

April 10, 2025
File No. 01204123.21-13

Mr. Baitong Chen
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Subject: Monthly Reaction Committee Determination on Reaction Area Boundary
Chiquita Canyon Landfill – Castaic, California

Dear Mr. Chen:

In accordance with Condition Nos. 9a and 9b of the Modified Stipulated Order for Abatement (SOFA) pertaining to the Chiquita Canyon Landfill (Landfill or Facility) (Case No. 6177-4), the Reaction Committee has reviewed newly acquired applicable data recorded during the month of March 2025, considered revisions of the estimated extent of elevated temperature landfill (ETLF) conditions exhibited at the subject Facility (referred to as the “Reaction Area” limits), and has prepared this determination on potentially revising the Reaction Area map.

Attachment A presents the Drawing, titled “Reaction Area Map”, prepared by SCS Engineers (SCS) and dated 4/7/25. The Drawing depicts the Reaction Area boundary as prescribed in Condition No. 9a, which corresponds to the limits of Cells 1/2A, 2B/3, 4, and Module 2B/3/4 P2, as a solid black line. The Drawing also depicts the estimated extent of ETLF conditions being experienced at the site based on the Reaction Committee’s review of scientific data as a dashed magenta line. The rationale that serves as the basis for considering adjustments and modifications to the Reaction Area boundary (or the determination to maintain the decreed boundary), include the following:

- LFG wellhead temperatures in excess of approximately 160 degrees Fahrenheit.
- Poor gas quality (defined as methane levels of less than 30 percent) in conjunction with methane-to-carbon dioxide (CH₄:CO₂) ratios less than 1.0.
- The concentration of hydrogen (H₂) in the LFG measured greater than 2 percent by volume.
- The concentration of carbon monoxide (CO) in the LFG measured greater than 2,000 ppm.
- Accelerated settlement of the landfill surface, defined as approximately 18 inches or greater within a 60-day period, and cracks in landfill cover. This corresponds to a strain value (i.e., settlement rate) rate of 3 percent per year for areas with a 300-foot waste column depth, which we believe is a reasonable average depth in the subject area of interest.
- First-hand observations of Landfill and/or SCS engineering, construction, and operations and maintenance (O&M) field personnel who are on-site related to: 1) atypical excess leachate quantities (presence and quantity of liquids); 2) instances of pressurized liquids emitting from the landfill surface, from boreholes during drilling, and from LFG wells; and, 3) the characteristics of the odors originating from the select areas of the waste footprint (often



described as “chemical-like” and distinctly different from typical LFG or landfill working face odors).

- Observations of subsurface waste conditions and characteristics as noted on borehole drilling logs for recently installed new wells and/or probes.
- Subsurface temperatures recorded at the in-situ waste temperature probes during March 2025.
- Temperature of gas or liquids measured at depth within the LFG well riser pipe (using an automated transmitter or manual field instrumentation).
- Since there were no drilling activities for new waste temperature probes during March 2025, there was no new data related to subsurface temperature and pressures associated with drilling.

CONSIDERATIONS FOR POTENTIAL ADJUSTMENTS TO THE ESTIMATED EXTENT OF ETLF CONDITIONS (DASHED MAGENTA LINE)

In making its monthly determinations, the Reaction Committee evaluates the above set of data parameters, in conjunction with one another, to identify meaningful trends indicating ETLF conditions, as opposed to fluctuations exhibited in isolated datapoints.

Each month, the Reaction Committee scrutinizes particular areas of the Landfill that have previously exhibited abnormal or fluctuating data, when applicable. As discussed below, despite minor variances in discrete areas of the landfill, the Committee has not discerned any meaningful trends with respect to the March 2025 data that would indicate the reaction has expanded into these areas.

Near CV-24083

During multiple monitoring events in March, well CV-24083 exhibited an average methane concentration of approximately 30 percent and an average LFG wellhead temperature of approximately 158 degrees Fahrenheit. The temperature during the most recent monitoring event on April 3rd measured 152 degrees F. At the adjacent well CV-24070, which is positioned closer to the current estimated extent of ETLF conditions (dashed magenta line) than CV-24083, the methane concentrations recorded during March were consistently above 30 percent and the temperatures were consistently below 140 degrees F. Well CV-24070 did not exhibit hydrogen above 2 percent. Accordingly, at this time, the Reaction Committee believes that no adjustment to the estimated extent of ETLF conditions in this discrete location is warranted, since the data recorded in March does not appear to signal a potential expansion of the subsurface reaction.

Near CV-24062

Recall that the LFG temperature recorded at the wellhead in CV-24062 in February demonstrated abrupt increases and decreases of 10 to 20 degrees Fahrenheit over relatively short timeframes (2-day to 7-day periods). While the hydrogen content measured in February was greater than 2 percent, the methane concentration measured in late February was 34 percent, suggesting that

methanogenesis is still prevalent within the surrounding waste mass. This well is equipped with a dewatering pump and the abrupt temperature fluctuations observed in February were likely associated with the ongoing liquid removal activities. During March, the LFG temperature measured in the wellhead fluctuated over a 13-degree range and methane concentrations averaged approximately 32 percent. During the most recent monitoring event on April 7th, this well exhibited 45 percent methane and an LFG wellhead temperature of 143.5 degrees F. The two adjacent wells, CV-24072 and CV-24073 exhibit LFG temperatures and methane concentrations with less variability and values that are not indicative of a reaction (methane concentrations above 30 percent and temperatures less than 140 degrees F). Furthermore, the in-situ waste temperatures at the adjacent temperature monitoring probe TP-13 (approximately 125 feet offset) are at or below 160 degrees F at all depth intervals. Accordingly, the Reaction Committee does not believe that any adjustment to the estimated extent of ETLF conditions in this discrete location is warranted at this time, since the data recorded in March does not appear to consistently signal a potential expansion of the subsurface reaction.

Near CV-24084 & TP-11

Considering the increasing temperatures recorded by the thermocouples at various depth intervals in TP-11 over the past several months, the Reaction Committee carefully considered the operating parameters recorded at the co-located well CV-24084, along with conditions at adjacent wells CV-24071 and CV-24156. While the 30-day maximum temperature recorded at the 125-foot interval in TP-11 is 169 degrees F, the average LFG temperature at the co-located well CV-24084 is less than 140 degrees F. While the average methane concentration exhibited at well CV-24084 during multiple monitoring events in March of 16 percent is suppressed, the most recent methane content recorded on April 8th is 42 percent. The hydrogen concentrations at CV-24084 were below 2 percent. The gas composition and temperatures at adjacent well CV-24156 are clearly inconsistent with ETLF conditions (methane content near 50 percent and temperatures less than 118 degrees). While adjacent well CV-24071 exhibited hydrogen greater than 2 percent, the methane concentrations above 30 percent and low temperature values are likewise inconsistent with ETLF conditions. Accordingly, the Reaction Committee does not believe that any adjustment to the estimated extent of ETLF conditions in this discrete location is warranted at this time, since the data recorded in March does not appear to consistently signal a potential expansion of the subsurface reaction.

Near TP-7, TP-29, TP-30, TP-31, and TP-32

On or about April 1, 2025, the Reaction Committee received documentation, prepared by Dr. Timothy D. Stark, Ph.D, PE, BC.GE and dated February 26, 2025, titled "Comments on November 26, 2024 Revised Soil Reaction Break/Barrier Plan and February 20, 2025 Waste Temperature Data for Chiquita Canyon Landfill Subsurface Elevated Temperature (SET) Event". This document was included as Exhibit 6 in the California Environmental Protection Agency Department of Toxic Substances and Control Imminent and Substantial Endangerment Determination and Order, effective April 2, 2025. Figure 2 of this document presented a delineation of the SET Event that is inclusive of temperature monitoring probes TP-7, TP-29, TP-30, TP-31, and TP-32. The Reaction Committee reviewed the in-situ waste temperatures recorded at these five probes and evaluated the surrounding LFG wells and field conditions in relation to the rationale that serves as the basis for considering adjustments and modifications to the Reaction Area boundary that are cited above. Based on this evaluation, there does not appear to be evidence of a potential expansion of the subsurface reaction into the portions of the waste mass along the delineation presented in Figure 2.

Accordingly, the Reaction Committee does not believe that any adjustment to the estimated extent of ETLF conditions in this discrete location is warranted at this time, since the data recorded in March does not appear to consistently signal a potential expansion of the subsurface reaction

TEMPERATURE MONITORING PROBE DATA

The Reaction Committee reviewed the temperature measurements recorded during March 2025 by the in-situ temperature monitoring probes. As of March 2025, four (4) of the twenty-eight (28) probes (TP-2, 3, 9, and 15) are located within the current estimated extent of ETLF conditions (dashed magenta line). Of the remaining twenty-four (24) probes positioned outside of the boundary, twelve (12) probes are positioned within relatively close proximity (within 200 feet) of this boundary. It is the Committee's opinion that the temperatures recorded by the 24 probes outside of the boundary during March 2025 are not indicative of a subsurface reaction and do not substantiate a decision to adjust the boundary of the reaction area at this time. Chiquita's submittal of temperature measurements to the Local Enforcement Agency, dated April 4, 2025, explained that there was an anomaly in the data recorded by the 30-foot thermocouple in TP-04, which was attributed to instrumentation malfunction/failure. In addition, the communication to LEA noted that *"During field investigation of TP-06, the thermocouples were evaluated and found to have had errors and failures since being brought back online from filling operations. The failed sensors are in the process of being replaced and new and corrected temperatures will be included in next week's submittal."*

The Reaction Committee evaluated the 30-day maximum temperatures recorded in TP-26 (173 degrees Fahrenheit at the 160-foot interval), TP-29 (183 degrees F at the 250-foot interval), TP-30 (170 degrees F at the 200-foot interval), and TP-31 (185 degrees F at the 190-foot interval). The Committee noted differentiation between the 30-day maximum temperatures in these four probes compared to the 30-day maximum temperatures measured at the two probes within the current estimated extent of ETLF conditions (dashed magenta line), specifically TP-3 (234 degrees F at 45-foot interval) and TP-9 (222 degrees at the 125-foot interval). Based on this differentiation, along with consideration of the other relevant criteria and data parameters, the Reaction Committee does not believe an adjustment to the boundary of the reaction area to include the portions of the waste footprint inclusive of TP-26, TP-29, TP-30, and TP-31 is warranted at this time.

HYDROGEN CONCENTRATIONS

The Reaction Committee also evaluated the concentration of hydrogen in landfill gas (LFG) during March 2025. Recall that certain wells positioned to the south and east of the reaction area boundary (where dewatering pumping was reactivated) have periodically demonstrated some increased hydrogen content in the LFG during the Reaction Committee's review of the data in previous months, which similarly was the case for the March data. The Reaction Committee noted in its review of the data that these wells did not exhibit elevated temperatures, except for isolated instances at wells CV-24083 and CV-24062. The most recent measurements recorded at these two wells confirm that sustained elevated temperature values have not been exhibited at this time. Other than these isolated values at these two wells, there was no evidence of the increased heat that is typical with ETLF conditions present at the wells exhibiting atypical hydrogen concentrations. As noted previously, the Committee suspects this increased hydrogen content may be attributable to substantial dewatering being accomplished throughout the Reaction Area and may be associated with gas movement from within the Reaction Area by existing horizontal collectors in close proximity. Thus, the presence of elevated hydrogen in these isolated locations does not suggest that ETLF

conditions are expanding south and east of the delineated boundary. Accordingly, the Reaction Committee does not believe an adjustment to the boundary of the reaction area is warranted at this time.


CONCLUSION

As presented on the Drawing included as **Attachment A**, the estimated extent of ETLF conditions (dashed magenta line) is fully contained within the Reaction Area boundary decreed in the SOFA (solid black line). Because the ETLF conditions are fully contained within the Reaction Area boundary and have not expanded into a new cell, the Reaction Committee finds no basis to modify the Reaction Area boundary as prescribed in Condition 9a at this time.

There was no dissenting opinion among the Reaction Committee members regarding this monthly determination. Supporting data is presented on the Drawing included as **Attachment A**. The maximum temperature measurements recorded at the 28 in-situ waste temperature monitoring probes during March are presented in **Attachment B** in graphical format. The landfill gas wellhead temperatures recorded at the extraction wells for the entire landfill footprint are reflected on the isothermal gradient range map presented as **Attachment C**. The carbon monoxide (CO) concentrations measured at the landfill gas wellheads in the vicinity of the data-driven reaction area boundary are depicted on the range map presented as **Attachment D**. The electronic database and recordkeeping platform enables these measurements to be downloaded into a tabular spreadsheet format, which can be submitted to the South Coast Air Quality Management District under separate cover, if requested.

Please contact either of the undersigned if you have questions or require additional information.

Sincerely,



Robert E. Dick, PE, BCEE
Senior Vice President
SCS Engineers



Patrick S. Sullivan, BCES, CCP
Senior Vice President
SCS Engineers

RED/PSS

cc: Nathaniel Dickel, SCAQMD
Christina Ojeda, SCAQMD
Pablo Sanchez Soria, PhD, CIH, CTEH
Neal Bolton, PE, Blue Ridge Services, Inc.
Richard Pleus, PhD, Intertox
Srividhya Viswanathan, PE, SCS Engineers

Mr. Baitong Chen

April 10, 2025

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Enclosures:

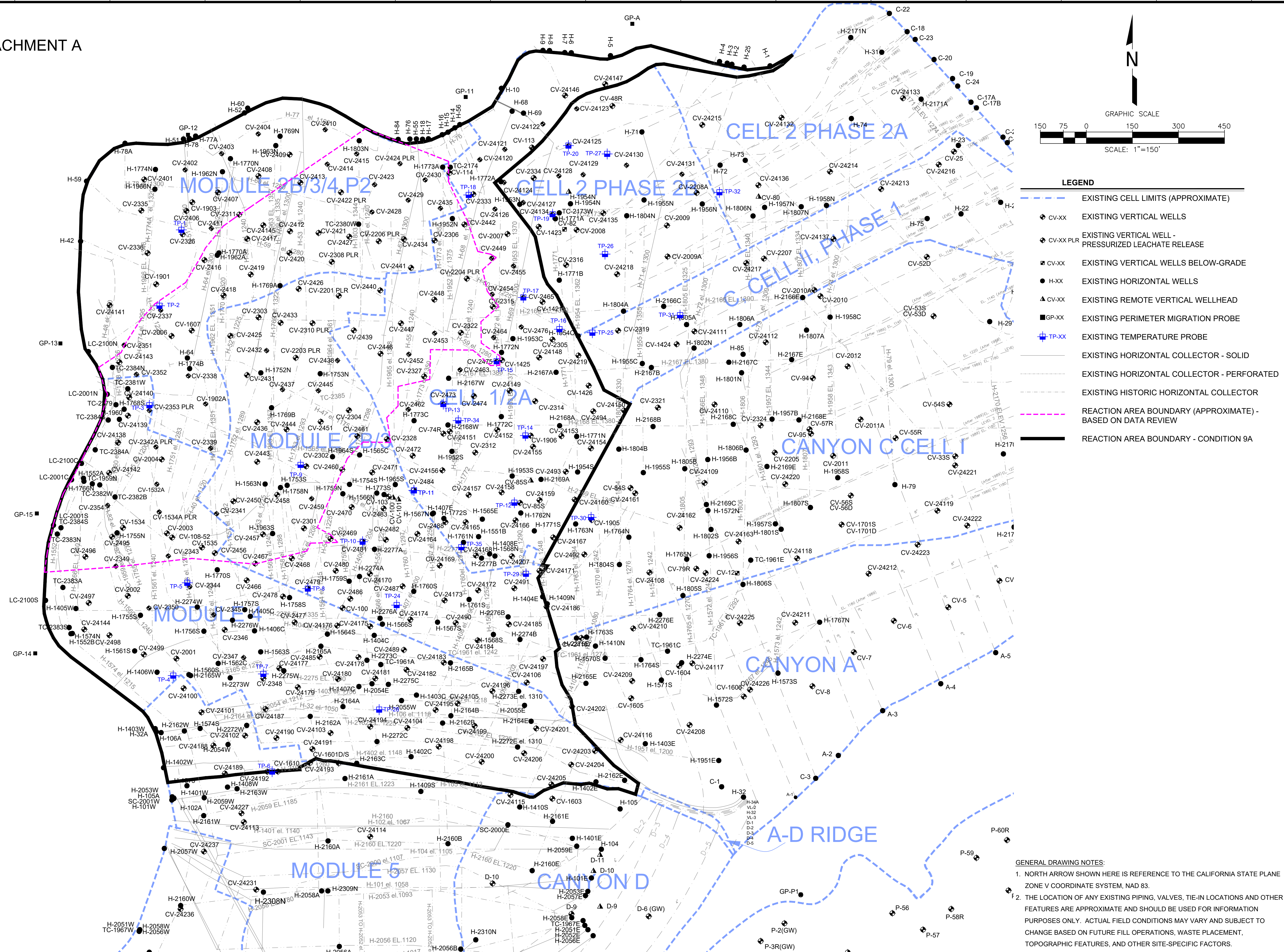
Attachment A – Reaction Area Map

Attachment B – In-Situ Waste Temperature Monitoring Probe Data

Attachment C – Isothermal Gradient Range Map

Attachment D – Wellhead Carbon Monoxide Range Map

ATTACHMENT A




LEGEND

- EXISTING CELL LIMITS (APPROXIMATE)
- CV-XX EXISTING VERTICAL WELLS
- CV-XX PLR EXISTING VERTICAL WELL - PRESSURIZED LEACHATE RELEASE
- CV-XX EXISTING VERTICAL WELLS BELOW-GRADE
- H-XX EXISTING HORIZONTAL WELLS
- CV-XX EXISTING REMOTE VERTICAL WELLHEAD
- GP-XX EXISTING PERIMETER MIGRATION PROBE
- TP-XX EXISTING TEMPERATURE PROBE
- EXISTING HORIZONTAL COLLECTOR - SOLID
- EXISTING HORIZONTAL COLLECTOR - PERFORATED
- EXISTING HISTORIC HORIZONTAL COLLECTOR
- - - REACTION AREA BOUNDARY (APPROXIMATE) - BASED ON DATA REVIEW
- REACTION AREA BOUNDARY - CONDITION 9A

GENERAL DRAWING NOTES:

- NORTH ARROW SHOWN HERE IS REFERENCE TO THE CALIFORNIA STATE PLANE ZONE V COORDINATE SYSTEM, NAD 83.
- THE LOCATION OF ANY EXISTING PIPING, VALVES, TIE-IN LOCATIONS AND OTHER FEATURES ARE APPROXIMATE AND SHOULD BE USED FOR INFORMATION PURPOSES ONLY. ACTUAL FIELD CONDITIONS MAY VARY AND SUBJECT TO CHANGE BASED ON FUTURE FILL OPERATIONS, WASTE PLACEMENT, TOPOGRAPHIC FEATURES, AND OTHER SITE-SPECIFIC FACTORS.

<div>SCS ENGINEERS</div> <div>ENVIRONMENTAL CONSULTANTS</div> <div>8799 BALBOA AVENUE SUITE 250 SAN DIEGO, CA 92123 (619) 571-5066 FAX: (619) 427-0805</div>				<div>DATE: 04/07/2025</div> <div>SCALE: AS SHOWN</div> <div>SHEET: 1</div>		<div>CLIENT:</div> <div></div> <div>CHIQUITA CANYON LANDFILL CASTAIC, CALIFORNIA</div>		<div>SHEET TITLE: REACTION AREA MAP MARCH, 2025</div> <div>PROJECT TITLE: CHIQUITA CANYON LANDFILL CASTAIC, CALIFORNIA</div>		<div>NO.</div> <div>REVISION</div> <div>DATE</div>	
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Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 2/20/2025 to 4/2/2025

From March 27, 2025, through April 2, 2025, there were two recorded temperature increases and one temperature decrease that triggered the notification limits set forth in the LEA's October 4, 2024 letter. Both increases and the decrease appear to be issues with the thermocouple or data head and are being evaluated as possible anomaly/outlier data.

Additionally, as of February 7, 2025, eight new TMPs (TMP-25, TMP-26, TMP-27, TMP-29, TMP-30, TMP-31, TMP-32, and TMP-34) have been installed and are online. None of these eight new TMPs indicate reaction temperatures occurring outside of the currently delineated data-driven reaction area boundary, and the three TMPs that were able to be drilled to within 20 feet of the liner (TMP-27, TMP-31, and TMP-32) show significantly cooler temperatures at the deepest thermocouple, as expected due to the cooling from the underlying earth. This data further supports the previous conclusions of cooler temperatures near the liner and the liner's integrity being uncompromised by elevated temperatures.

Chiquita provides the following updates:

- TP-04
 - 30-foot thermocouple showed an increase in maximum temperature of 33°F from 167°F to 200°F from March 26th to March 27th, then an increase in maximum temperature of 33°F from 200°F to 233°F from March 27th to March 28th, and then a decrease in maximum temperature of 60°F from 233°F to 173°F from March 28th to March 30th. No other thermocouples of TP-04 showed a change of temperature during this time and we believe the thermocouple is beginning to fail. The 30-foot thermocouple was taken offline on April 2nd for testing and diagnostics to determine if the temperatures are in error or the thermocouple is falling.
- TP-06
 - During field investigation of TP-06, the thermocouples were evaluated and found to have had errors and failures since being brought back online from filling operations. The failed sensors are in the process of being replaced and new and corrected temperatures will be included in next week's submittal.

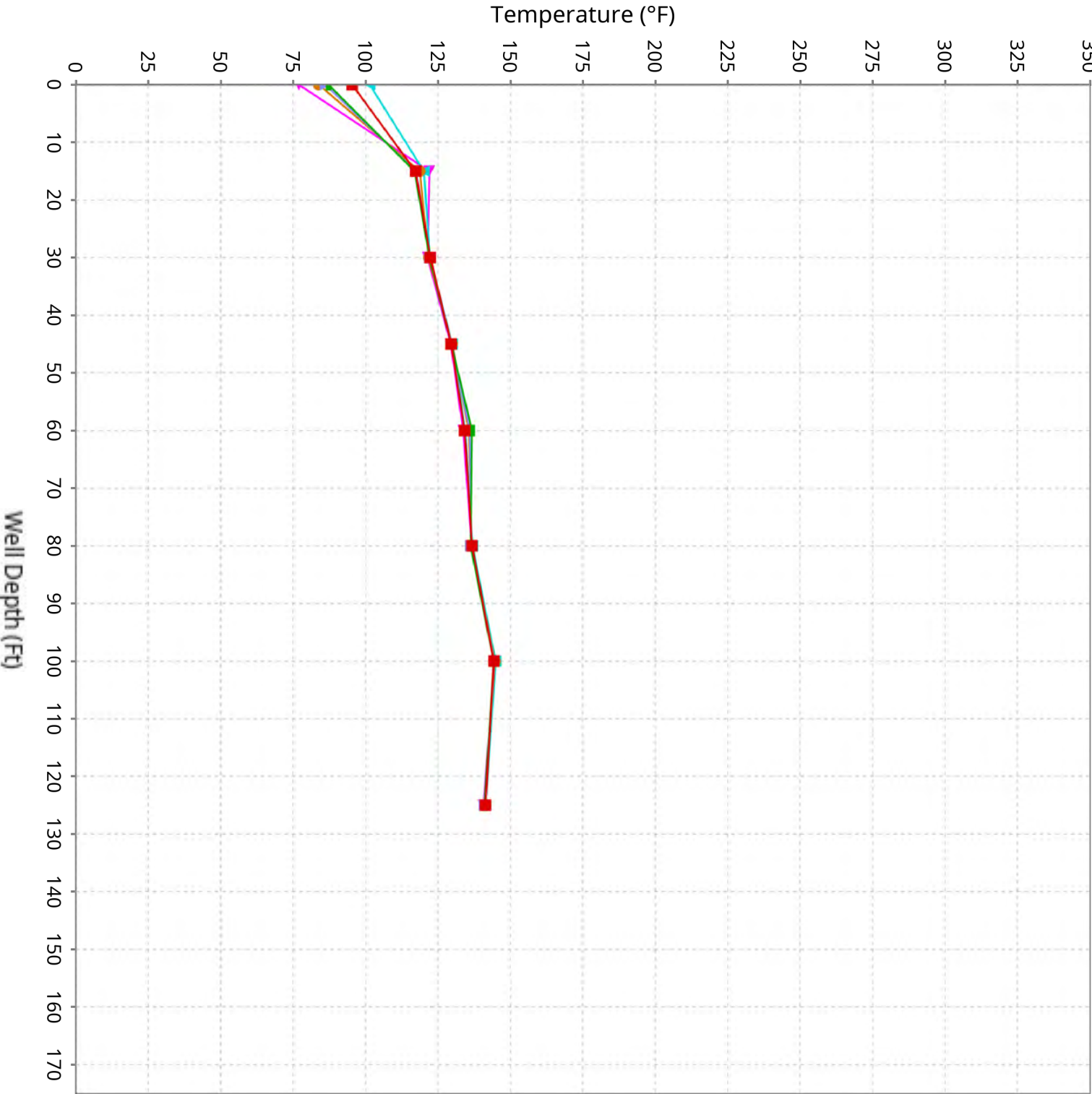
SCS ENGINEERS

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274 Granite Run Drive
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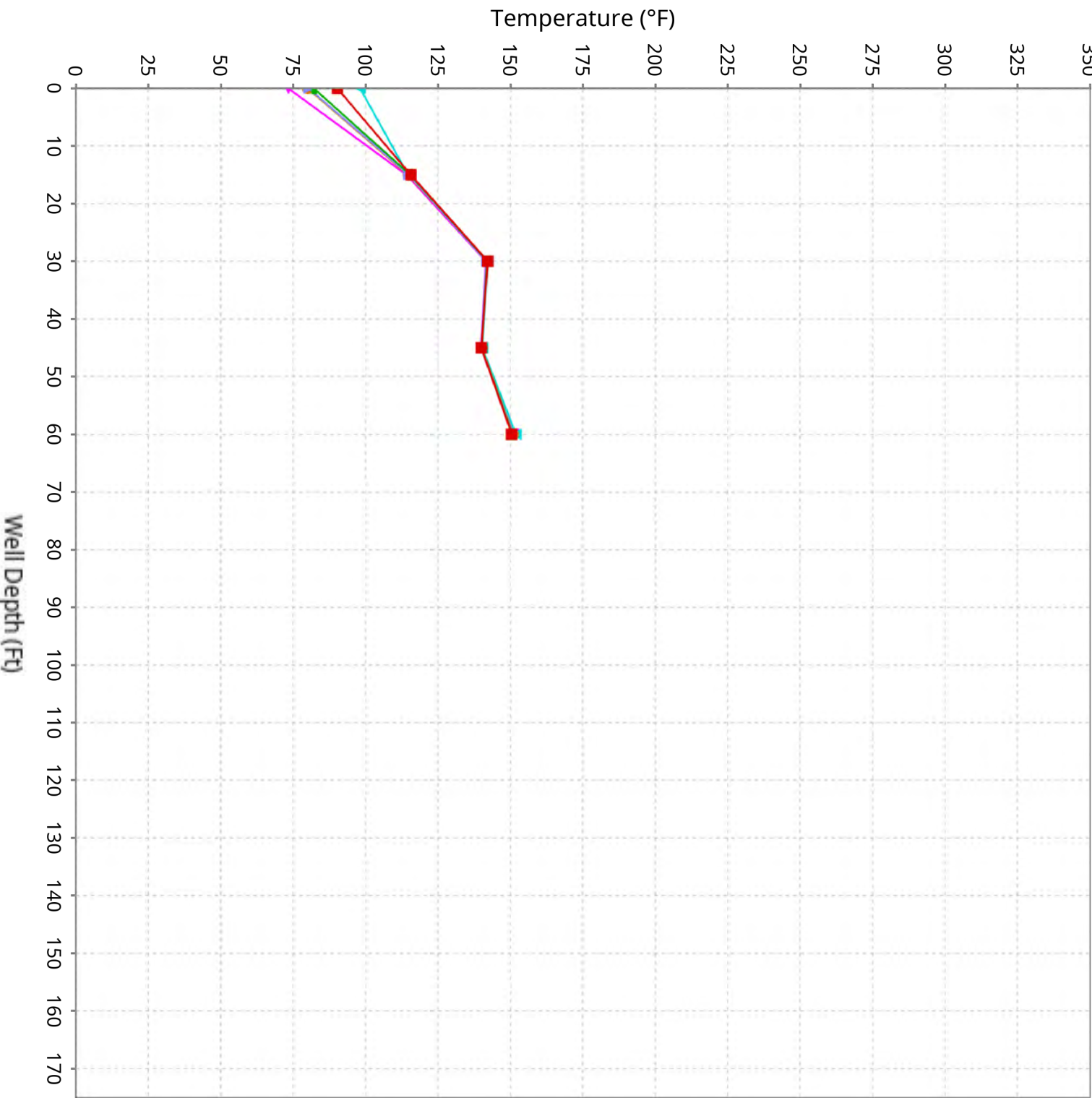
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-1

Maximum data for 2/20/2025 to 4/2/2025



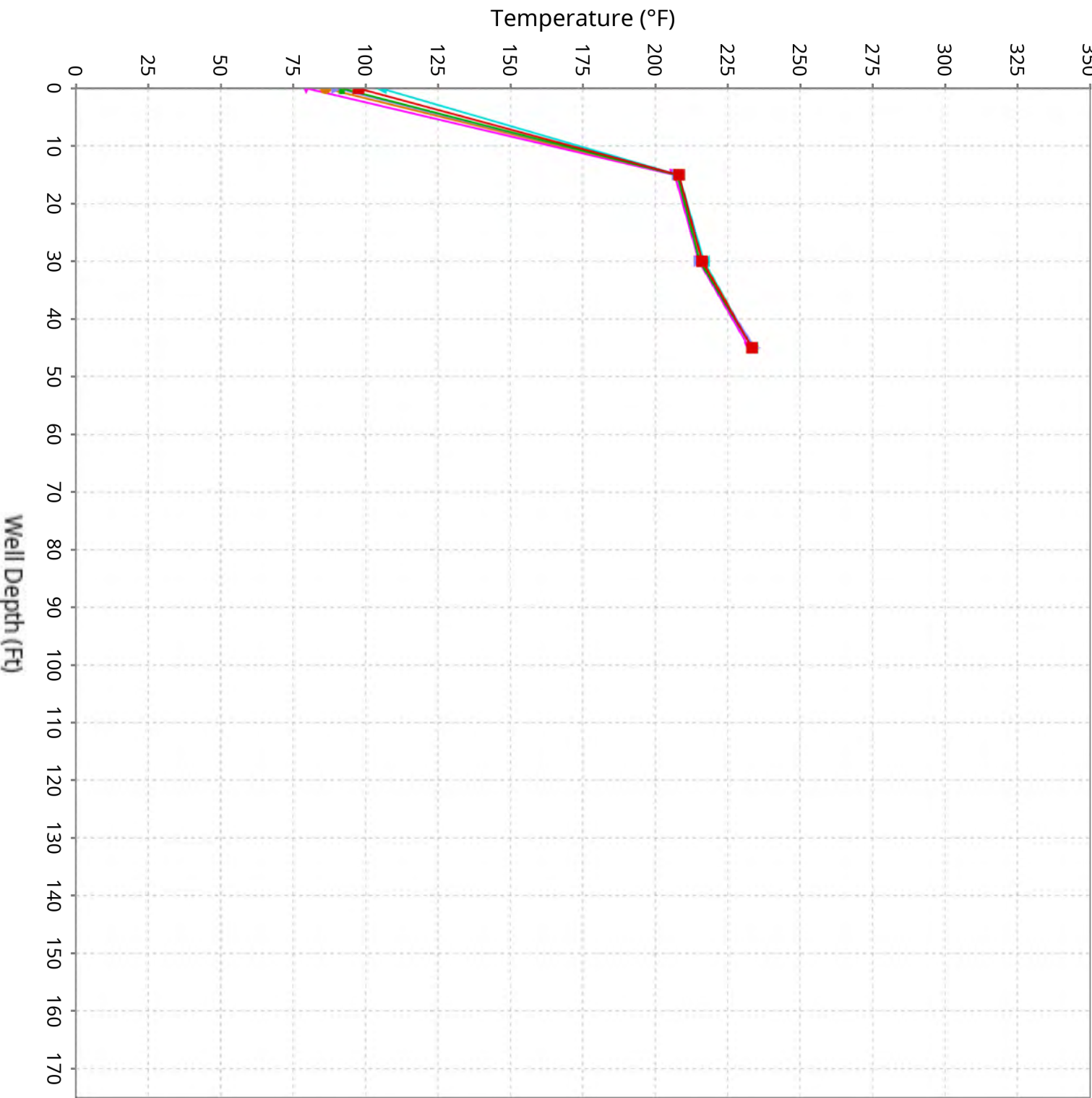
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-2

Maximum data for 2/20/2025 to 4/2/2025



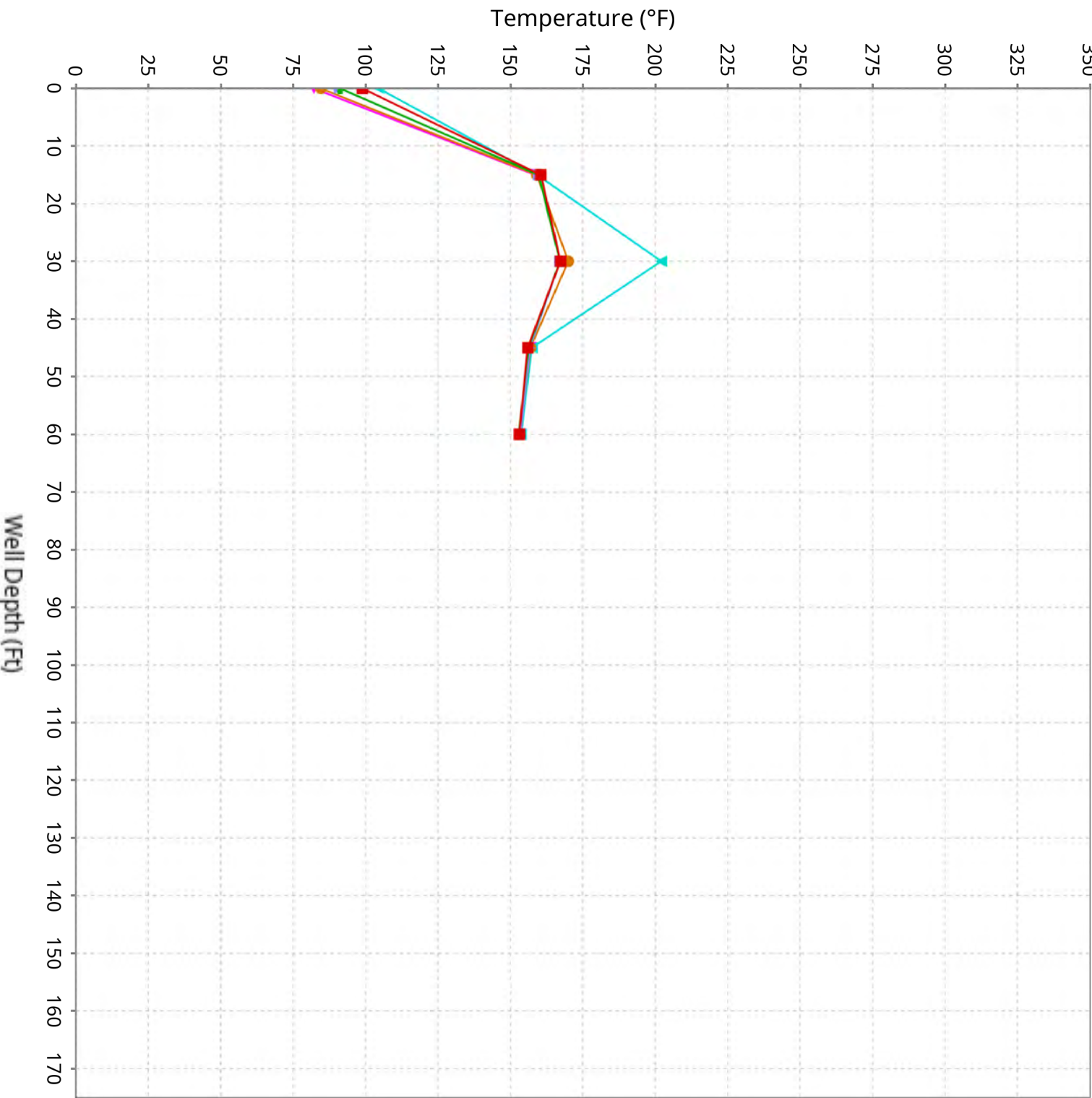
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-3

Maximum data for 2/20/2025 to 4/2/2025



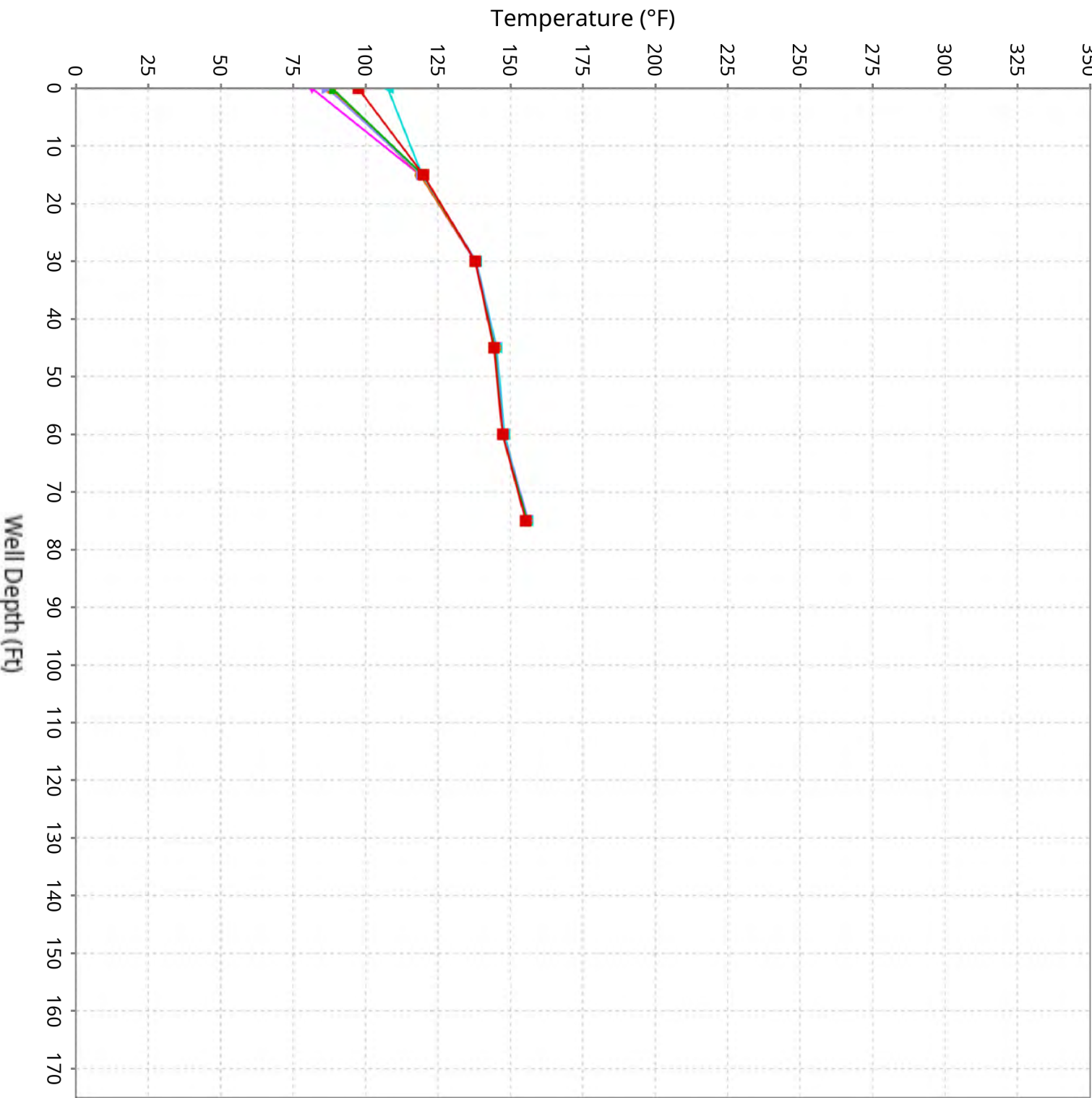
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-4

Maximum data for 2/20/2025 to 4/2/2025



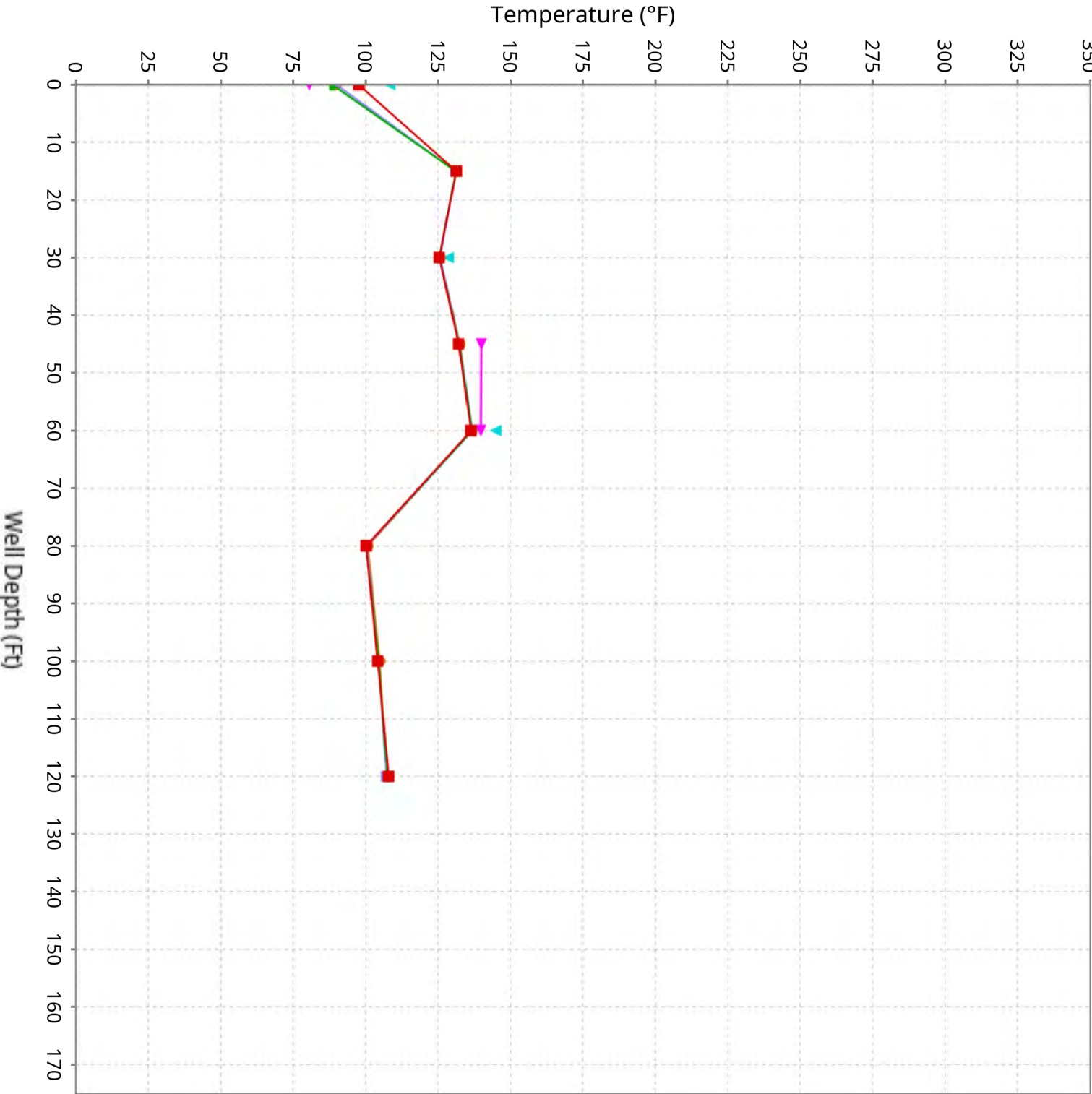
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-5

Maximum data for 2/20/2025 to 4/2/2025



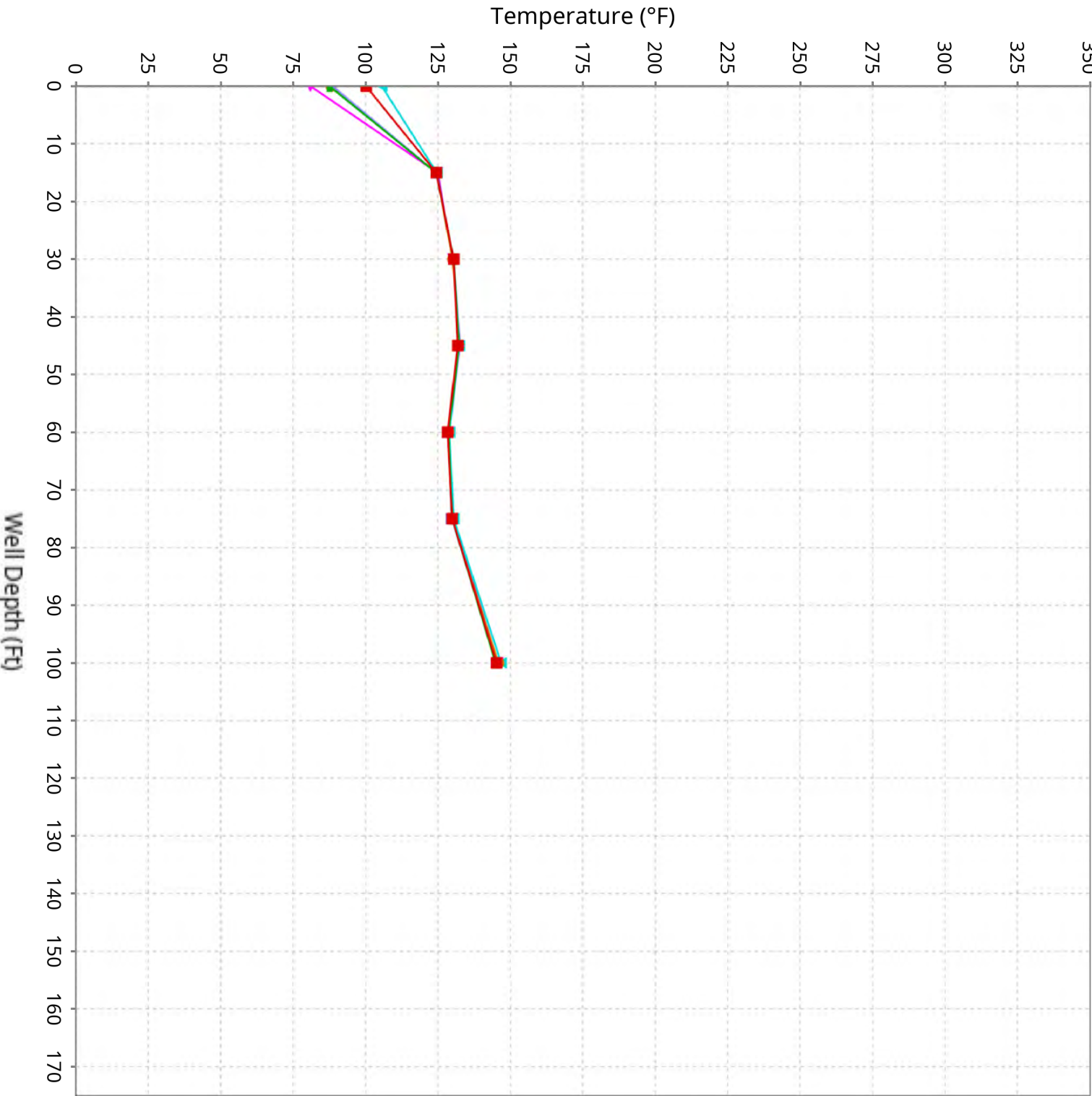
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-6

Maximum data for 2/20/2025 to 4/2/2025



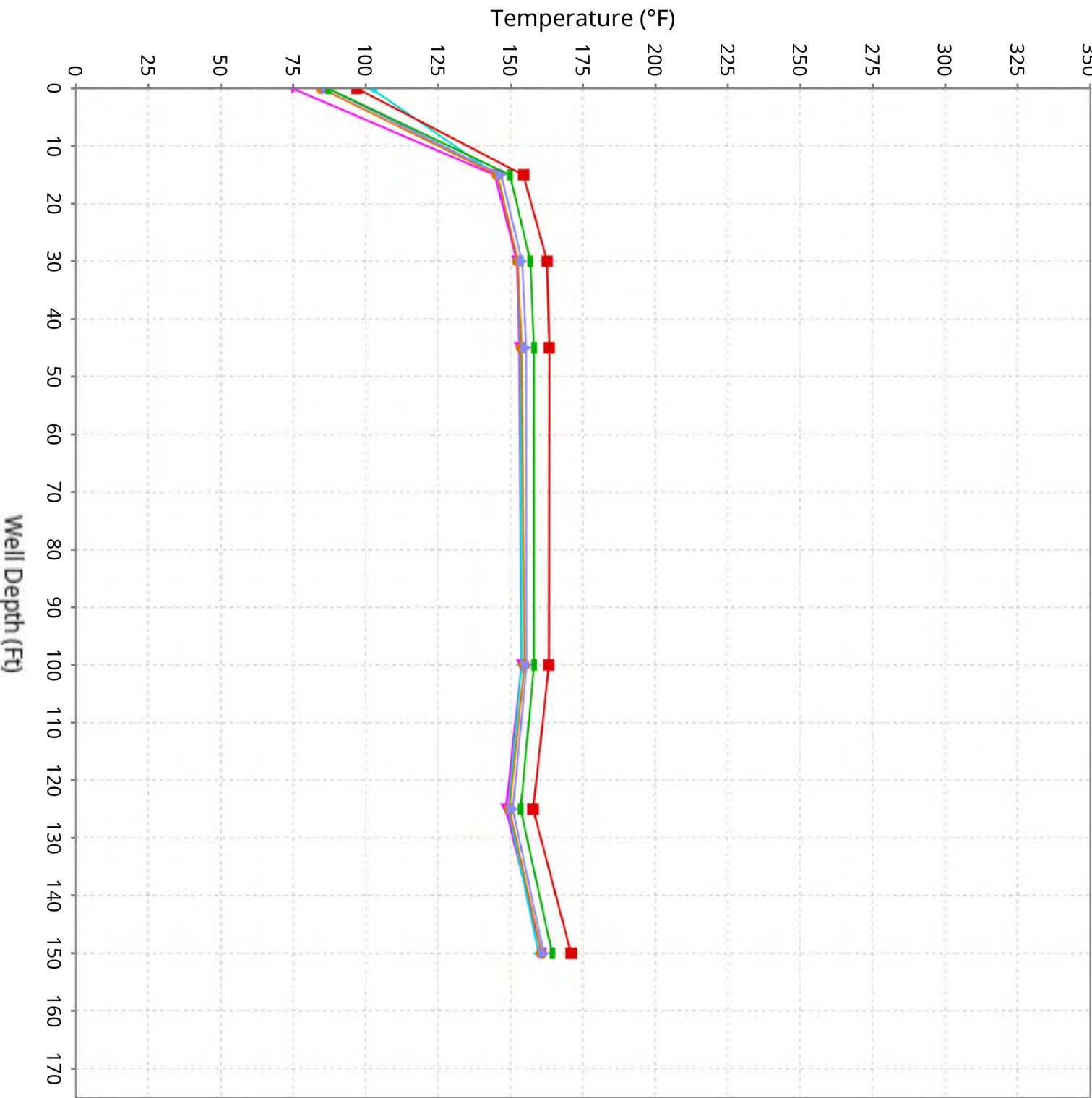
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-7

Maximum data for 2/20/2025 to 4/2/2025



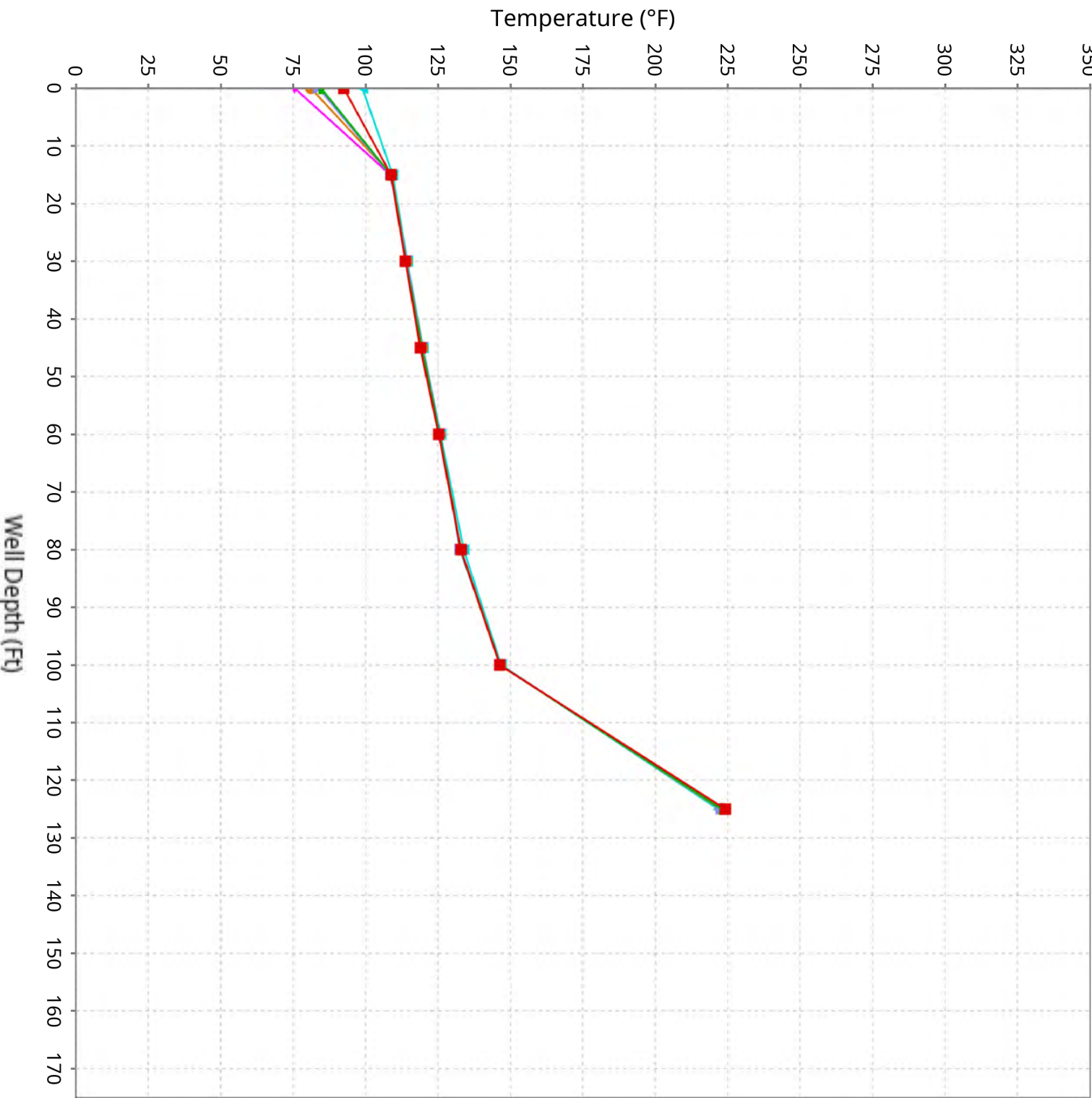
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-8

Maximum data for 2/20/2025 to 4/2/2025



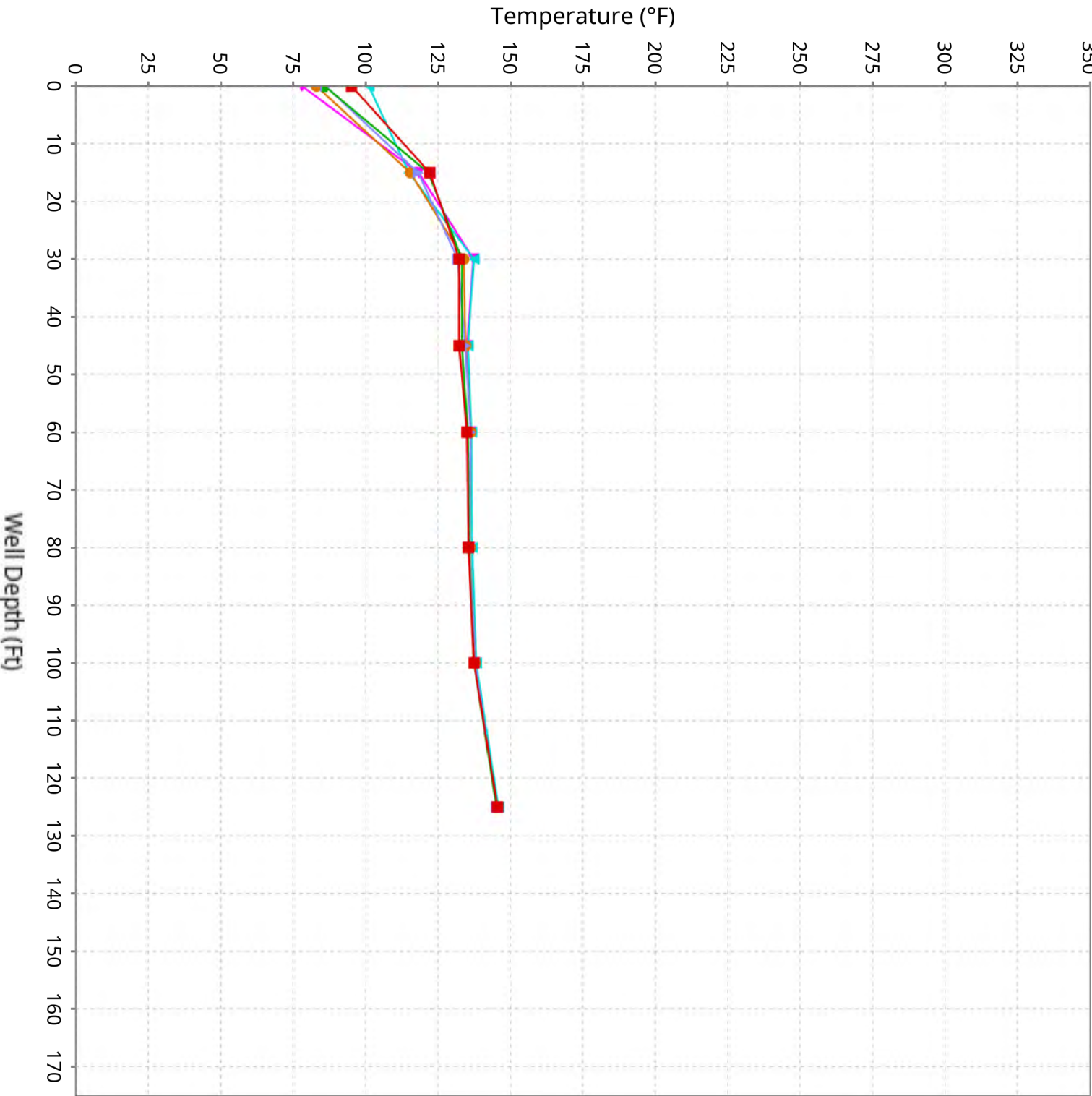
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-9

Maximum data for 2/20/2025 to 4/2/2025



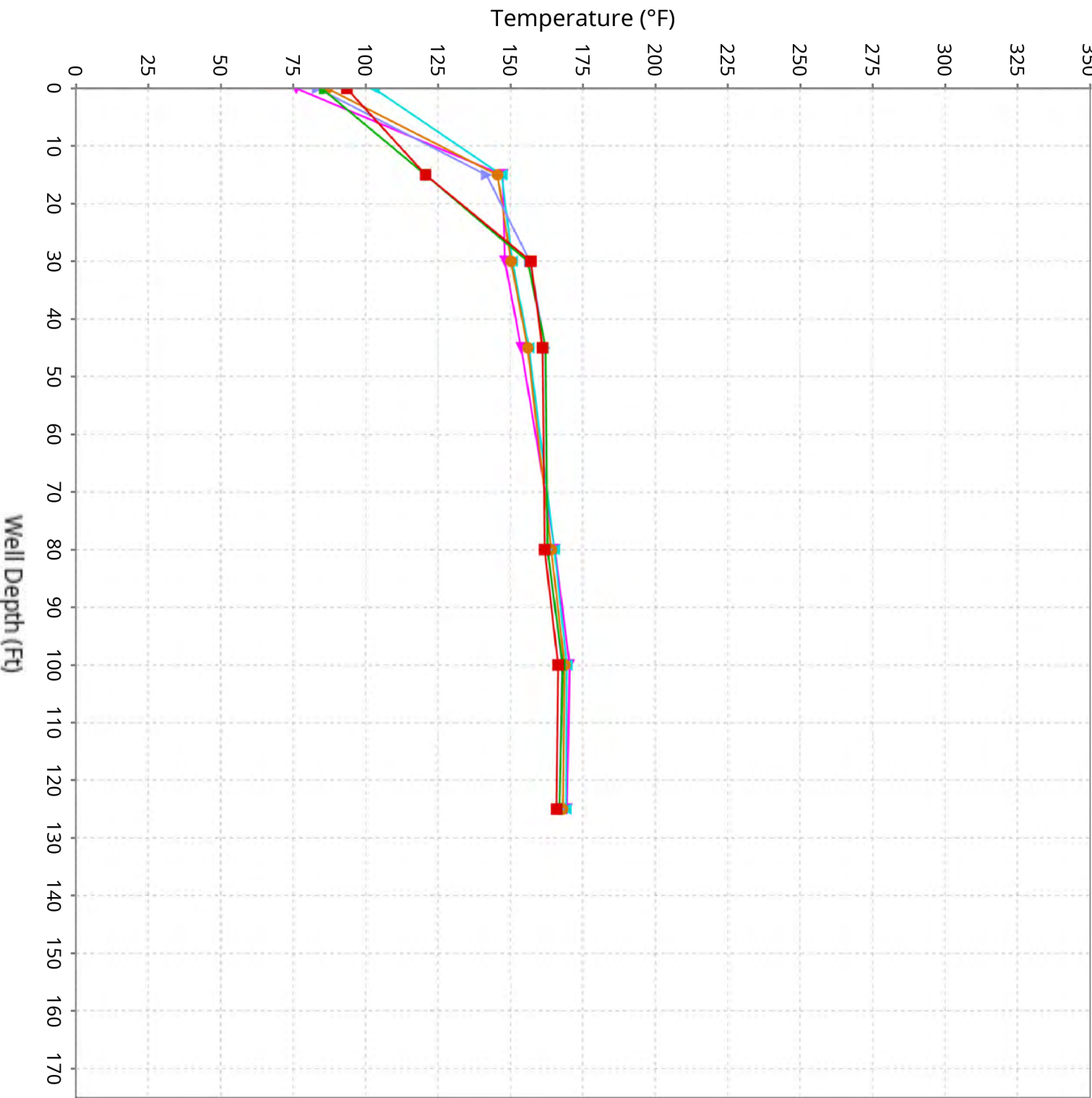
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-10

Maximum data for 2/20/2025 to 4/2/2025



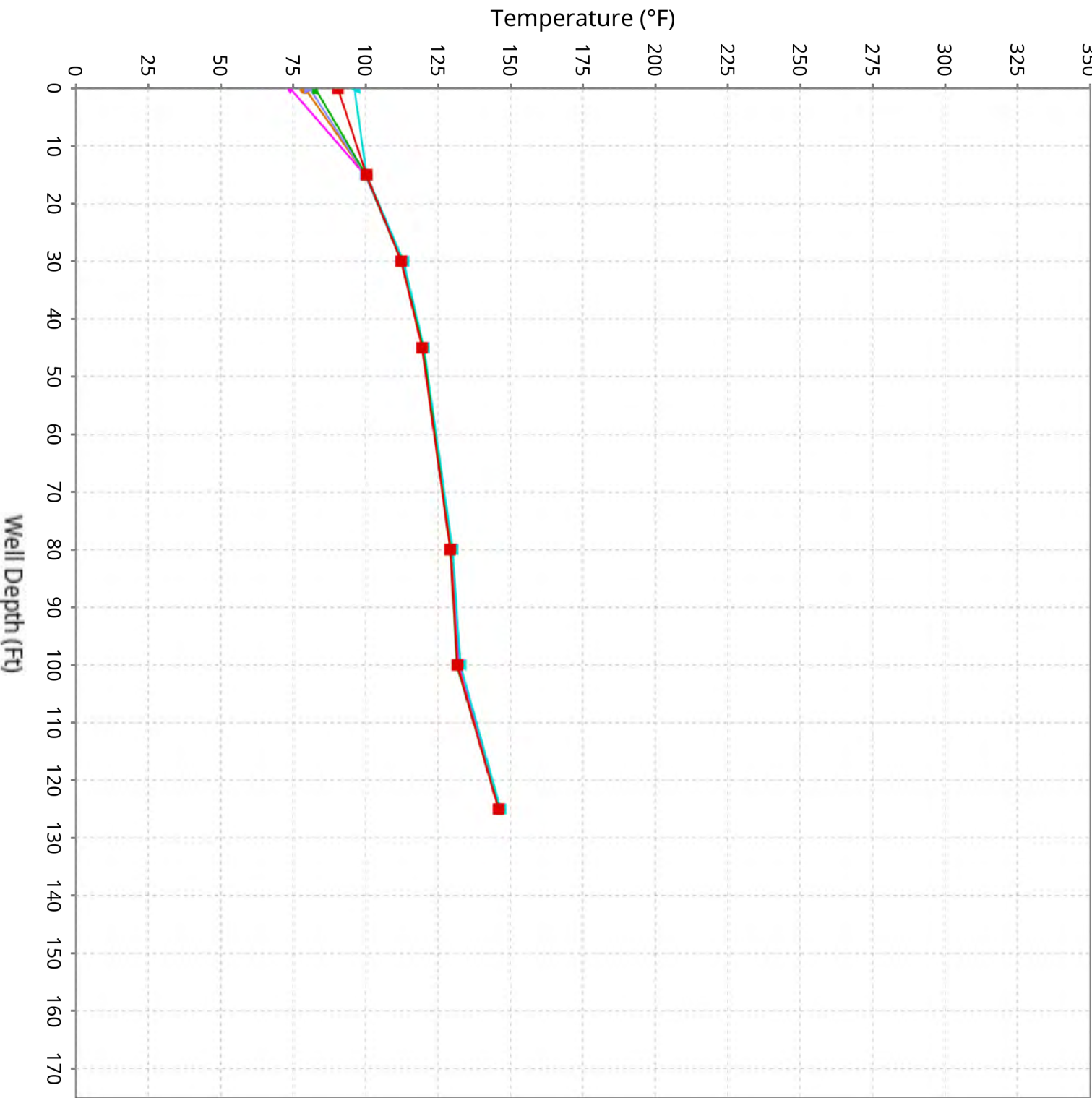
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-11

Maximum data for 2/20/2025 to 4/2/2025



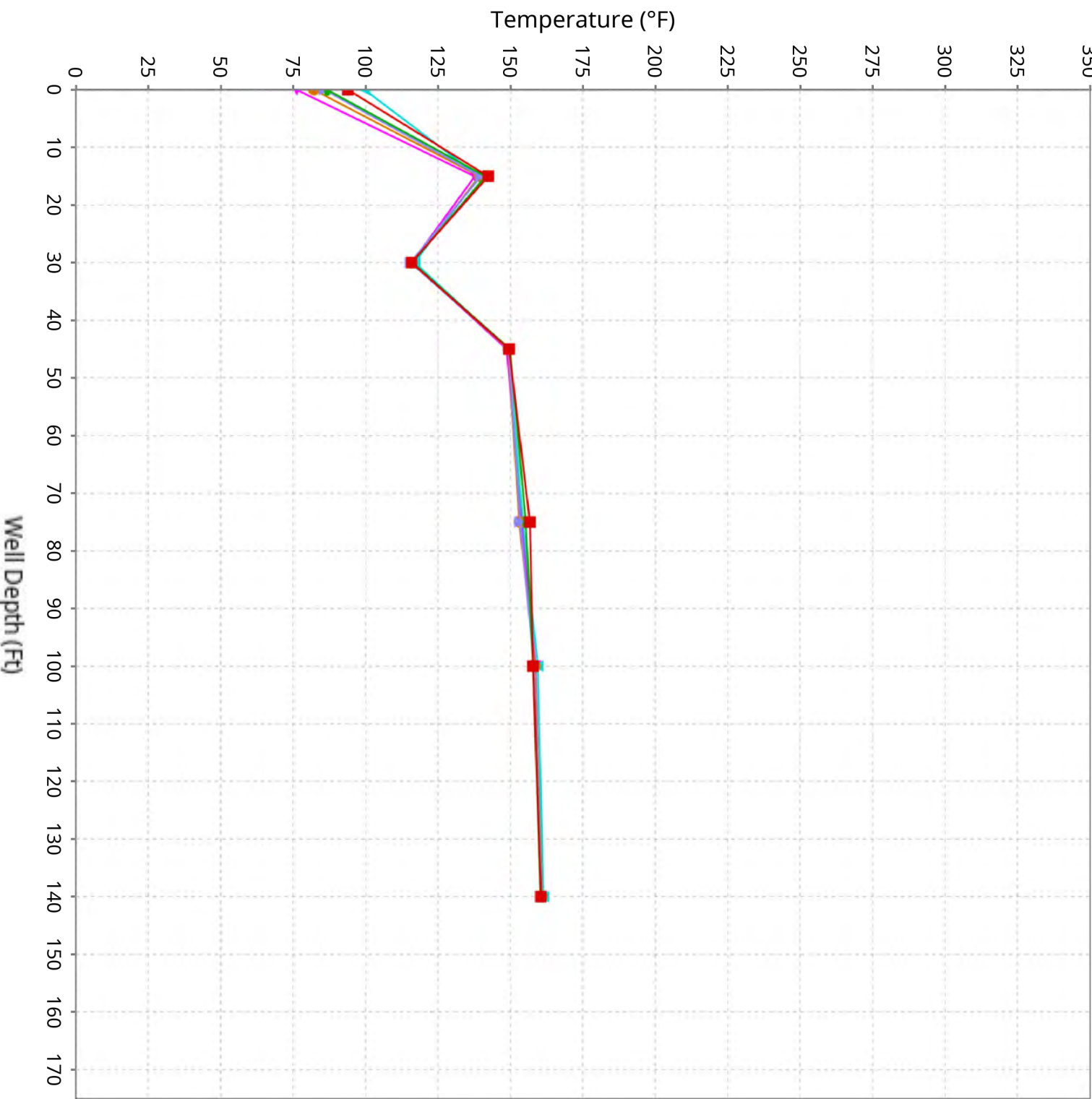
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Maximum data for 2/20/2025 to 4/2/2025



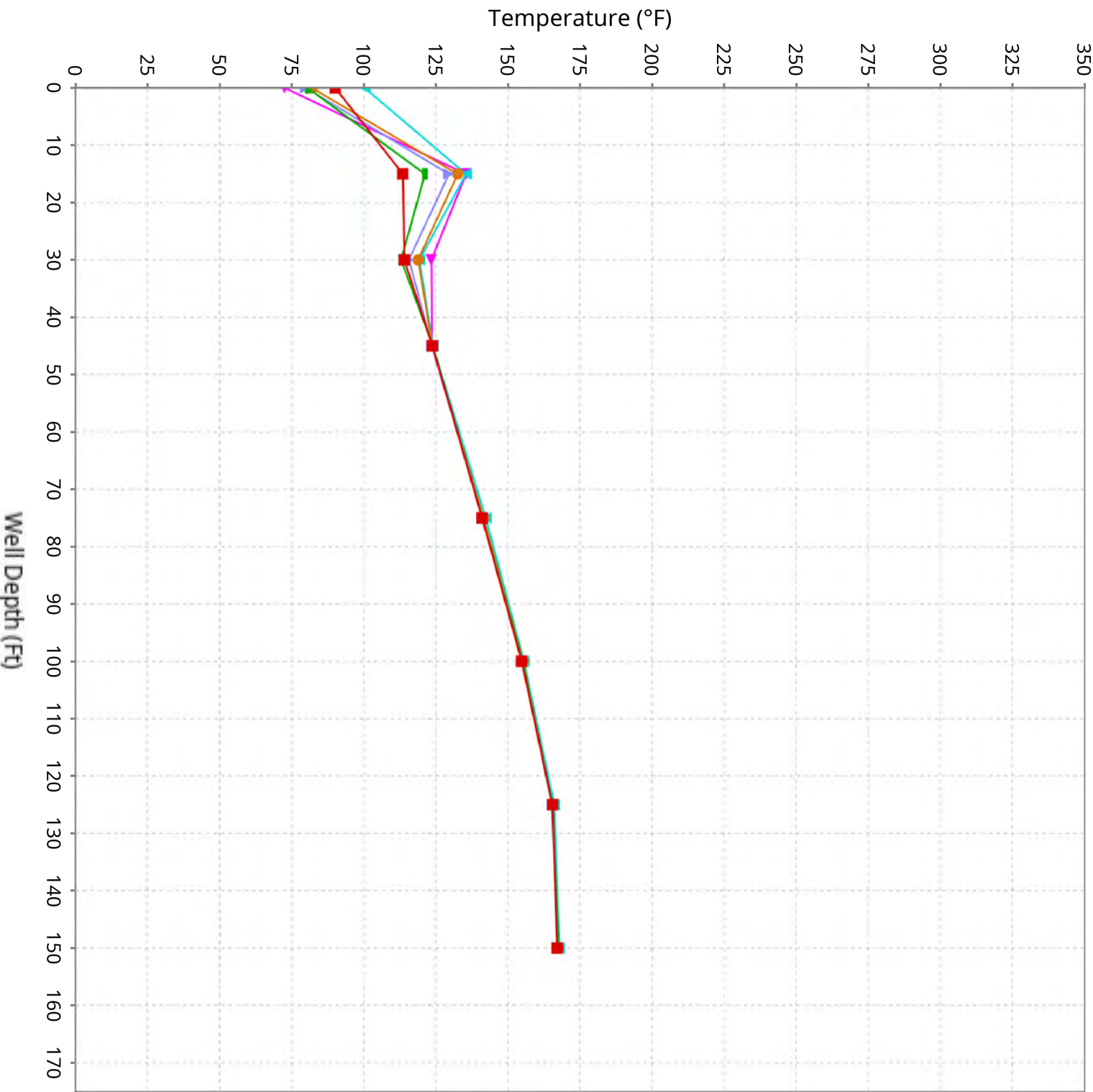
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-13

Maximum data for 2/20/2025 to 4/2/2025



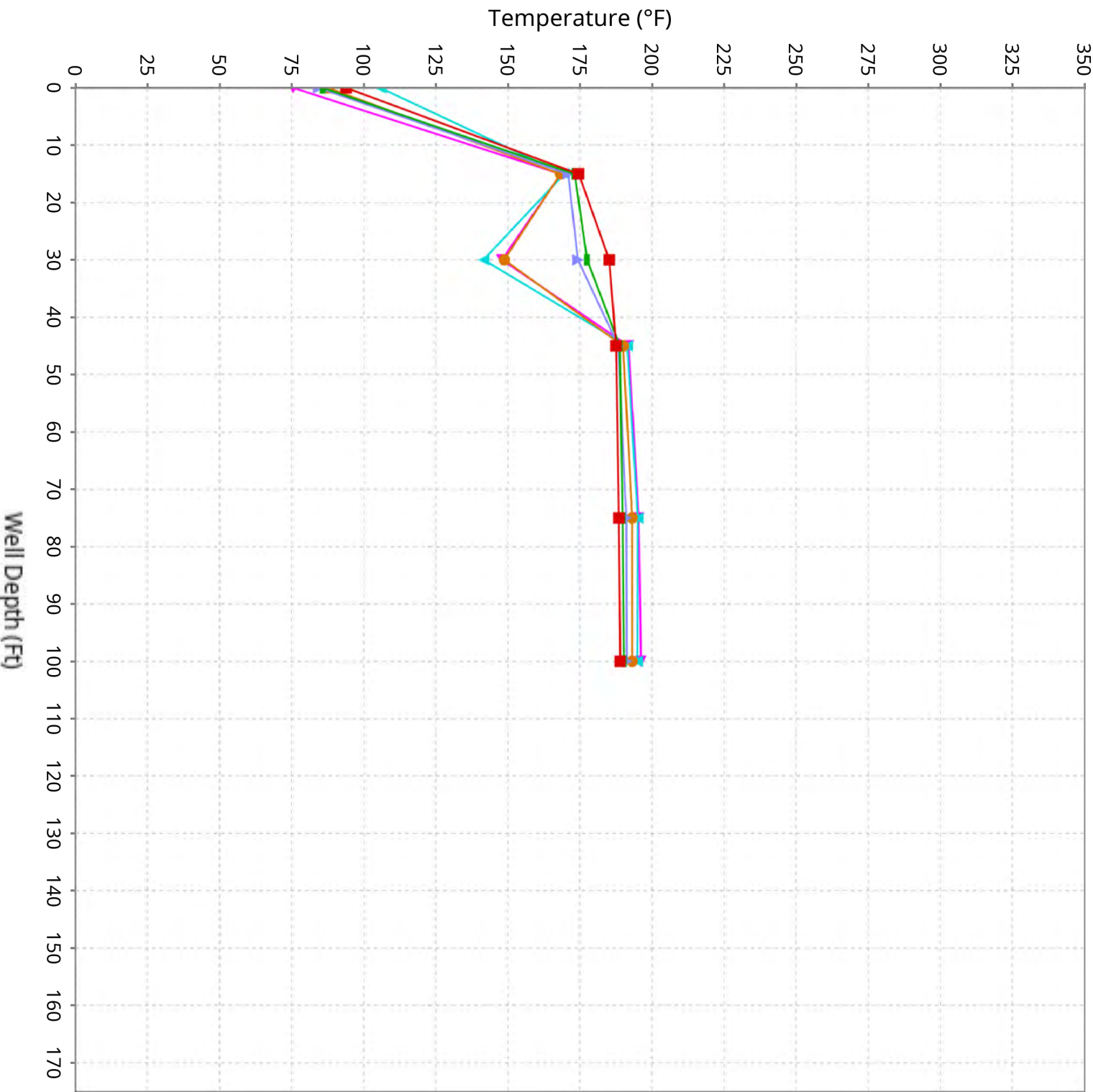
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-14

Maximum data for 2/20/2025 to 4/2/2025



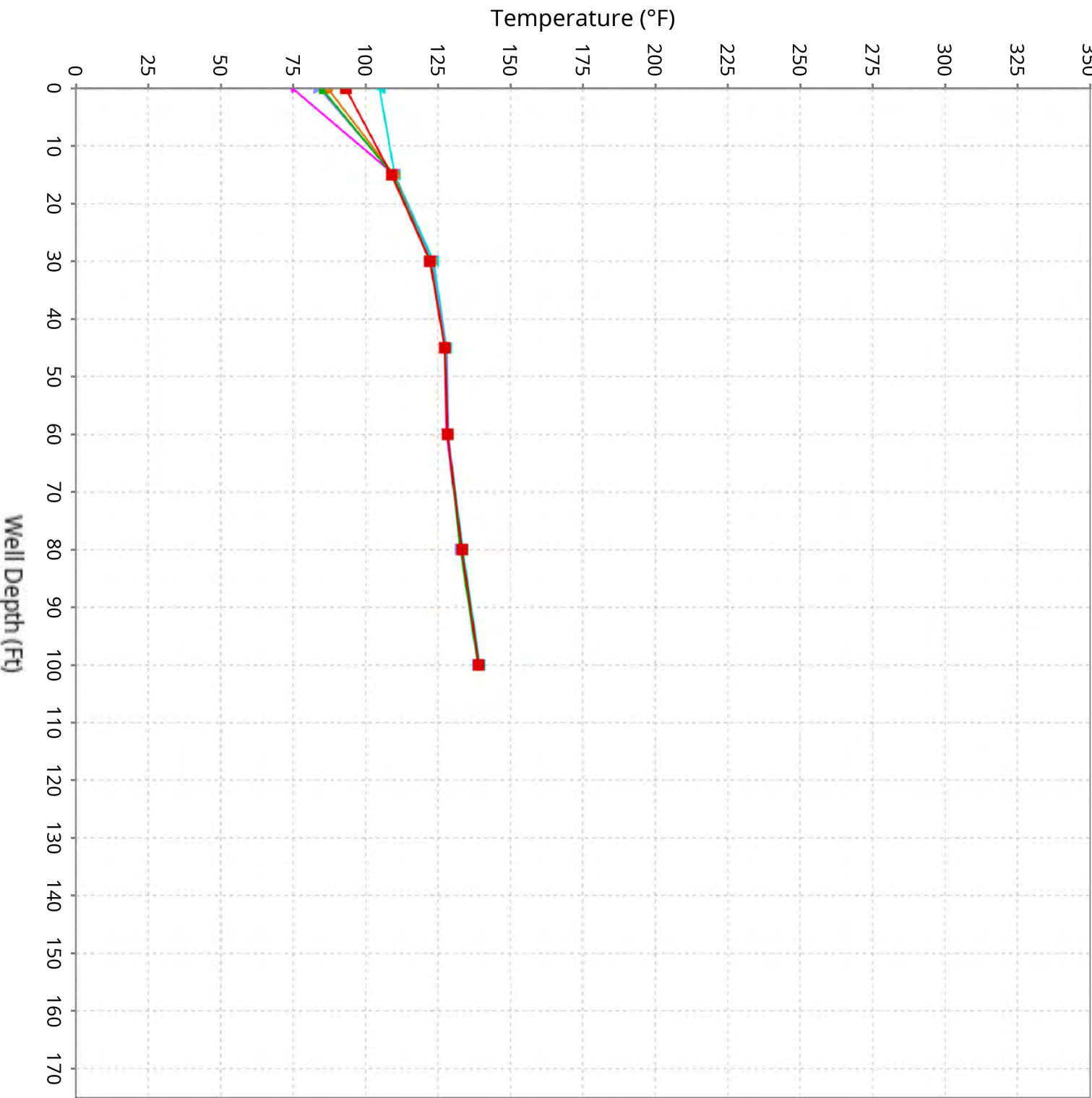
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-15

Maximum data for 2/20/2025 to 4/2/2025



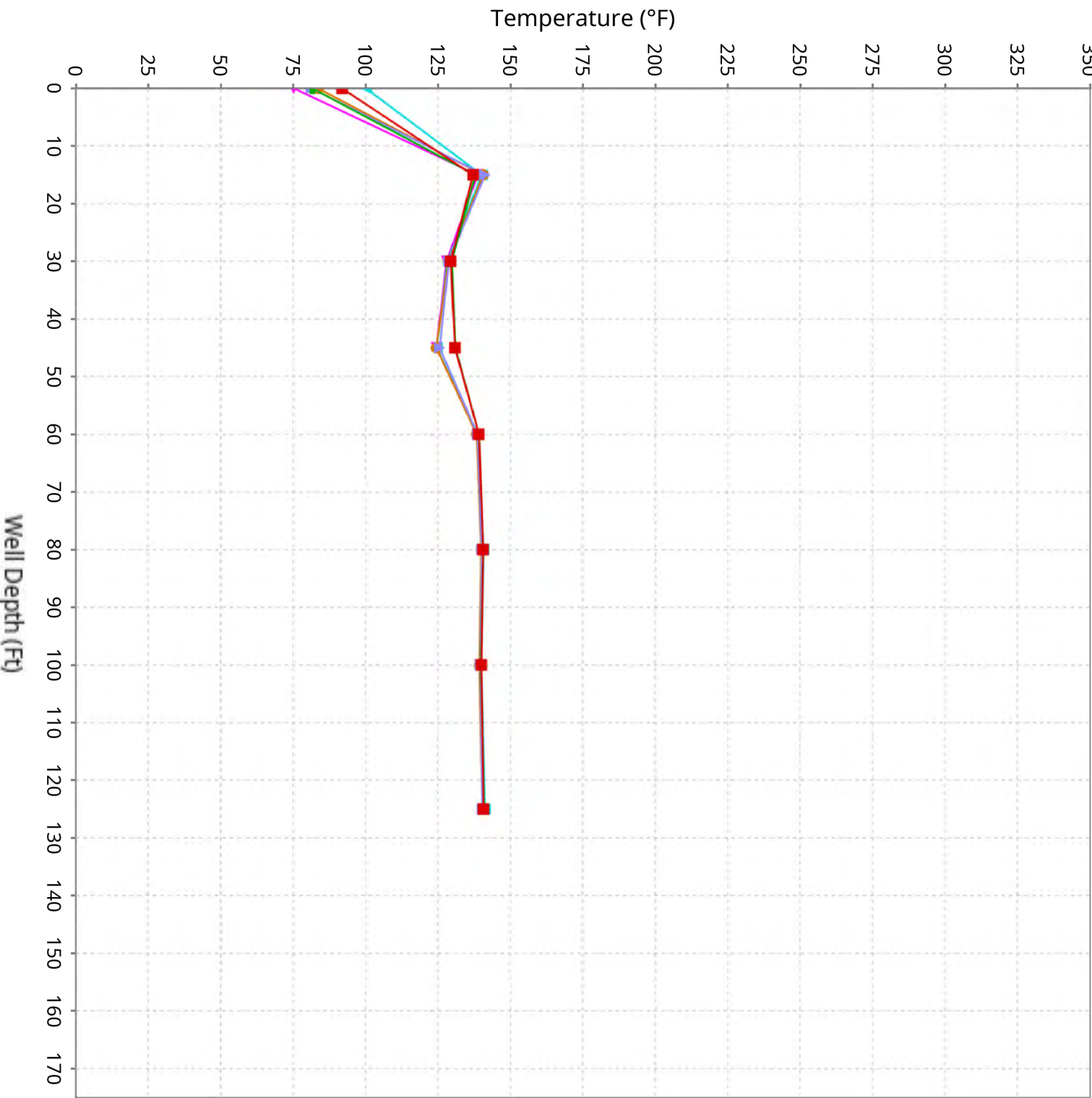
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-16

Maximum data for 2/20/2025 to 4/2/2025



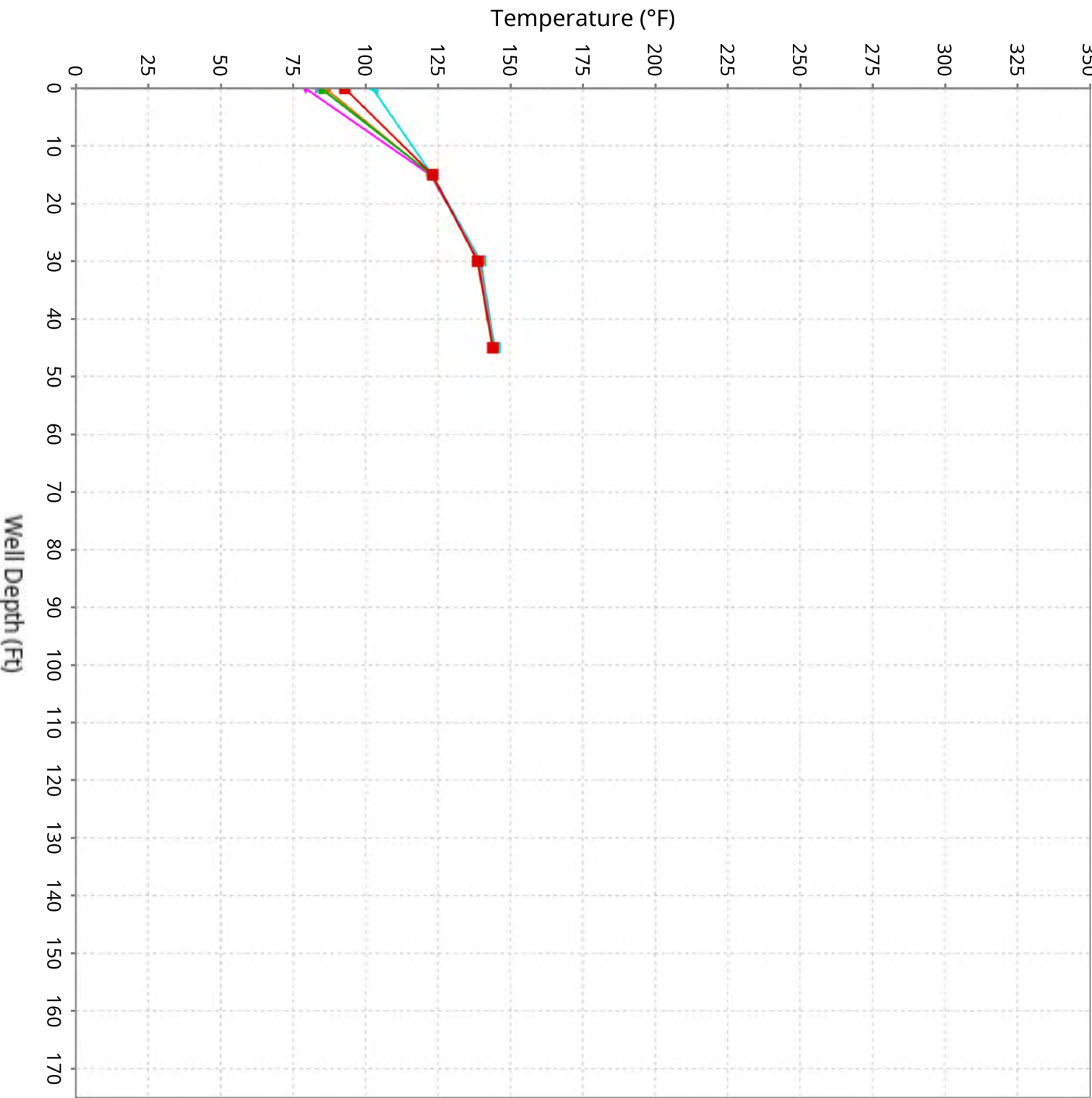
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-17

Maximum data for 2/20/2025 to 4/2/2025



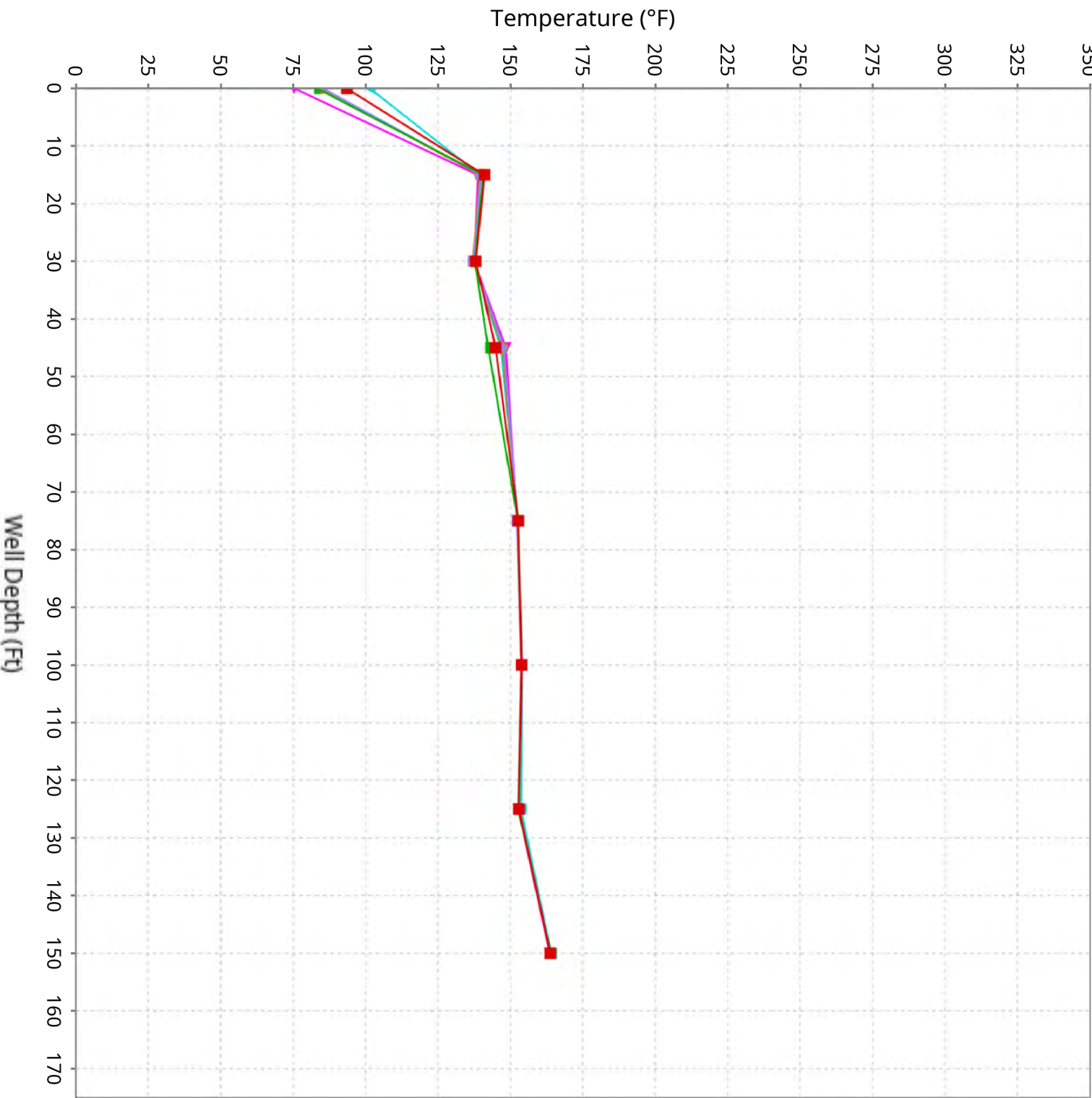
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-18

Maximum data for 2/20/2025 to 4/2/2025



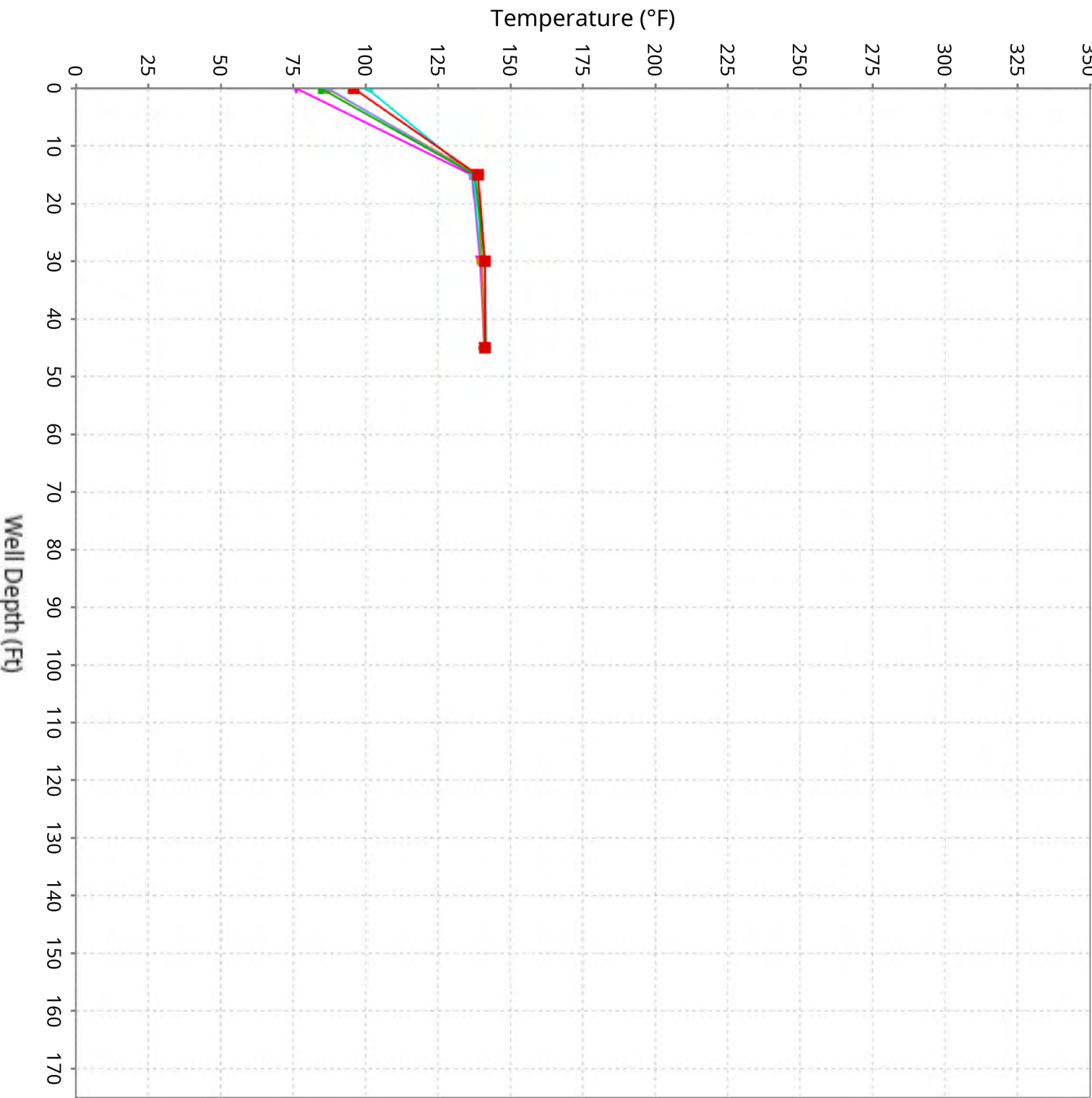
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-19

Maximum data for 2/20/2025 to 4/2/2025



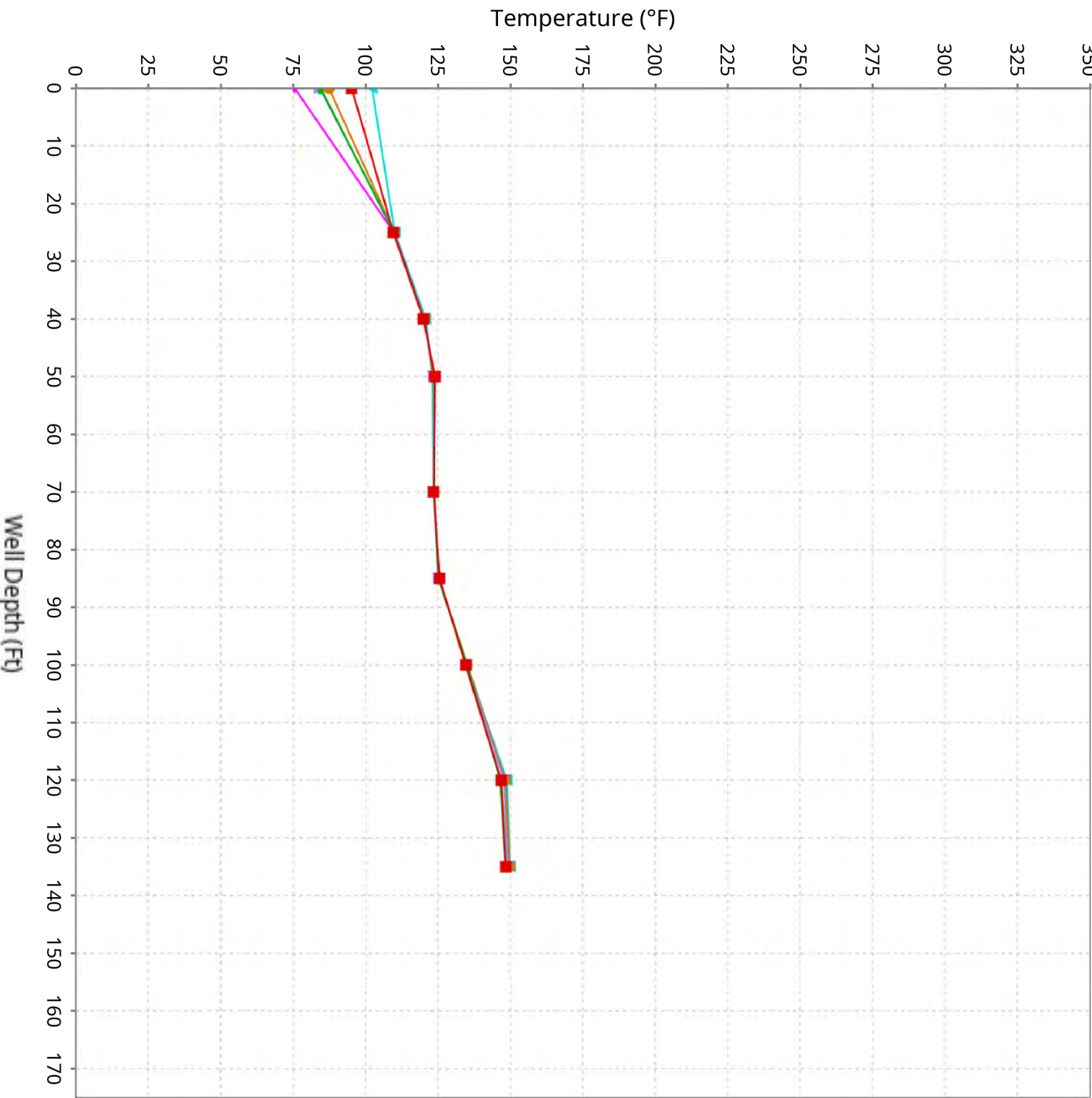
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-20

Maximum data for 2/20/2025 to 4/2/2025



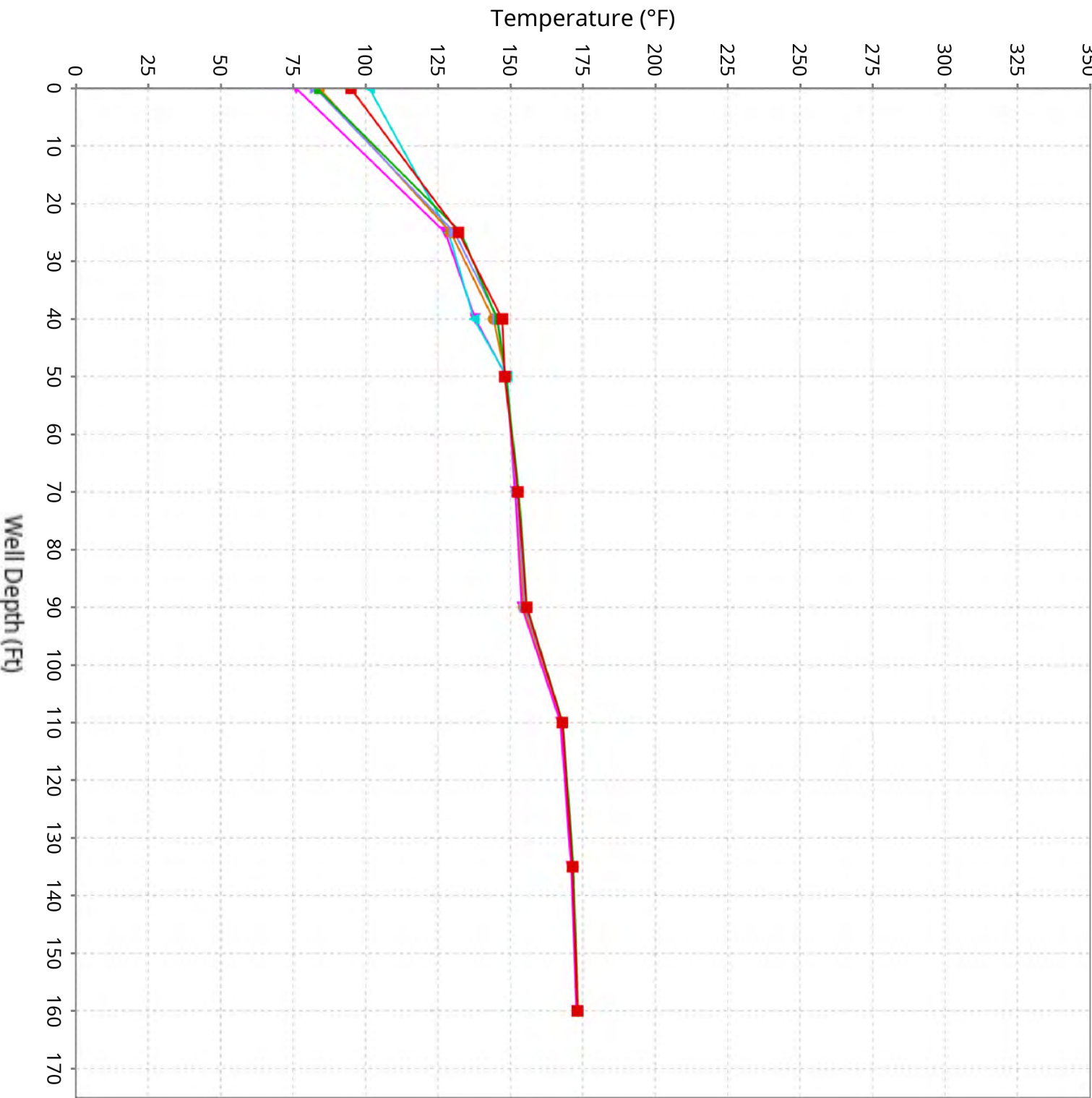
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-25

Maximum data for 2/20/2025 to 4/2/2025



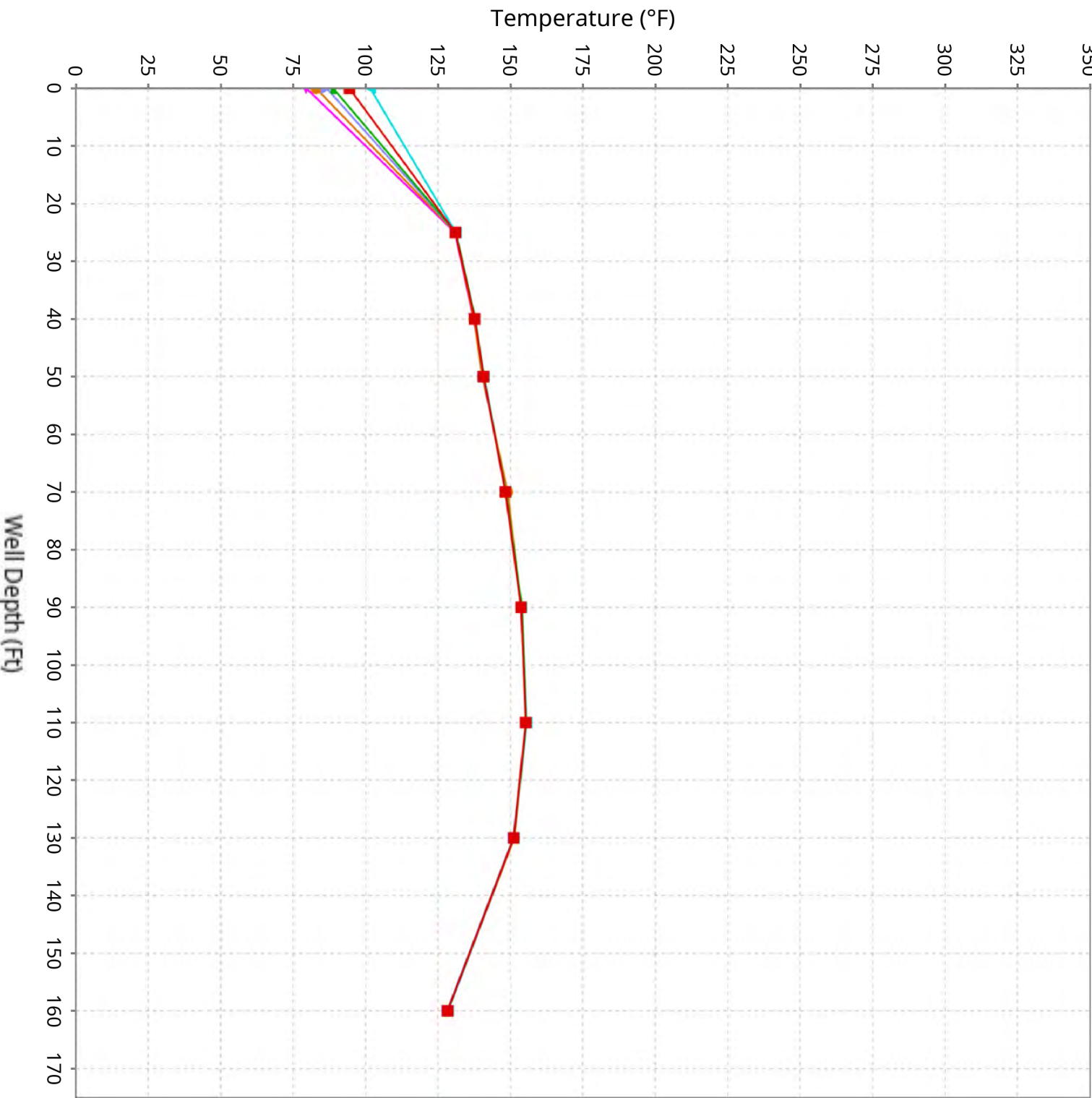
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-26

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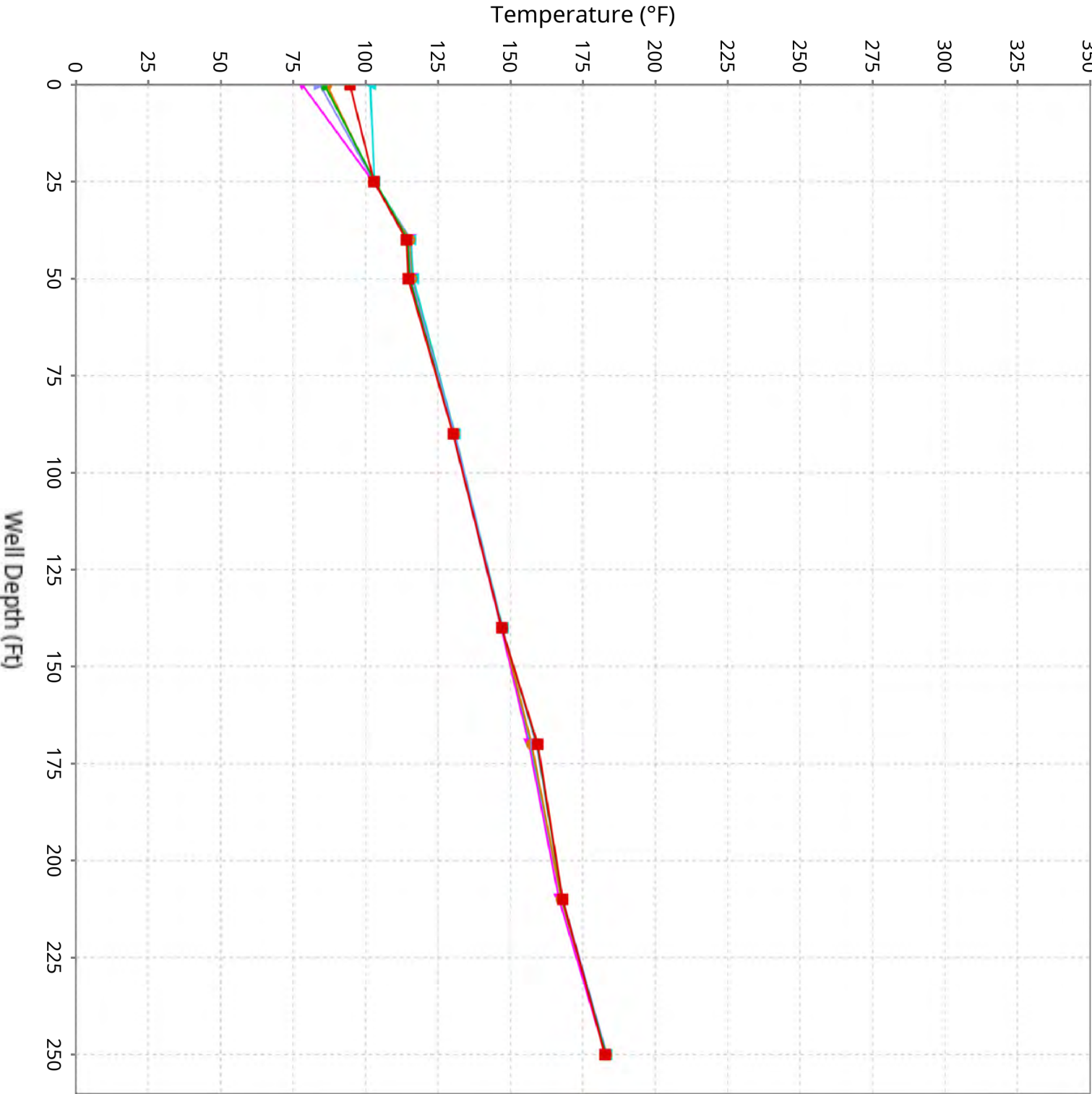
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-27

Maximum data for 2/20/2025 to 4/2/2025



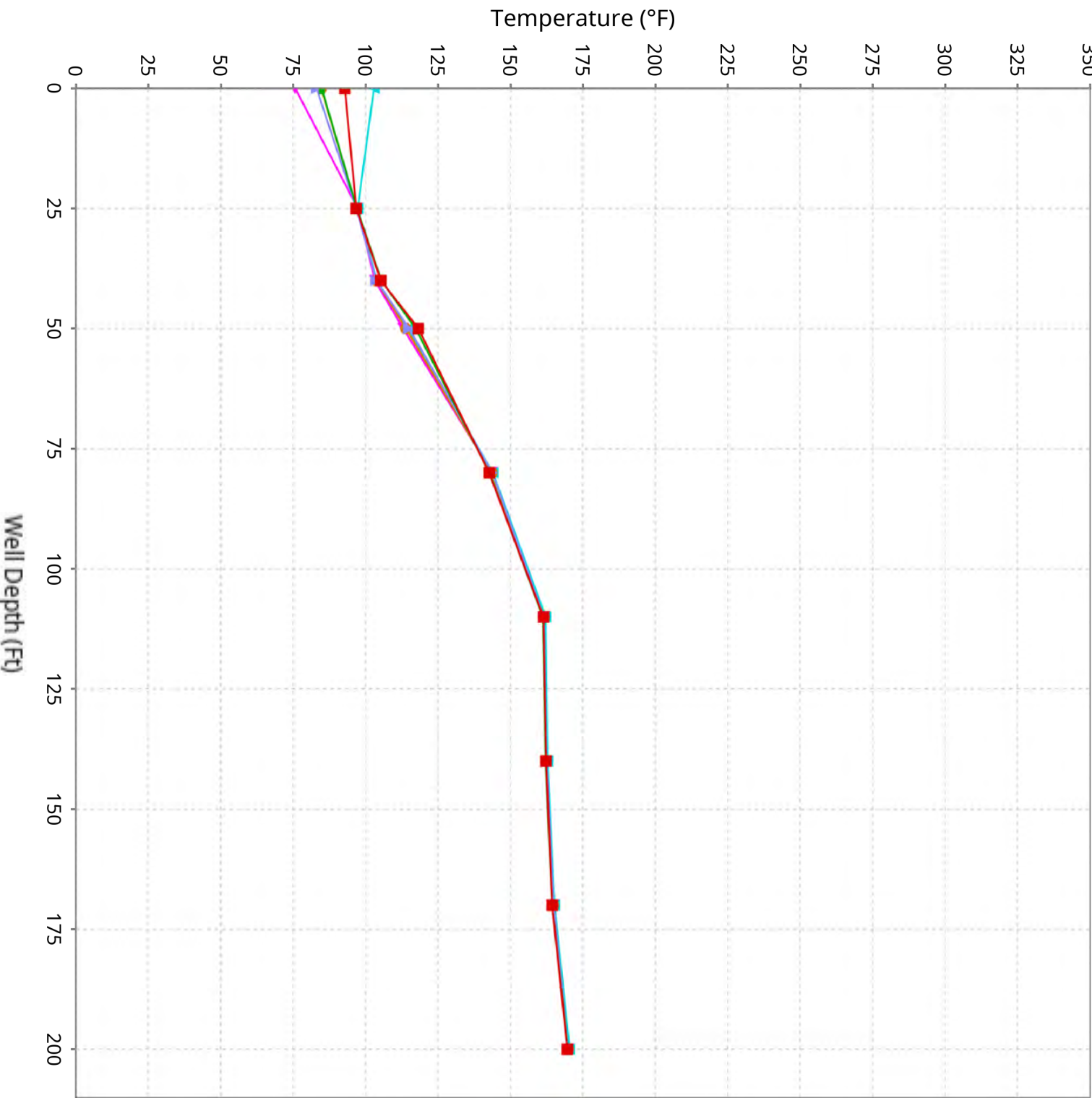
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-29

Maximum data for 2/20/2025 to 4/2/2025



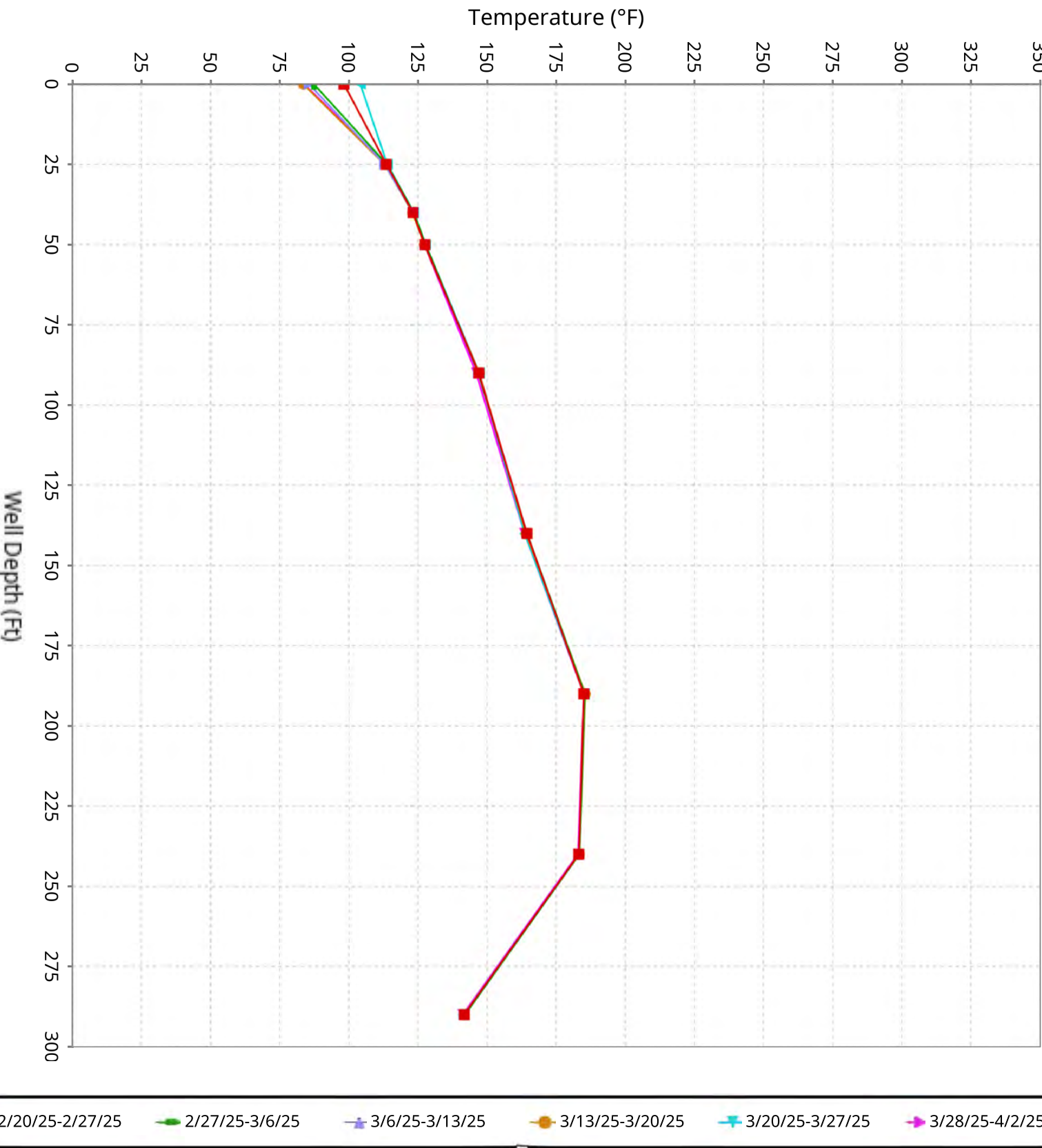
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-30

Maximum data for 2/20/2025 to 4/2/2025



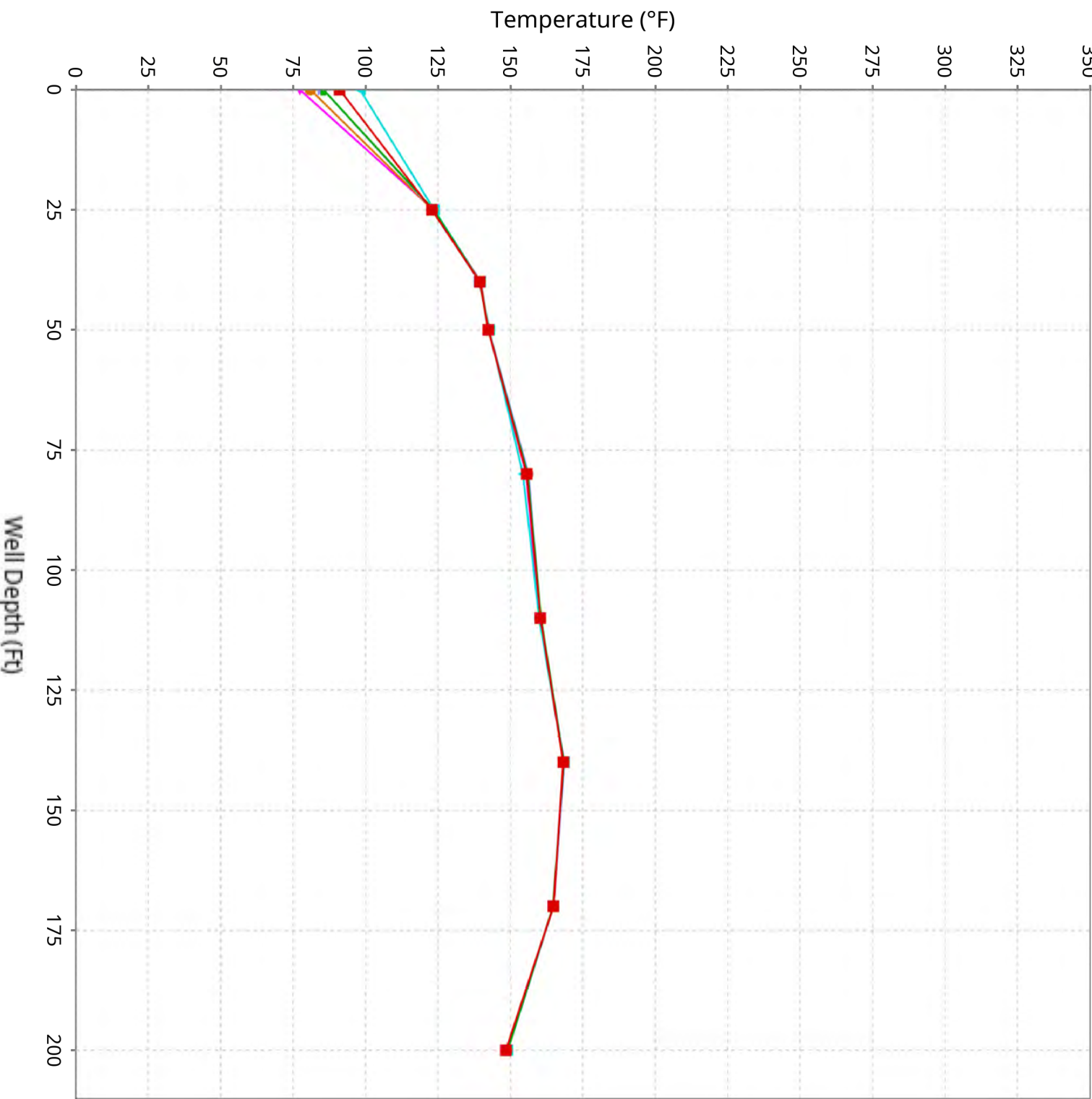
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-31

Maximum data for 2/20/2025 to 4/2/2025



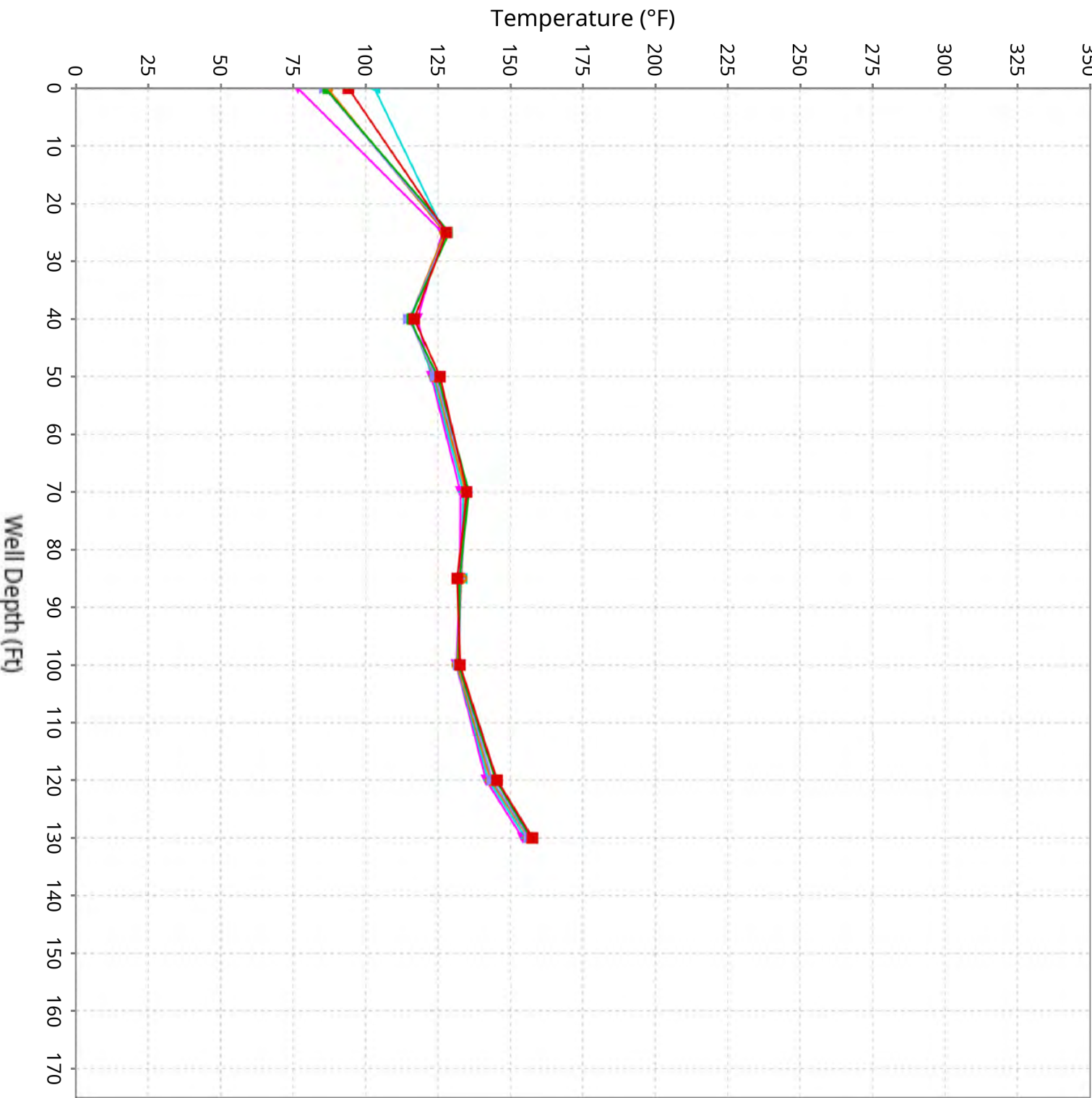
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-32

Maximum data for 2/20/2025 to 4/2/2025

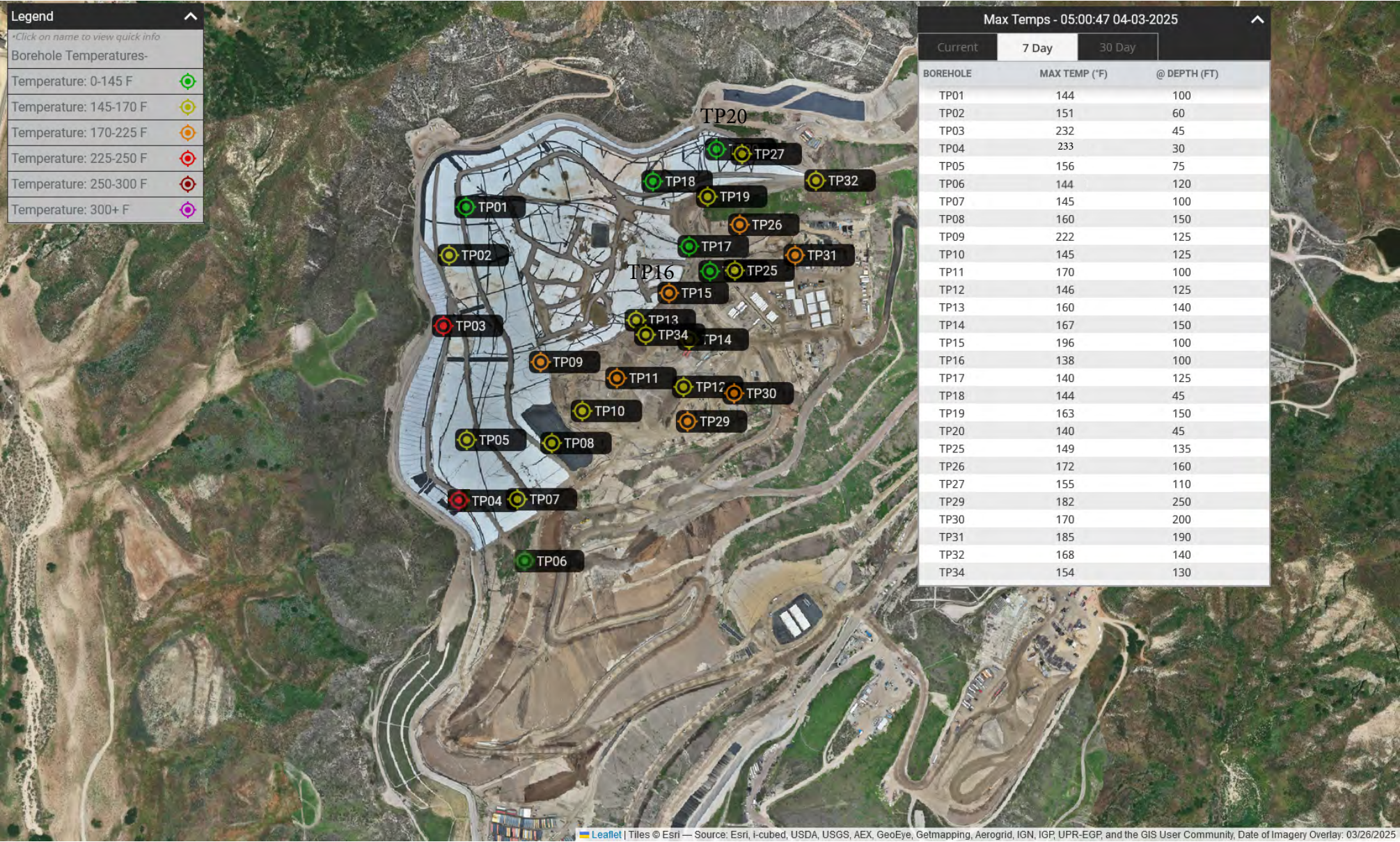


Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-34

Maximum data for 2/20/2025 to 4/2/2025



Maximum Vertical Temperature Map from Temperature Probes at Chiquita Landfill



Thirty Day Maximum Vertical Temperature Map from Temperature Probes at Chiquita Landfill

