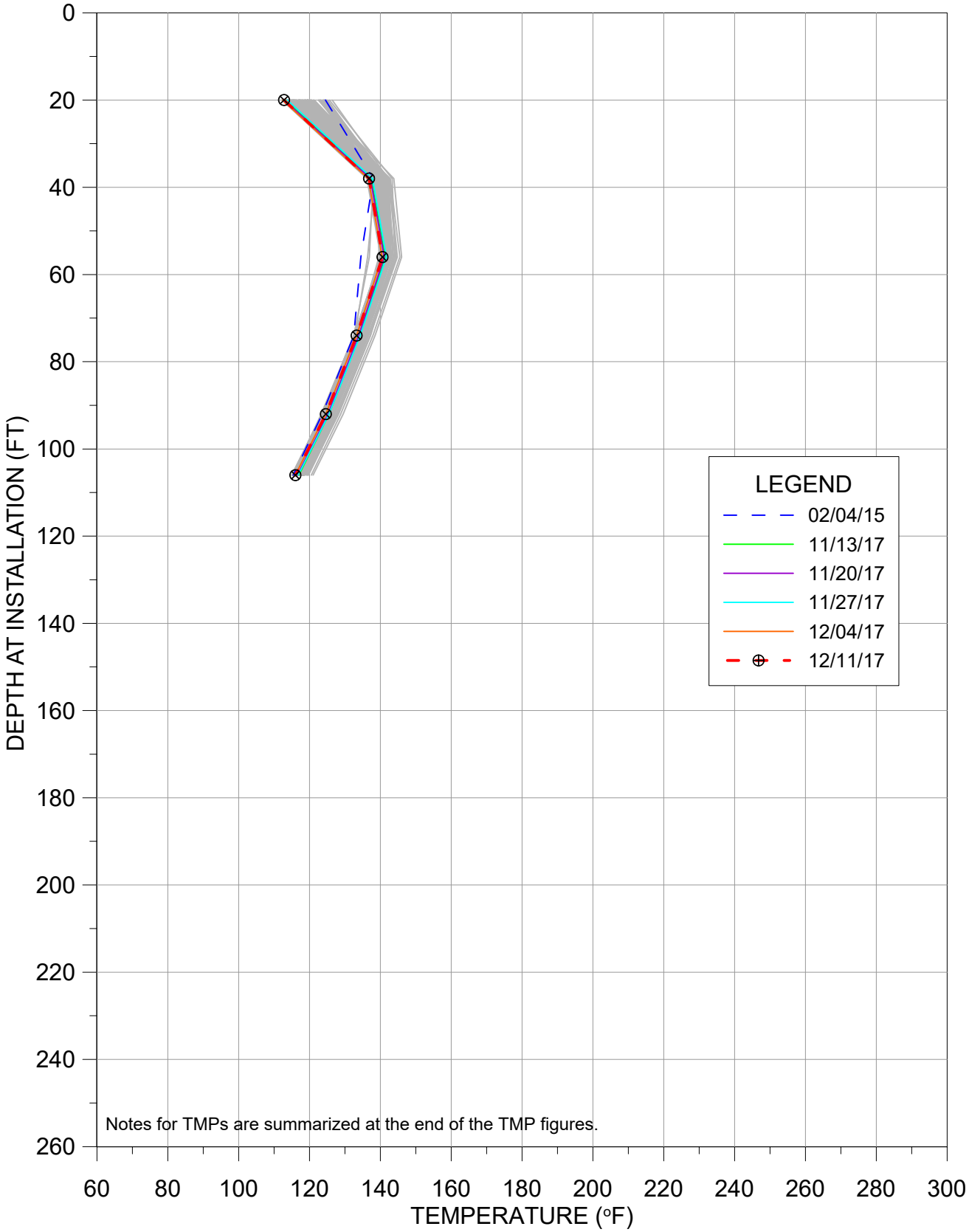
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-22



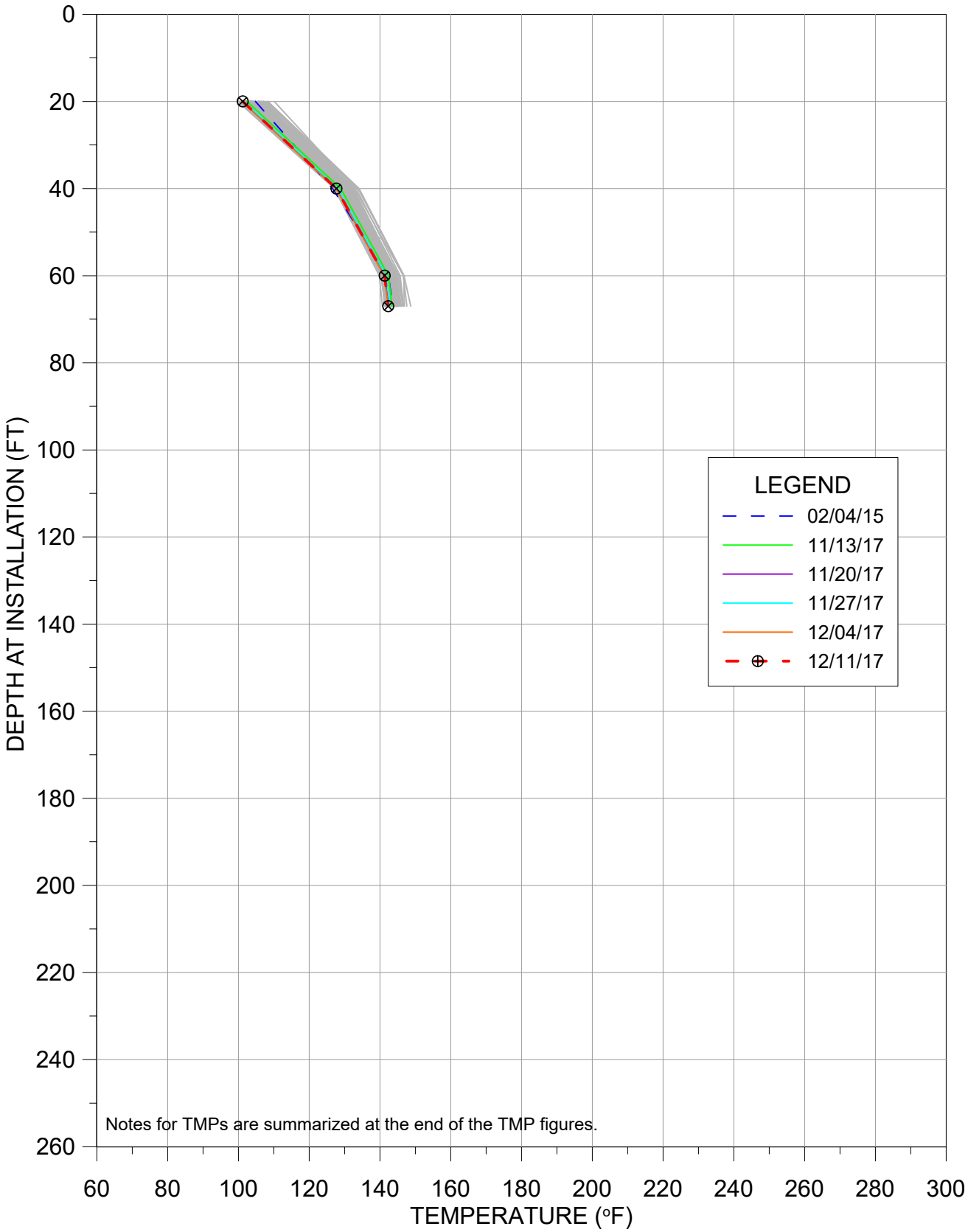
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-23



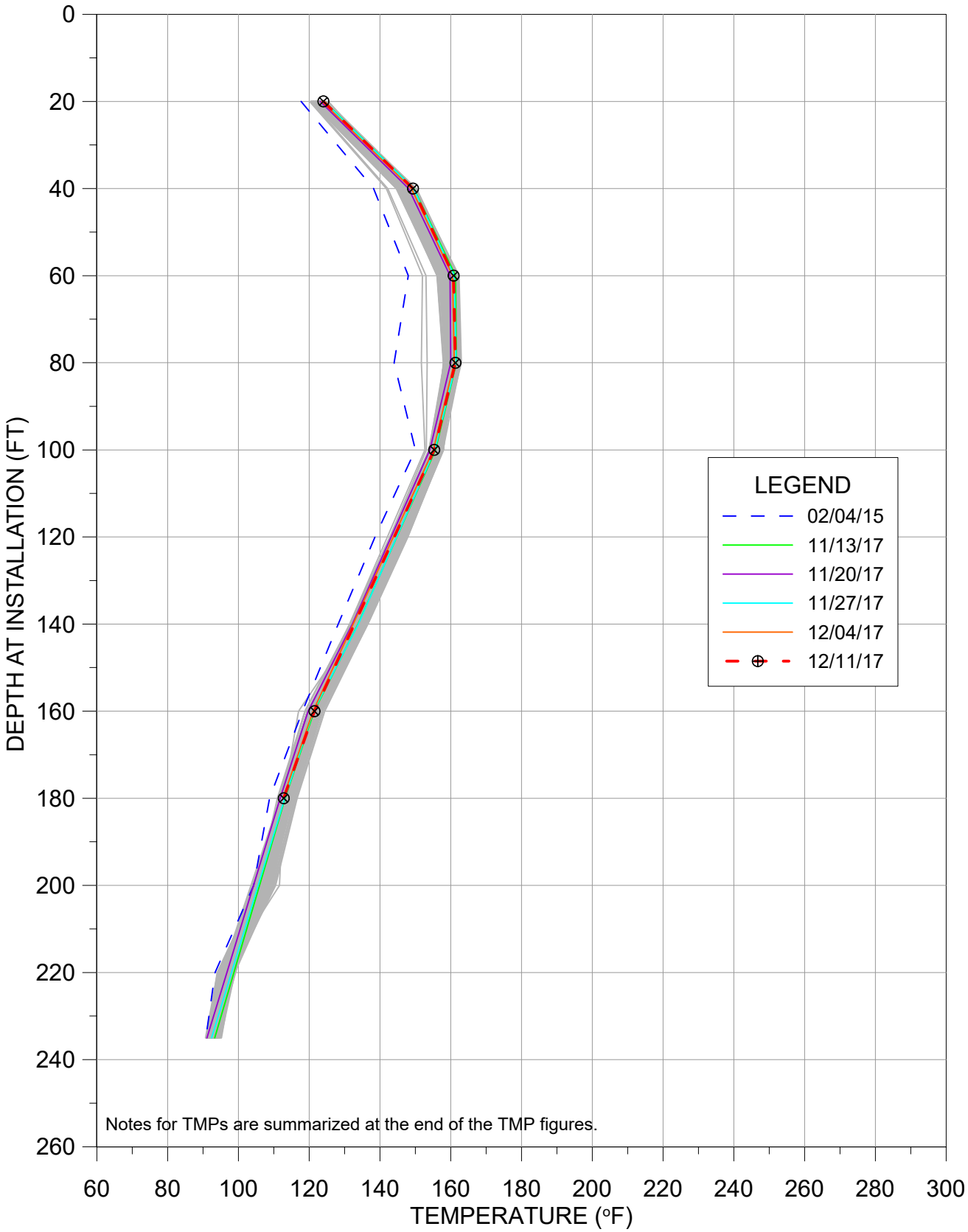
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-24



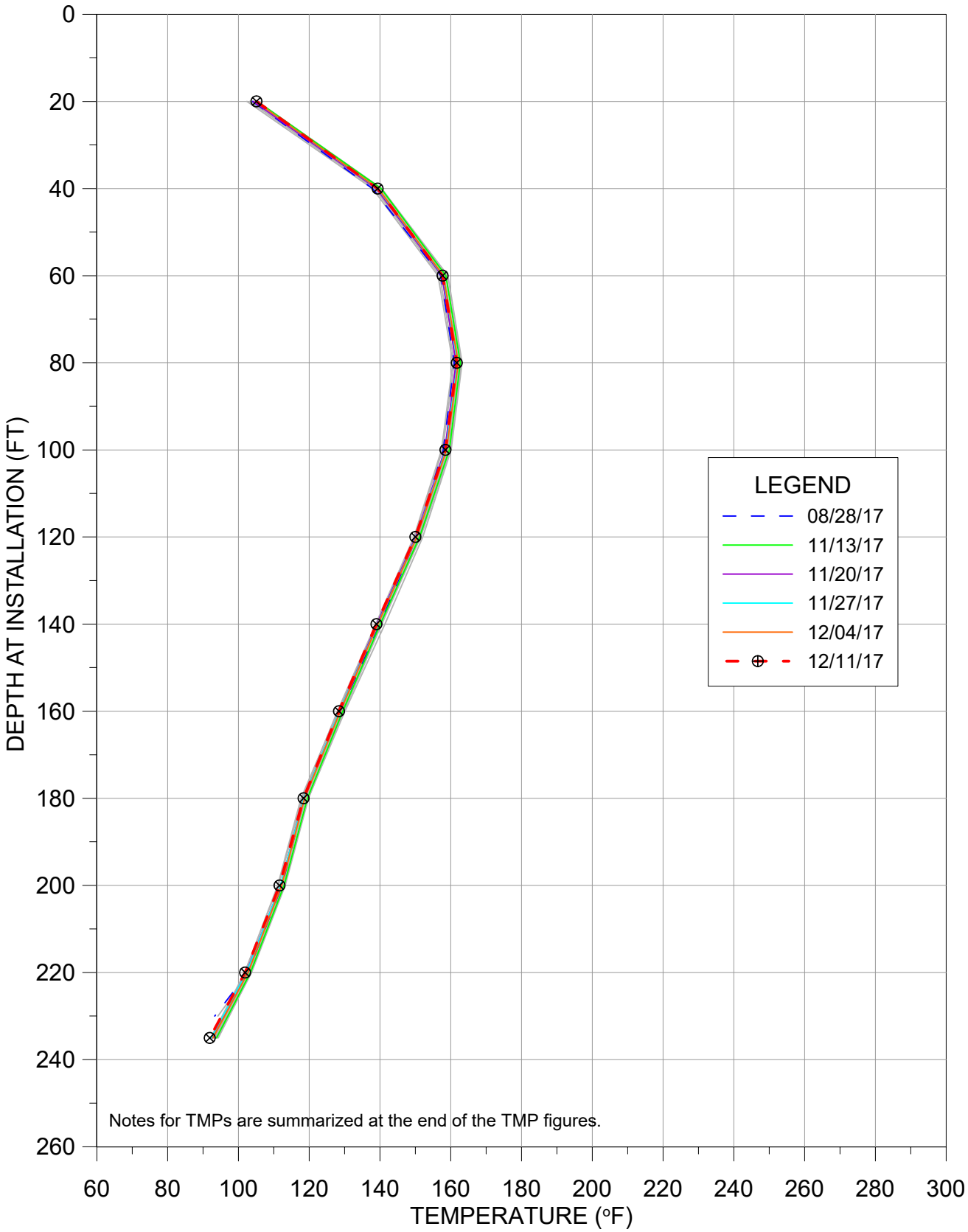
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-25



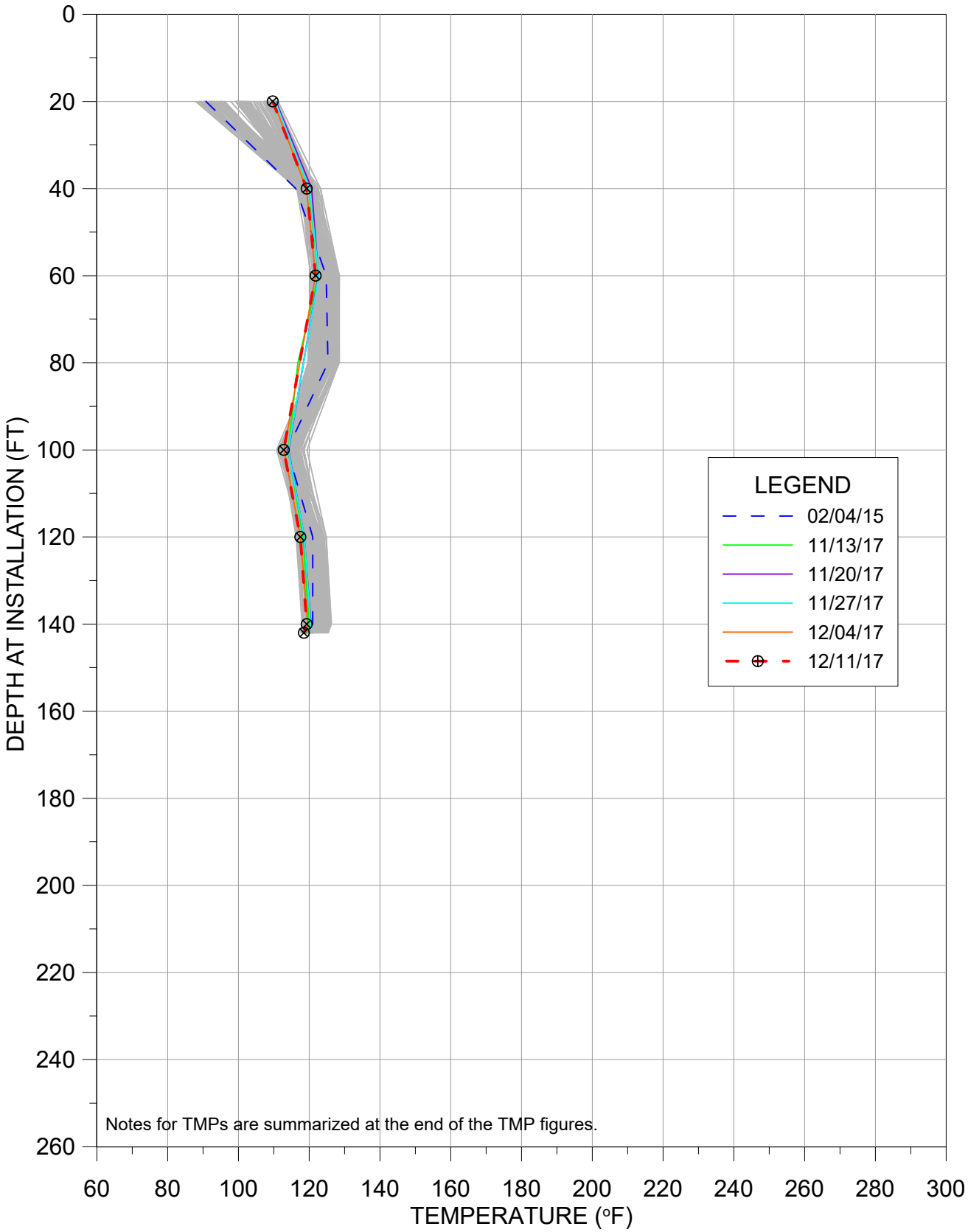
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-25R



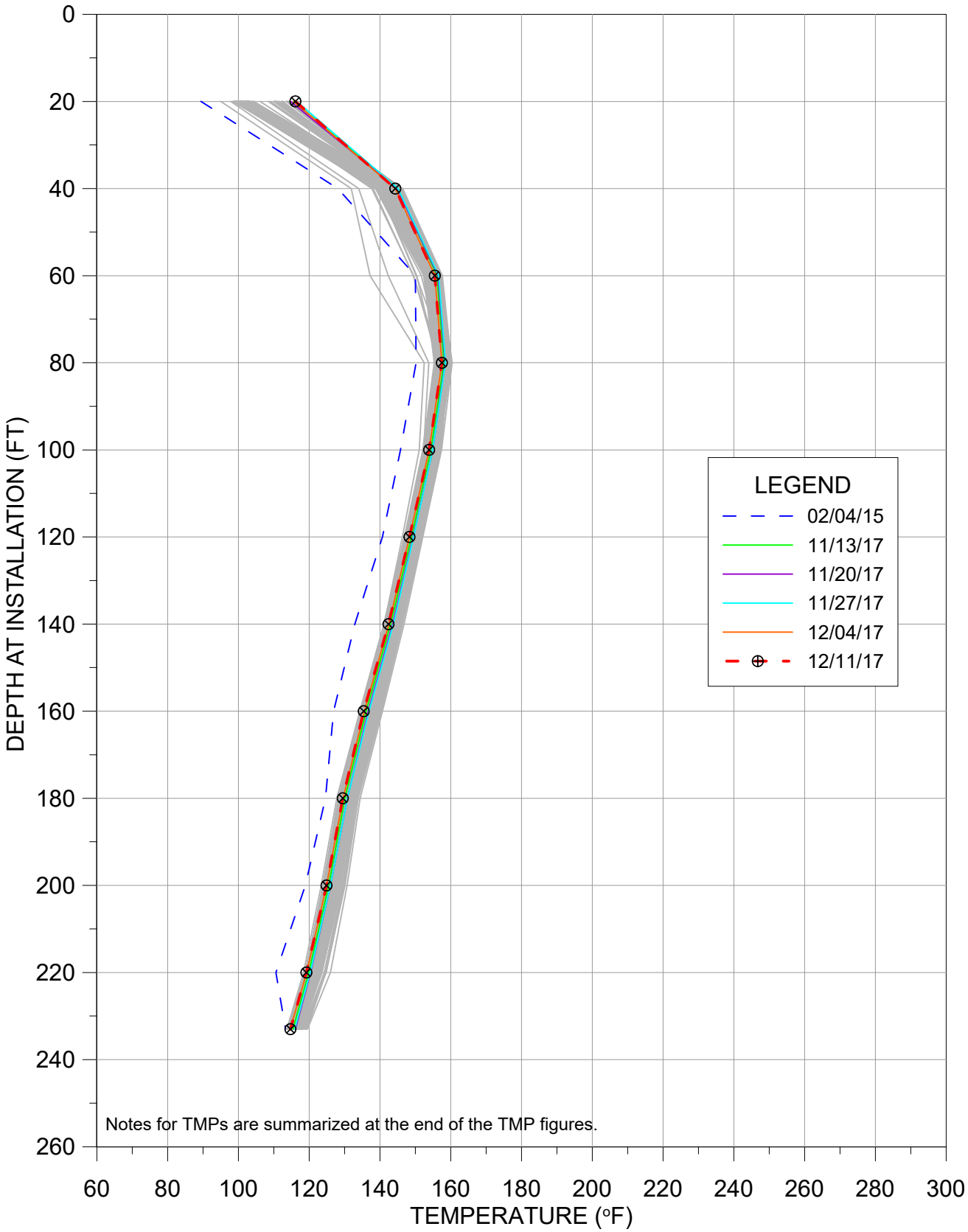
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-26



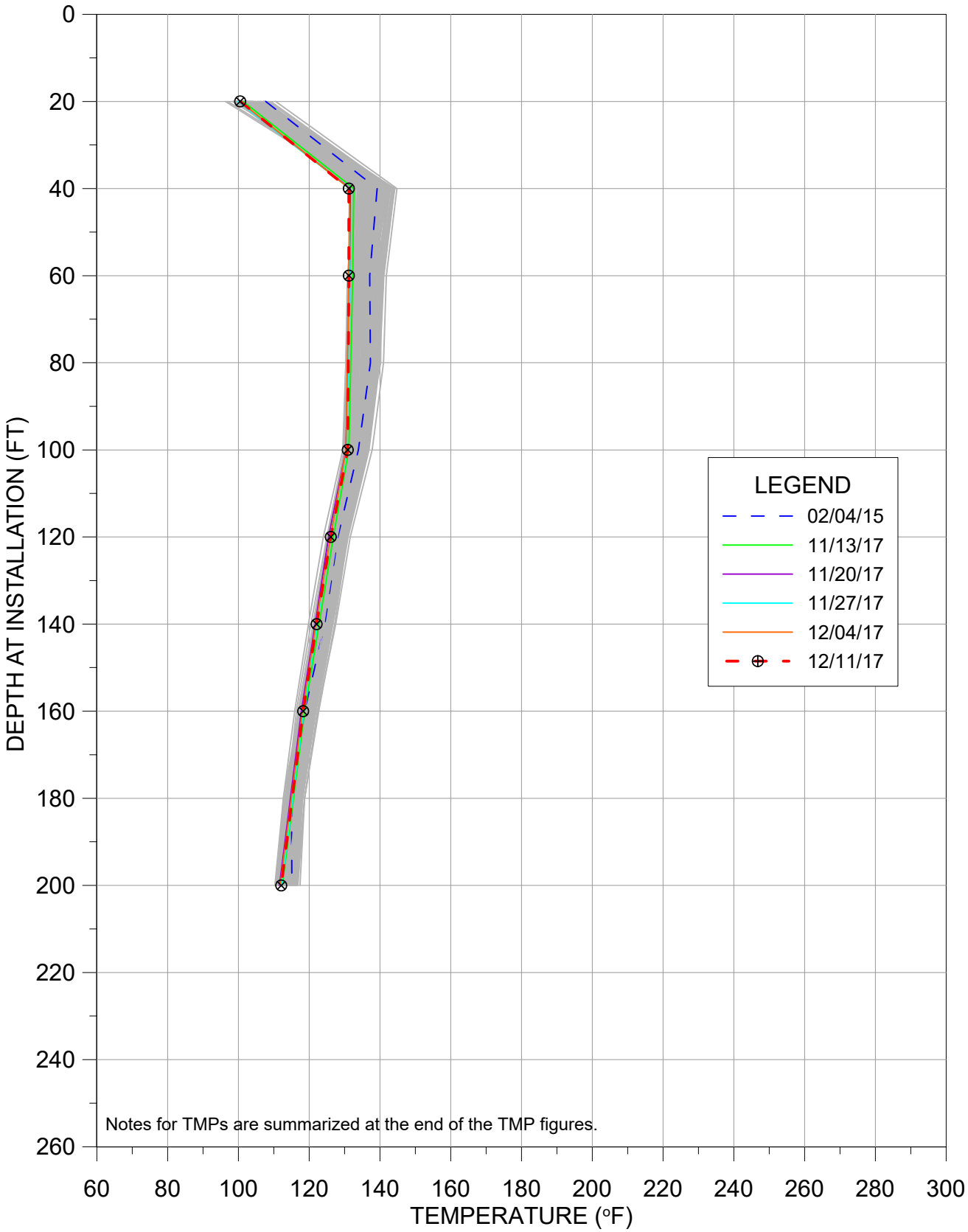
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-27



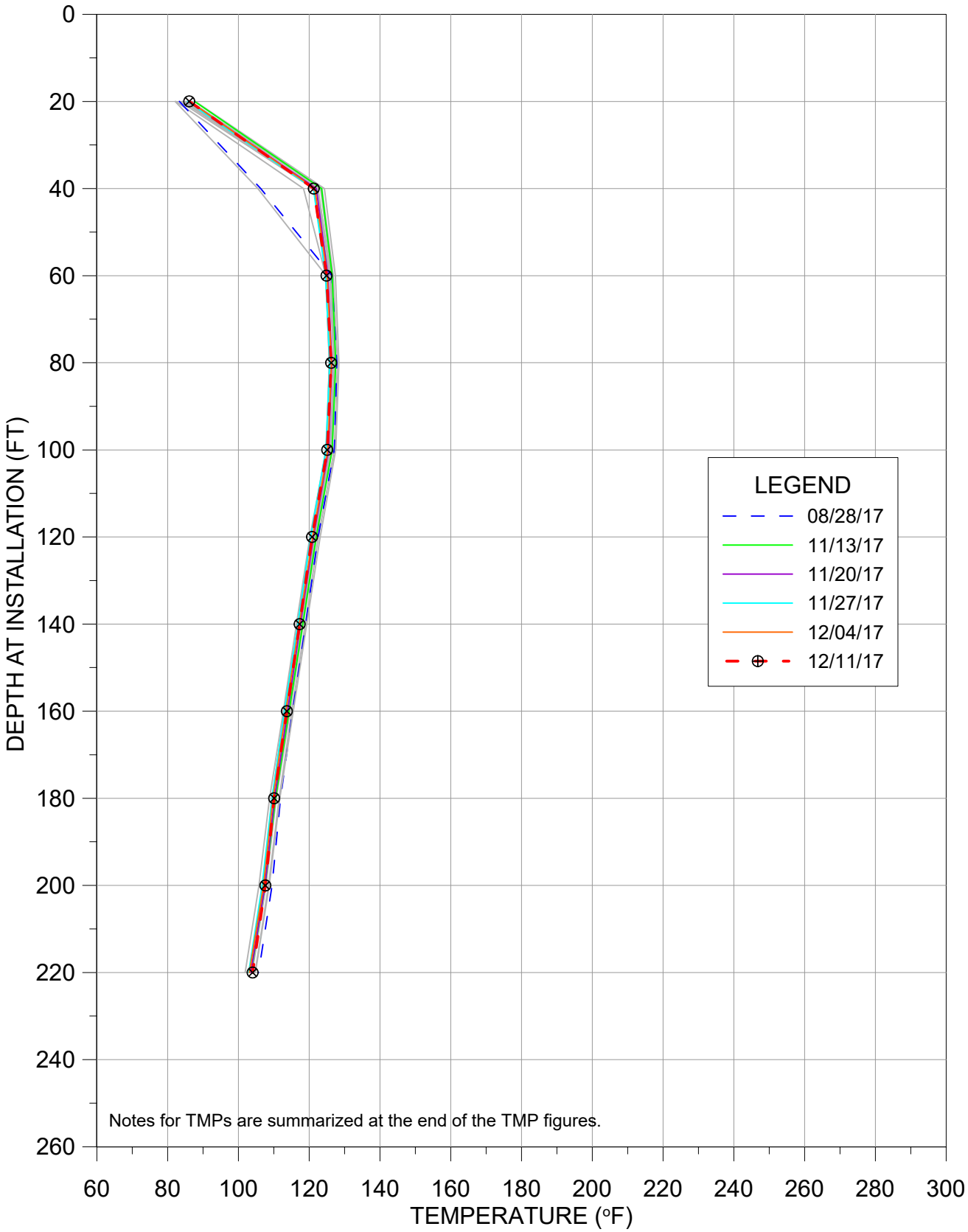
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-28



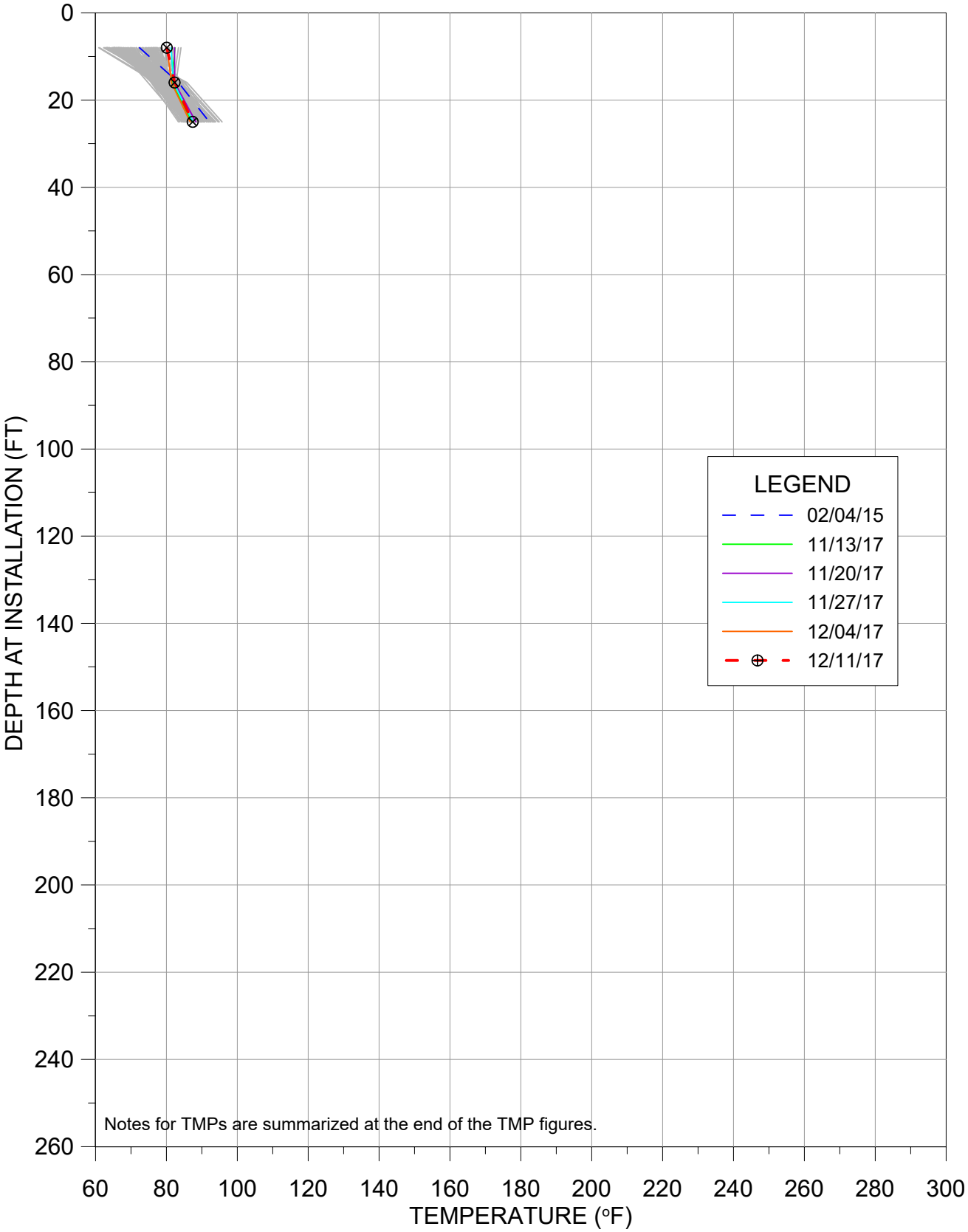
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-28R



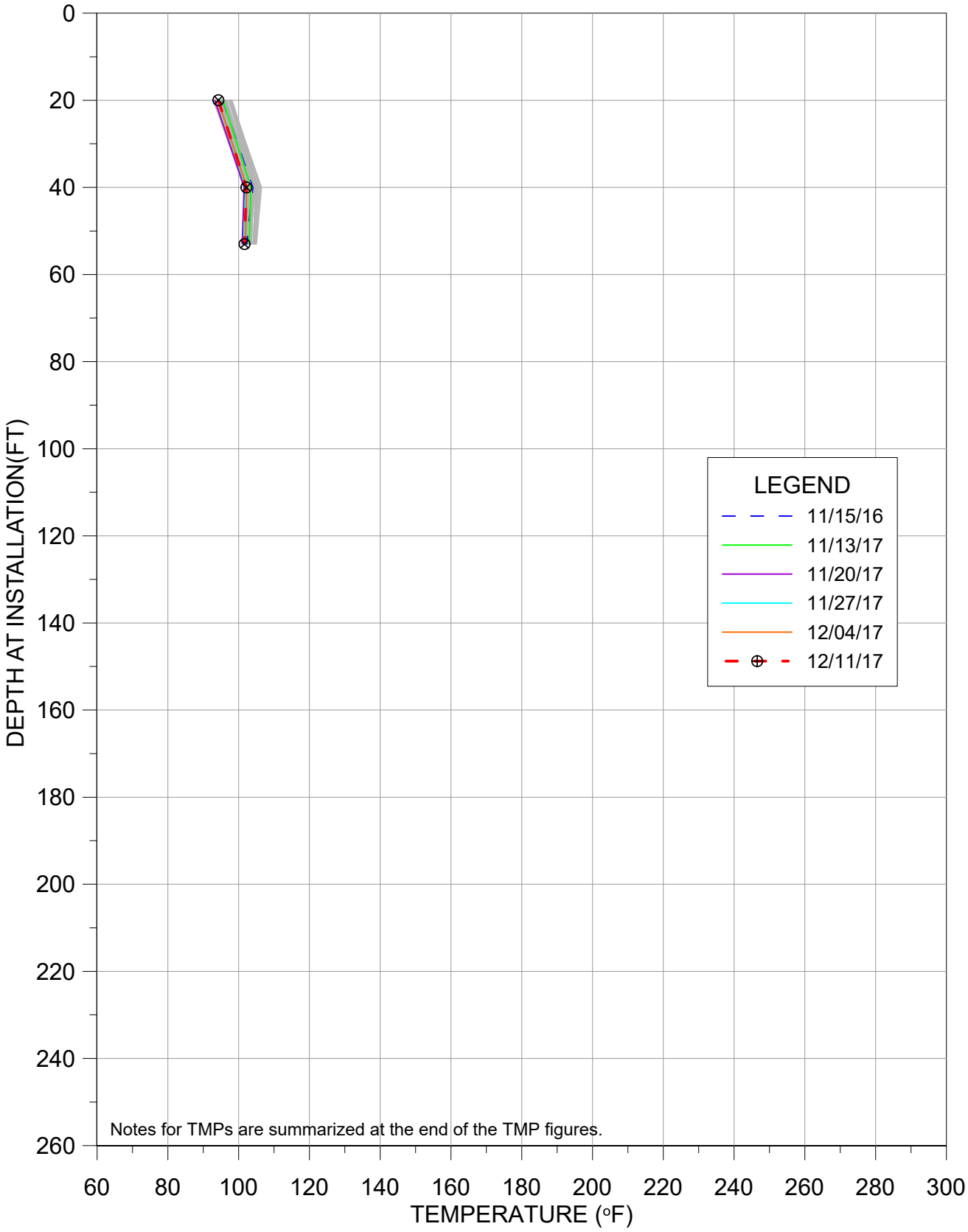
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-29



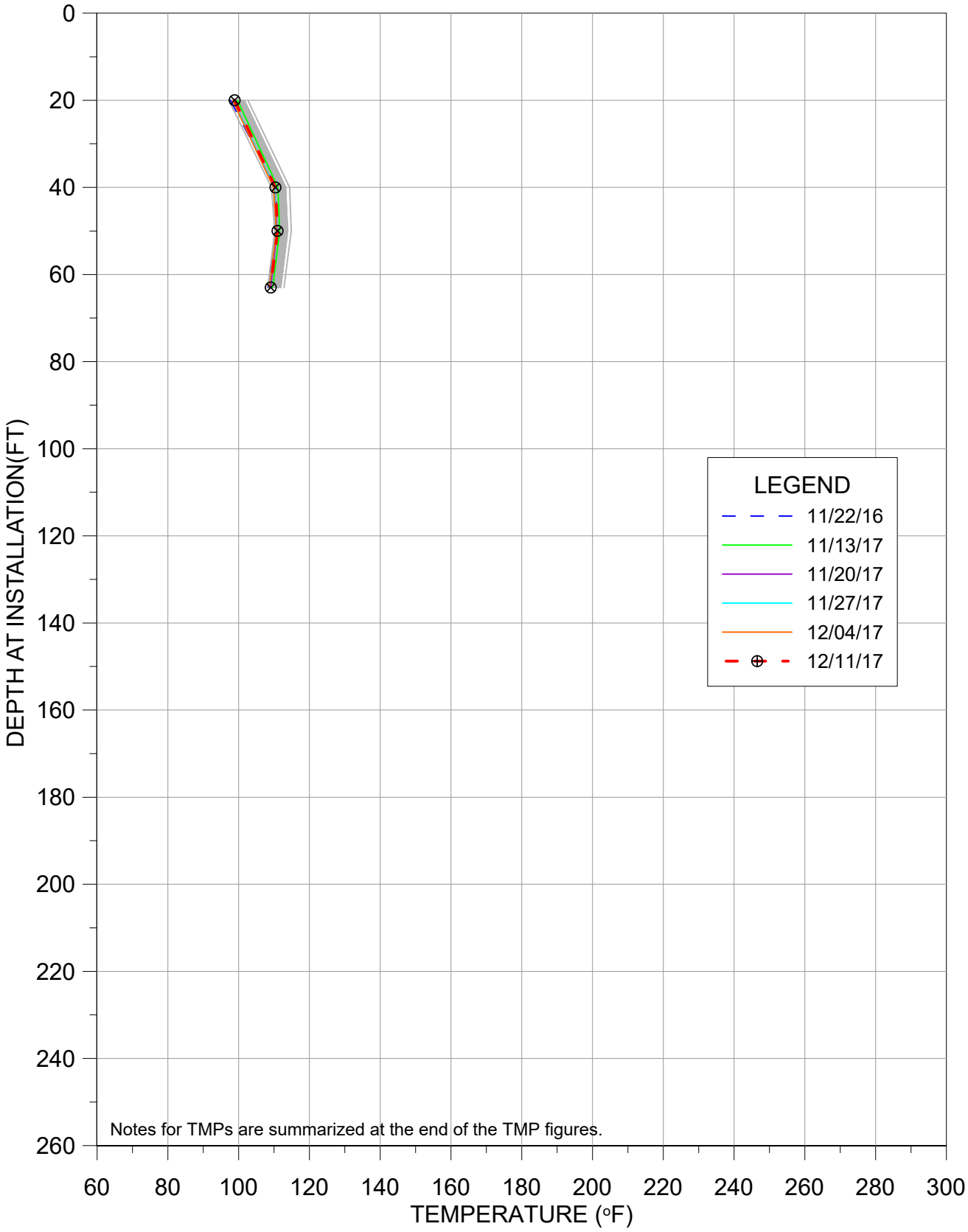
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-33



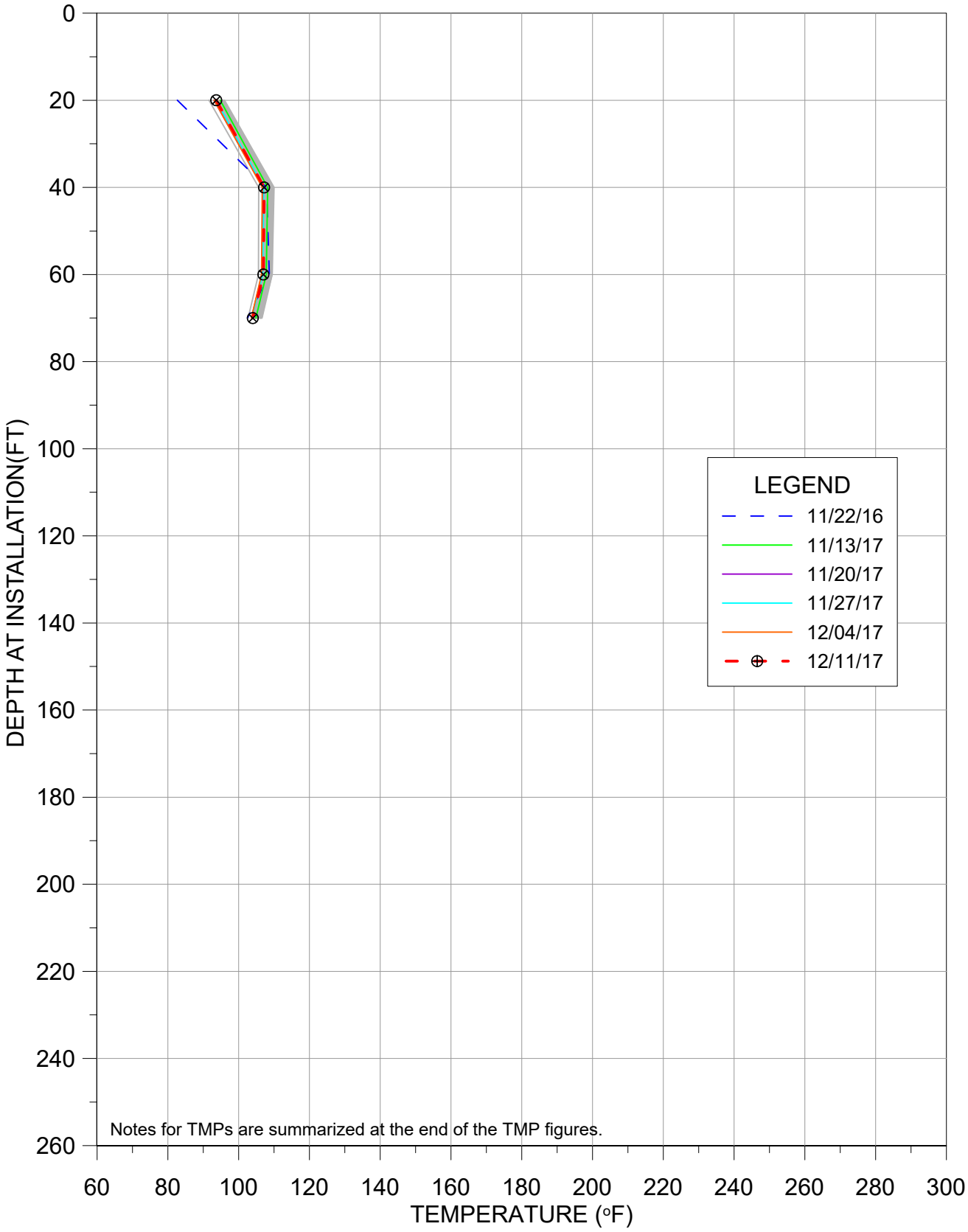
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-34



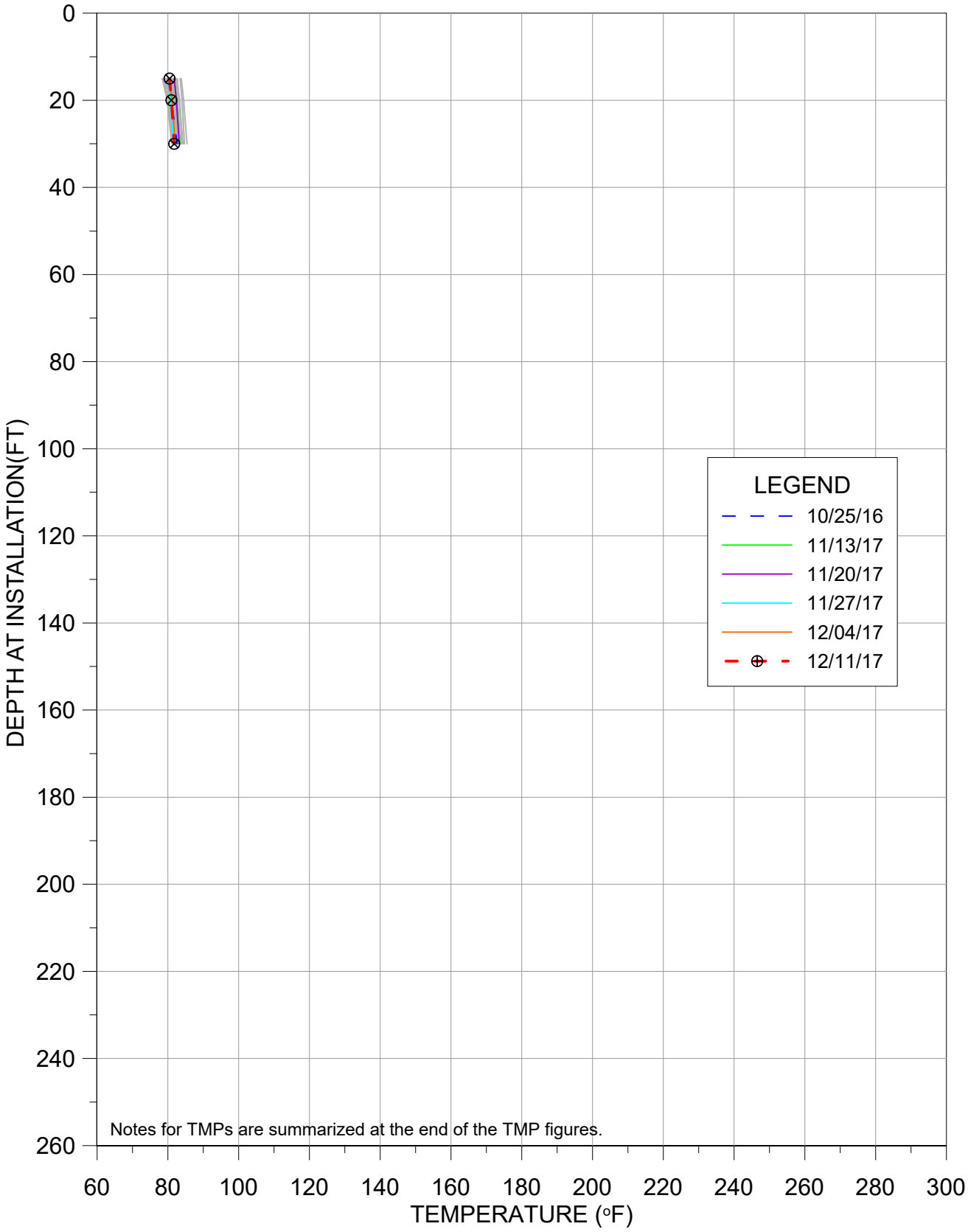
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-35



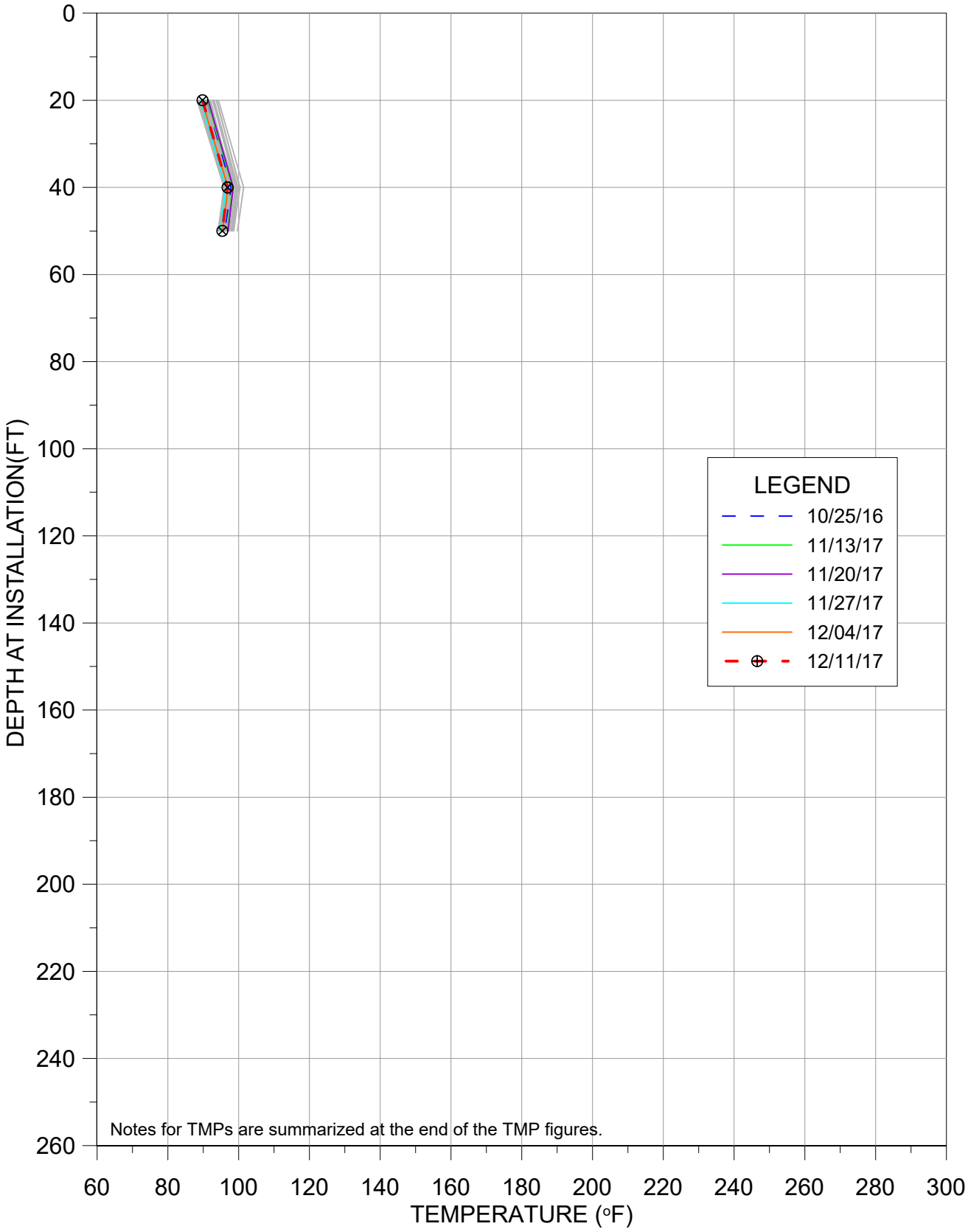
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-36



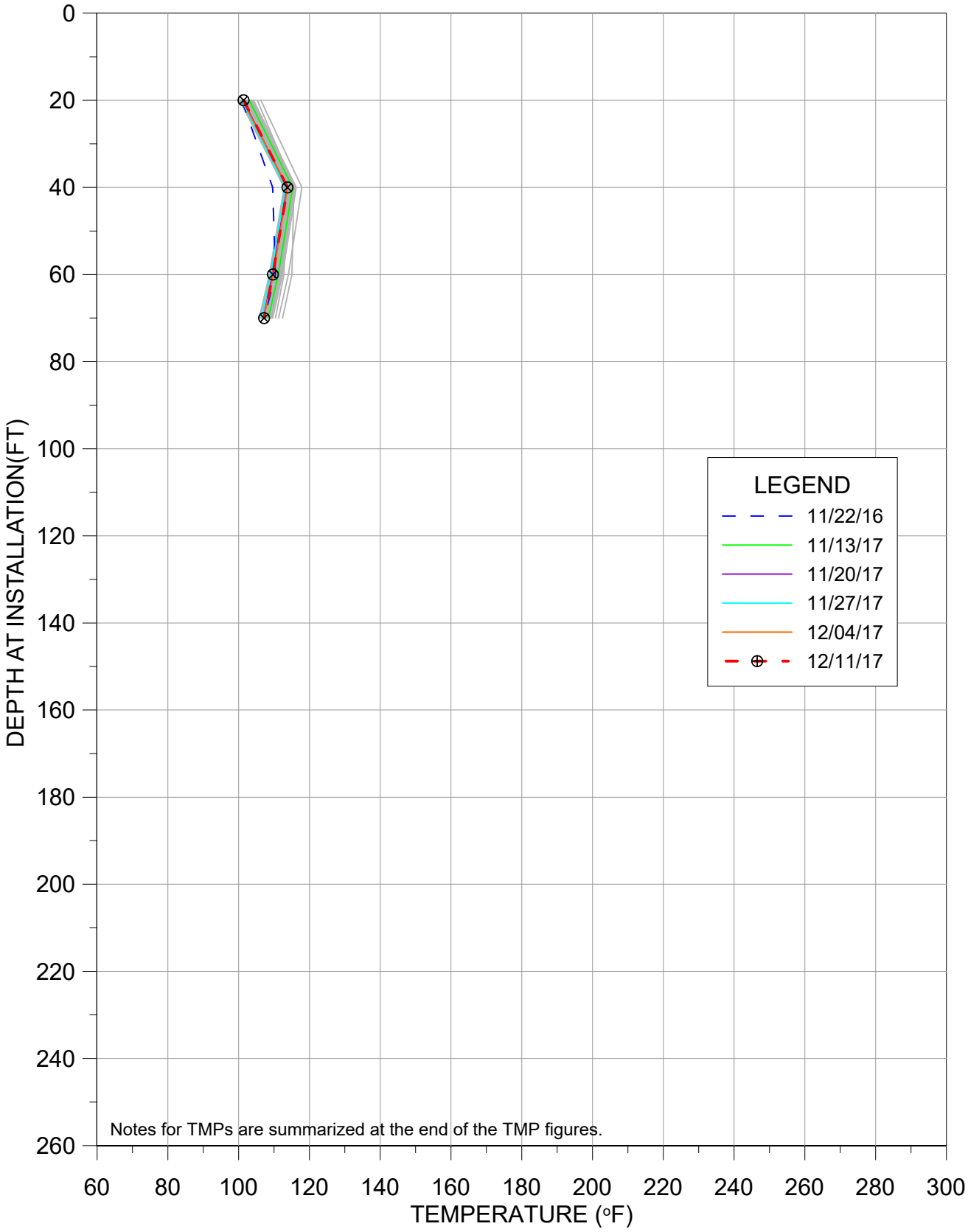
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-37



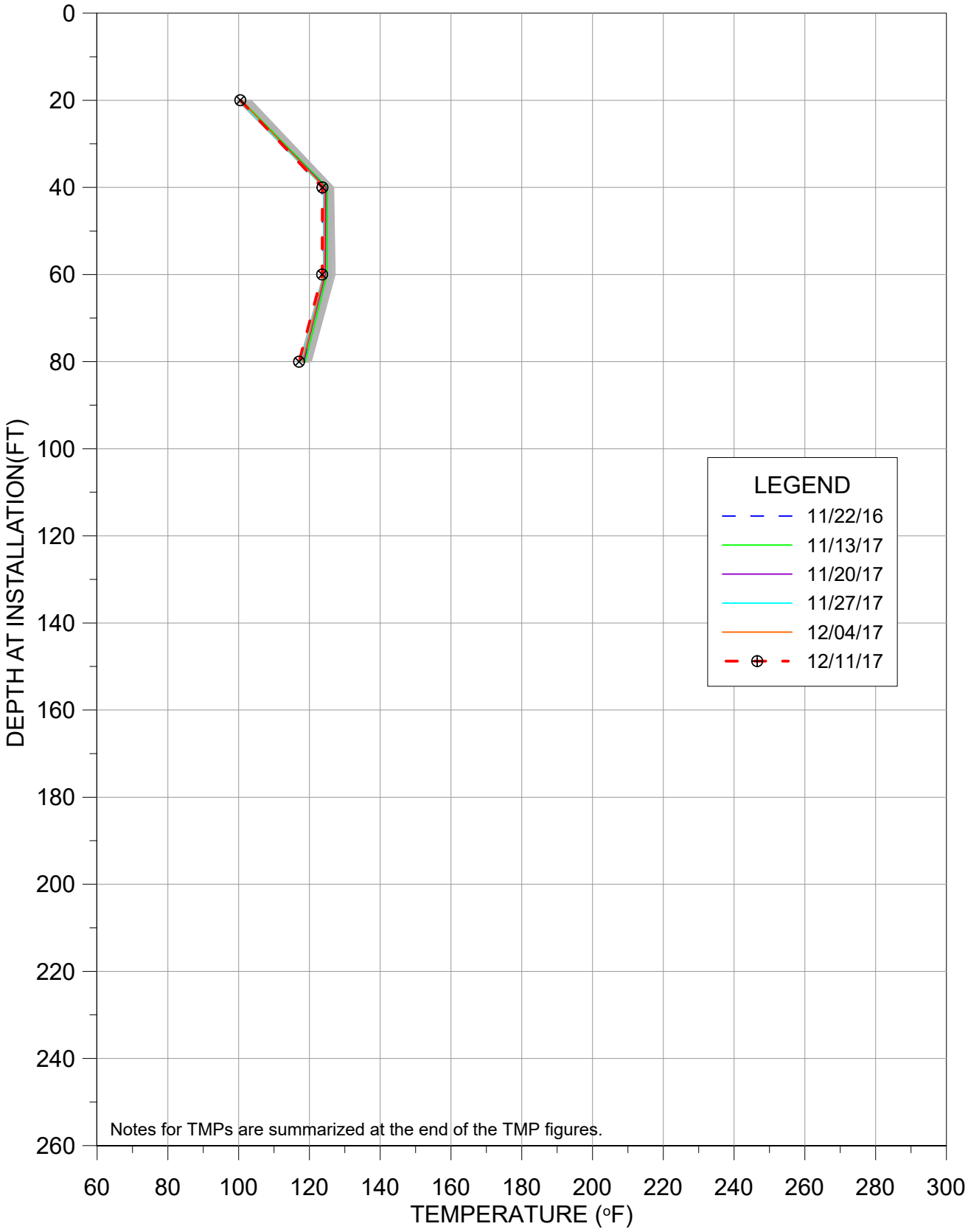
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-38



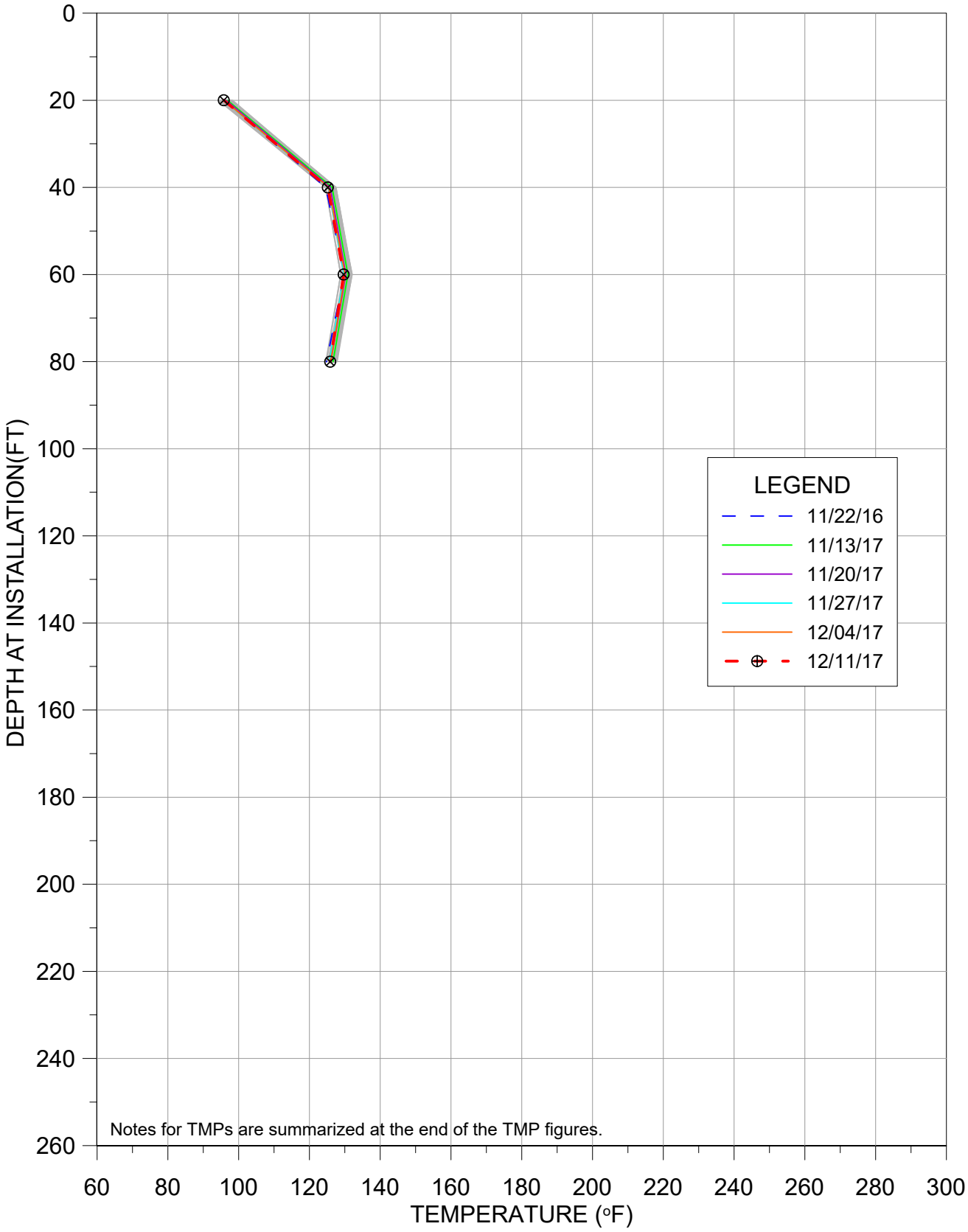
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-39



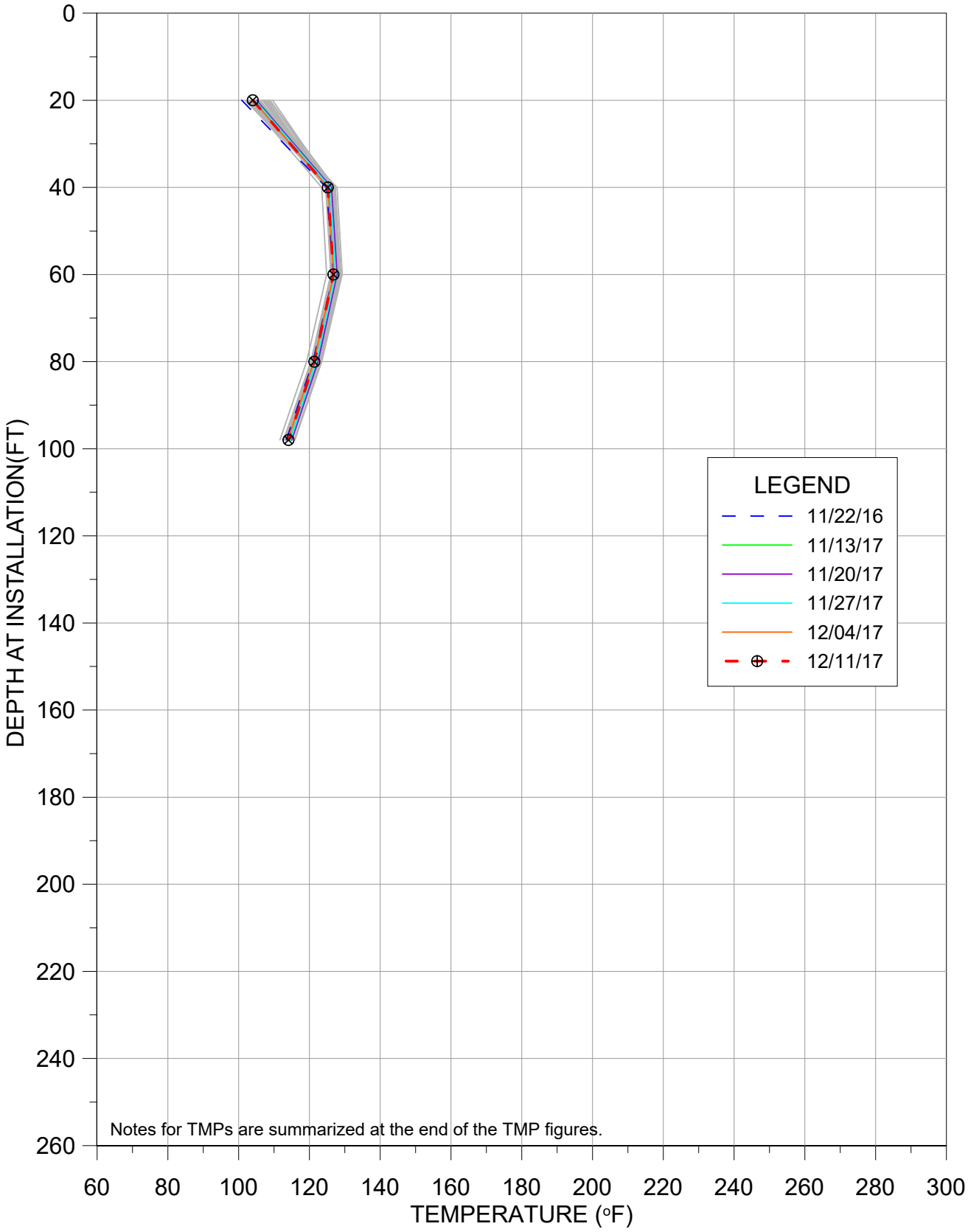
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-40



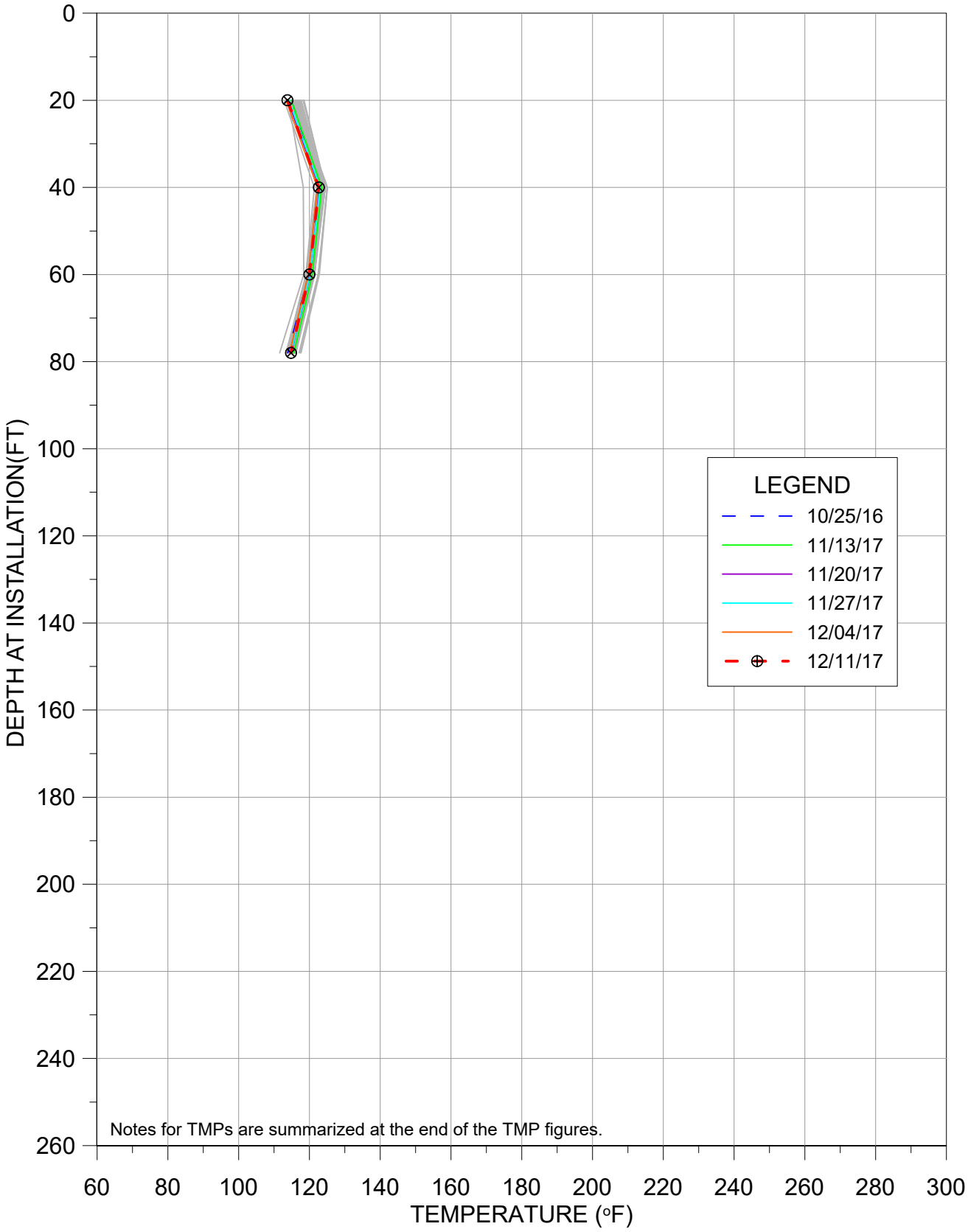
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-41



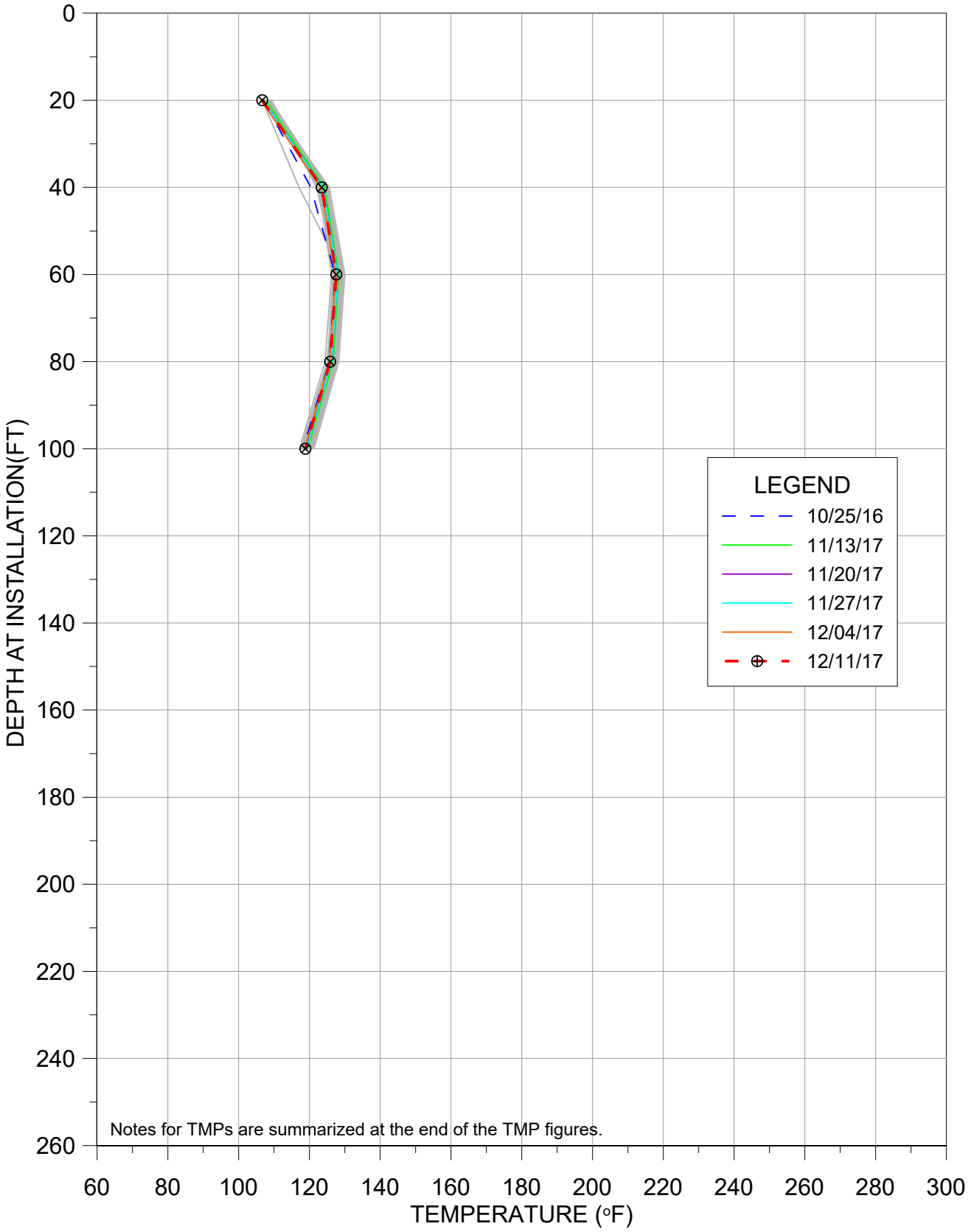
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-42



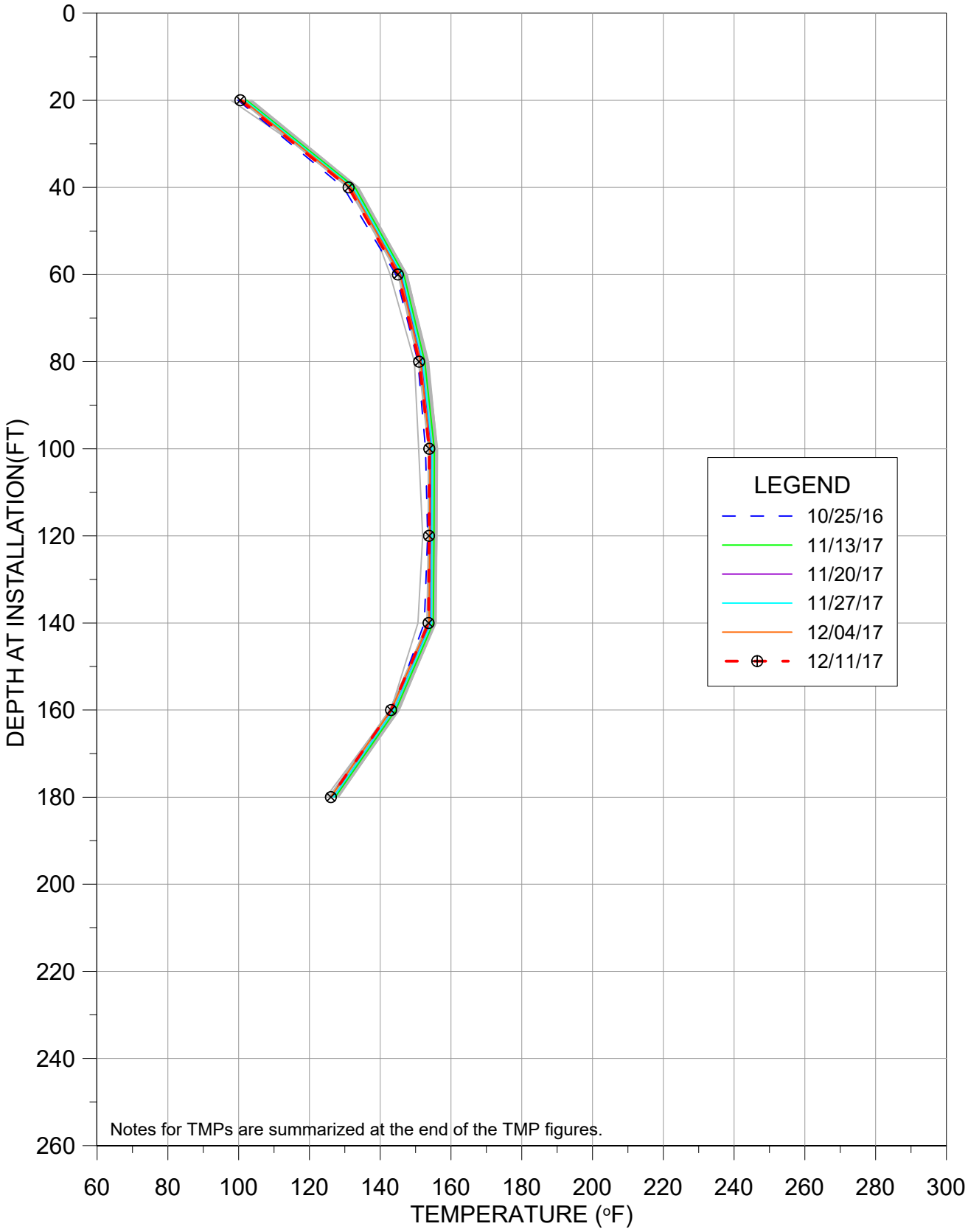
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-43



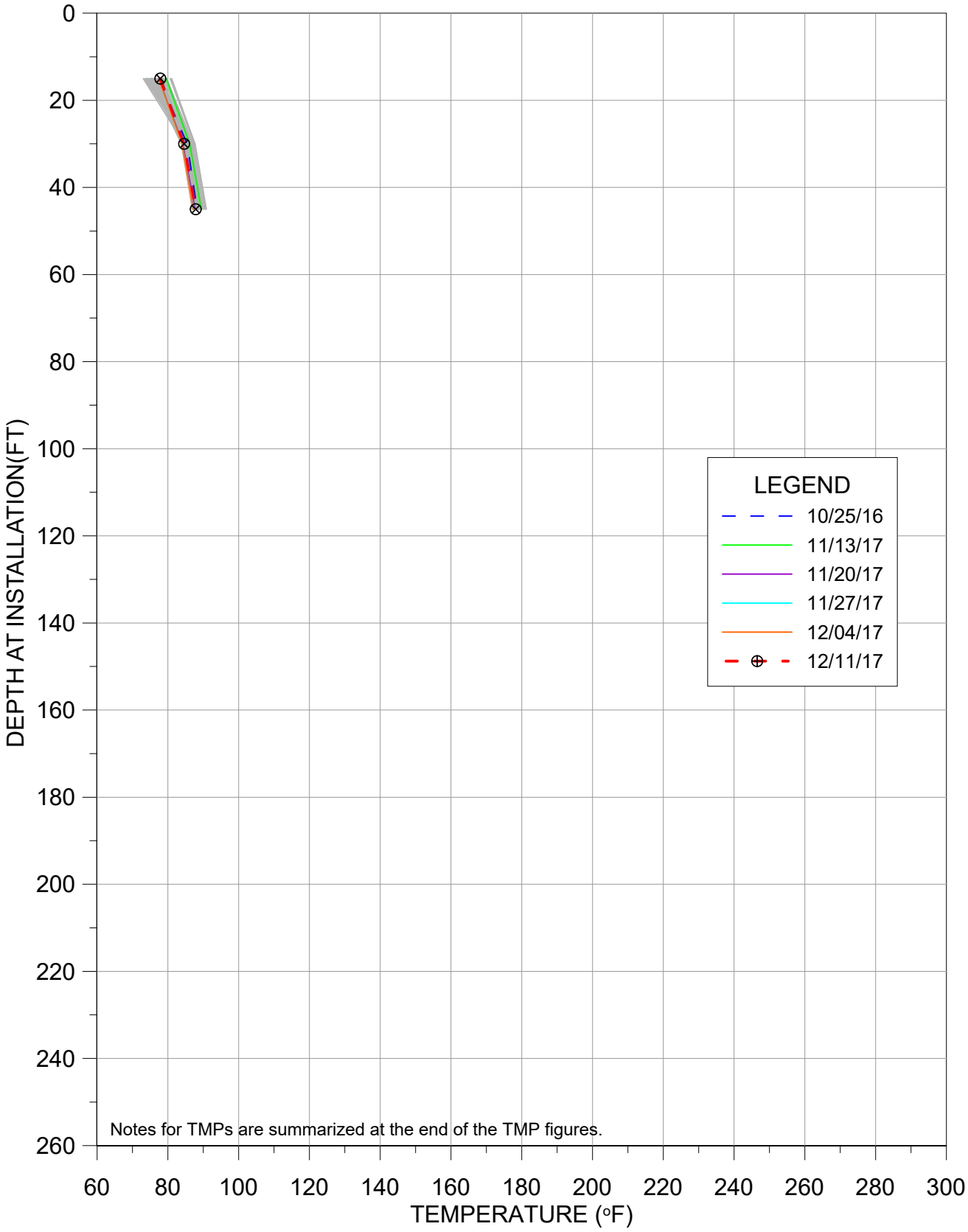
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-44



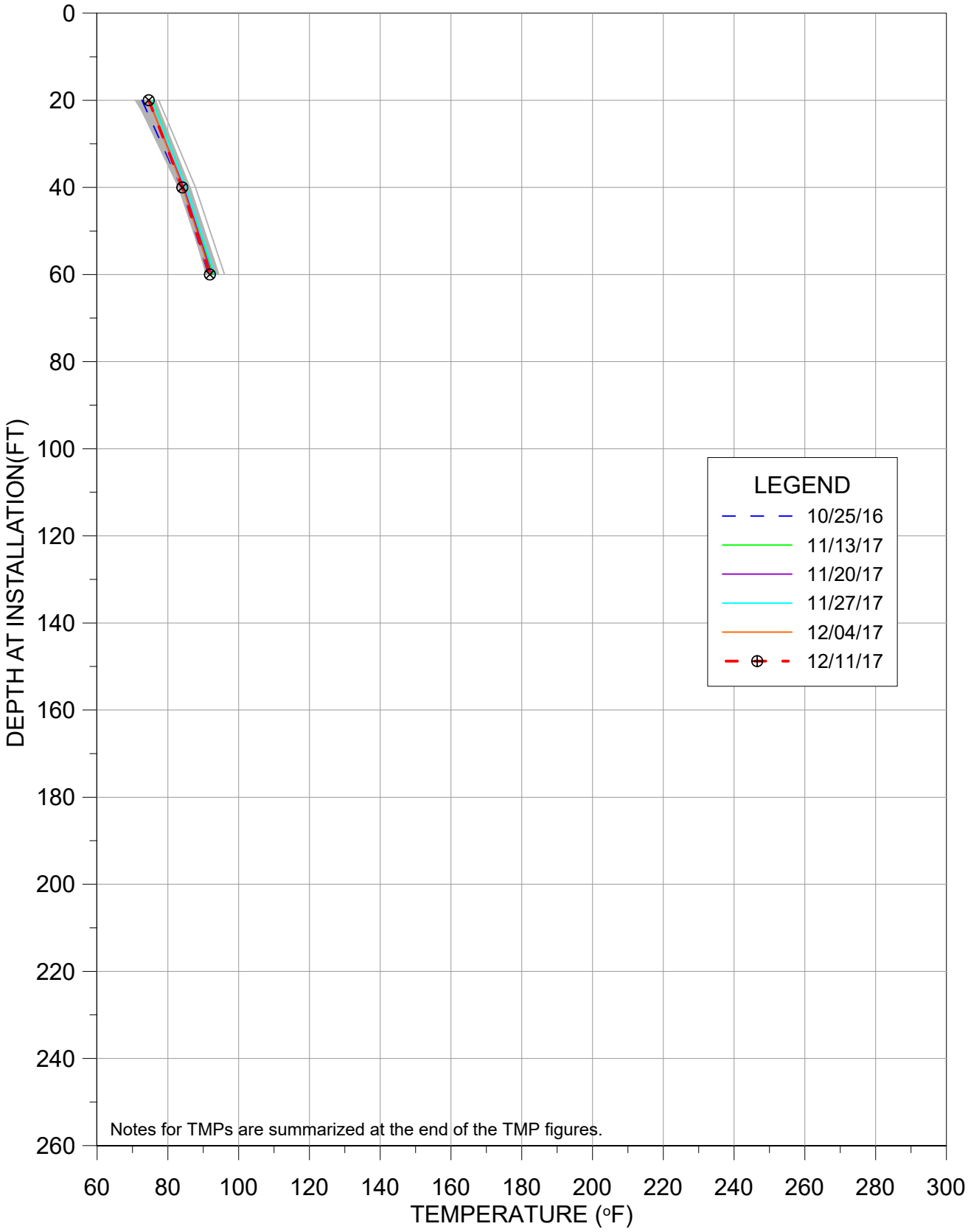
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-45



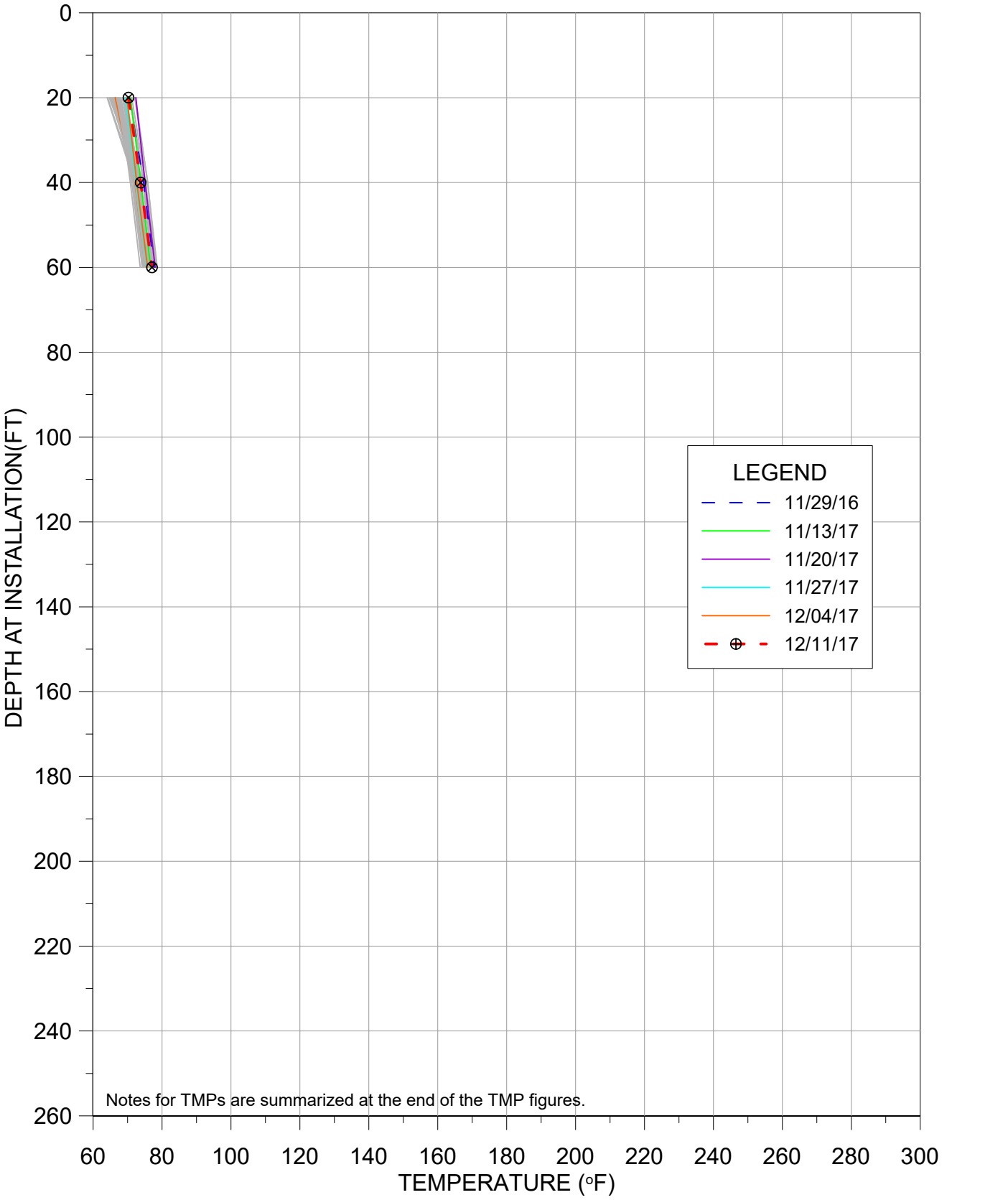
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-46



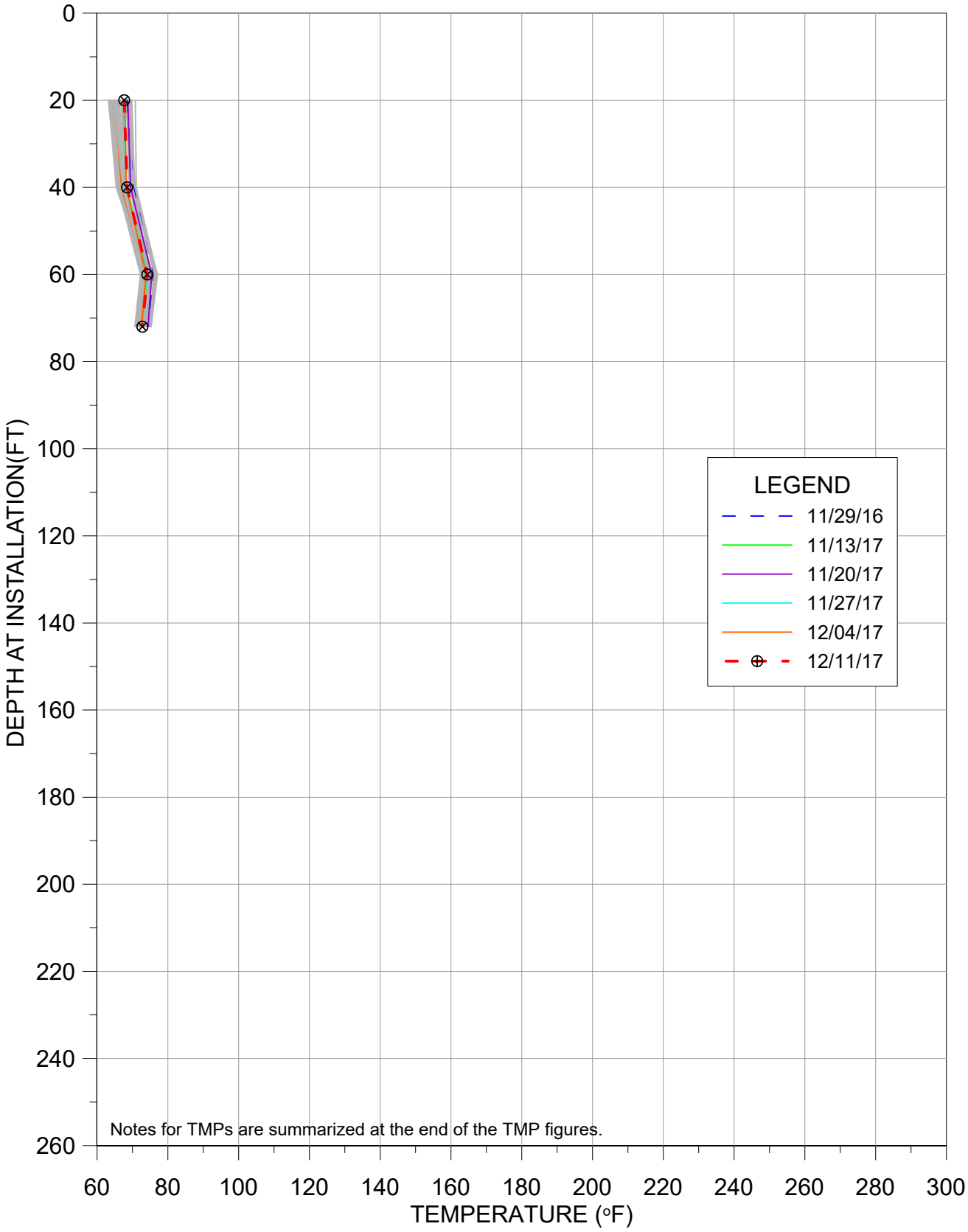
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-47



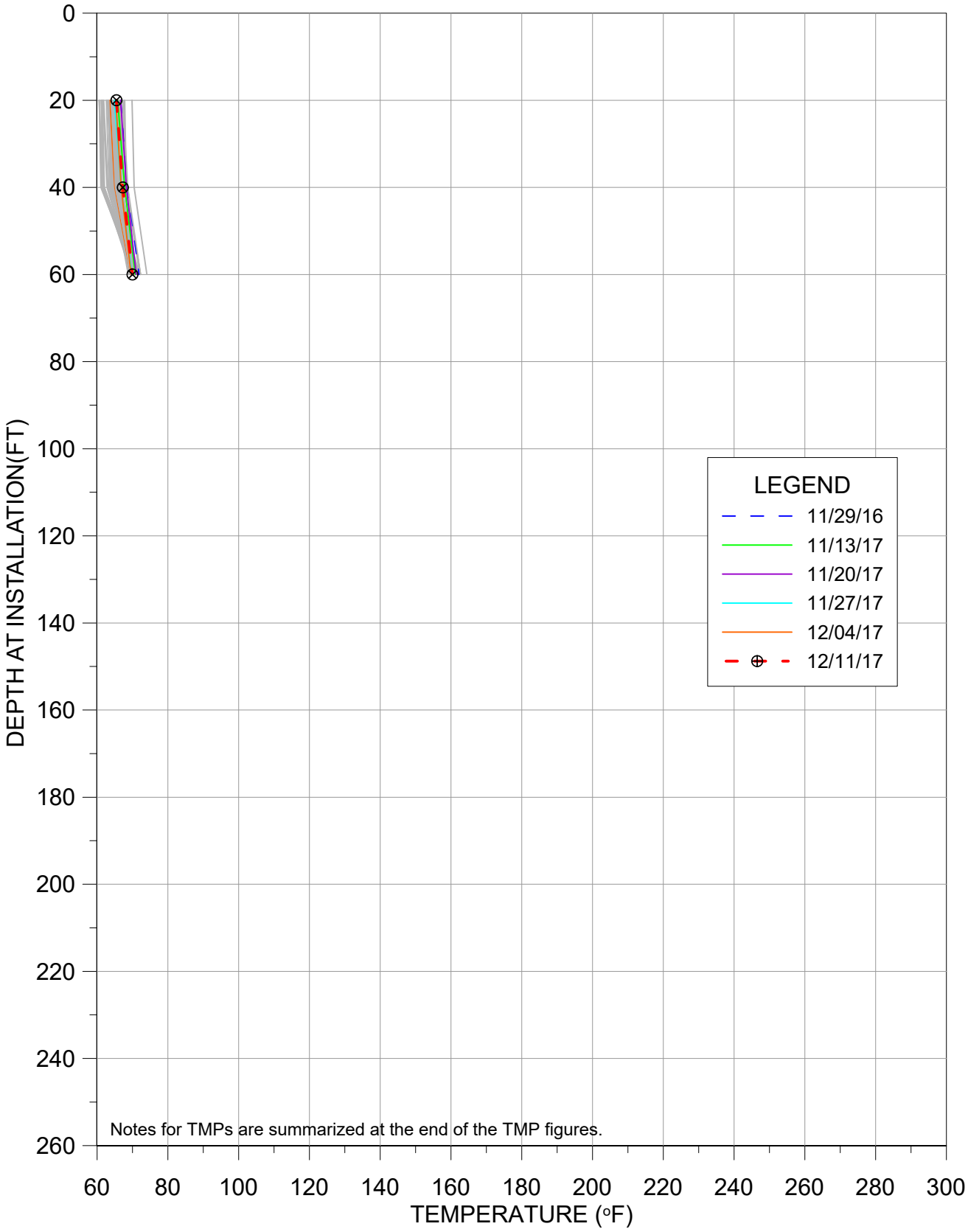
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-48



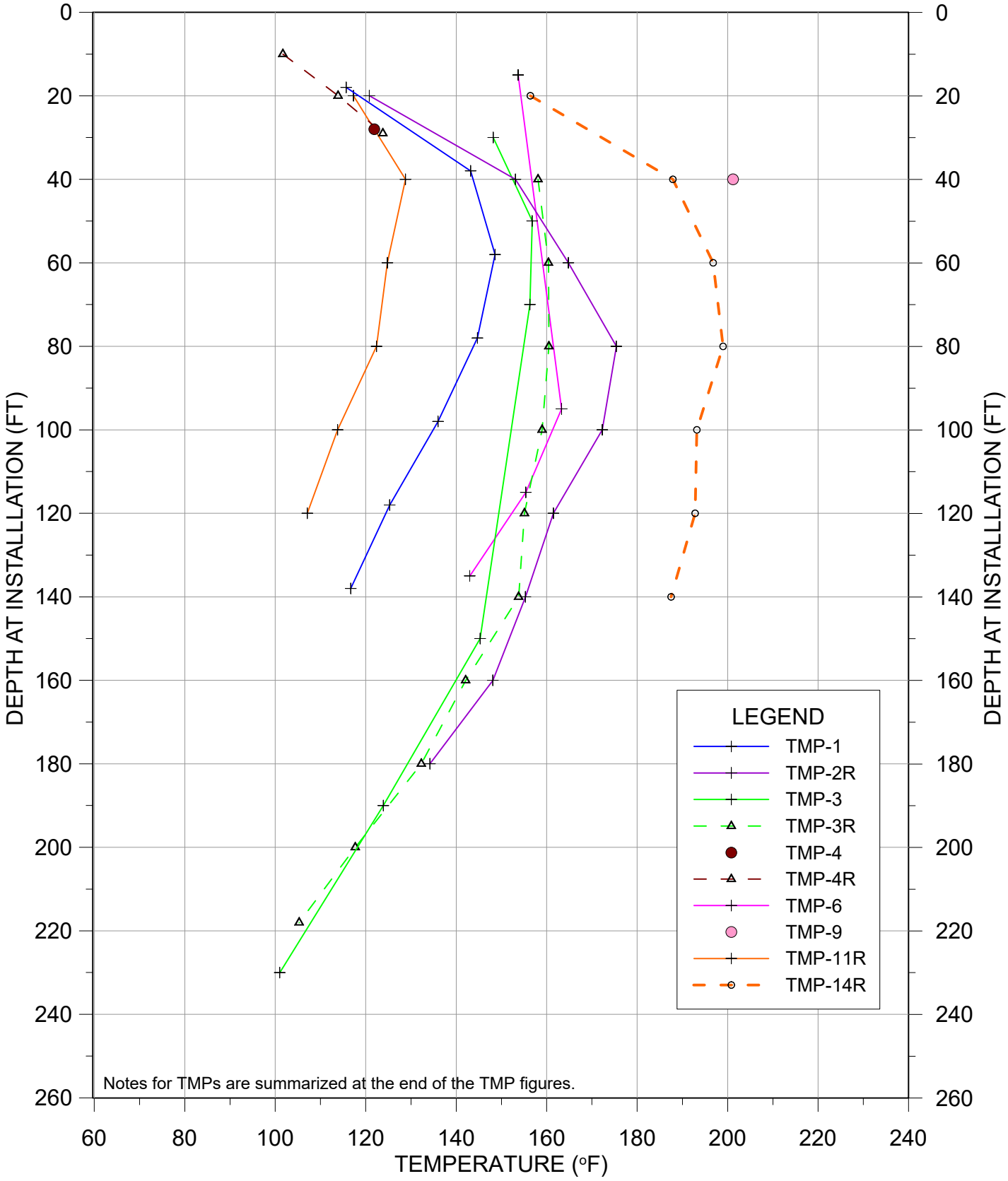
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-49



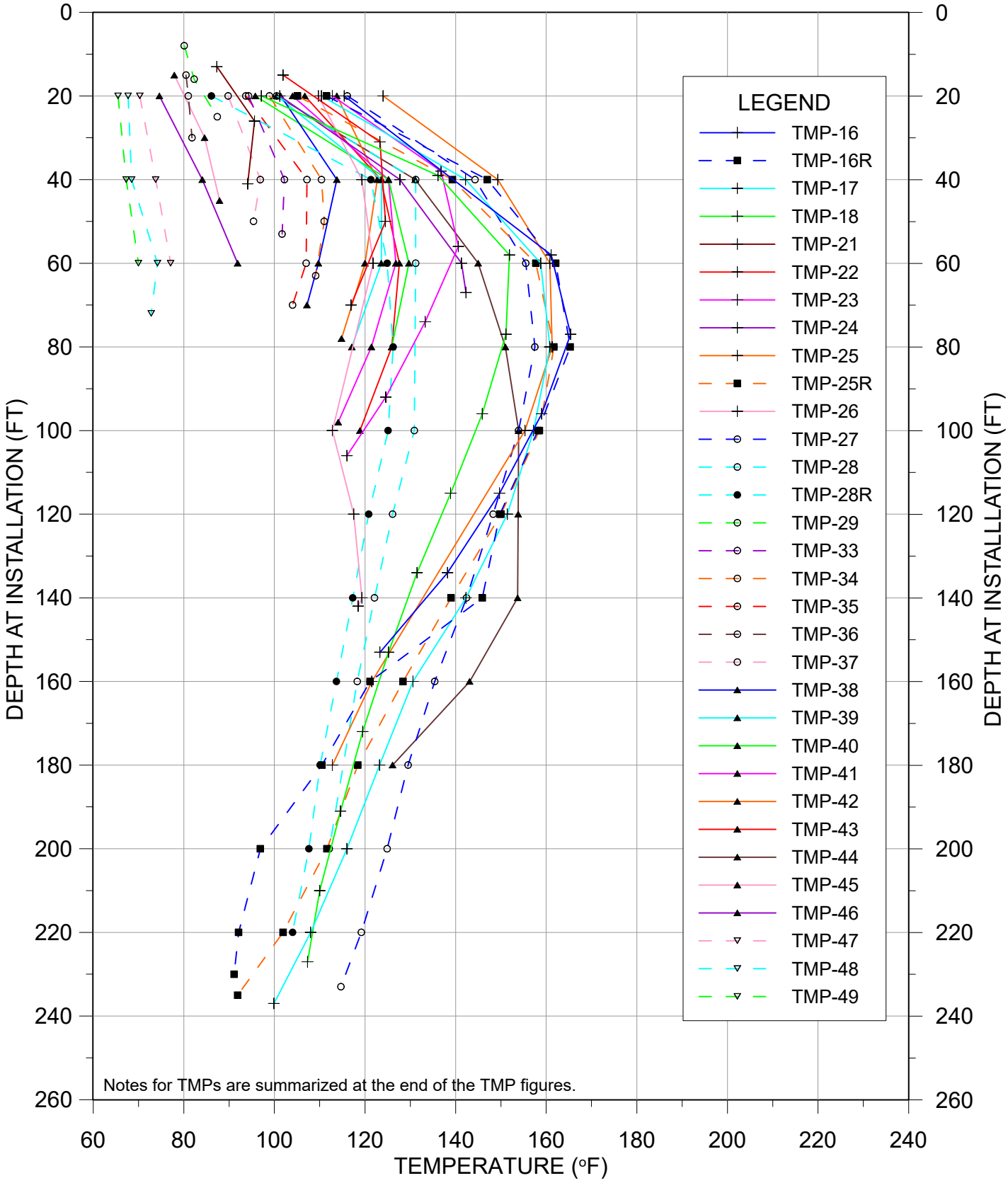
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

12/11/2017



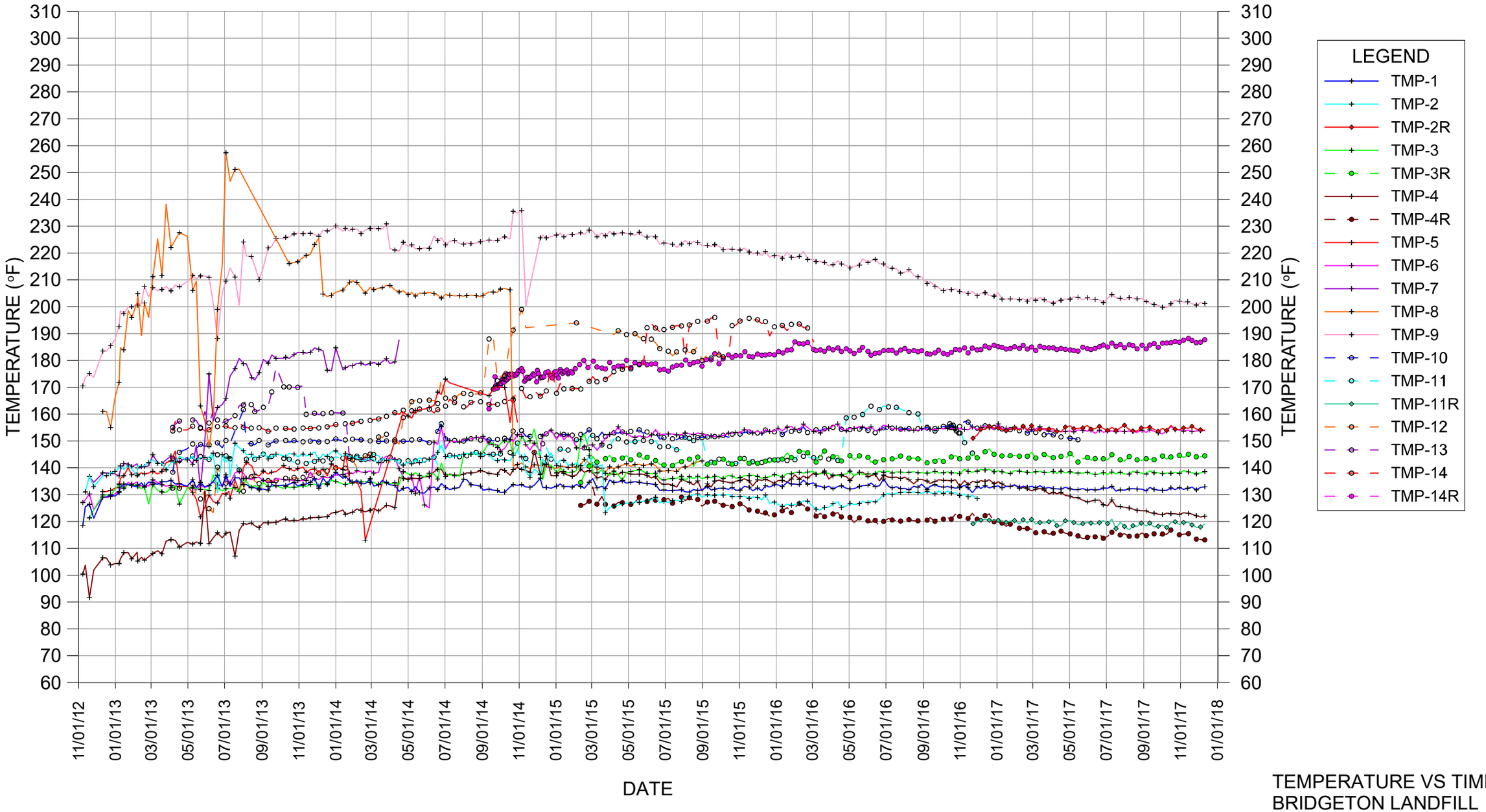
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

12/11/2017 - NORTH QUARRY



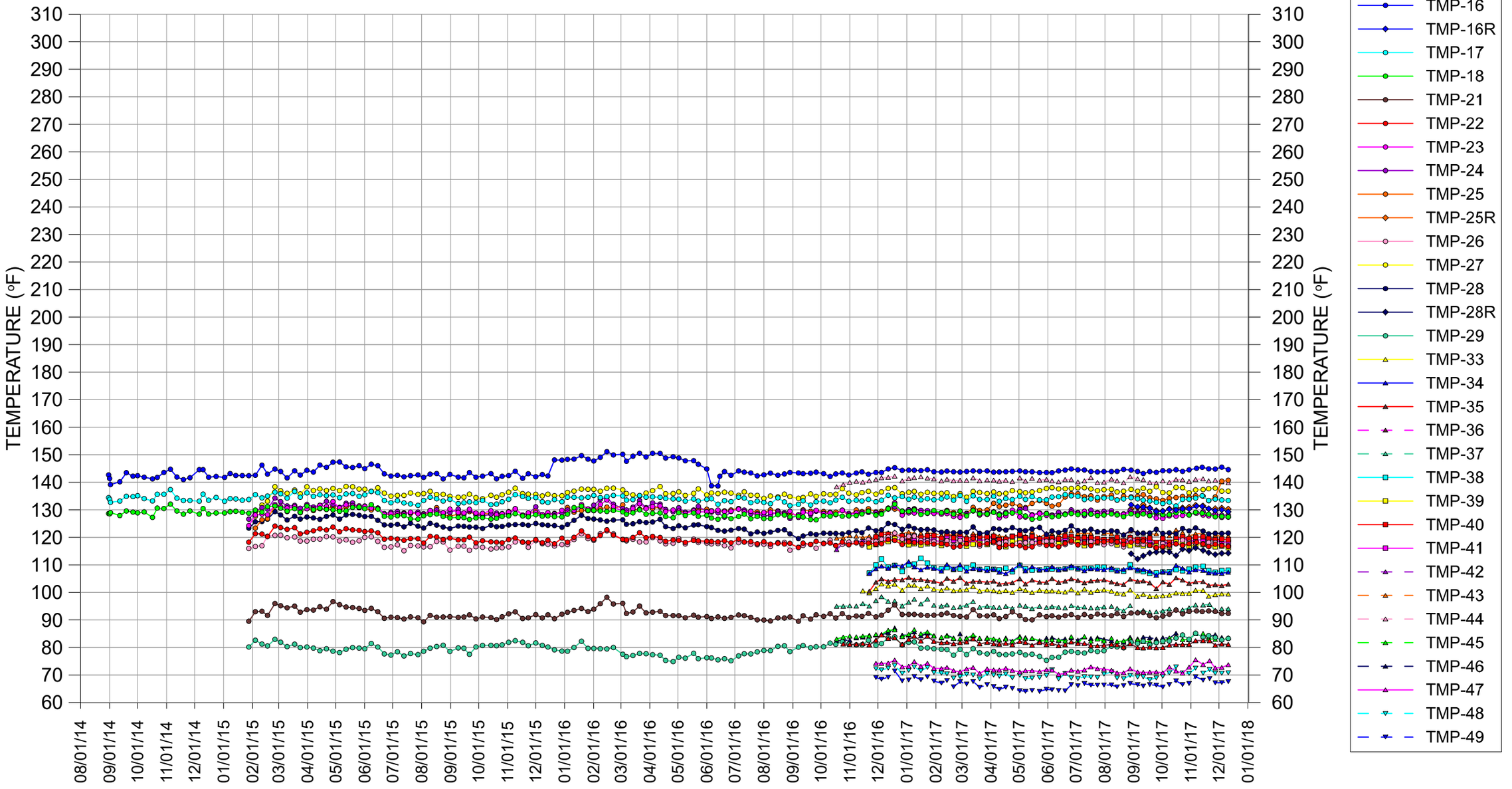
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

AVERAGE TEMPERATURES



TEMPERATURE VS TIME
BRIDGETON LANDFILL

AVERAGE TEMPERATURES - NORTH QUARRY

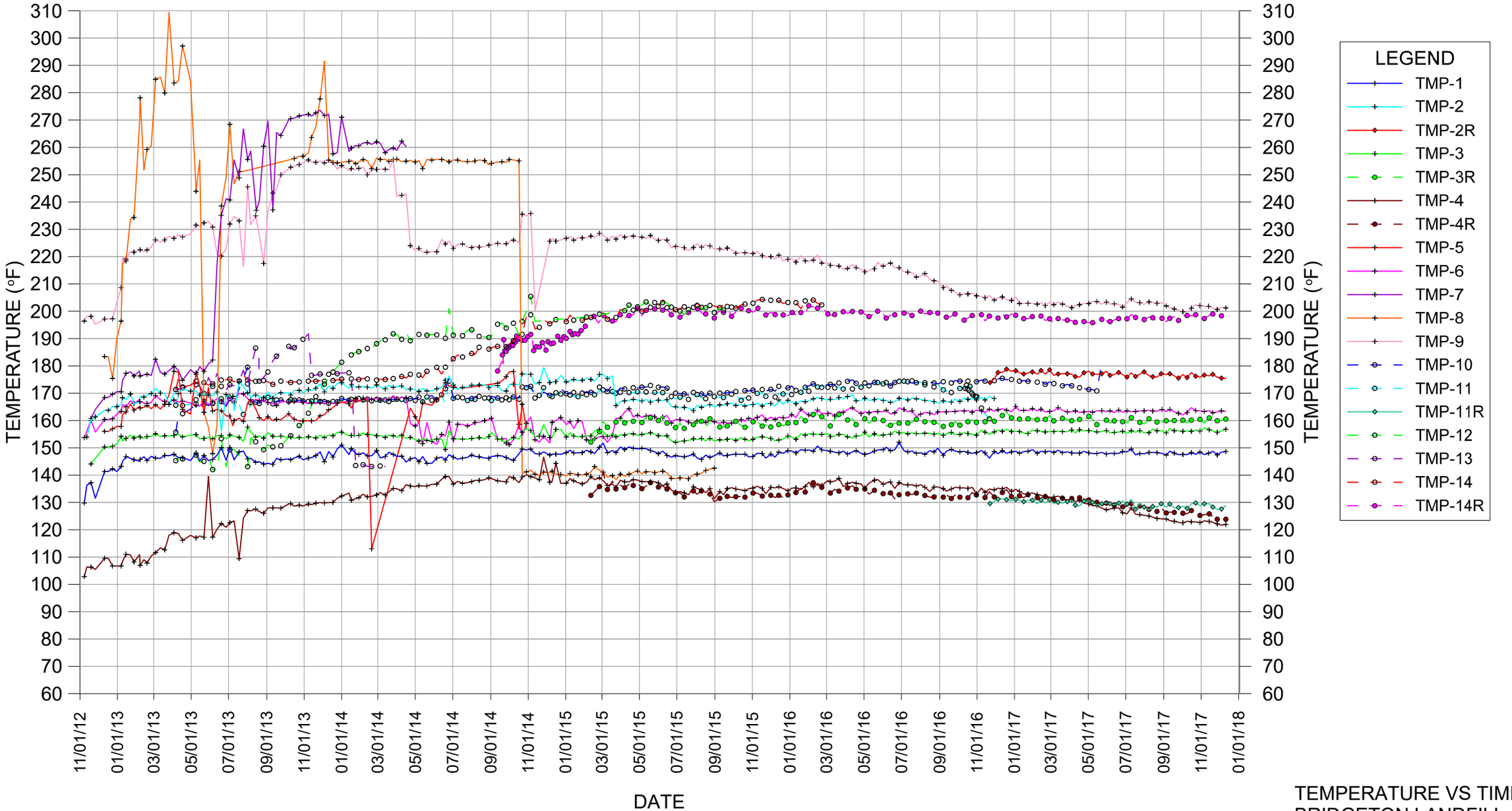


LEGEND

- TMP-16
- TMP-16R
- TMP-17
- TMP-18
- TMP-21
- TMP-22
- TMP-23
- TMP-24
- TMP-25
- TMP-25R
- TMP-26
- TMP-27
- TMP-28
- TMP-28R
- TMP-29
- TMP-33
- TMP-34
- TMP-35
- TMP-36
- TMP-37
- TMP-38
- TMP-39
- TMP-40
- TMP-41
- TMP-42
- TMP-43
- TMP-44
- TMP-45
- TMP-46
- TMP-47
- TMP-48
- TMP-49

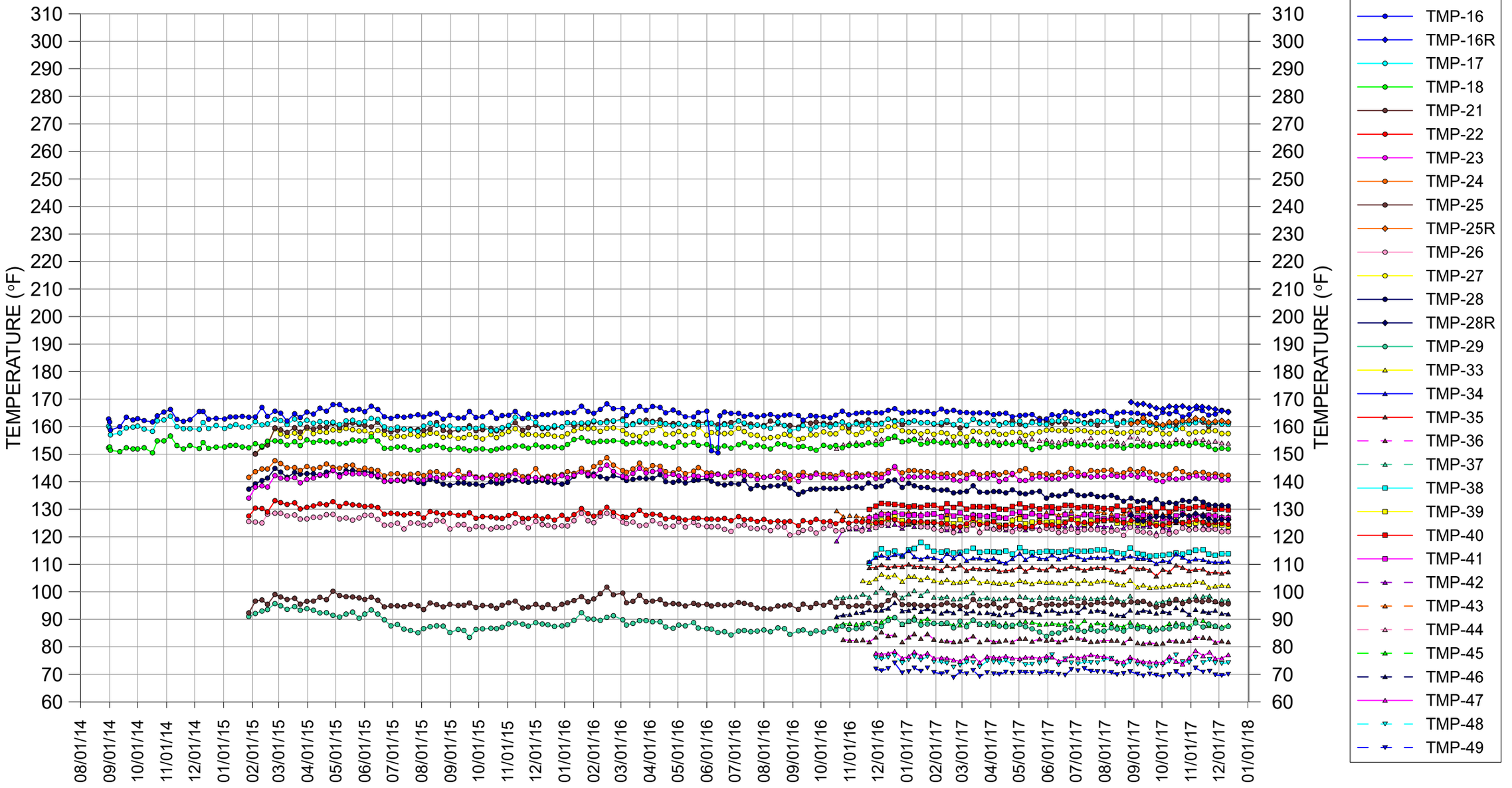
TEMPERATURE VS TIME
BRIDGETON LANDFILL

MAXIMUM TEMPERATURES



TEMPERATURE VS TIME
BRIDGETON LANDFILL

MAXIMUM TEMPERATURES - NORTH QUARRY



TEMPERATURE VS TIME
BRIDGETON LANDFILL

TMP BRIDGETON LANDFILL NOTES

TMP notes that are new for the reporting week are in **bold.**

TMP-1: NONE

TMP-2:

1. TMP-2 has been replaced by TMP-2R and will no longer be monitored or included in the presentation.

TMP-2R:

1. Data reported on 11/29/2016 was inadvertently left as the 11/22/2016 data. This was corrected on 12/5/2016 reading submittal.

TMP-3:

1. No reliable temperature readings have been obtained at 170 ft depth since 1/29/2014, except on 3/13/2014.
2. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 10, 90, 130, 210 and 250 ft depths are no longer reliable.
3. The connectivity tests on 10/28/2014 conducted by Feezor Engineering showed that units at 10, 90, 110, 130, 210 and 250 ft depths are not reliable.

TMP-3R:

1. The unit at 20 ft depth had a fluctuating resistance since 9/25/2017. Therefore the temperature is determined to be unreliable.

TMP-4:

1. The connectivity tests on 4/11/2014 conducted by CEC showed that the unit at 48 ft depth is no longer reliable.

TMP-4R: NONE

TMP-5: TMP NO LONGER IN SERVICE– Verified by Connectivity testing by Feezor Engineering in March 2015.

TMP-6:

1. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 35, 55, 75, 155, 175, and 195 ft depths are no longer reliable.
2. No reliable temperature readings have been obtained at the unit at 215 ft depth since 6/13/2014.

TMP-7R: TMP NO LONGER IN SERVICE

TMP-8: TMP NO LONGER IN SERVICE

TMP-9:

1. Unit at 100 ft depth had an inaccurate temperature reading on 8/1/2013 and no reading since 8/6/2013.
2. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 20, 60, 80, and 100 ft depths are no longer reliable.

TMP-10:

1. All units were verified by connectivity testing by Feezor Engineering on 6/1/2017 to be unreliable.

TMP-11:

1. All units were verified by connectivity testing by Feezor Engineering on 11/23/2016 to be unreliable.
2. TMP-11 is no longer in service and will not be included in the presentation.

TMP-11R: NONE

TMP-12:

2. All units were verified by connectivity testing by Feezor Engineering in October 2015 to be unreliable.

TMP-13: TMP NO LONGER IN SERVICE

TMP-14:

1. All units were verified by connectivity testing by Feezor Engineering in March 2016 to be unreliable.

TMP-14R:

1. Due to the connectivity test results by Feezor Engineering on TMP-14 (see note above), TMP-14R is added to this reporting data set as of 3/7/2016.

TMP-15: TMP WAS NEVER IN SERVICE

TMP-16:

1. A connectivity test conducted by Feezor Engineering showed that the units on TMP-16 may not be reliable since 9/9/2015. Further testing at the end of September 2015 showed possible connectivity on some of the units.
2. The unit at 153 ft depth had a low resistance reading and unreliable temperature since 12/21/2015.

3. The unit at 39 ft depth had a higher than acceptable resistance reading and unreliable temperature between beginning on 2/7/17. Unit resumed normal resistance on 3/28/17 but is still considered unreliable as no repairs were done to reducer the resistance. NOTE REVISED-10/13/17

TMP-16R: NONE

TMP-17: NONE

TMP-18: NONE

TMP-19: NOT PART OF THIS SUBMITTAL (HEAT EXTRACTION TMP)

TMP-20: NOT PART OF THIS SUBMITTAL (HEAT EXTRACTION TMP)

TMP-21: NONE

TMP-22: NONE

TMP-23: NONE

TMP-24: NONE

TMP-25:

1. The unit at 200 ft provided an apparent anomalous reading on 3/28/2017. Subsequent readings on 4/4/2017 showed the unit to have failed (see below). The unit is no longer working and the reading of 3/28/2017 was likely unreliable.
2. The unit at 200 ft depth had a resistance reading greater 4000 ohms on 4/4/2017. A connectivity test conducted by Feezor Engineering on 4/7/2017 showed that this unit also had cross-connectivity. The unit is therefore determined to be no longer working as of the 4/4/2017 reading.
3. The unit at 120 feet had a higher than acceptable limit on 7/10/2017. Also, a connectivity test conducted by Feezor Engineering on 4/7/2017 showed that this unit may be unreliable. Therefore, this unit is determined to be unreliable.
4. The unit at 220 ft has been reported as unable to attain a reading of any kind since 6/19/17. The unit is considered to be on no longer working as of that date.
5. The unit at 235 ft resistance reading was reported to be fluctuating on 11/20/2017, on 12/4/2017 no resistance reading was able to be obtained. This unit is determined to be unreliable as of 12/4/2017.

TMP-25R: NONE

TMP-26:

1. Resistance on unit at 80 ft dropped 12.9 ohms (11/06/2107) and subsequent resistance reading continue to be low. Upon further investigation by Feezor Engineering, this unit is determined to be unreliable.

TMP-27: NONE

TMP-28:

1. The unit at 217 ft depth has had no resistance or temperature readings since installation.
2. The unit at 80 ft depth had a resistance drop and an unreasonable temperature decrease on 6/1/2016. The temperature has since fluctuated and is determined to be unreliable.
3. The unit at 180 feet has had a higher than acceptable limit since 3/28/2017 and is therefore determined to be unreliable as of the 4/4/2017 reading.

TMP-28R: NONE

TMP-29: NONE

TMP-33: NONE

TMP-34: NONE

TMP-35: NONE

TMP-36: NONE

TMP-37: NONE

TMP-38: NONE

TMP-39: NONE

TMP-40: NONE

TMP-41: NONE

TMP-42: NONE

TMP-43: NONE

TMP-44: NONE

TMP-45: NONE

TMP-46: NONE

TMP-47: NONE

TMP-48: NONE

TMP-49: NONE

TMP vs DEPTH and TMP vs ELEVATION (for **12/11/17**):

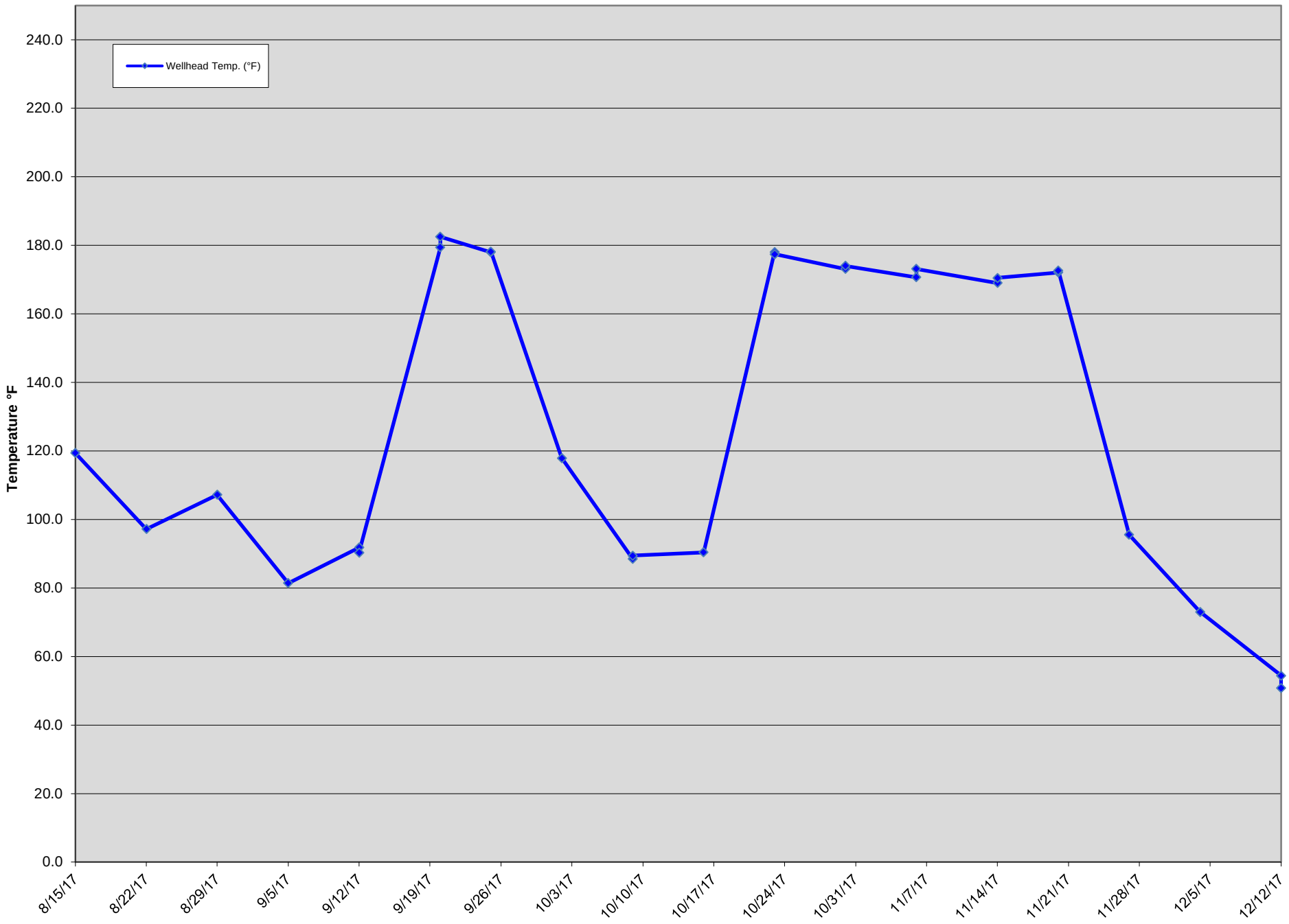
1. There were no reliable temperature readings for TMP-13 since 3/19/2014.
2. There were no reliable temperature readings for TMP-7R, as determined by the connectivity test on 4/11/2014.
3. There were no reliable temperature readings for TMP-5 since 11/5/2014.
4. There were no reliable temperature readings for TMP-12 since 9/28/2015.
5. There were no reliable temperature readings for TMP-8 since 9/9/2015.
6. There were no reliable temperature readings for TMP-14, confirmed since 3/7/2016.
7. There were no reliable temperature readings for TMP-11 as determined by the connectivity test on 11/23/2016.
8. TMP-2 has been replaced by TMP-2R and will no longer be monitored.
9. TMP-11 is no longer in service and will not be included in the presentation.
10. There were no reliable temperature readings for TMP-10 since 5/30/20P17.

ATTACHMENT C

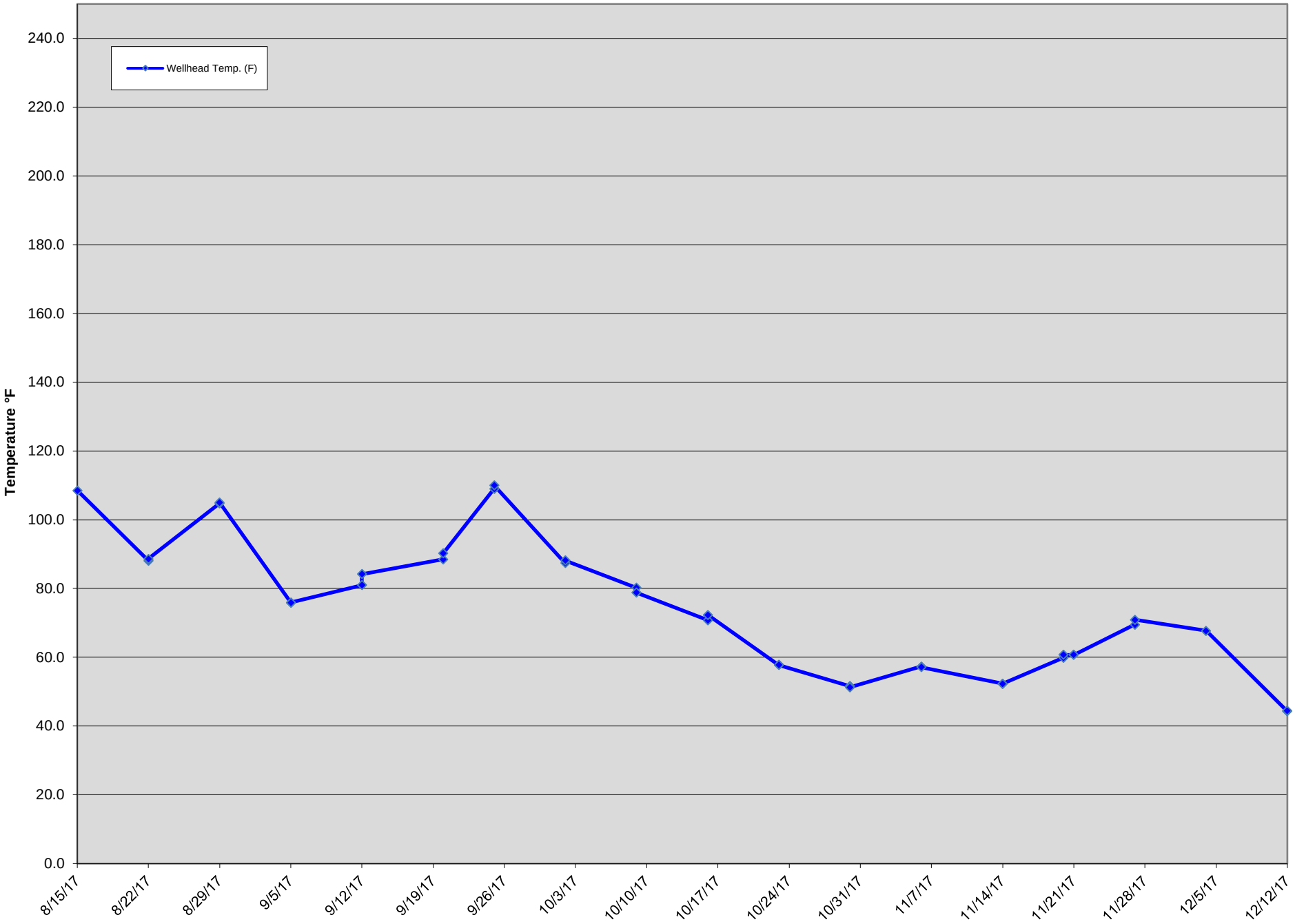
GAS INTERCEPTOR WELLHEAD TEMPERATURE GRAPHS

Gas Extraction Wells - Bridgeton Landfill

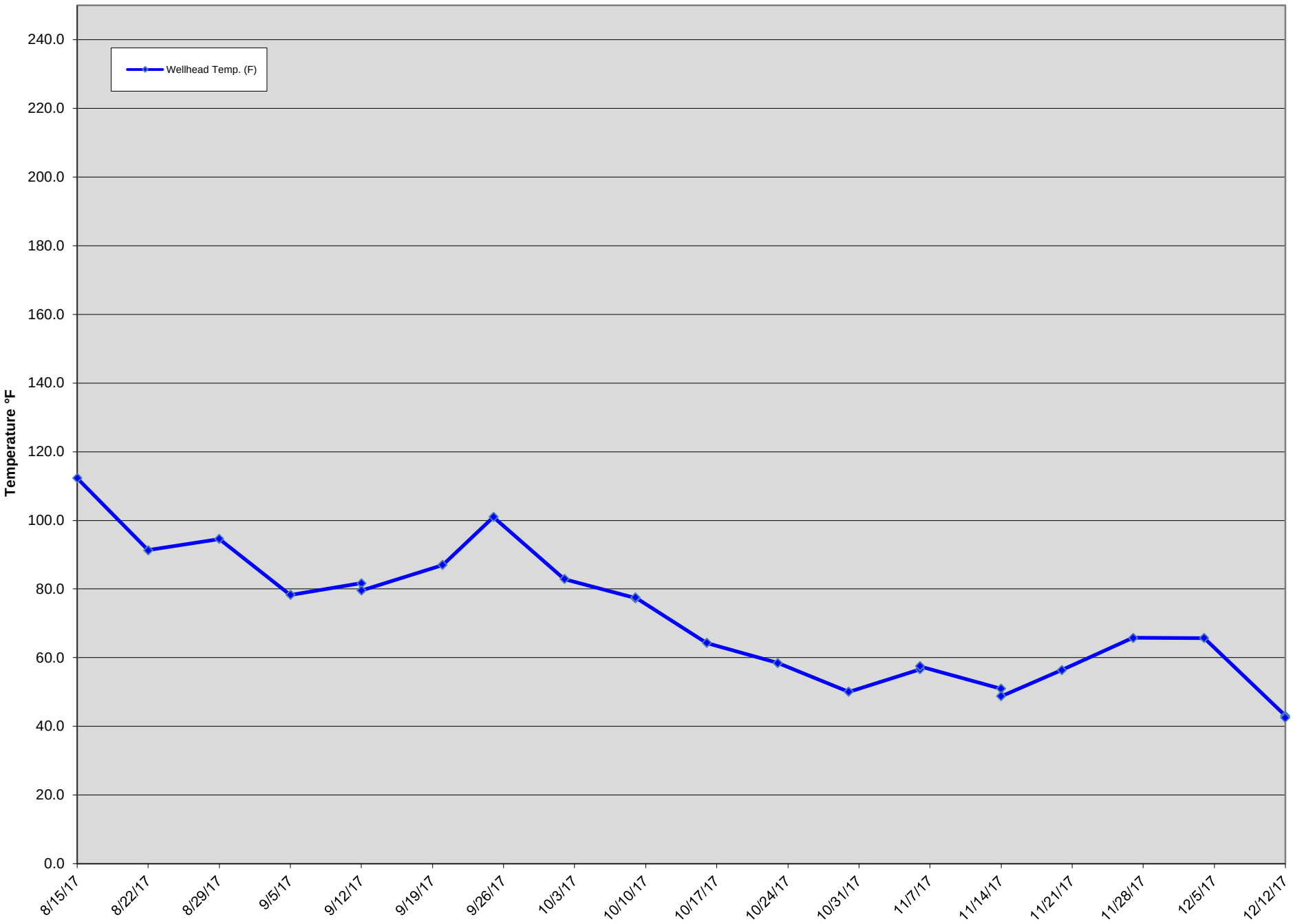
GIW-1 Wellhead Temperatures



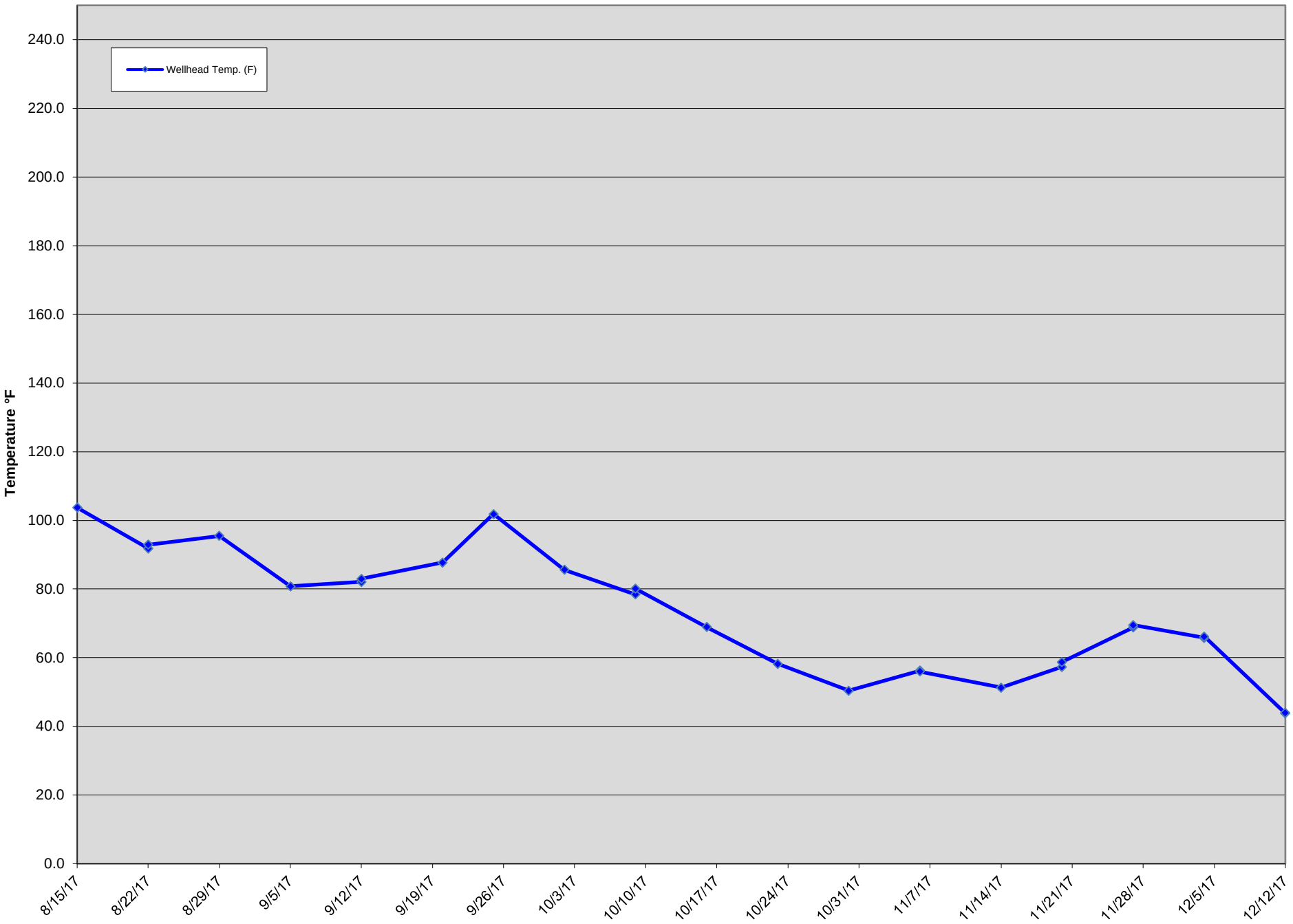
GIW-2 Wellhead Temperatures



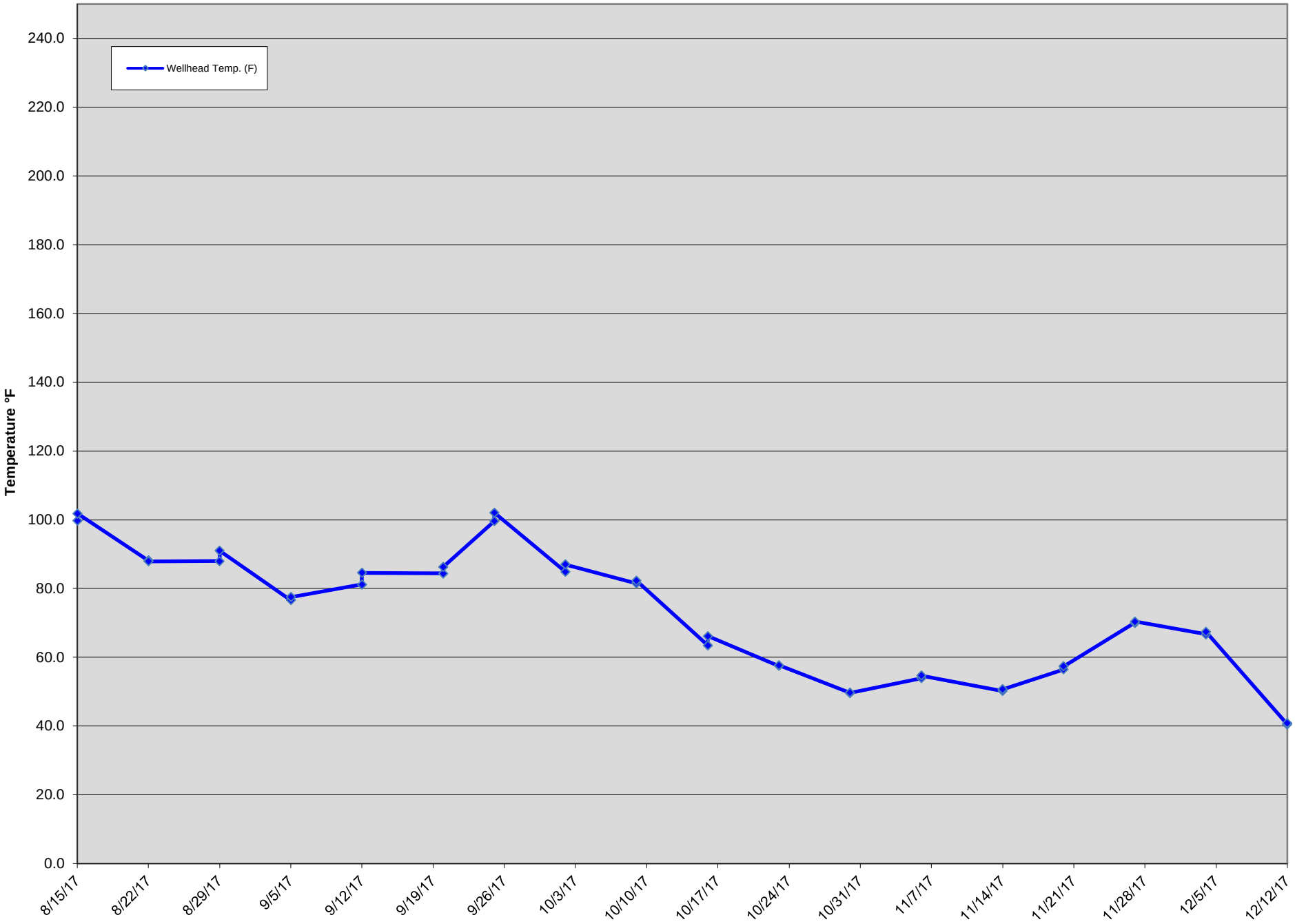
GIW-3 Wellhead Temperatures



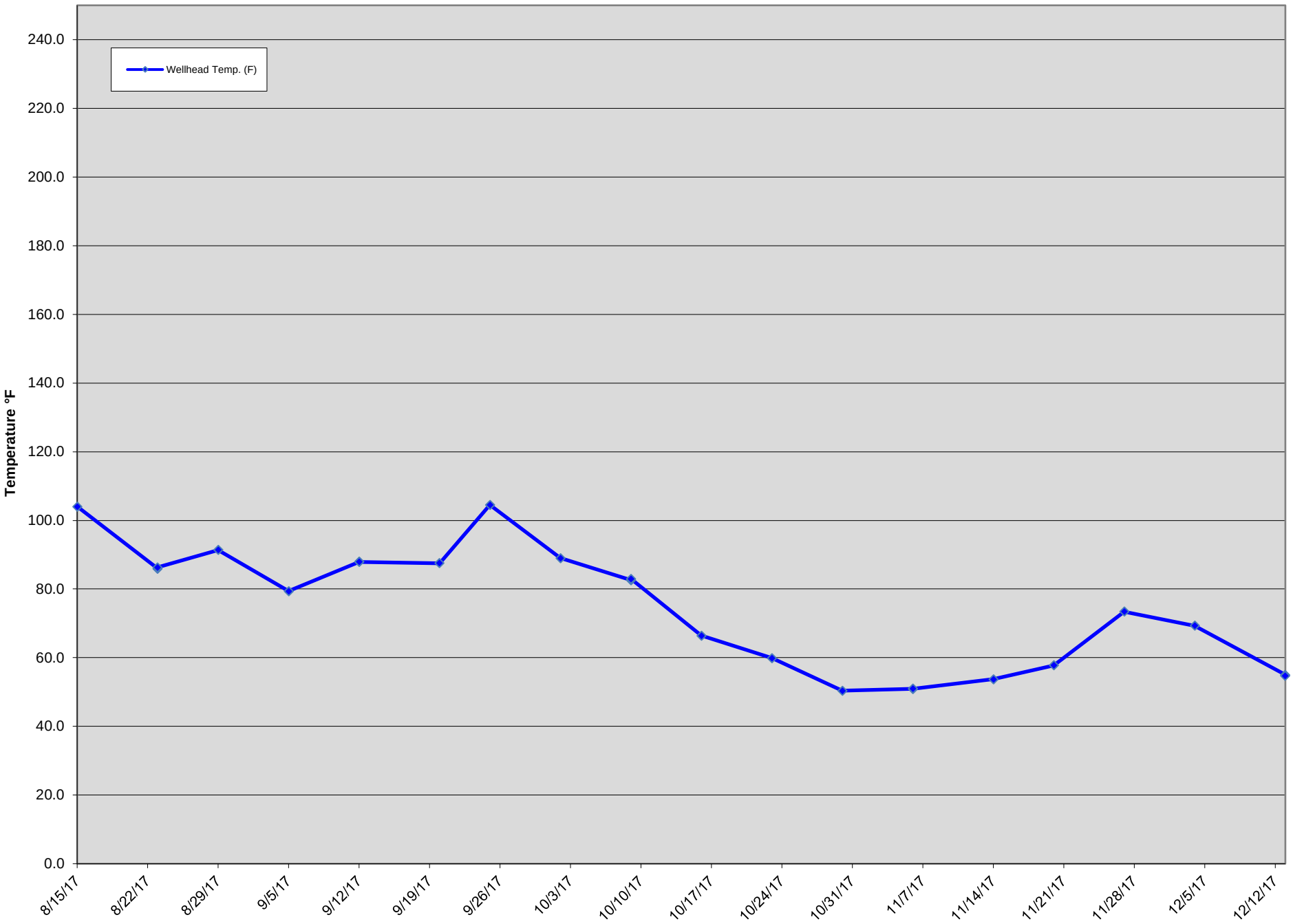
GIW-4 Wellhead Temperatures



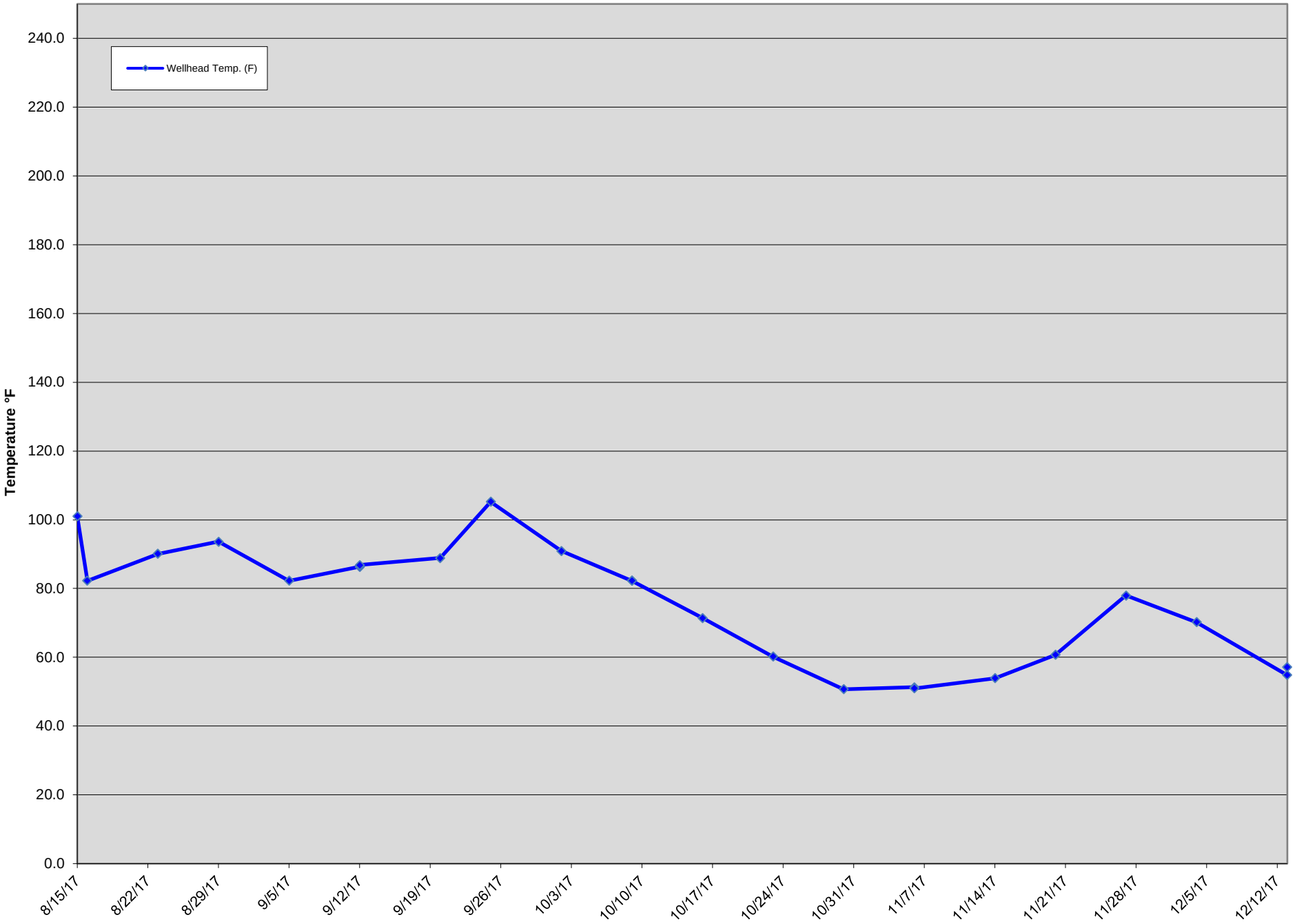
GIW-5 Wellhead Temperatures



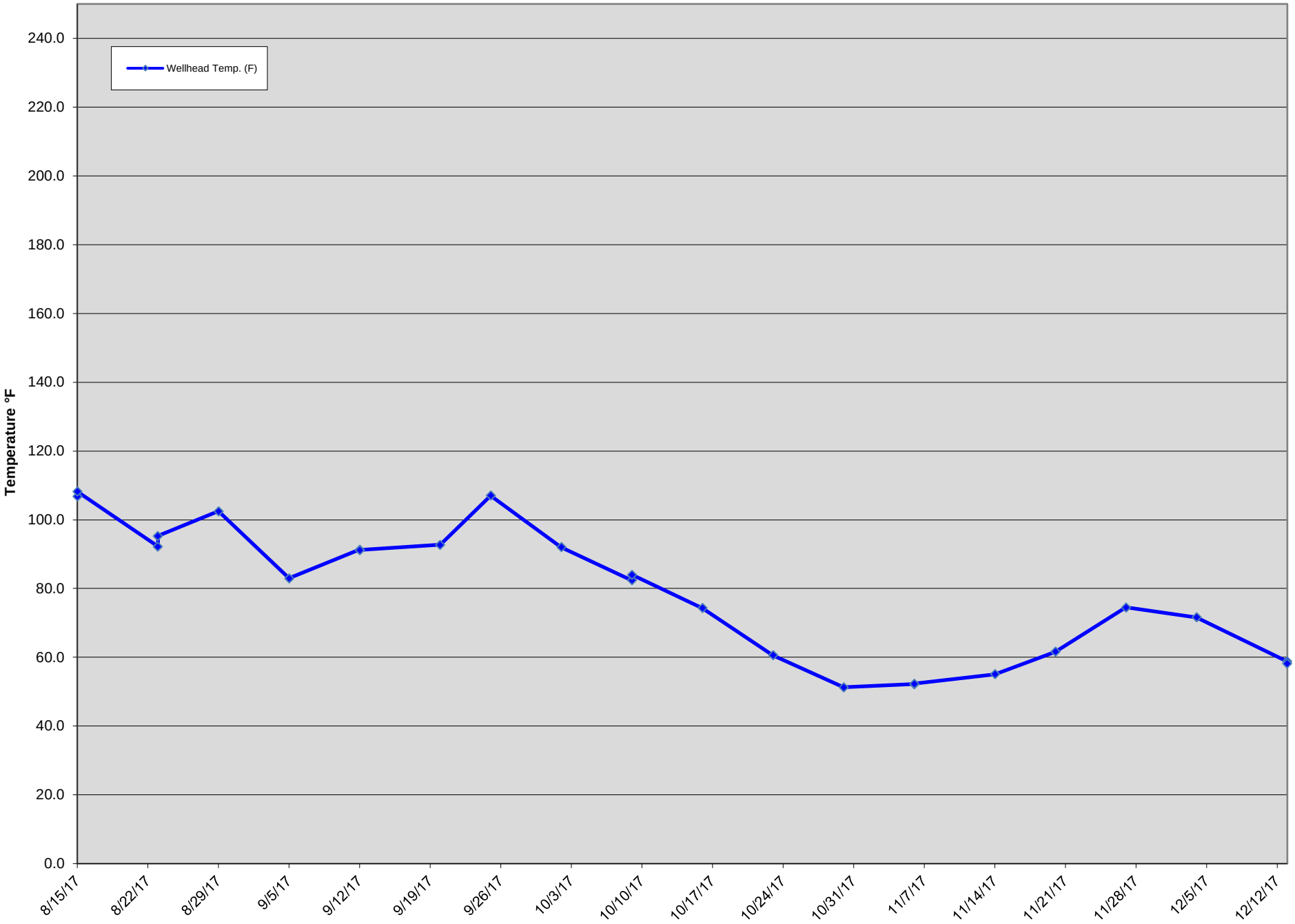
GIW-6 Wellhead Temperatures



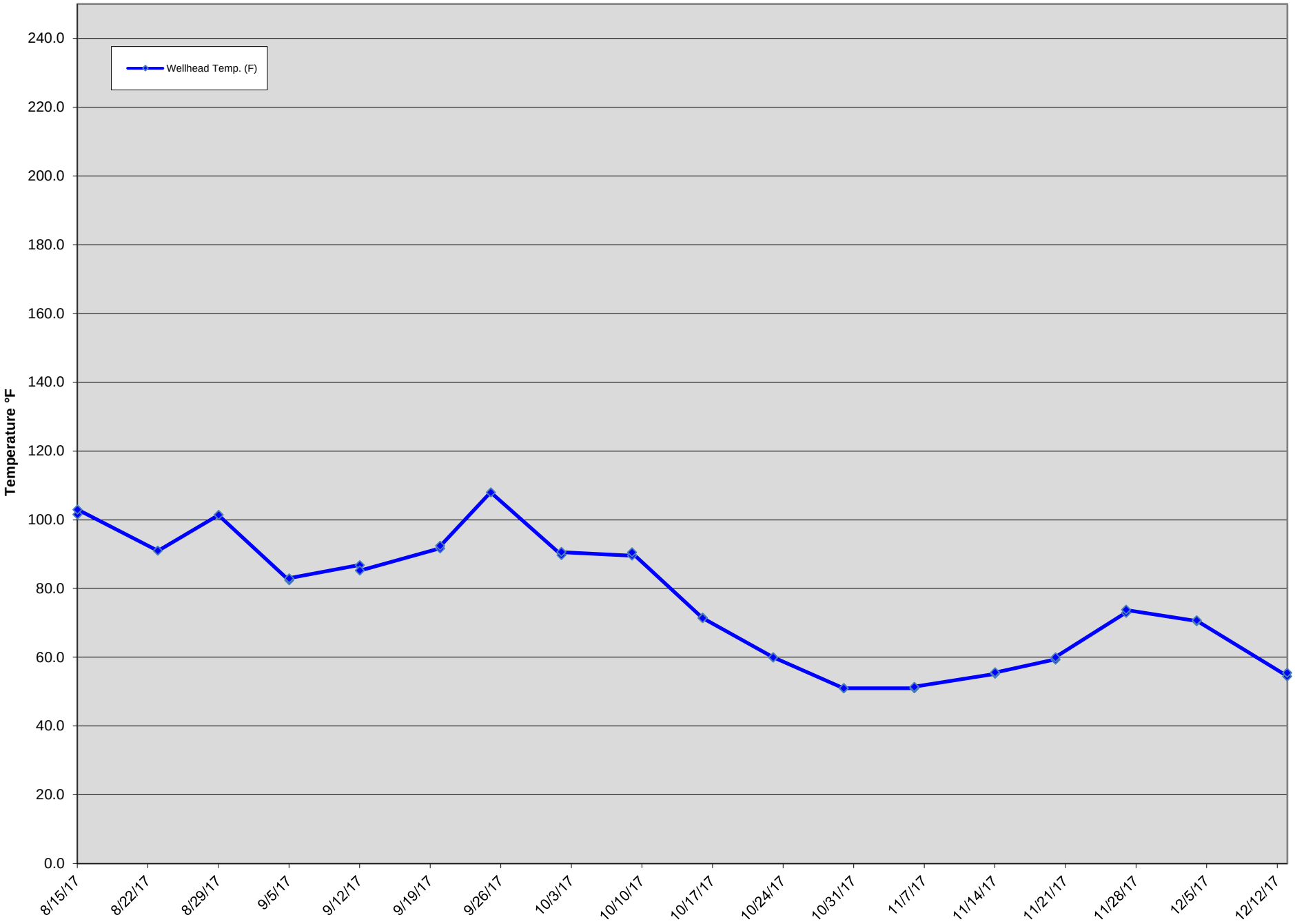
GIW-7 Wellhead Temperatures



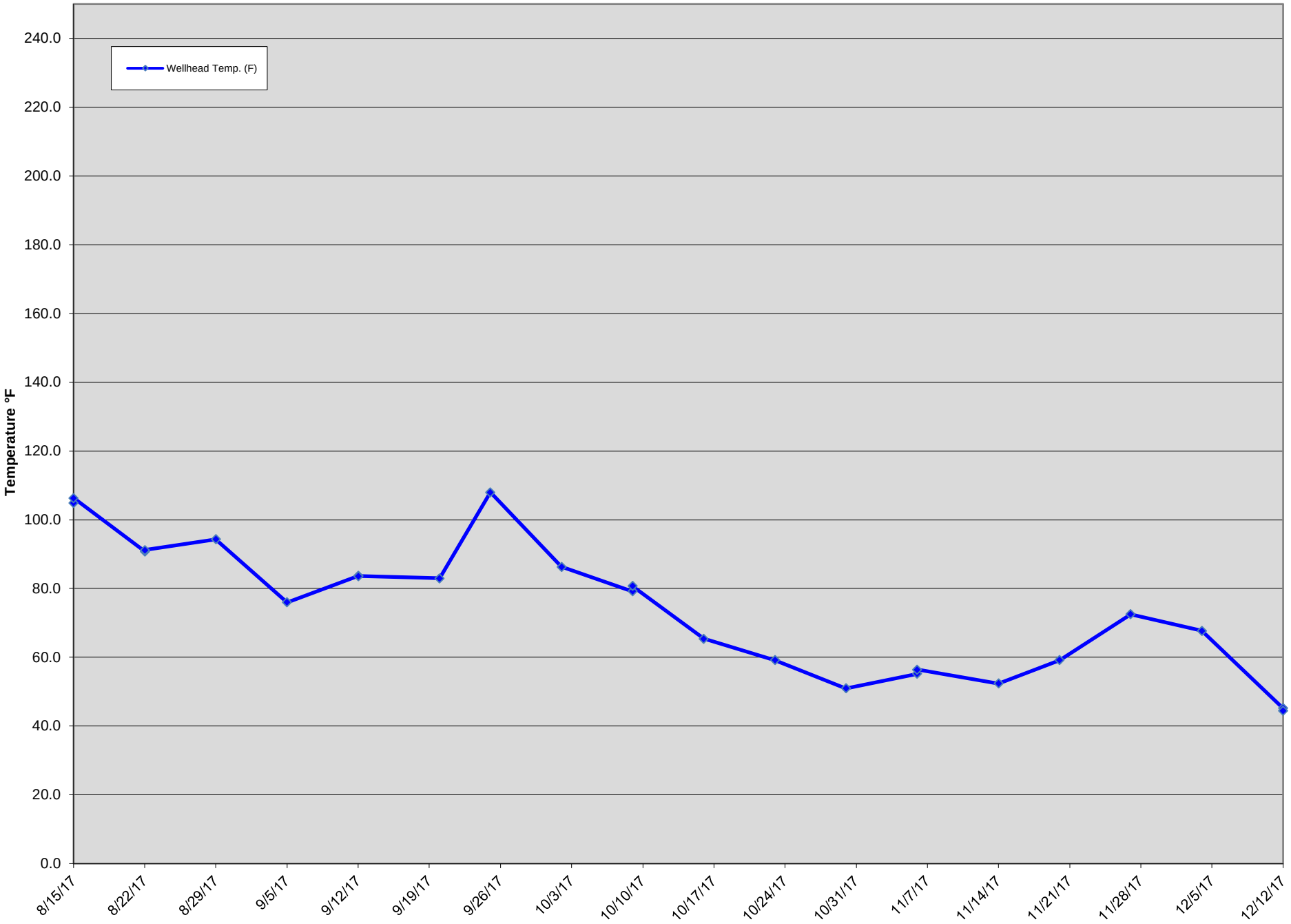
GIW-8 Wellhead Temperatures



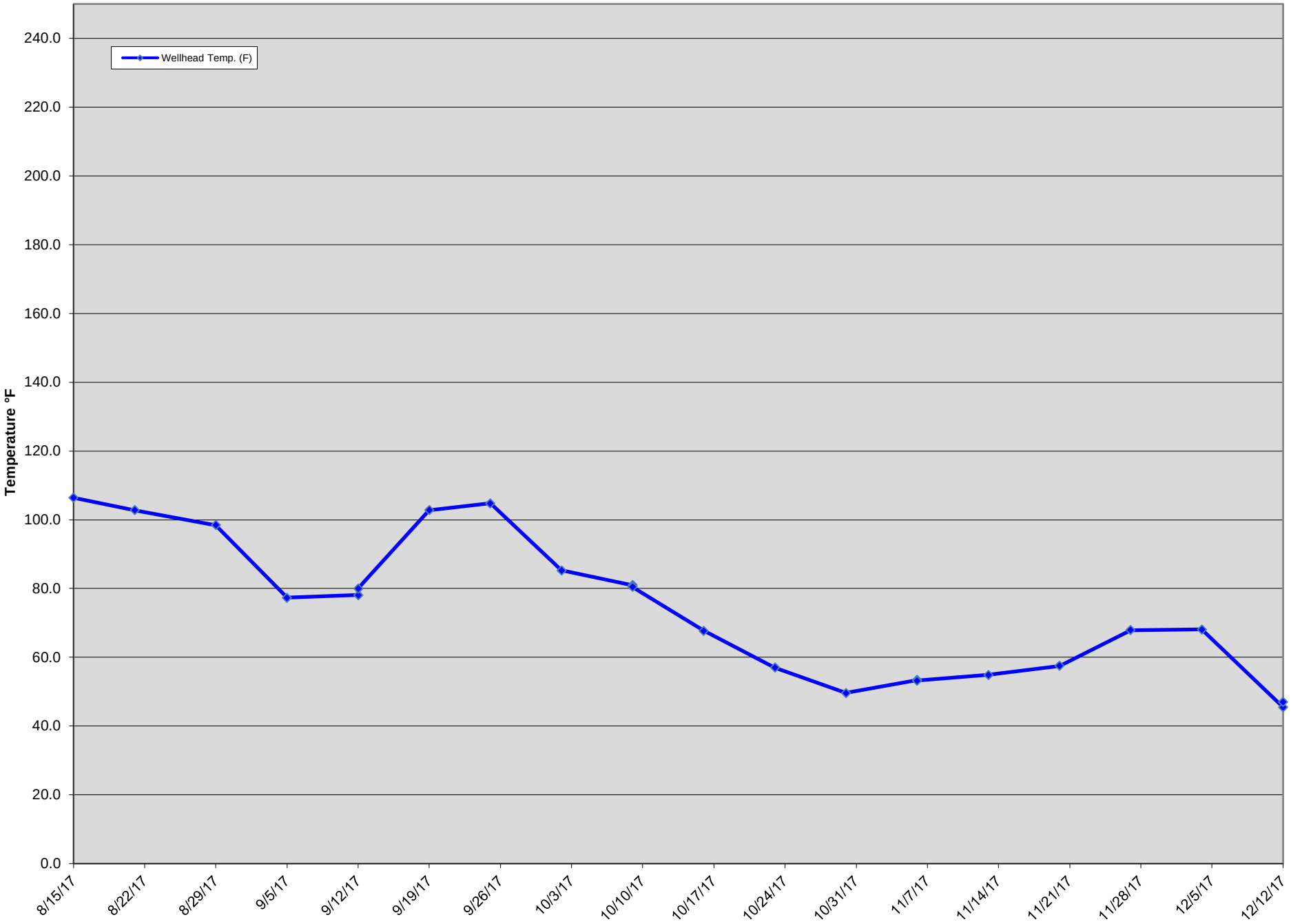
GIW-9 Wellhead Temperatures



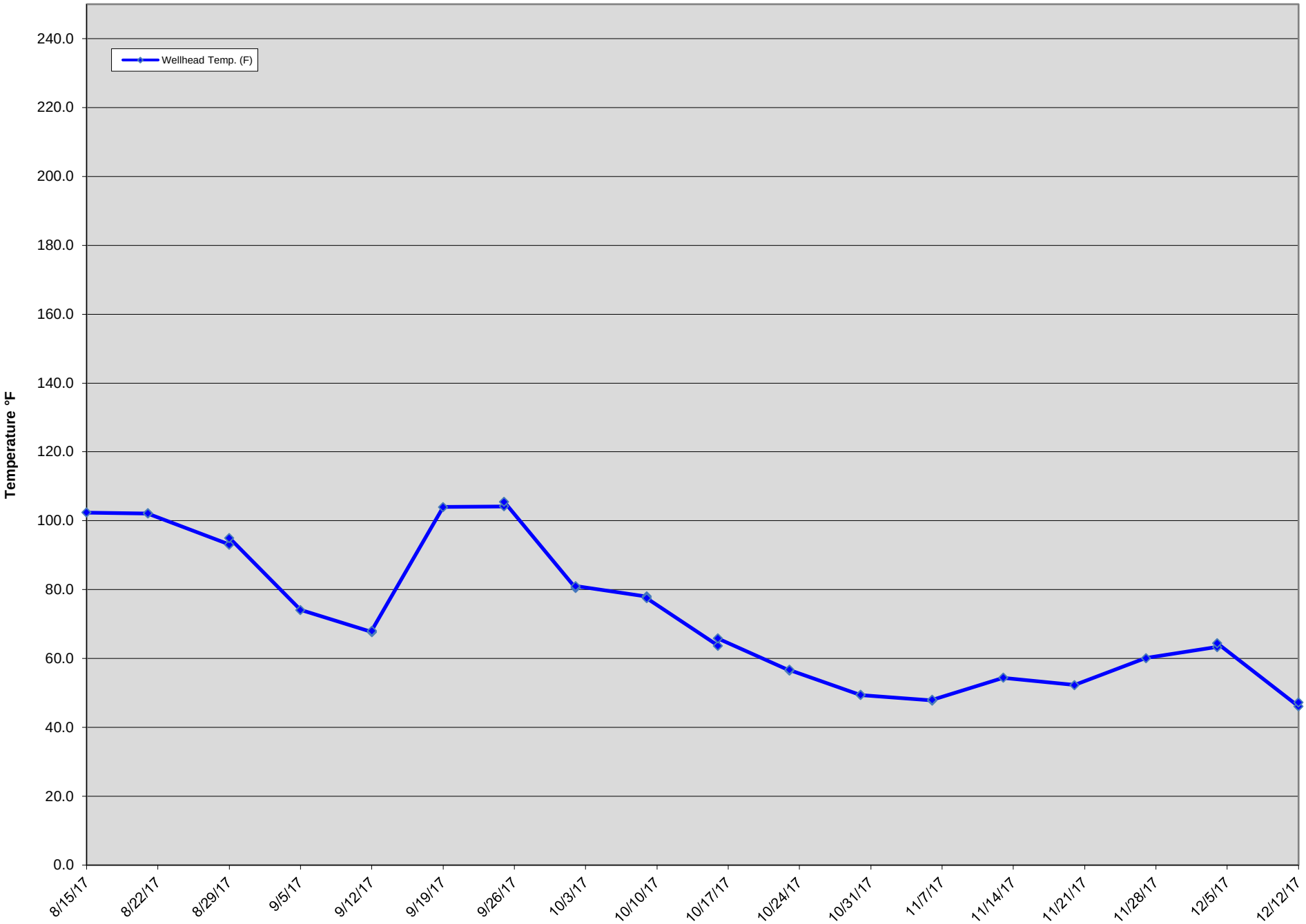
GIW-10 Wellhead Temperatures



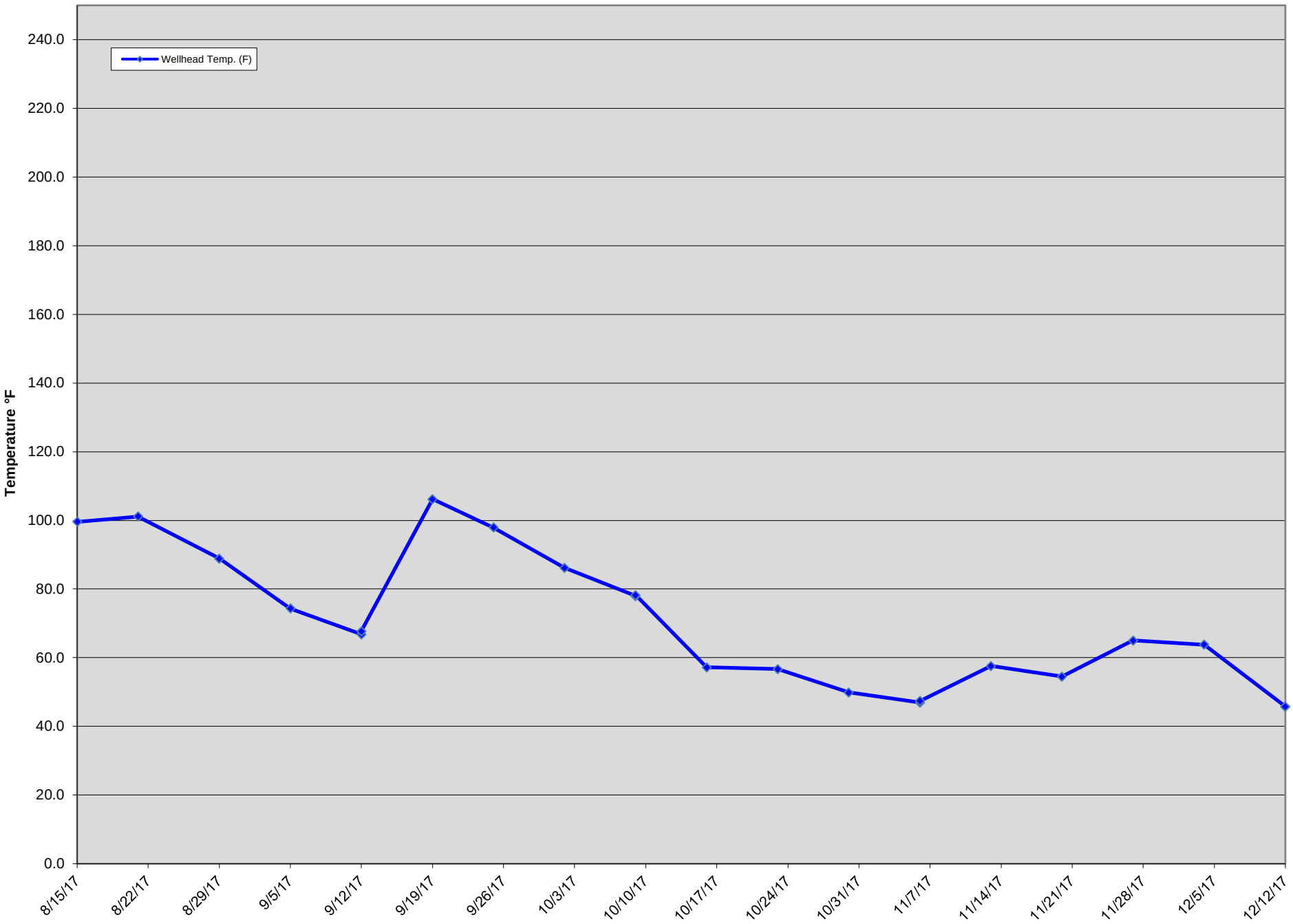
GIW-11 Wellhead Temperatures



GIW-12 Wellhead Temperatures



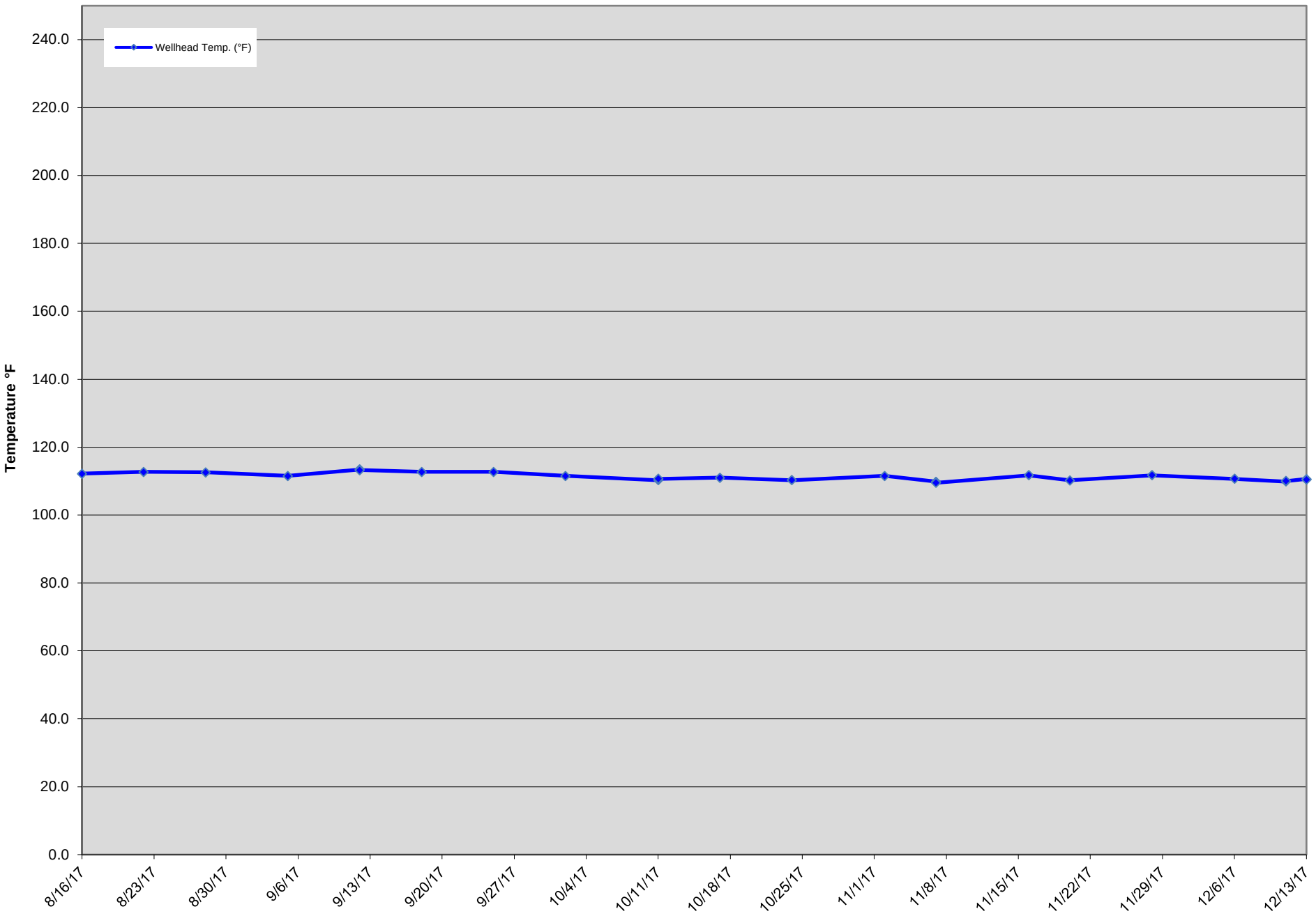
GIW-13 Wellhead Temperatures



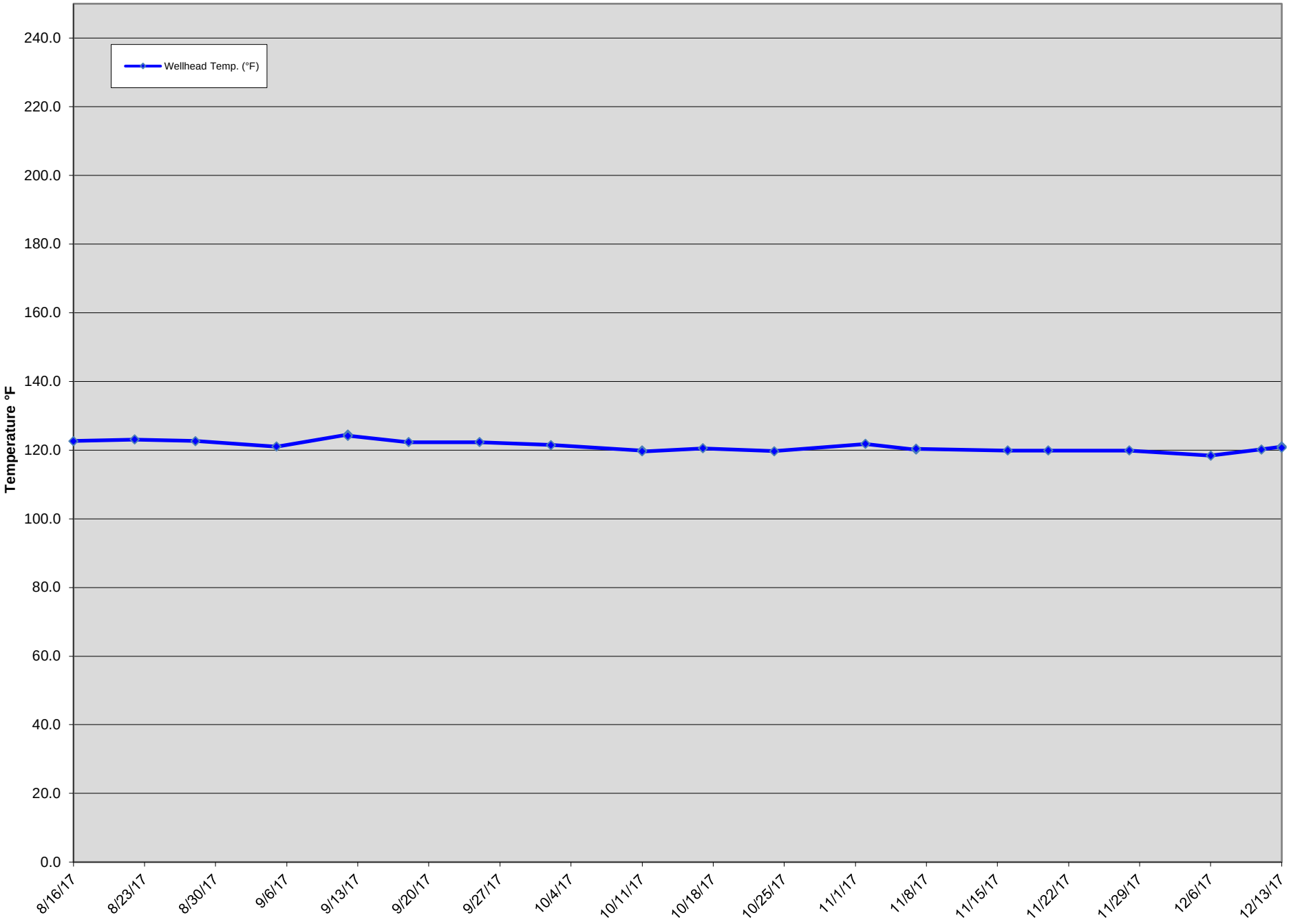
ATTACHMENT D

NECK-AREA GAS EXTRACTION WELL DATA

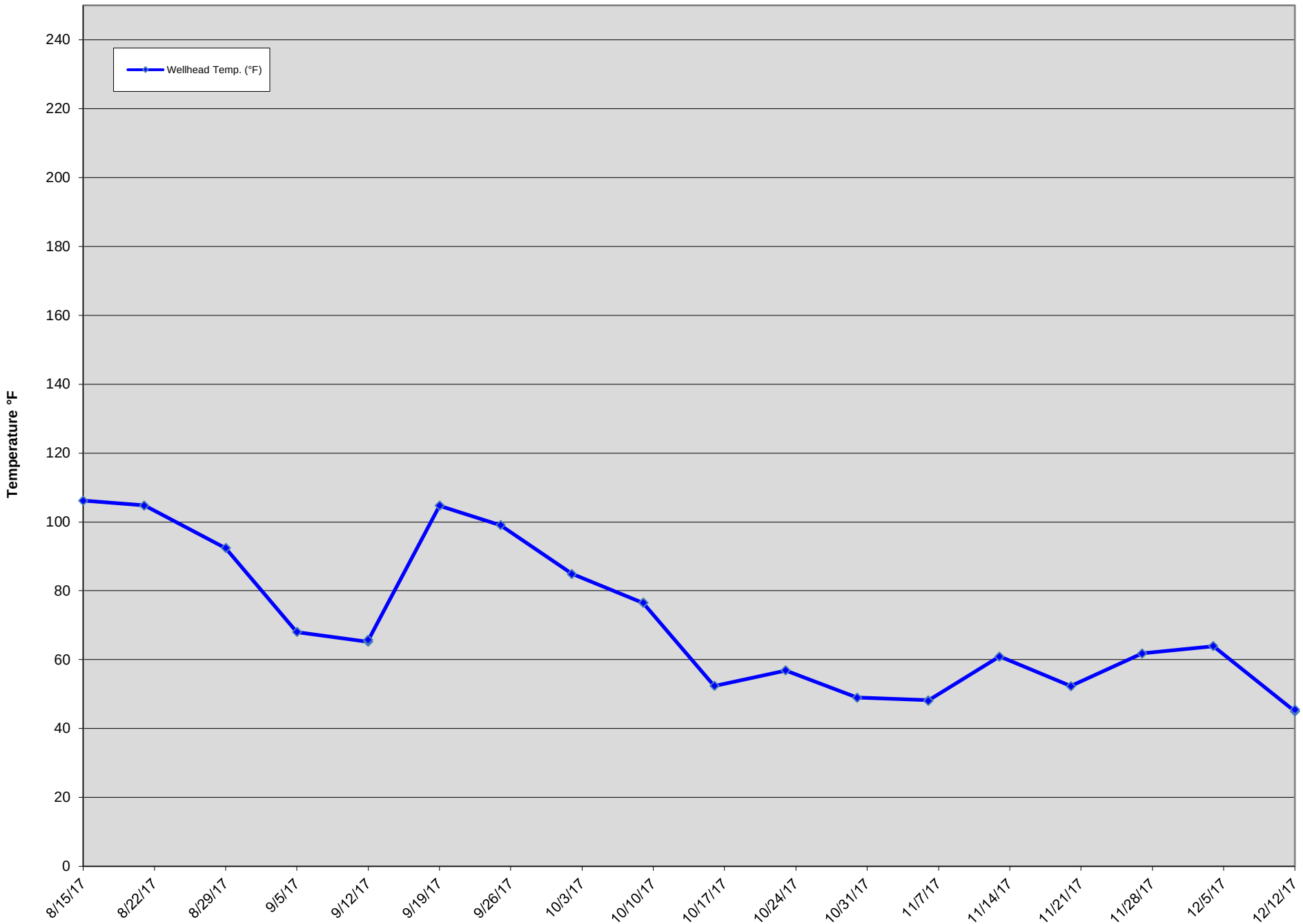
GEW-008 Wellhead Temperatures



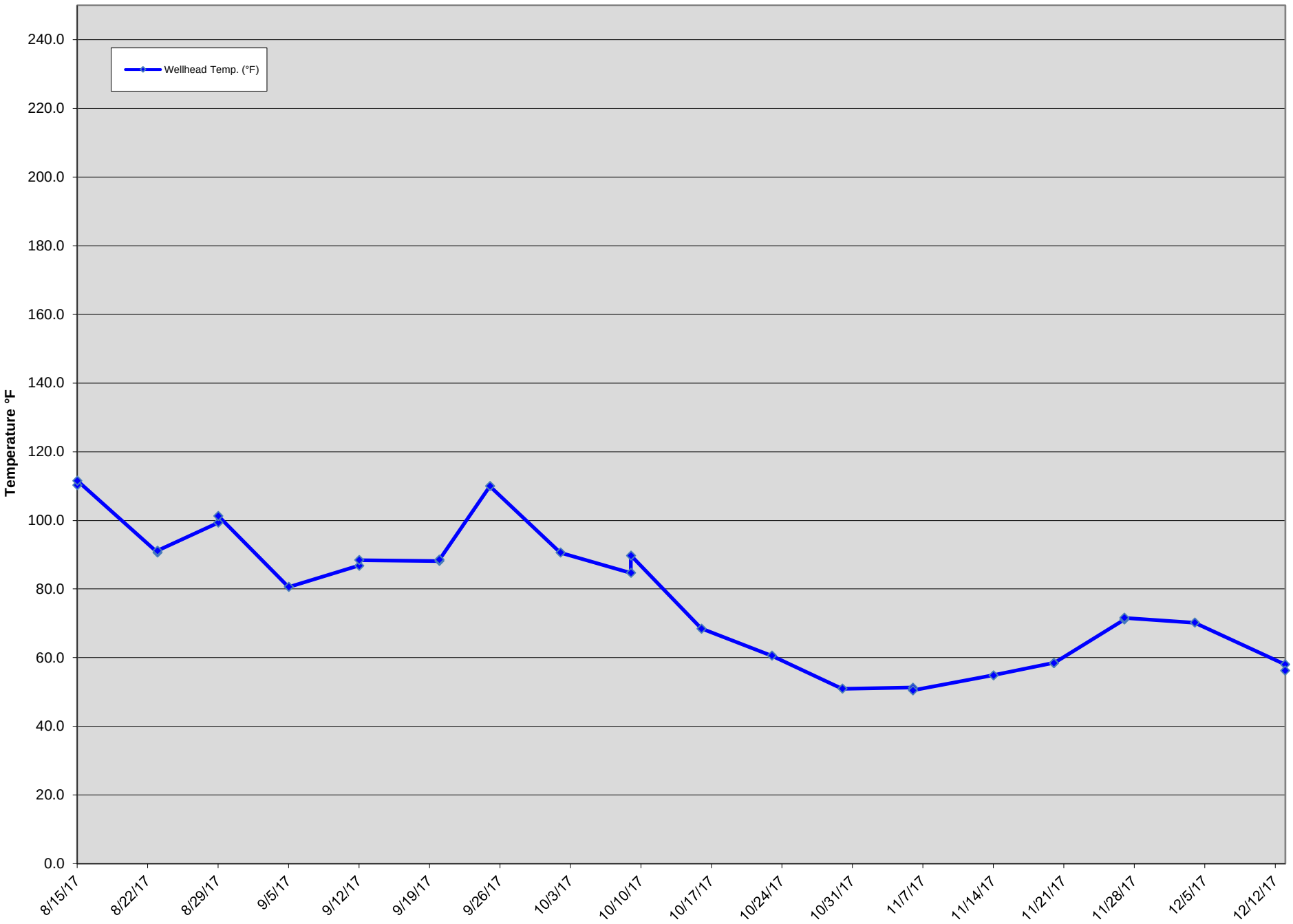
GEW-009 Wellhead Temperatures



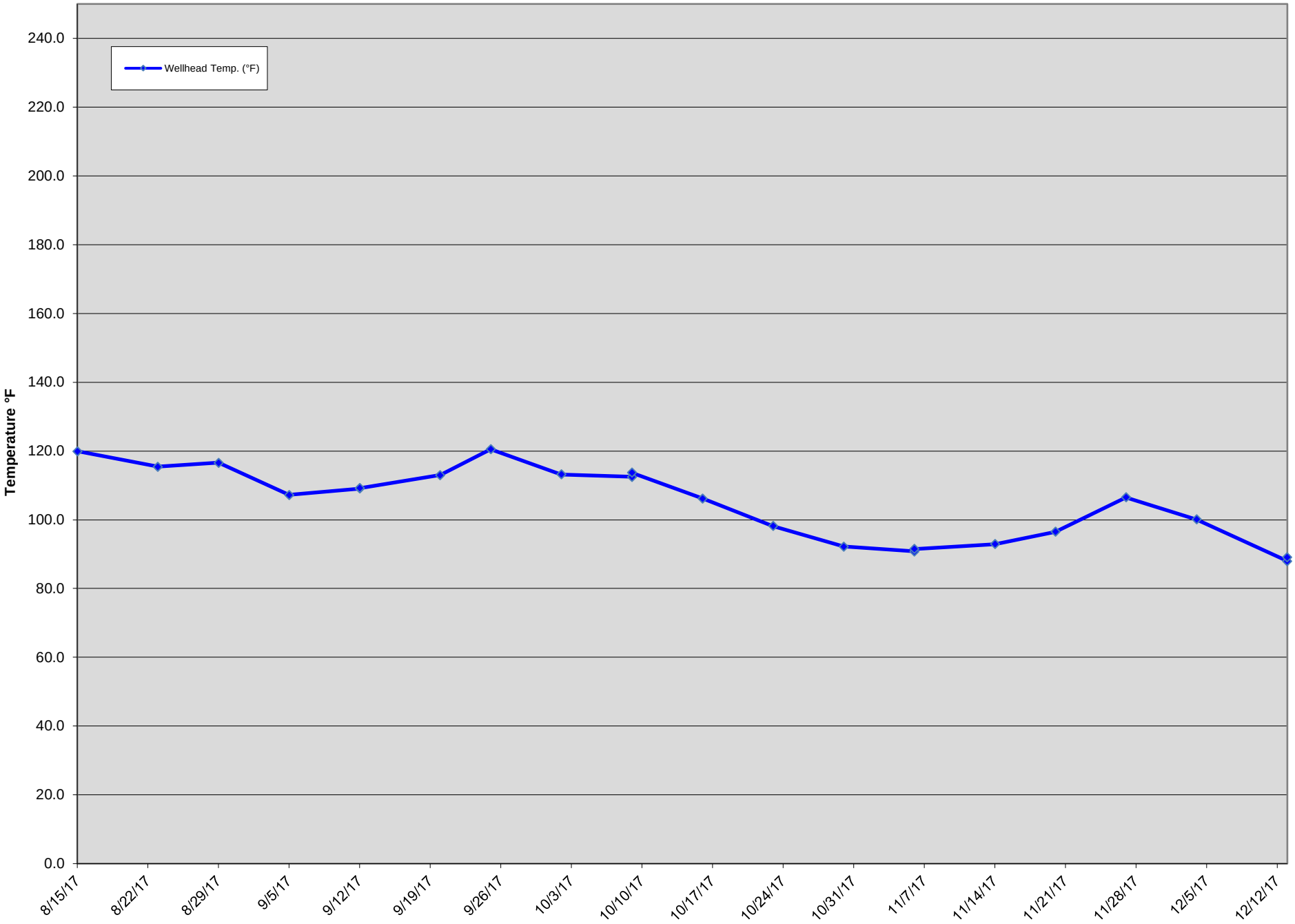
GEW-010 Wellhead Temperatures



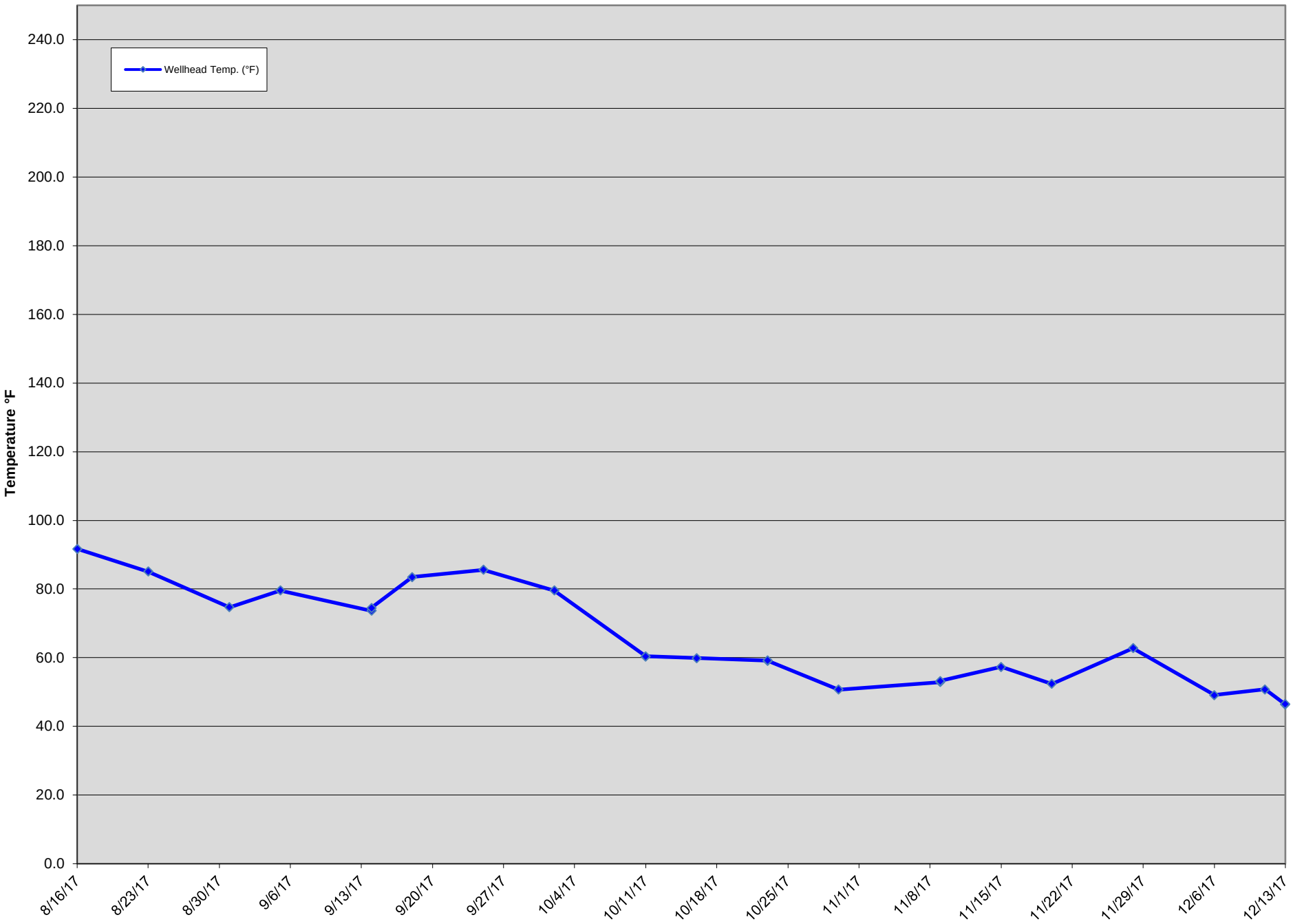
GEW-038 Wellhead Temperatures



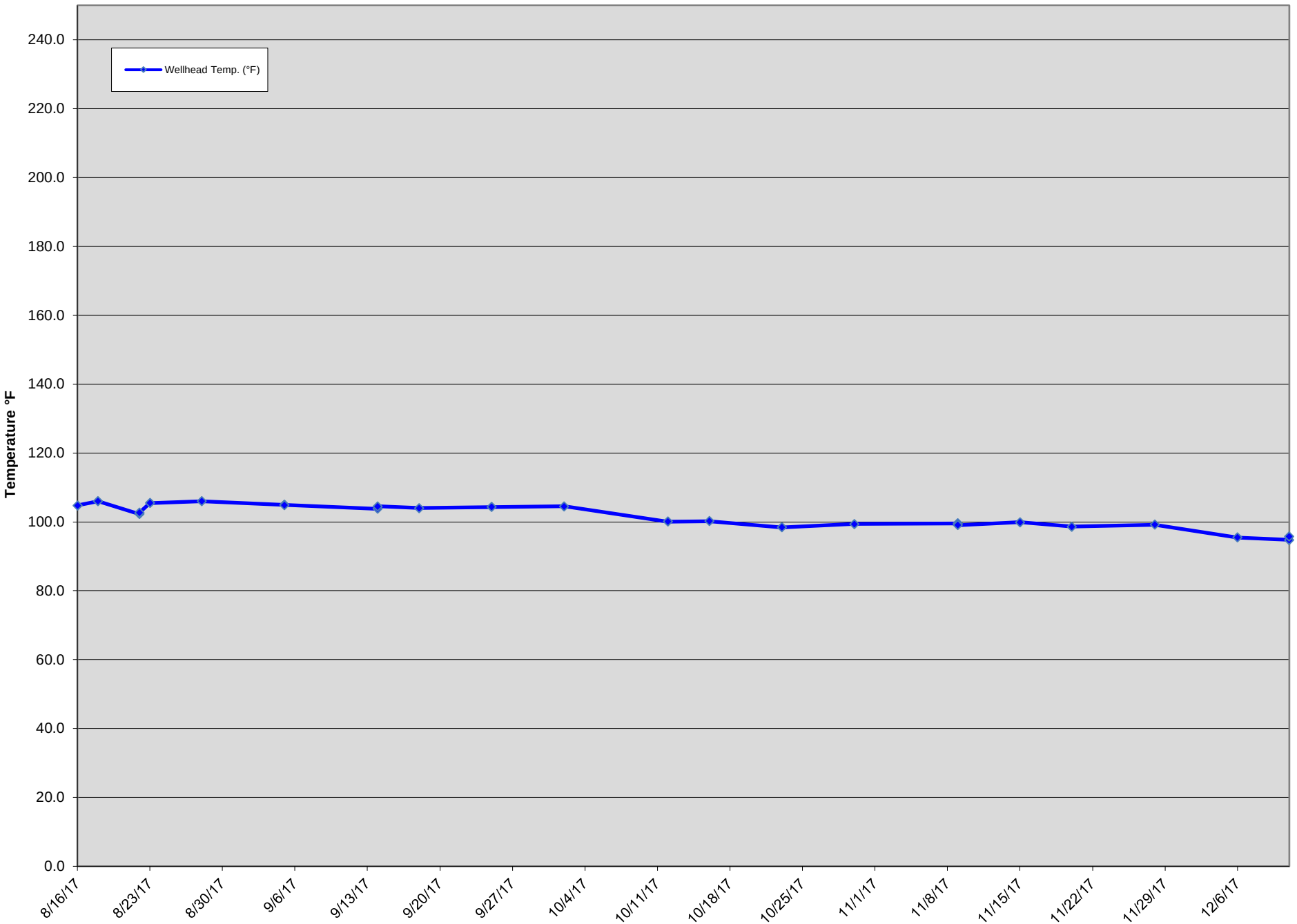
GEW-039 Wellhead Temperatures



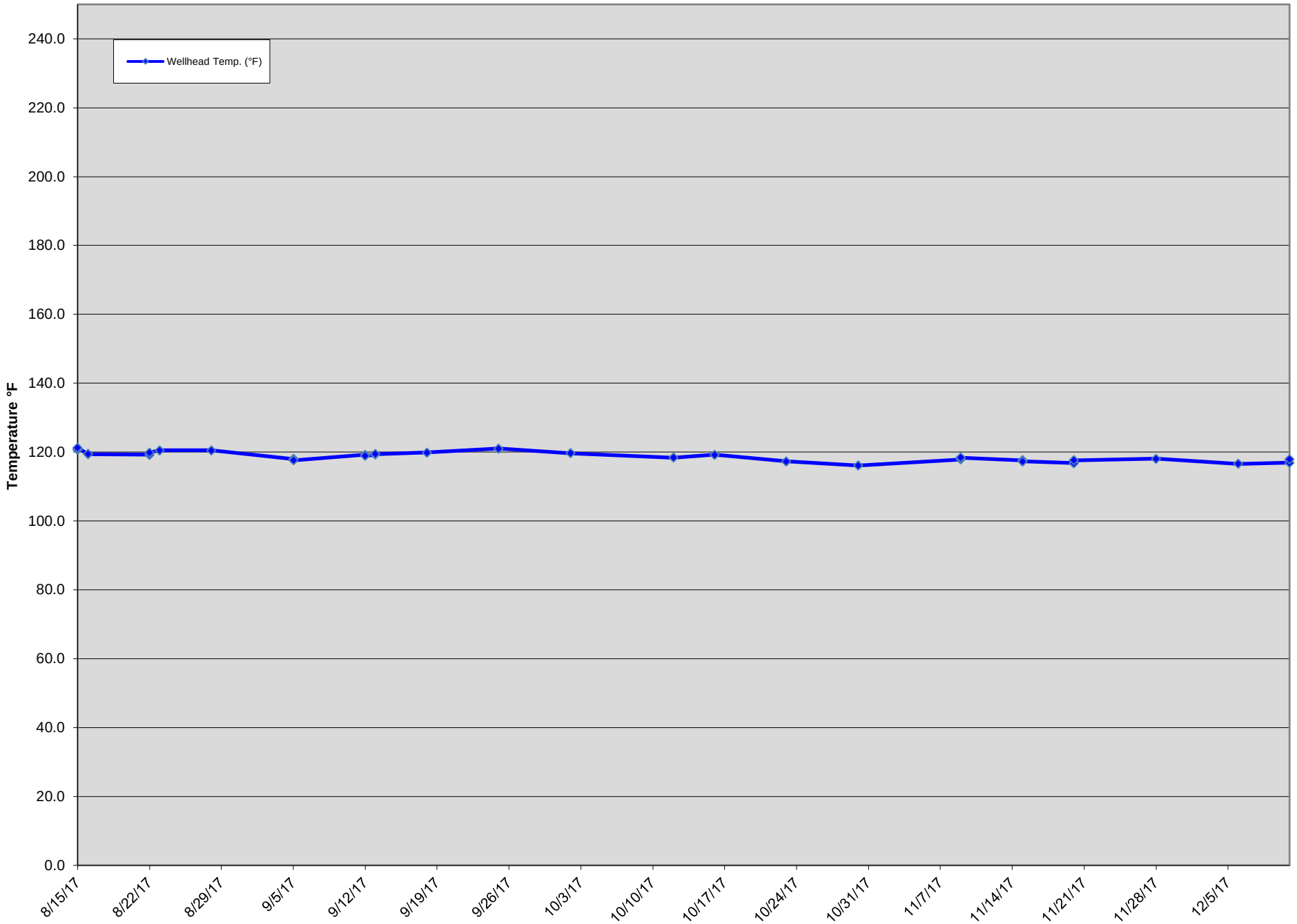
GEW-040 Wellhead Temperatures



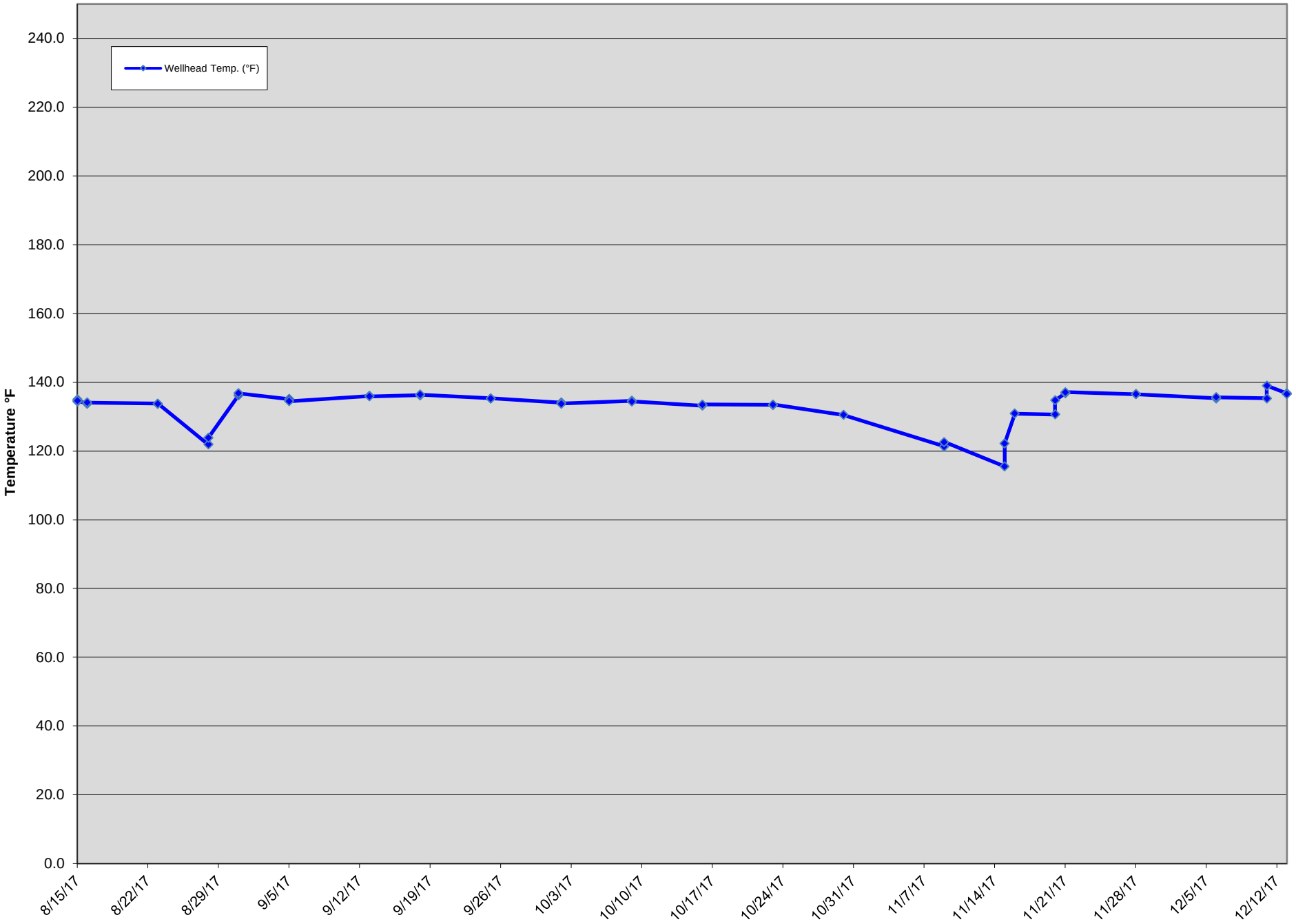
GEW-041R Wellhead Temperatures



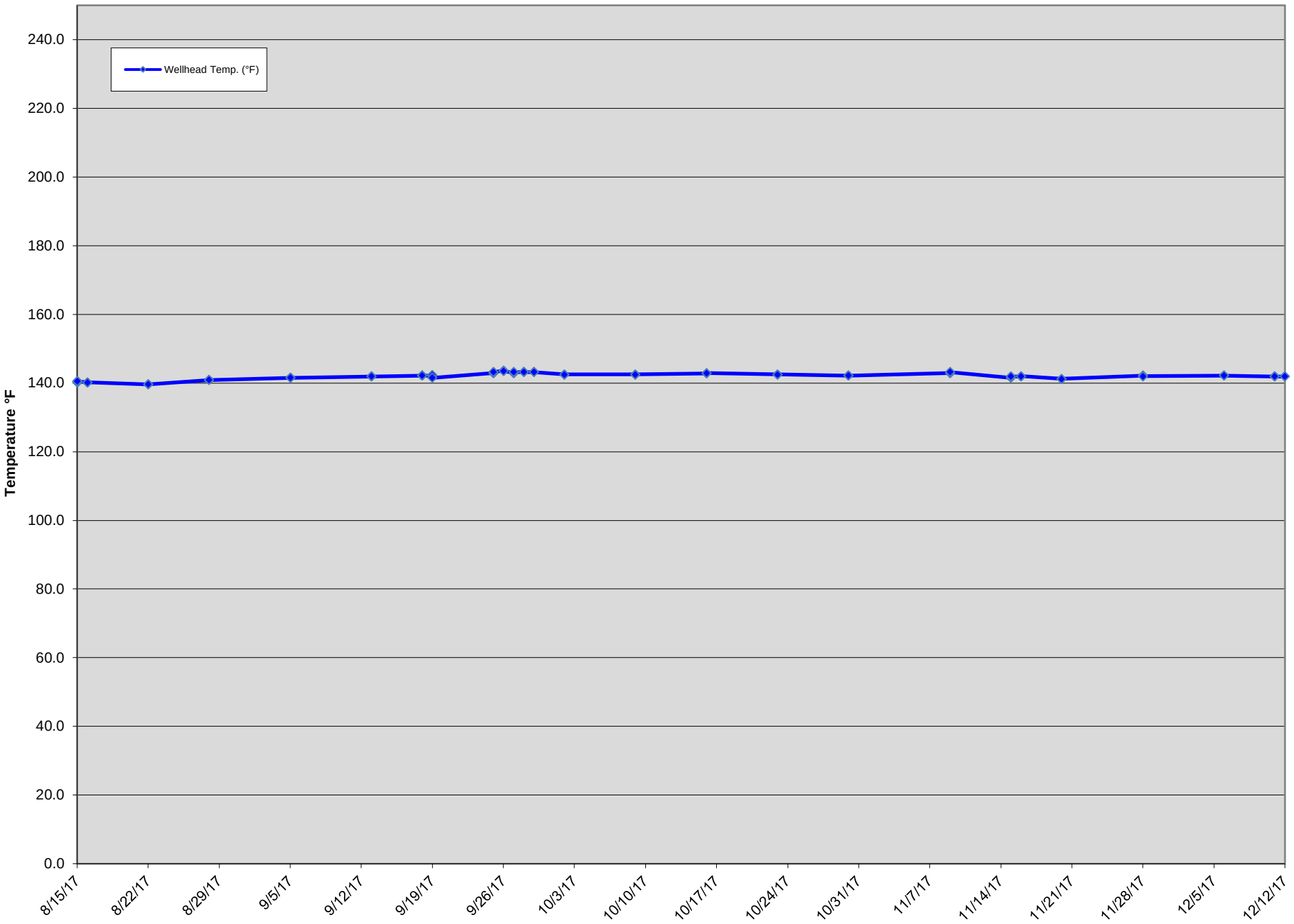
GEW-043R Wellhead Temperatures



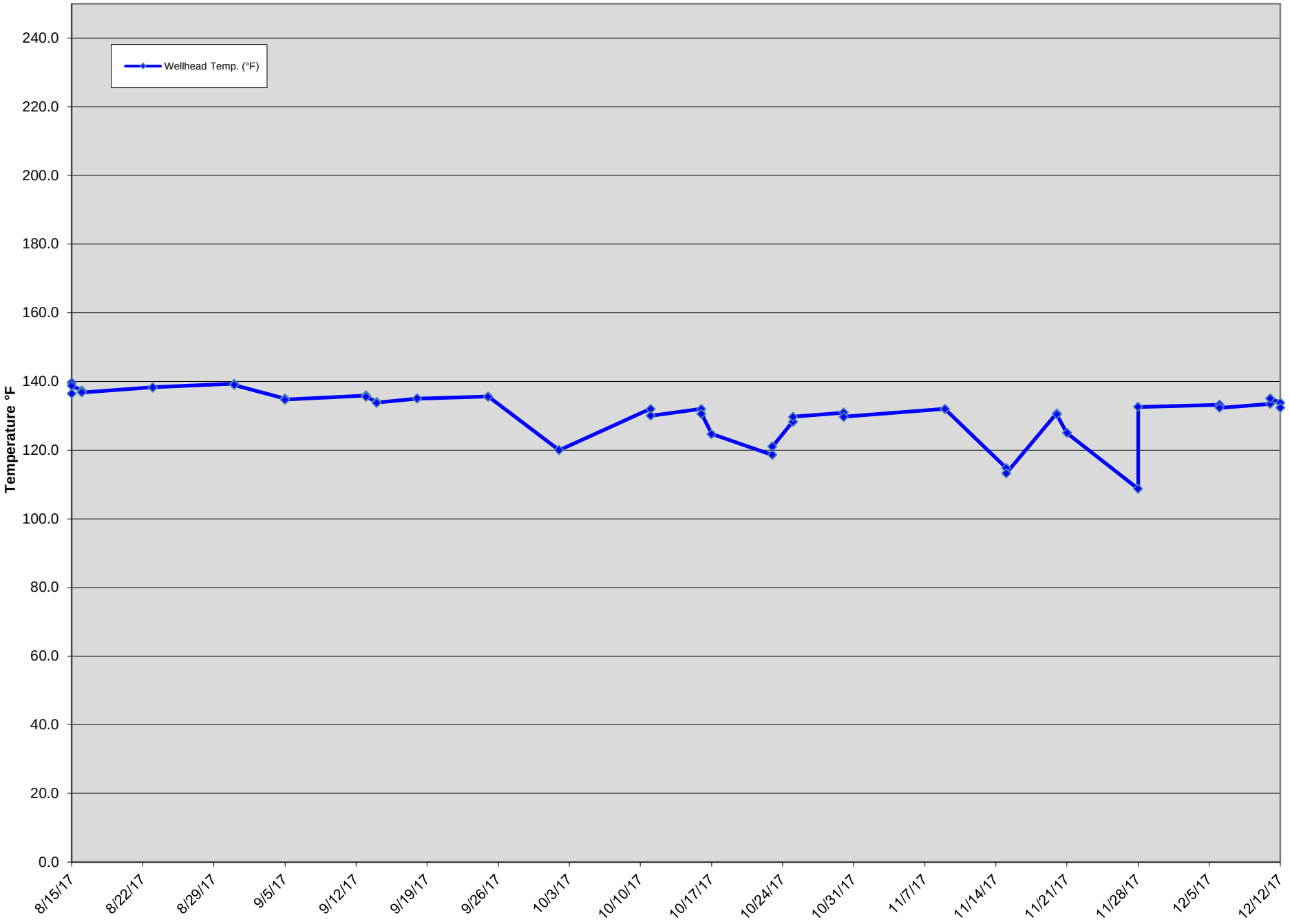
GEW-053 Wellhead Temperatures



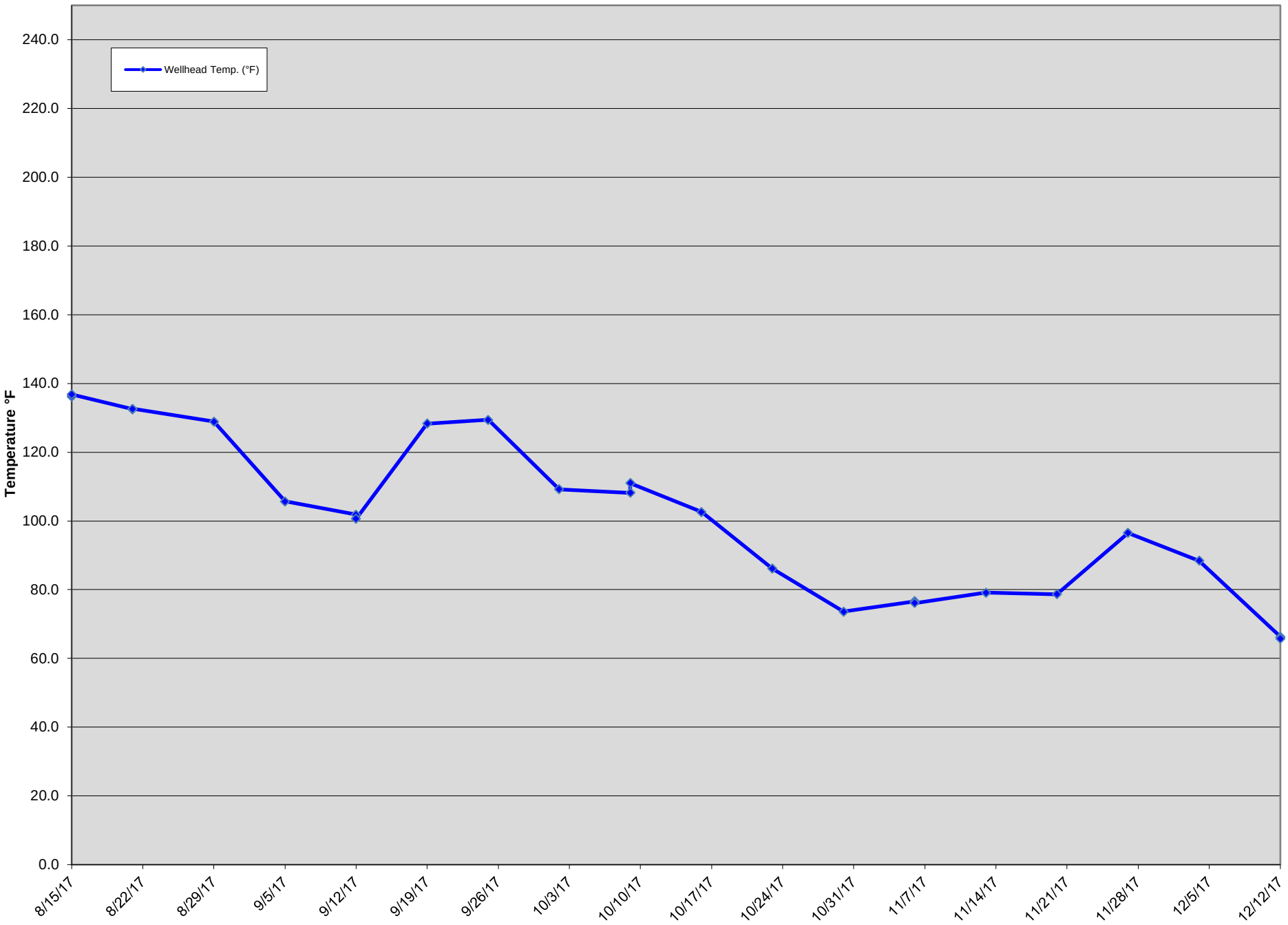
GEW-054 Wellhead Temperatures



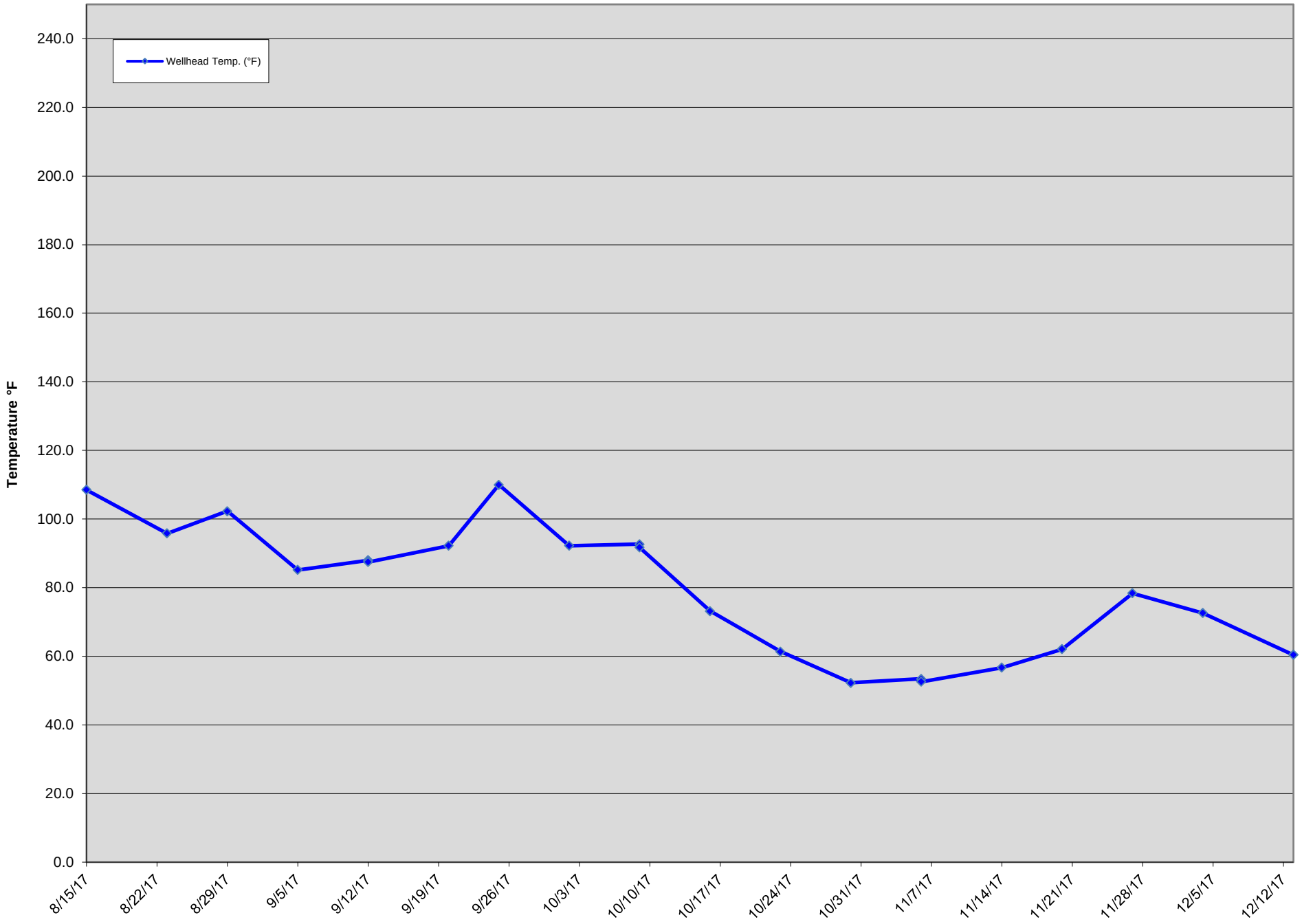
GEW-055 Wellhead Temperatures



GEW-056R Wellhead Temperatures



GEW-109 Wellhead Temperatures



GEW-110 Wellhead Temperatures