

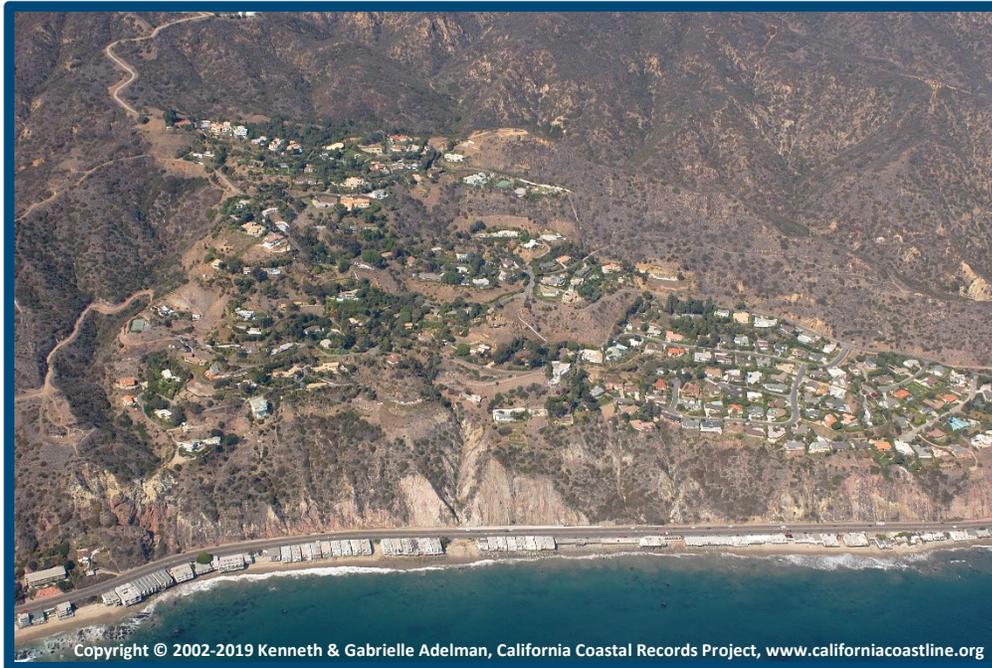
FY21/22 Maintenance and Monitoring

AD98-1, Big Rock Mesa

City of Malibu, California

Yeh Project No.: 220-276

November 4, 2022



Prepared for:

City of Malibu
23825 Stuart Ranch Rd.
Malibu, California 90265
Attn: Mr. Arthur Aladjajian

Prepared by:

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November 4, 2022

Project No. 220-276

City of Malibu
23825 Stuart Ranch Rd.
Malibu, California 90265

Attn: Mr. Arthur Aladjajian, Public Works Superintendent

Subject: Annual Monitoring and Maintenance Report FY21/22, City of Malibu Assessment District 98-1, Big Rock Mesa, Malibu, CA

Dear Mr. Aladjajian:

Yeh and Associates, Inc. is pleased to submit this monitoring and maintenance report FY21/22 City of Malibu Assessment District AD-1, Big Rock Mesa in Malibu, California. This report was prepared in accordance with our Agreement for Professional Services, dated June 22, 2020 between the City of Malibu and Yeh and Associates, Inc. This report provides geotechnical an annual summary of monitoring and maintenance for the project over fiscal year July 1, 2021 to June 30, 2022.

The geotechnical services consisted of monitoring and maintenance, data management, public outreach, reporting, NPDES compliance and capital improvement planning. A map showing the location of the maintenance and monitoring facilities are provided on Plate 1. Plate 2 provides a summary of maintenance activities performed during the monitoring year.

We appreciate the opportunity to be of service. Please contact Loree Berry at 805-289-9590 x271 or lberry@yeh-eng.com if you have questions or require additional information.

Sincerely,
YEH AND ASSOCIATES, INC.


Nick Simon, GIT
Project Geologist

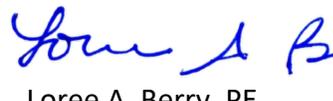

Loree A. Berry, PE
Senior Project Manager



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1. INTRODUCTION

Yeh and Associates (Yeh) was retained by the City of Malibu (City) to perform maintenance and monitoring of the existing geotechnical instrumentation and dewatering facilities within the City of Malibu's Big Rock Mesa Landslide Assessment District, 98-1. The project location is shown by the polygon on Figure 1. This report presents monitoring results, a maintenance summary, and facilities status for the monitoring year July 1, 2021 through July 30, 2022 (monitoring year). Yeh monitors groundwater levels, surveys slope inclinometers and crack gauges, measures the dewatering flow from dewatering wells and horizontal drains. Yeh also oversees and maintains function of the monitoring and dewatering facilities. Plate 1 is attached and shows the approximate locations of the specific assessment district monitoring facilities. Table 1 summarizes the equipment inventory and the approximate frequency of monitoring and maintenance over the monitoring year. Plate 2 and Section 4.0 of this report and provides detailed summary of the maintenance activities performed during this monitoring year.

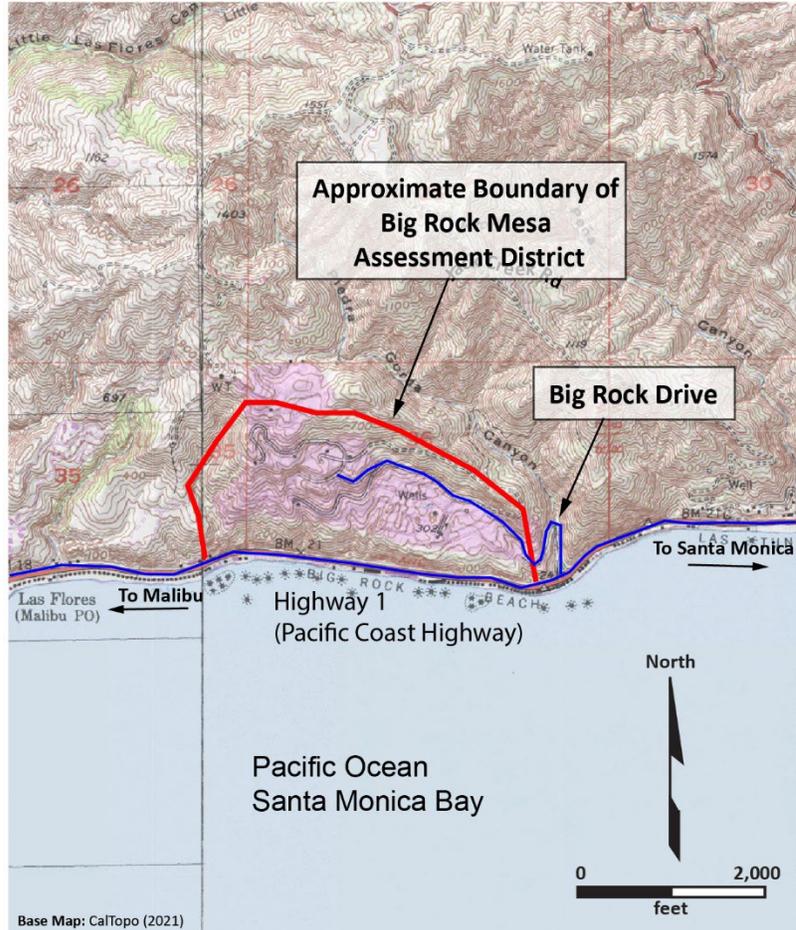


Figure 1: Project Location Map

Table 1. Summary of Annual Monitoring and Maintenance

Type of Monitoring Instrument or Dewatering Device	Number of Locations	Brief Description	Monitoring Frequency	Maintenance Effort ²
Standpipe piezometer	29 ¹	1.5-inch to 3.25-inch diameter perforated PVC, aluminum, or casing, used to measure depth to groundwater using electric sounder or by a transducer/datalogger	monthly; hourly data from pressure transducer	low
Inclinometer survey casings	26 ¹	1.5-inch to 3.25-inch diameter grooved casings made of PVC, or aluminum used to survey for shear displacement by an inclinometer probe	quarterly to annually	low
Dewatering wells	24	6-inch diameter steel or PVC casings equipped with 0.5 to 3HP submersible pump and connected to electrical controls, pumped water flows through meter and into conveyance piping to discharge	monthly	high
Horizontal Drains (hydraugers)	36	1-inch to 1.5-inch perforated PVC casings drilled slightly higher than horizontal into the face of the bluff and into the slope for hundreds to thousands of feet and used to drain groundwater that intercepts the casing. Flow can be measured along PCH before it flows to discharge	monthly	medium
Big Rock Master Water Meter #0138193	1	Meters imported water to Big Rock Mesa, data obtained from Los Angeles County Public Works	monthly	N/A
Big Rock Mesa Rain Gauge #1239	1	Documented Rainfall, Data obtained from Los Angeles County Public Works	monthly	N/A
PK Nail Crack Gauges	5	PK survey nails set in the pavement to straddle existing cracks within areas of previously documented landslide related distress cracking	quarterly	low
Ocean outfall ports	10	Water quality sampling and testing in accordance with active LARWQB NPDES Compliance File CI-6893	Monthly/weekly	Low to medium
Notes:				
¹ - standpipe and inclinometer casings are same device. Some casings are no longer usable ³ to survey with a modern inclinometer probe but are used to collect groundwater level measurements. ² - maintenance effort (generalized): "high" – services monthly, "medium" – services quarterly, "low" – services annually ³ – Unusable inclinometer casings are sheared, twisted, compressed, or otherwise deformed to an extent that survey data is unreliable with current standard inclinometer survey equipment.				

1.1 PHYSIOGRAPHIC SUB-REGIONS

Monitoring results are discussed with respect to the six physiographic sub-regions within the overall 1983 landslide boundary and are described by BYA (1992) and similarly by D.A. Evans (1986) as: Headscarp, Eastern, PCH, Central, Bluff and Western Extension. Figure 2 presents the approximate areas associated with the six physiographic sub-regions and they are described below. Each are composed of landslide blocks or complexes of landslide blocks that possess common structural and hydrologic characteristics (BYA, 1992).

- **Headscarp Region:** delineated on the north by the 1983 re-activated landslide boundary west of the Inland Lane fault which runs north-south just west of the Inland Lane and Piedra Chica cul-de-sacs and borders the Eastern Region to the east, the Central Region to the south, and the Western Extension Region to the west.



- **Eastern Region:** delineated on the north and east by the 1983 re-activated landslide boundaries, it is separated from the Central Region on the west by the Inland Lane fault which trends approximately north-south just west of the Piedra Chica and Inland Lane cul-de-sacs and borders the PCH region on the south at the base of the bluffs along PCH.
- **Central Region:** extends west from the Inland Lane fault which runs north-south just west of the Inland Lane and Piedra Chica cul-de-sacs to the eastern edge of the 1983 re-activated slide boundary. It extends north-south from the head scarp area to the bluffs along PCH.
- **Bluff Region:** southern portion of the 1983 re-activated slide in the area of Roca Chica Drive and includes the complex shallow landslides within in the bluff face to PCH.
- **PCH Region:** delineated from the base of the bluffs along PCH and south across PCH to the mapped 1983 landslide toe location.
- **Western Extension Region:** extends west from the eastern boundary of the 1983 re-activated slide to Rockpoint Canyon and from above the upper terminus of Big Rock Drive in the north to PCH in the south. The Western Extension Region was not part of the active slide during 1983 and is not known to have undergone any movement.

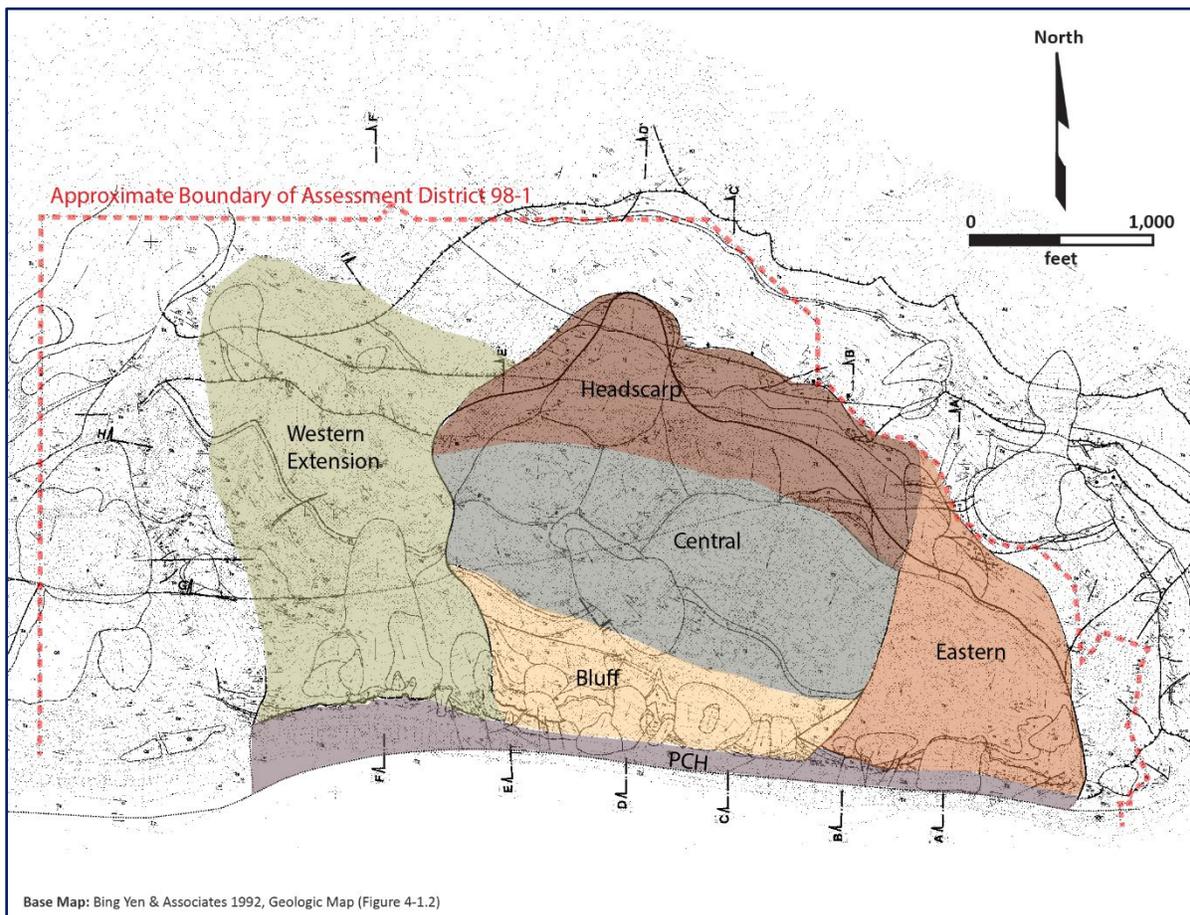


Figure 2: Approximate Boundaries of Physiographic Subregions



2. MONITORING

The following provides the result of monitoring the water level in standpipe piezometers and the results of inclinometer surveys performed.

2.1 GROUNDWATER LEVELS

Groundwater levels were measured approximately monthly in 29 standpipe piezometers shown on Plate 1. Pneumatic piezometers were installed with some of the inclinometers up until 1998. They were measured intermittently to assess for perched water conditions. The majority of the existing pneumatic piezometers no longer function and the reliability of the remaining locations are not certain. Pneumatic piezometers were not measured during the monitoring year. Appendix A includes historic pneumatic piezometer results.

Groundwater level data and hydrographs for individual standpipes are presented in Appendix A for the monitoring year. Water levels are acquired by lowering an electric probe into the standpipe to contact the groundwater surface and manually record the depth to water. Standpipes PC-1, SP-3A, SP-26 and SP-33 were fitted with pressure transducers programmed to read water levels at one-hour intervals for 1 month or longer. Table 2 summarizes the average groundwater levels over the monitoring year for each of the six physiographic regions. Average and average peak water levels for each standpipe within each region were calculated over the monitoring year. Of the six regions, the PCH and Western Extension regions showed an increase in average groundwater levels over the monitoring year. The PCH and Eastern Mesa regions recorded an increase in average peak water elevation. All other physiographic regions recorded a decrease in average and average peak groundwater levels. Summaries for groundwater levels for each of the physiographic regions are described below.

Table 2: Summary of Average Groundwater Elevations

Assessment District Sub-Region	Total No. of Standpipes Monitored	2021-2022 Average Groundwater Elevation (ft)	Change in Average Groundwater Elevation from Prior Monitoring Period (ft)	2021-2022 Average Peak Groundwater Elevation (ft)	Change in Average Peak Groundwater Elevation from Prior Monitoring Period (ft)
Headscarp	1	552.7	-0.5	553.1	-1.4
Eastern	4	37.6	-1.3	46.2	+4.0
Central	8	220.7	-4.7	231.6	-2.1
Bluff	4	35.1	-1.7	36.8	-3.1
PCH	8	9.1	+0.2	9.9	+0.1
Western Extension	4	373.8	+2.0	377.4	-2.4

2.1.1 HEADSCARP REGION

Water levels in the Headscarp region are monitored using SP-26 only. The average water level in SP-26 decreased by 0.5 foot since the prior monitoring year. Water levels in SP-26 have remained



consistent since approximately 2006. The maximum variability of measured groundwater between any month over the monitoring year was less than 1 foot.

2.1.2 EASTERN REGION

Average groundwater levels within the Eastern region decreased by 1.3 feet since the prior monitoring year. Groundwater levels within individual standpipes located in the Eastern region remained consistent with previous measurements with some temporal responses to rainfall events with the exception of SP-3A which recorded a water level rise of 17.4 feet between January and June 2022. A transducer was installed in SP-3A in May 2022 to collect nearly continuous water level data and to exclude potential error from manual sounder measurements. That data will be evaluated over the following monitoring year to assess the potential causes of rising water levels. Monthly water level data from the remaining standpipes that are within the Eastern Region are presented in Appendix A.

2.1.3 CENTRAL REGION

Average groundwater levels within the Central Region decreased by 4.7 feet since the prior monitoring year. Water levels in SP-16 and SP-16A fluctuate in response to activity in Dewatering Well BYA-1 which was out of service for a period in June for maintenance and again from November to February for rehabilitation. Water levels in the remaining standpipes of the Central Region decreased or remained approximately the same since the prior monitoring year.

2.1.4 BLUFF REGION

Average water levels within the Bluff Region decreased by 1.7 feet since the prior monitoring year. Water levels in SP-32 have been generally declining since the annual peak measurement reported in August 2020 and have declined approximately 16.4 feet since then, with a temporary 5-foot rise between June and August 2021 and a temporary 3-foot rise between December and March 2022 that was likely in response to rainfall in December 2021. Water levels in the other standpipes in the Bluff Region remained essentially unchanged or decreased since the prior monitoring year.

2.1.5 PCH REGION

Average groundwater levels within the PCH region increased by 0.2 feet since the prior monitoring year. Groundwater levels within individual standpipes located in the PCH region remained essentially consistent with the previous monitoring year with some response to tidal influences and isolated rainfall events. An exception is SP-30, which recorded a water level rise in response to the December rainfall event and has remained elevated since then. It was noted that standing water ponds on the shoulder of PCH above the standpipe vault and it is suspected that SP-30 is being filled with direct runoff from surface waters.



2.1.6 WESTERN EXTENSION REGION

Average water levels in the western extension region increased by 2.0 feet since the prior monitoring year. The increase is primarily due to SP-23 recording a 9.3-foot water level rise since August 2021. SP-23 has a history of water level fluctuation. In August and September 2020, SP-23 was found to be dry. The SP-23 casing is approximately 396 feet deep, out of plumb and distorted. A transducer will be installed to collect nearly continuous water level data and to exclude potential error from manual sounder measurements. Water levels in the remaining standpipes in the Western Extension were essentially unchanged from the prior year.

2.2 SLOPE INCLINOMETERS

2.2.1 INCLINOMETER MONITORING EVENTS

Yeh surveyed a total of 23 inclinometers during the monitoring year. Cumulative and incremental change plots of the A and B directions are attached in appendix B. Page B-1 presents a tabular summary of historic through present slope inclinometer conditions and results. Inclinometers were reviewed and compared to previous surveys for an indication of distinct shear-type movement. No distinct shear movement was detected from the inclinometer surveys performed during the monitoring year. Inclinometer survey results are summarized below by subregion:

2.2.2 HEADSCARP REGION

The Headscarp Region consists of the steep slopes at the northern boundary of the mapped landslide. SP-26 is the only usable inclinometer in the Headscarp Region. BYA (1996) reported that SP-26 was sheared off at approximately 40 feet during the 1983-1984 slope movement. The upper approximately 40 feet of casing was replaced and reportedly backfilled with a foam product. SP-26 continues to display inconsistent readings and difficulty achieving probe stabilization in the upper 40 feet. The issue appears to be associated with void space and lack of backfill surrounding the upper 40 feet of casing. No discernable shear-type movement was recorded during the monitoring year on either the shallow sub-slide or the deeper basal shear zone of the greater Big Rock Mesa Slide.

2.2.3 EASTERN REGION

Two inclinometers are monitored within the Eastern Region; PC-1 and SP-3A. Neither SP-3A or PC-1 displayed discernable shear-type movement during the monitoring year. Additionally, inclinometer SP-11 is located in the PCH Region directly south of the Eastern Region and near the toe of the 1983 landslide. SP-11 is considered relevant to the Eastern Region and is included in this section. Inclinometer SP-11 did not display discernable shear-type displacement during the monitoring year.

2.2.4 CENTRAL REGION

There are five inclinometers monitored in the Central Region; SP-9A, SP-16A, SP-17B, SP-35 and SP-36. Each of those were surveyed during the monitoring year. Inclinometers surveyed during this monitoring year did not display discernable shear-type displacement.

2.2.5 BLUFF REGION

Two inclinometers were surveyed within the Bluff Region; SP-32 and SP-34. Neither inclinometer displayed discernable shear-type displacement during the monitoring year.

2.2.6 PCH REGION

There are eight inclinometers located in the PCH Region: SP-19, SP-11, SP-12, SP-27A, SP-14, SP-15, SP-29 and SP-30. During the monitoring year, Yeh surveyed each of the eight inclinometers. The inclinometer casings surveyed during this monitoring year did not display discernable shear-type displacement.

2.2.7 WESTERN EXTENSION REGION

There are four inclinometers being surveyed within the Western Extension Region; SP-20, SP-21, SP-22 and SP-23. Surveyed inclinometers in the Western Extension Region did not display discernable shear type movement during the monitoring year.

3. WATER BUDGET TRACKING

3.1 RAINFALL DATA

Yeh obtained rainfall data for the 2021-2022 monitoring year from the Big Rock Mesa Rain Gauge #1239 operated by the Los Angeles County Department of Public Works. Plate 3 - Rainfall Graph displays historical monthly and average annual rainfall for the Big Rock Mesa area from October 1968 through September 2022. Prior to 1984, rainfall data was obtained from the Carbon Canyon Rain Gauge #447C and after 1984 from the onsite Big Rock Mesa Rain Gauge #1239. Recorded rainfall for the Big Rock Mesa area over monitoring year totaled 12.52 inches, which is 2.8 inches below the 54-year area average of 15.3 inches. Approximately 10.20 of the 12.52 total inches were received in a series of rain events in December 2021 with a single event on December 29 and 30 that recorded 5.71-inches. Other rainfall events included 1.34-inches of rainfall in March with all other months receiving a total of from 0 to 0.6 inches.

Plate 4 – Summary of Groundwater Levels, Dewatering and Rainfall shows annual rainfall deviation from the 54-year mean and compares rainfall amounts to total dewatering output changes.

3.2 IMPORTED WATER USAGE

Yeh collected monthly water usage readings for Big Rock Mesa from the Los Angeles County Department of Public Works master water meter #138193 located at the corner of Rockport Way and



Big Rock Drive and acquired meter data directly from the LA Country Waterworks District 29. The average water imported to the site as calculated between June 16, 2021 and July 6, 2022 was 154.7 thousand gallons per day, which is 6.5% less than the 2020-2021 monitoring year. Recorded water usage over the monitoring year was consistently elevated between approximately January 2021 and January 2022. A plot of monthly usage and water usage trendline is included on Plate 5 – Total Dewatering Production and Total Water Consumption.

3.3 DEWATERING

Yeh tracks dewatering production for pumping dewatering wells installed throughout the regions and gravity horizontal drains (hydraugers) installed at the base of the bluffs. During the 2021-2022 monitoring year dewatering production averaged 60,7496 gpd, which is a decrease of 7.8-percent from the previous monitoring years' average production of 65,882 gpd.

3.3.1 DEWATERING WELL PRODUCTION

Yeh performed monthly monitoring of production for the 24 active dewatering wells. Well production is measured approximately monthly for each well by reading flow totalizers that are installed along the discharge line. Production data and well status for individual wells is included in Pages B-1 through B-4. A graph showing total well production since 1993 is included on Plate 5.

The average total well production during the monitoring year was 47,906 gpd which is 5.2-percent lower than last year's average production of 50,519 gpd and 6.9-percent less than the historical production average of 51,483 gpd calculated from 1993 to present and 31.3-percent less than the maximum production of 69,741 gpd recorded during the 2004-2005 monitoring year. Well production typically varies in response to rainfall. The decrease observed during this monitoring year can be additionally attributed to several wells being temporarily shut down for maintenance and well rehabilitation, including well BYA-1.

Yeh personnel measure flow from the dewatering wells and also tracks their performance and maintains and troubleshoots equipment for maximize performance. Figure 3 presents a plot of measured flow from dewatering well W-3 between January 2018 to present. The plot is annotated with the dates of maintenance and repair that was performed that resulted in improvement to the well's dewatering performance. This is an example of how the use of well video logging and pressure

transducer data was used to make repairs and adjustments to maximize the existing dewatering capacity.

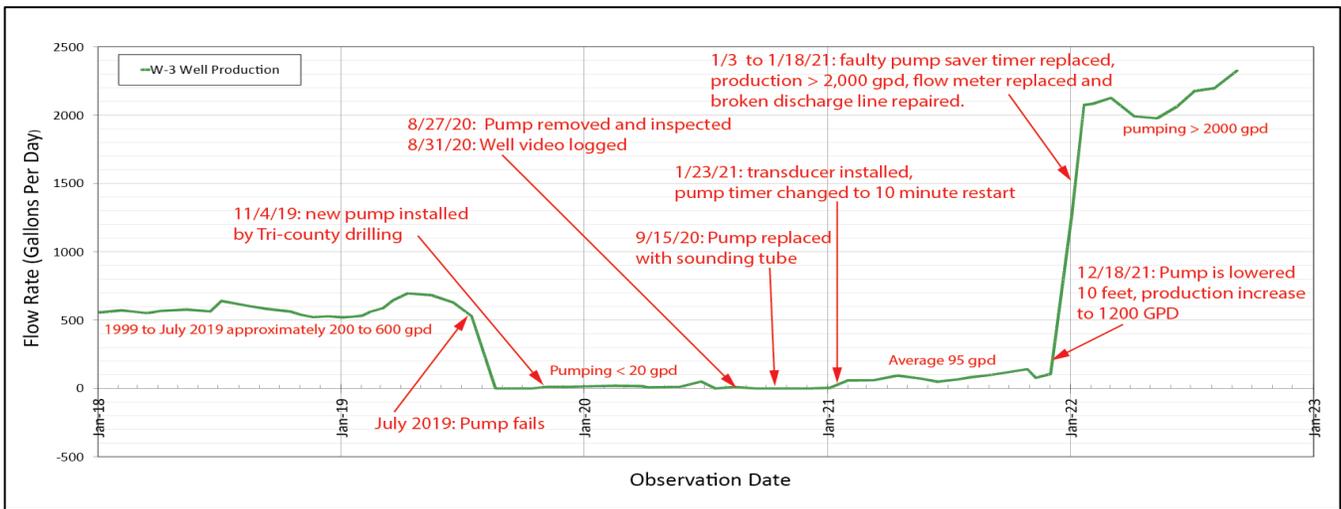


Figure 3: W-3 production data from 1/2019 to 9/2022

3.3.2 HYDRAUGER PRODUCTION

Yeh performed monthly monitoring for 36 hydraugers. Hydrauger production is measured directly from a sampling port installed on each hydrauger. A graph showing total hydrauger production since 1993 is presented on Plate 5. Production plots and status for individual hydrauger locations are included in Appendix C.

The average monthly hydrauger production during the 2021-2022 monitoring year was calculated to be 12,843 gpd which is approximately 16.4 percent less than last year’s average monthly production of 15,363 gpd. Hydrauger production over the monitoring year was highest in February and March, likely in response to the season’s rainfall.

4. MAINTENANCE AND CAPITAL IMPROVEMENTS

A summary table of the maintenance and capital improvement activities performed over this monitoring year is provided on Plate 2. Typical maintenance activities to dewatering wells include assessing and replacing or repairing dewatering well pumps, well electronics and well controls, repairs to well equipment vaults, and repairs to well discharge lines. Typical maintenance to hydraugers included PVC repairs at the bluff face along Highway 1 or within the conveyance piping for discharge. Capital improvements include replacement and rehabilitation of existing facilities and special projects to improve the monitoring and maintenance capabilities. Yeh performed numerous maintenance and repairs to dewatering facilities and improvements to the project assets throughout the monitoring year.

Larger maintenance projects for the 2021-2022 monitoring year included replacement of leaking well discharge lines beneath paved streets in Inland Lane and Seamoor Drive and rehabilitation to dewatering wells BYA-1 and W-2. Well rehabilitation included chemical treatment, casing scrubbing and airlifting of sediment and debris from the bottom of the wells. Effluent produced during the scrubbing and airlift process was directly contained in a 2,000-gallon tanker truck and disposed offsite.



Figure 4: Photo Left - 12/8/21 discharge line repair in Inland Lane; Photo Right - 2/11/22 airlifting equipment operation at BYA-1

5. GROUNDWATER QUALITY MONITORING

The City of Malibu has permitted the dewatering discharge with the Los Angeles Regional Water Quality Control Board (Water Board) under the National Pollutant Discharge Elimination System (NPDES) under permit CAG994004 order number R4-2013-0095. Order number R4-2013-0095 expired on July 6, 2018 and the Water Board is currently in the process of creating a new permit and new order R4-2018-0125. Yeh and the City continue to coordinate with the RWQB regarding our test results, sampling procedures, and future effluent limits. The City received renewed enrollment in June 2022 for Order R4-2018-0125, and will be implemented beginning in the 2022-2023 monitoring year.

Yeh and Associates, Inc., as a consultant for the City, performed the NPDES monitoring and reporting for this monitoring year in general accordance with the active permit. Analyses were conducted at certified laboratories, in accordance with current U.S. EPA procedures. Analytic results of the water quality sampling for each quarter are attached in Appendix D - Quarterly Results. Quarterly Discharge Monitoring Reports were submitted the Waterboard for Q3 and Q4 of 2021 and Q1 and Q2 of 2022 for monitoring year.

6. ADDITIONAL OBSERVATIONS AND MONITORING

- Yeh performed a visual reconnaissance and reviewed seven locations where ground cracks had been historically documented in a 1993 Major Ground Crack Check Location map (BYA, 1993). Yeh also continued to measure PK-nail crack gauges locations: two on Pinnacle way, one at the intersection of Big Rock Drive and Cool Oak Way, one at the hairpin turn on Big Rock Drive south of Rockport Way and one in the Seamoor Drive cul-de-sac. The crack gauges were measured periodically from January to September 2021 and no discernible movement or pattern of movement was detected. Yeh will continue to periodically measure the crack gauges.
- Yeh continued to observe a water seep along the base of the bluff between hydraugers HD-4 and BYA-H10.
- Yeh continued to observe two intermittent seeps behind the existing soldier pile wall between hydraugers HD-12 and HD-10.
- No large-scale seismic events occurred in the Southern California area during the monitoring year. One earthquake with a magnitude 4.0 or greater was recorded within a 100-mile radius. On September 18, 2021, a M 4.3 event occurred approximately 2 km east of Carson, CA. No effects from that event were noted in the Big Rock Mesa monitoring instruments or dewatering facilities.
- Recommend replacement of corroded well control boxes for dewatering wells W-1 and BYA-1.
- Continue efforts to install and implement remote transmitting meters for dewatering production and water levels.
- Ground surface monitoring with InSAR satellite data was introduced in September 2022 and will be presented during the next monitoring year.
- Proposed future Capital Improvement projects include:
 - Rehabilitate dewatering wells W-1 and BYA-9 and attempt to recover depth by removing existing sediment at well bottom.
 - Rehabilitate dewatering wells BYA-5 and FW-1 to improve water quality results for NPDES compliance.
 - Replace inclinometers that cannot be surveyed or have uncorrectable error due to significant past deformity, high levels of curvature, are significantly out of plumb, or limit survey ability (SP-3, SP-33, SP-24, SP-10, SP-26, SP-11). Replacement inclinometer casings are recommended to replace past survey coverage within the eastern, central, PCH and headscarp regions.
 - Install 1 or more new hydraugers at the observed seep between HD-4 and BYA-H10 and at seepage locations behind the soldier-pile wall between HD-12 and HD-10.

- Dewatering wells BYA-1 and W-3 should be replaced to original depth as part of long-term capital improvement planning.

7. REFERENCES

California Coastal Records Projects; Copyright © 2002-2019 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.californiacoastline.org

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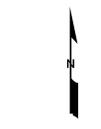
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Maintenance and Monitoring Facilities
 Assessment District 98-1, Big Rock Mesa
 City of Malibu, California



- Dewatering Well
- Hydrauger Outfall
- Hydrauger Installation Length
- Conveyance Point
- Ocean Discharge Point
- Approximate Limits of Primary Land Movement
- Western Extension Boundary
- Big Rock Mesa Landslide Assessment
- Slope Inclinerometer/Standpipe Piezometer
- Slope Inclinerometer/Standpipe Piezometer (standpipe only, not usable for inclinometer)
- Catch Basin
- Master Water Meter
- Storm Drain



SCALE 1:2,100
 200 100 0 200 Feet

DATE:	PROJECT NUMBER:	PLATE:
December 2021	220-276	1
DRAWN BY:	APPROVED BY:	
M. Boyd	L. Berry	



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FY21/22 MAINTENANCE SUMMARY

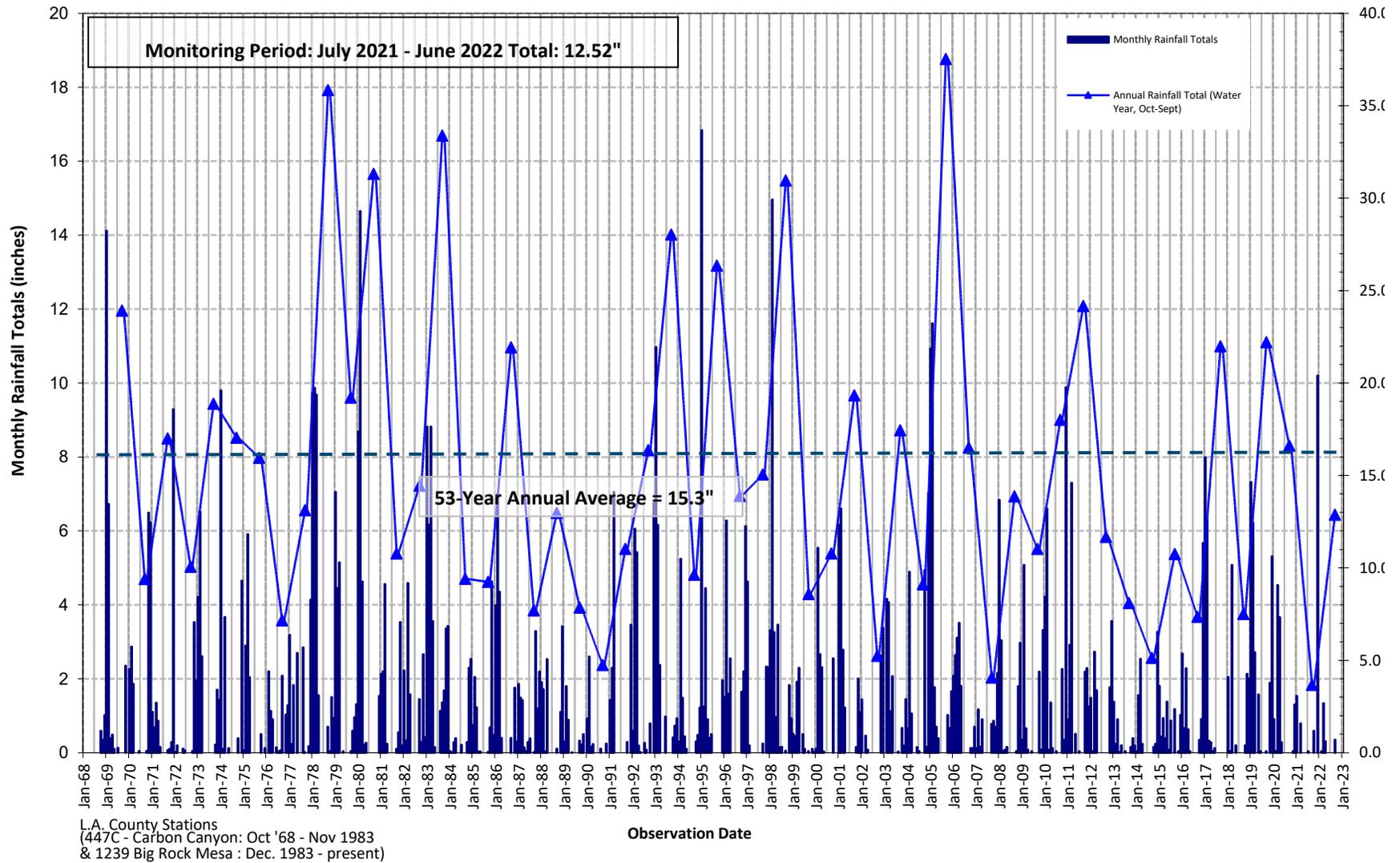
Row ID	Date Entered	Facility	Description/Observations	Status or Resolution
1	Jul-20	W-3	sudden decrease in production after pump replacement by previous contractor on 11/4/19. There is no sounding tube, airline or sounder access through well cover to establish water level.	8/25/20 bypass pump saver and pump ran dry to confirm water level is near pump intake
				8/27/20: CP removes pump
				8/31/2020: WRS video logs well
				CP tested pump at shop after removal and found pump to be operating normally
				9/15/20: CP reinstalled the same pump and motor and drop pipe, added 1" ID sounding tube to well. Pump continues to operate at low volume between 0 and 10 gpd
				1/23/21 transducer installed in sounding tube and monitoring at 1 minute intervals.
				2/1/21: well controls changed based off transducer data resulting in increase production to 60 gpd. Pump controls changed two more times between February and April. Between April-21 and 12/17/21 average production had increased to 95 gpd. Suspected that the timer on the pump saver was not accurately controlling the pump restart and that the restart interval is longer than the timer set on the pump saver (new task added 12/1/21)
				12/17/21: After review of water level data, video logs and previous contractors field notes, decided on attempt to lower pump approximately 10 feet by lifting pump by crane and adding 10 feet of drop pipe and sounding tube to top of pipe and reinserting, attempt is successful. Well appears to pump longer, Yeh installed transducer in well and allowed pump to run for a period of time to assess drawdown/recharge and production. However, upon returning to download transducer on 12/28/21, well was powered off at the circuit breaker. Turned well back on and allowed to pump. 1/3/22 CP assessed well to see if pump had tripped breaker and determined the pump was operating normally.
				1/3/22: CP found flow meter was not working (new task added 1/3/22 Row ID 13)
				1/3/22: CP rewired the pump saver due to possible interference by a backup pump control. Yeh returned on 1/5/22 and downloaded transducer and confirmed the pump saver restart timer continued to be set to 10 minutes but transducer data shows the pump is restarting after over 1 hour, pump saver timer is defective and will replace pump saver. (new task added Row ID 6)
				1/5/22: Yeh noted leaking into the well vault, probably from a broken discharge line (new task added 1/5/22 Row ID 14)
				After lowering pump 10 feet average production increased from 95 gpd to 1200 gpd. Pump saver with defective timer was replaced on 1/18/22 and production increased from 95 gpd to approximately 2,000 gpd for February through the end of June .
2	Jul-20	BYA-1	known casing damage at 250 feet	1/27/22: WRS attempted to clear previously identified possible obstruction at 250 feet. Attempt to clear obstruction was unsuccessful, during airlifting and in post-attempt video log well appears filled in with formation rock below approximately 250 feet.
3	Jul-20	BYA-1	electrical box is damaged, and decomposed, bottom of box is corroded away, door falling off, this item is to replace the electrical box	Consulted, visited site and obtained quotes from Taft, Harts, Layne and Quest. Visited site with Edison. Received final estimate from Quest to perform work beginning of 2022-2023 FY.
4	Jul-20	W-1	electrical box is damaged, and decomposed, bottom of box is corroded away, door falling off, this item is to replace the electrical box	Consulted, visited site and obtained quotes from Taft, Harts, Layne and Quest. Visited site with Edison. Received final estimate from Quest to perform work beginning of 2022-2023 FY.
5	Aug-20	W-18	leaking discharge line at well vault	on hold
6	Feb-21	W-3	2/1/21 well controls were changed based off transducer data, well controls changed 2 more times between February and April and between April and December 17, 2021, it was suspected that the timer on the pump saver was not accurately controlling the pump restart and that the actual restart interval is longer than the timer set on the pump saver.	1/3/22 CP assessed and rewired the pump saver due to rule out possible interference by a backup / old pump control on panel. Determined there was no interference
				1/6/22 and 1/17/22: Yeh returned to downloaded transducer and confirmed that the timer set on the pump saver continued to be set to 10 minutes while the pump continued to retort after 1 to 3 hours.
				1/18/22 CP replaced pump saver. Well production subsequently increased from approximately 1200 gpd to 2000 gpd. Transducer confirms accuracy of new timer. Pump restart set to 30 minutes.
7	Jun-21	BYA-1	6/2/21 during transducer download for well performance monitoring, noted that water level in well which had been steady, suddenly began rising, pump was just installed new on 10/2020.	6/2/21: Yeh assess well production, continuously pumping with production down from 6 gpm to 4gpm
				6/23/21: subsequent transducer check shows second sudden water level rise on 6/20/21, well now pumping continuously at 2 gpm.
				7/8/21: flow meter was not moving, well turned off, will need to replace pump and motor and consult WRS to assess for possible rehab for bacterial growth and/or corrosive well condition.
				7/12/21: Pump removed and replaced with new pump. Pumping continuously @ 10 GPM will monitor for decreased production while in consult with WRS for well rehab options.
8	Jul-21	BYA-9	during transducer download/npdes metals sampling, vault full of water and running onto street and down gutter, meter still running, most of discharge still flowing to storm drain	7/8/21: CP drained vault with hand pump, noted water spraying from discharge pipe on pump side of meter at flange, will contact BP to excavate and repair discharge pipe.
				7/9/21: Assessed by BP, preparing estimate and repair plan.
				7/29/21: BP saw-cut asphalt, excavated, cut and repaired discharge line and hot-patched asphalt. Well returned to service.
9	Sep-21	BYA-3	no production on monthly meters reading calculations.	9/10/21: Yeh onsite to assess well. Power line from well electrical meter up Edison power pole was broken off and hanging down resulting in no power to the well. Yeh contacted Edison for emergency repair.
				9/10/21: Edison performed repairs, power restored and pump is functioning, normally.

FY21/22 MAINTENANCE SUMMARY

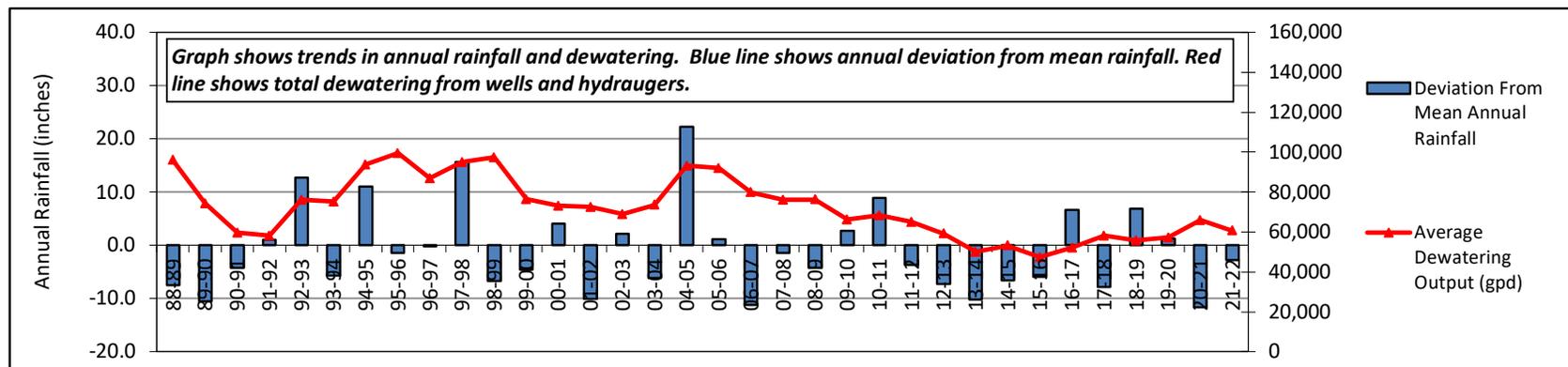
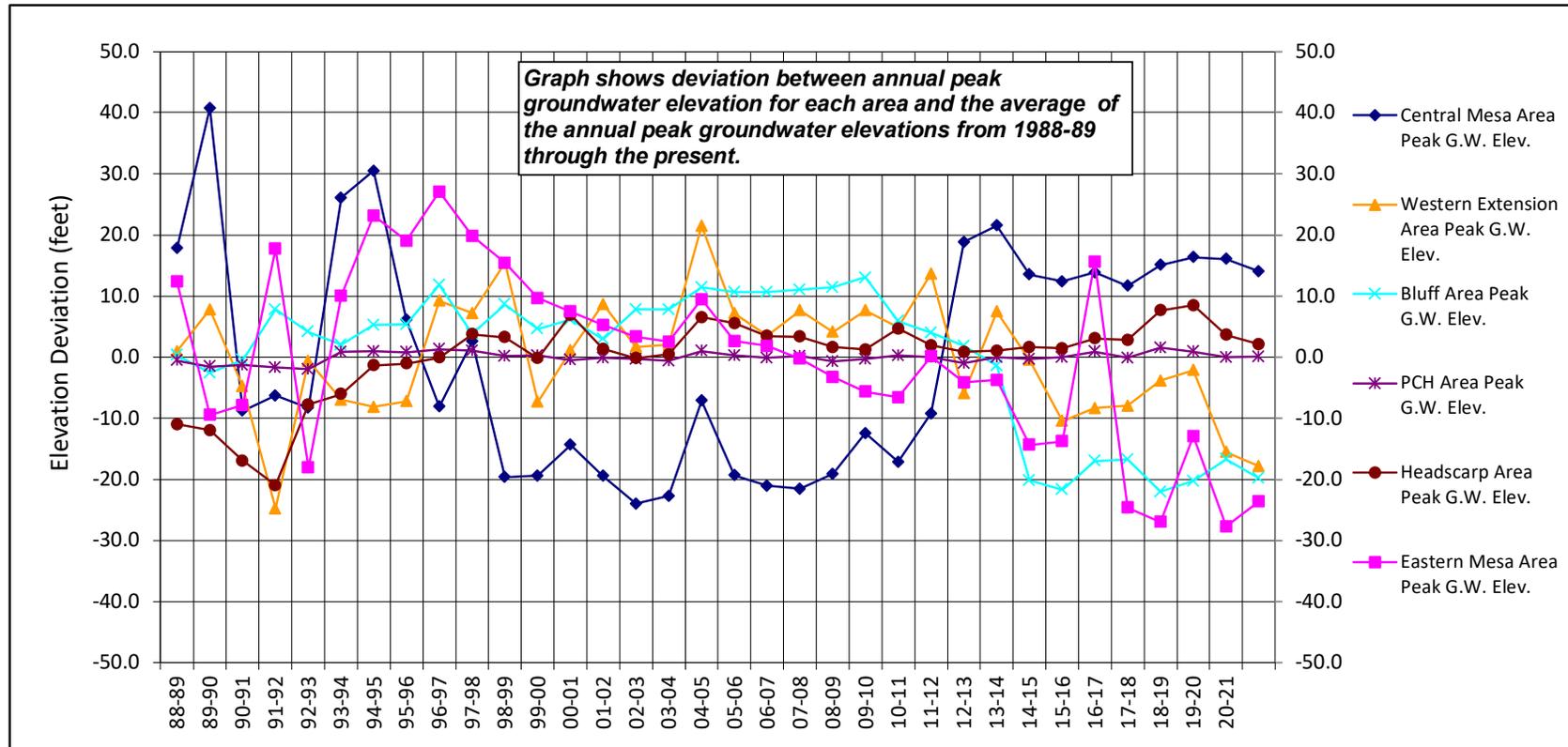
Row ID	Date Entered	Facility	Description/Observations	Status or Resolution
10	Nov-21	BYA-1	no production noted during monthly meter reading calculations. Pump had been replaced new on 7/12/21	DEWATERING WELLS
				11/13/21: Assessed by CP. Pump switching off at low amps at pump saver, amps at 7. Bypassed pump saver and pump ran with no production and low amps. Pump/motor will need to be replaced.
				11/17/21: Pump pulled by CP. Pump inspection reveals intake clogged with rust colored sludge. Probable bacteriological condition that will recur if left untreated, requires full rehabilitation.
				11/22 to 12/22: In consult with WRS to effect plan to treat well condition and handle discharge.
				12/8/21: received final quote from WRS
				1/3/21: Yeh set up no parking along curbs at BYA-1.
				1/5/21: Well rehab services pre-rehab video logged well and consult with Yeh.
				2/9/22 and 2/10/22: WRS performed 2 days of repeated chemical treatment and scrubbing of well casing.
				2/11/22: WRS and Burns Pacific performed one day of airlift with water added from water truck and discharge collected in 2,000 gallon tanker for offsite disposal.
				2/15/22: WRS performed post rehab video.
2/17/22: CP installs new pump and motor with same drop pipe and sounding tube as prior at 240' depth.				
2/18/22: Yeh installs pressure transducer and assess well, well operating normally				
11	Nov-21	Discharge line on Inland lane	Reported by residents that parent is intermittently wet on north side of Inland Lane Cule De Sac. 11/12/21 assessed by Yeh, water was observed seeping through pavement near W-1, W-2, BYA-13 discharge line junction box, assess for broken or clogged buried discharge line.	11/12/21 Yeh Assess water levels in the vicinity, turned off W-1, W-2, BYA-13. Install transducers in W-1, W-2 and SP-33.
				1/12/21: Yeh assess for leak and to determine cause of leak, was able to determine that wet condition is related to wells W-1, W-2 and BYA-13 which flow into common discharge line at north side of Inland lane. Require access to storm drain but manhole bolts are frozen.
				11/15/21: BP able to access manhole, and attempted to flush line through junction box where discharge line can be accessed. blockage was assessed a approximately 7.5' from junction box and attempted to flush and remove, but line blockage could not be dislodged.
				11/18/21: Yeh accesses manhole at end of cul-de-sac to test all pumps to determine layout of discharge lines and makes diagram for BP and city.
				BP sets up no parking
				12/7/21: BP saw cut asphalt and excavated from junction box to locate leak/clog and makes repairs. Broken section of pipe just beneath the asphalt was located and repaired.
				12/8/21: BP backfills excavation and hot-patches the asphalt repair. All wells returned to service
				12/17/21: BP tack seams along repairs
12	Dec-21	BYA-14	meter well full of water, water appears to have overtopped vault and had flowed into gutter, possible discharge or meter leak, still approximately normal volume discharging into storm drain	12/9/21: observed vault to be dry, turned on pump there was no leaking observed. Leave pump on, continue to monitor, vault was filled again on 12/17/21 and 1/26/22. Vault was intermittently filled until approximately May 2022, continued to monitor but vault appears to have stayed dry since.
13	Jan-22	W-3	when checking pump electronics, CP noted flow meter not working, pump had been lowered 10 feet on 12/17/21 likely sediment or debris has clogged meter.	1/6/22: CP replaces flow meter, flow meter operating normally as of 1/17/22, repair complete.
14	Jan-22	W-3	Yeh downloading transducer to asses pump saver timer noted that water was leaking into well vault, suspect that clogged flow meter had increased back pressure in aging galvanized discharge line	1/6/22: CP area north of vault excavated to expose and locate a leak approximately 6 inches outside the well vault, turned off pump to prevent flooding residents yard
				1/8/22: Yeh attempted to apply temporary clamp, but noted the leak extended into the concrete of the well vault, will require Burns pacific to repair
				1/11/22: Assessed by BP
1/12/22: BP excavated and replaced approximately 4 feet of discharge line, reconnected it to the pump drop pipe, and patched the vault wall with concrete, well was returned to service.				
15	May-22	W-2	during monthly production checks for May, sudden decrease in production noted, pump had been replaced 9/11/2020. Video log 8/31/2020 showed roots had infiltrated into well, likely continued root growth had impacted new pump/motor.	6/10/22: Coast Pump removed pump and drop pipe, appears intake is clogged with vegetation debris
				6/10/22: Well Rehab Services pre-rehab video log of well. Numerous roots and organic debris observed. Will perform full rehab on well to eliminate roots and airlift debris.
				6/13/22 and 6/14/22: WRS performs two full days of chemical treating, scrubbing and swabbing well casing
				6/15/22: WRS and BP onsite, airlifting well with water added to well from water truck and discharge captured in 2,000 gal tanker truck. Airlifted approximately 40 feet of sediment derived from the chem treat and scrubbing process.
				6/21/22: WRS post-rehab video log, log reveals roots have effectively been eliminated from the well and casing mineralization significantly reduced.

FY21/22 MAINTENANCE SUMMARY

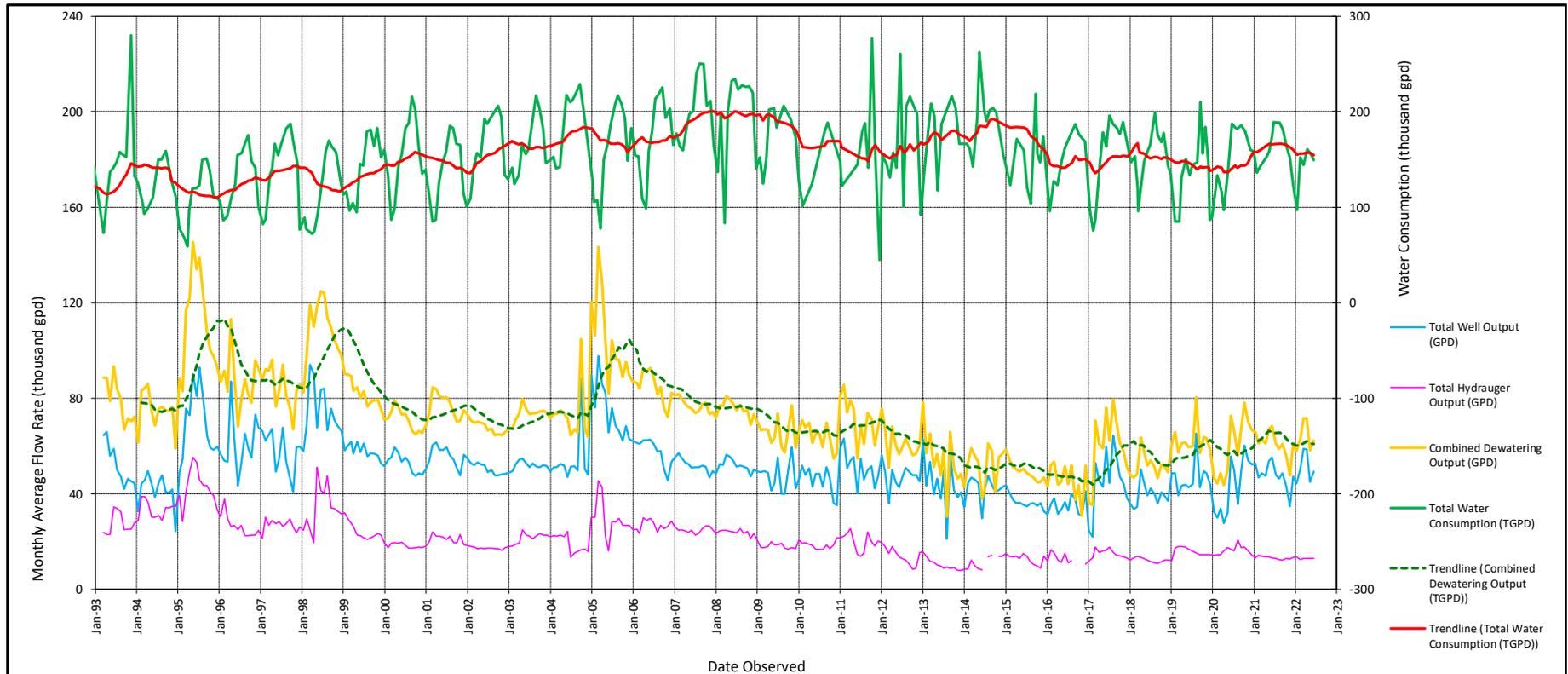
Row ID	Date Entered	Facility	Description/Observations	Status or Resolution
				DEWATERING WELLS
				7/5/22: CP installs new pump and /motor with the same drop pipe and sounding tube as prior. Well returned to service, operating normally
16	May-22	W-2	During well assessment W-2, electrician noted faulty wiring in well vault from junction box to pump. Wires are too small and no ground is present.	7/5/22: Quest to replaced faulty wiring during pump replacement in coordination with with CP.
17	Jun-22	W-16	6/16/22 during monthly production checks for June, sudden decrease in production noted from 8,000 gpd to 1,400 gpd, technician observed meter was not moving during meter reading and W-16 normally flows nearly continuously. From 6/16/22 to 7/6/22 well production down to 14 gpd.	6/21/22: Well and controls assessed by Yeh, No production, shuts off at pump saver after 2 to 5 seconds. Contact and consult with CP.
				6/30/22: Yeh set up no parking for CP access
				7/1/22: Assessed by CP, will remove pump and replace during FY 2022-2023 (pump was removed 7/6/22, tested and inspected and replaced with new pump/motor on 7/18/22)
18	Jun-22	W-16	6/21/2022 during well assessment noted flow meter clicking, about to fail	7/18/22: CP replaces flow meter
		HYDRAUGERS		
	Jul-20	HD 5,6,23	Conveyance line from western hydrauger cluster in broken and leaking causing standing water behind K-Rail	waiting for Caltrans permit to proceed with work in Caltrans ROW. Caltrans permit approved 11/10/2020
				12/3/20: Site meeting with BP.
			3/11/21 and 3/12/21.: Yeh personnel performed temporary repair to conveyance line. Excavated and removed 20' section of 4" PVC pipe dislodged between two previous older repairs and unclogged blockage near distal end of pipe at Port 9	
			2/2022: Repair completed by Burns pacific. Conveyance line repaired, realigned and extended to flow into Port 9.	
19	Jul-20	HD-10 HD-111	Conveyance line from HD-10 and HD-11 broken underground and leaking behind solidier pile wall, also causing HD-190 and 11 flow to backup up into slope	waiting for Caltrans permit to proceed with work in Caltrans ROW. Caltrans permit approved 11/10/2020
				12/30/20: onsite meeting with BP
				10/5/21: Burns Pacific used backhoe to excavate and locate broken line/clog. Replaced approximately 60 feet of 3" pvc discharge line, pass through into storm drain Port 6 and rebury, also potholed along base of wall to confirm 1991 as-built discharge line diagrams (diagrams appear incorrect)
20	Sep-20	HD-26	broken discharge line subsurface at HD-26	hydrauger is discharging into storm drain with temporary flexible pipe
21		INCLINOMETERS		
22	Jul-20	SP-11	top of inclinometer casing is cracking	pending, readings do not appear affected by condition
23	Jul-20	SP-30	top of inclinometer casing is cracking, allows soil into standpipe	pending, readings do not appear affected by condition water level may be affected



RAINFALL GRAPH
 Landslide Assessment Districts
 Malibu, California



SUMMARY OF GROUNDWATER LEVELS, DEWATERING, AND RAINFALL
 Big Rock Mesa Landslide Assessment District
 Malibu, California



TOTAL DEWATERING PRODUCTION AND TOTAL WATER CONSUMPTION
Wells and Hydraugers(Combined)/Total Water Consumption
 Big Rock Mesa Landslide Assessment District
 Malibu, California

APPENDIX - GROUNDWATER LEVELS

Big Rock Mesa: Standpipe Piezometer Information				
Piezometer ID	Surface Elev. (ft)	Depth (ft)	Perforation Interval Elevation (ft)	Installer
PCH Standpipe Piezometers				
SP-11	27	58	Unknown	Evans
SP-12	26	40	Unknown	Evans
SP-14	25	30	Unknown	Evans
SP-15	20	82	Unknown	Evans
SP-19	25	82	Unknown	Evans
SP-27A	29	94	Unknown	Evans
SP-29	27	138	Unknown	Evans
SP-30	29	128	Unknown	Evans
Bluff Standpipe Piezometers				
SP-10	295	332	Unknown	Evans
SP-28	270	358	Unknown	Evans
SP-32	233	354	Unknown	Evans
SP-34	270	382	-112 to -107	BYA
Headscarp Piezometers				
SP-26	745	346	Unknown	Conv
Central Standpipe Piezometers				
SP-9A	365	300	Unknown	Evans
SP-16	285	240	Unknown	Evans
SP-16A	285	392	Unknown	Evans
SP-17	540	192	Unknown	Evans
SP-17A	540	238	Unknown	BYA
SP-24	370	382	Unknown	Conv
SP-35	345	396	-51 to -46	BYA
SP-36	380	254	120 to 125	BYA
Western Standpipe Piezometers				
SP-20	430	326	Unknown	Conv
SP-21	660	280	Unknown	Evans
SP-22	780	332	Unknown	Conv
SP-23	860	398	Unknown	Conv
Eastern Standpipe Piezometers				
PC-1	250	160	87.5 to 90	BYA
SP-3	212	132	Unknown	Evans
SP-3A	203	246	Unknown	Evans
SP-33	208	374	Unknown	Evans

Evans - D.A. Evans

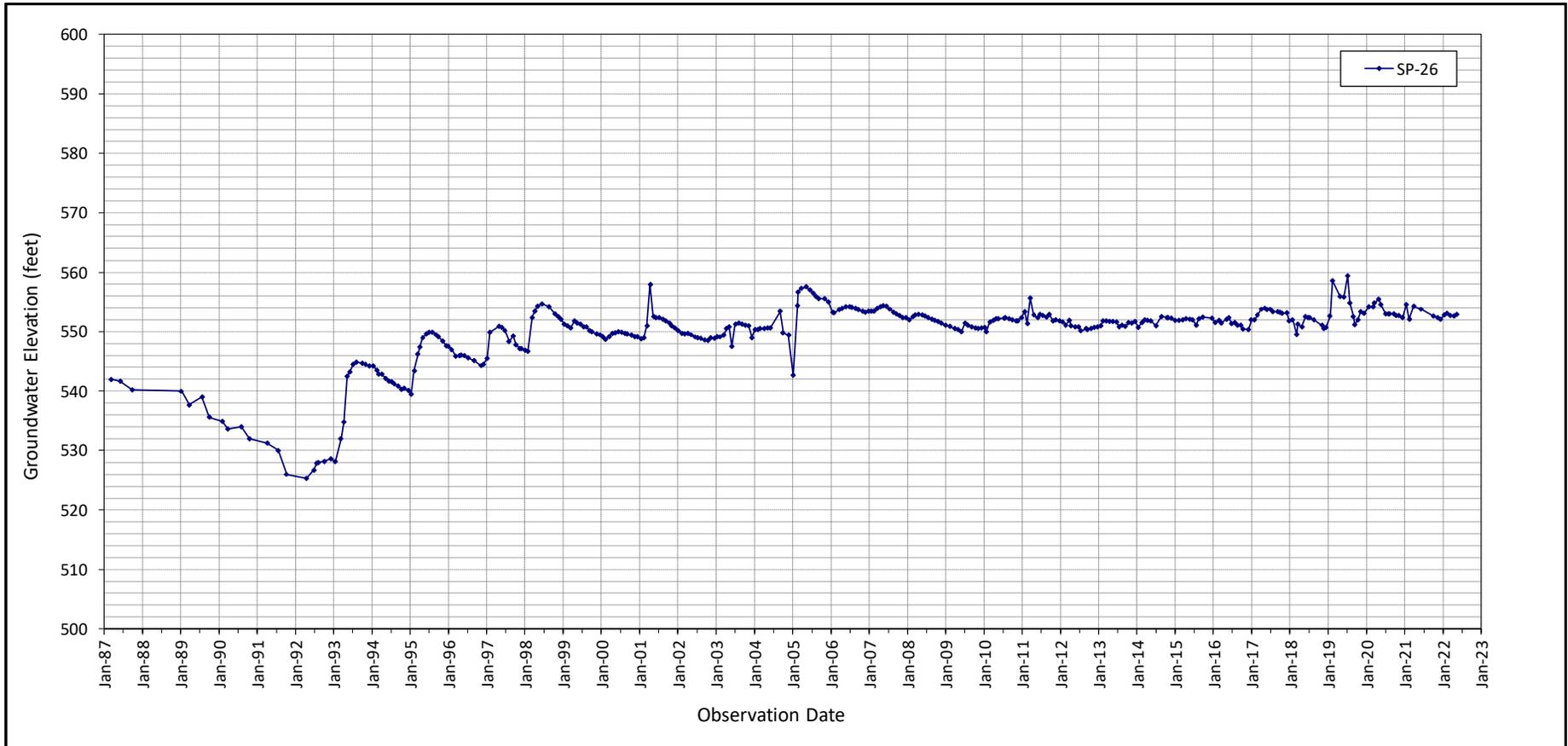
Converse - Converse Consultants

BYA - Bing Yen and Associates

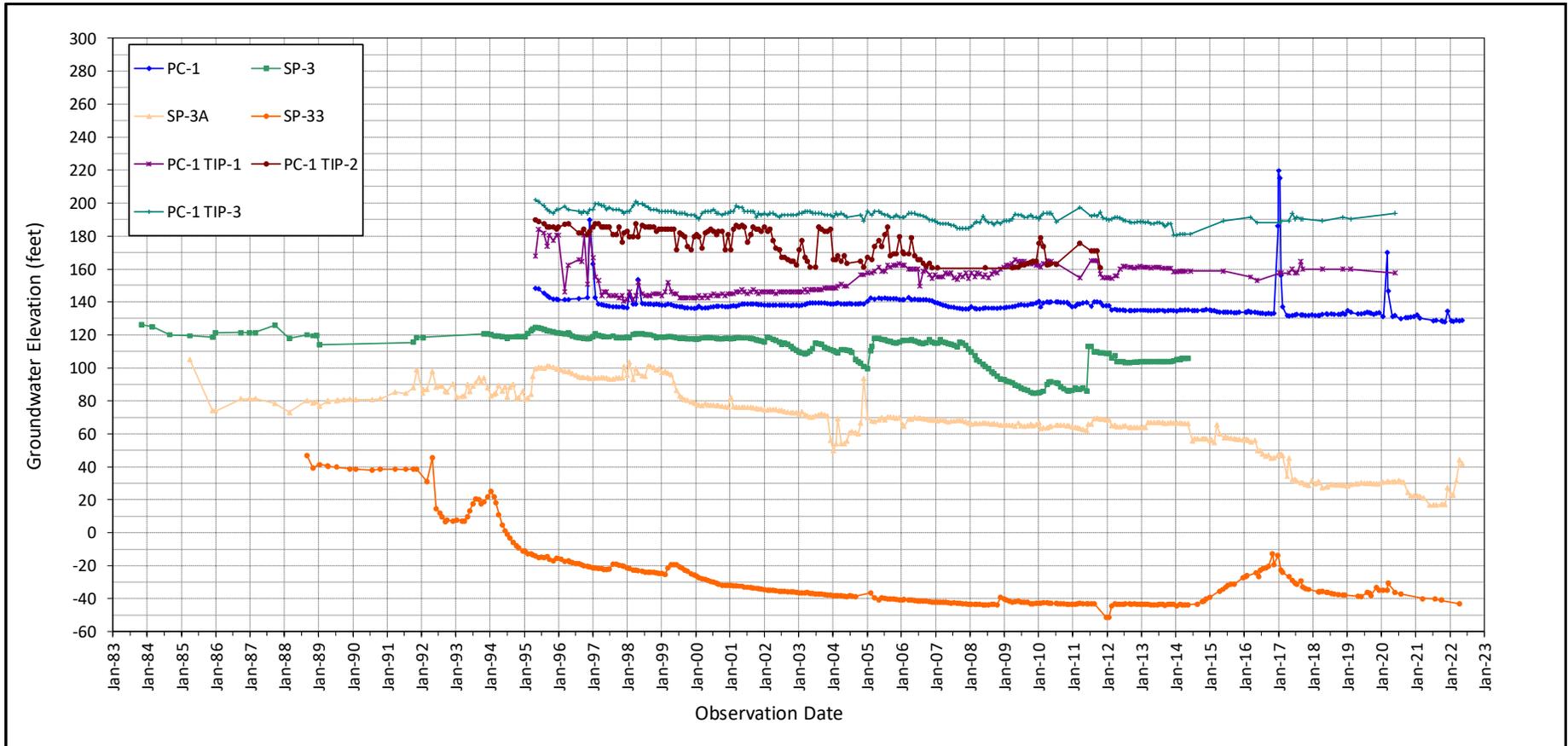
PNEUMATIC PIEZOMETER INFORMATION					
Piezometer ID	Surface Elev. (ft)	Tip No.	TIP DEPTH (ft.)	INSTALL BY	STATUS
W-10**	432	230	230	BYA	No air-line, has sounder access, no data reported
W-11**	507	214	214	BYA	Air-line present, no sounder access, no data reported
W-15**	295	164	164	BYA	Air-line present, no sounder access, no data reported
PC-1	250	TIP-1	120	BYA	Functioning as of 2020, not measured during monitoring year
		TIP-2	90		0 PSI since November 2011
		TIP-3	70		Functioning as of 2020, not measured during monitoring year
		TIP-4	40		Non-Functioning, no return air flow
		TIP-5	20		Non-Functioning, no return air flow
SP-5A*	NA	TIP-1		BYA	Non-functioning - Covered by asphalt pavement
		TIP-2	NA		
		TIP-3			
SP-8A*	NA	TIP-1		BYA	Non-functioning - Covered by landslide
		TIP-2	NA		
		TIP-3			
SP-17A*	540	TIP-1	Unknown	BYA	Non-functioning, no return air flow
		TIP-2	Unknown		
		TIP-3	Unknown		
		TIP-4	Unknown		
		TIP-5	Unknown		
SP-34	270	TIP-1	381	BYA	Functioning as of 2020, not measured during monitoring year
		TIP-2	282		Functioning as of 2020, not measured during monitoring year
		TIP-3	182		Low PSI since installation, not reported
		TIP-4	82		Non-Functioning, no return air flow
SP-35	345	TIP-1	393	BYA	Functioning as of 2020, not measured during monitoring year
		TIP-2	293		Functioning as of 2020, not measured during monitoring year
		TIP-3	193		Functioning as of 2020, not measured during monitoring year
		TIP-4	98		Non-Functioning, no return air flow, not reported
SP-36	380	TIP-1	255	BYA	Functioning as of 2020, not measured during monitoring year
		TIP-2	195		Functioning as of 2020, not measured during monitoring year
		TIP-3	95		0 PSI since installation, not reported
BYA-2*	665	TIP-1	Unknown	BYA	Non-functioning, no return air flow
		TIP-2	Unknown		
		TIP-3	Unknown		
BYA-3A*	NA	TIP-1		BYA	Non-Functioning
		TIP-2			
		TIP-3	NA		
		TIP-4			
BYA-4A*	NA	TIP-1		BYA	Non-functioning, no return air flow
		TIP-2			
		TIP-3	NA		
		TIP-4			
		TIP-5			
		TIP-6			
BYA-5A*	NA	TIP-1		BYA	Non-Functioning, Paved over
		TIP-2	NA		
		TIP-3			
		TIP-4			
GEO-2 (OB-2)*	305	TIP-1		GS	Non-Functioning
		TIP-2	NA		
		TIP-3			
GEO-1*	NA	TIP-1		GS	Restricted Access (possibly malfunctioning)
		TIP-2	NA		
		TIP-3			

NOTE: * Not functioning or no longer monitored pneumatic piezometer
** Inactive dewatering well air-line

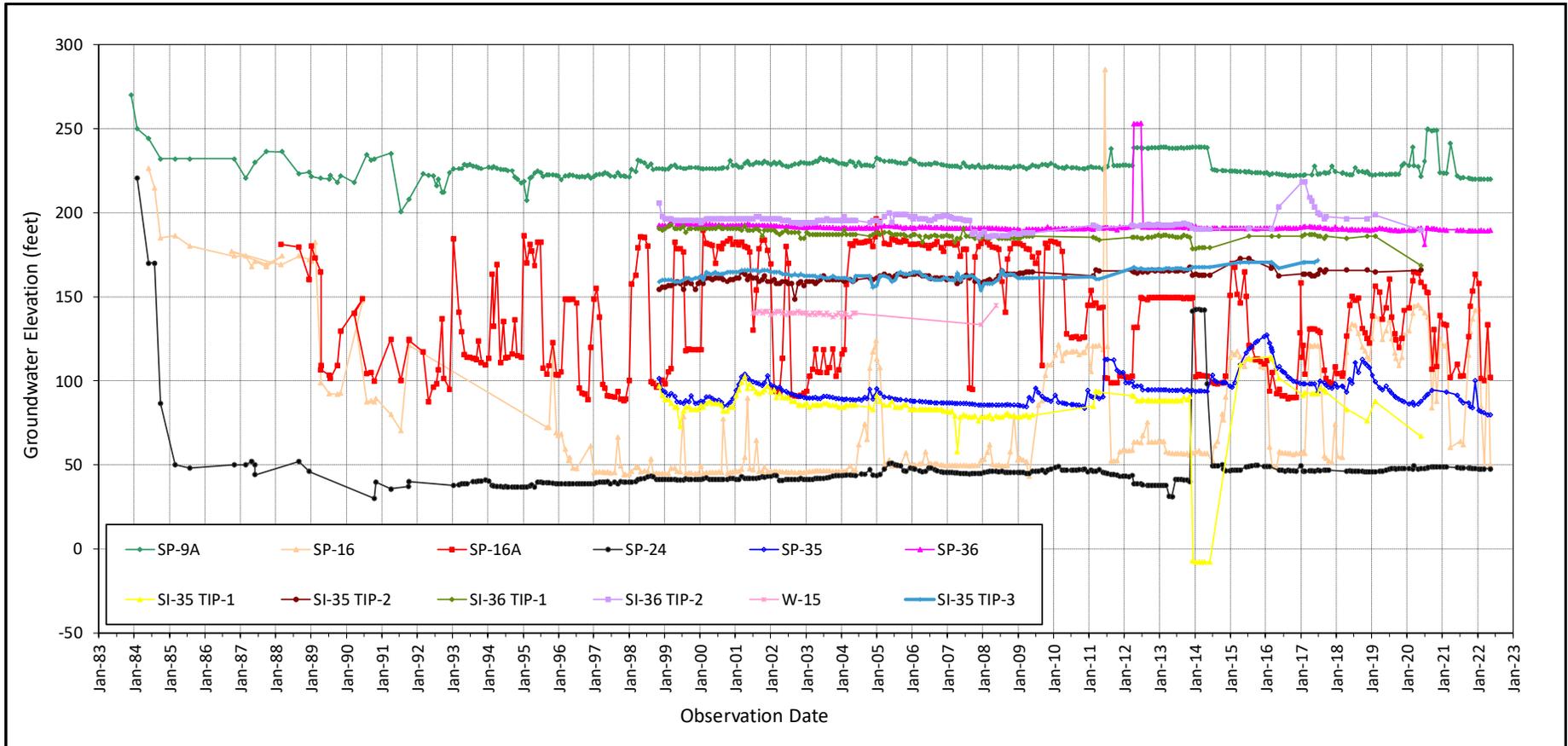
Piezometer I.D.		1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Highest Recorded	Mean '91-'22	Stand Dev.	'21-'22 vs '97-'98	'21-'22 vs '20-'21	'21-'22 vs mean		
PCH REGION																																																
SP-11	Mean El.						5.7	5.3	4.7	4.5	5.7	5.7	5.5	5.8	5.5	5.8	6.3	5.5	4.8	5.4	5.4	5.2	5.3	5.1	5.4	4.9	4.6	5.1	8.4	7.8	4.7	4.8	5.0	5.3	5.7	5.9	4.8	5.0	5.2	5.1	Jul-16	5.5	0.8	-0.7	-0.1	-0.4		
	Highest El.						6.4	5.8	5.5	5.0	6.0	7.4	6.9	7.5	6.7	7.3	8.1	6.5	5.5	8.3	7.0	5.7	5.8	5.9	7.6	5.9	5.2	5.6	11.8	8.8	5.0	5.1	5.9	6.1	7.2	7.2	5.2	6.0	5.5	5.1	11.8	6.5	1.4	-2.2	-0.4	-1.5		
SP-12	Mean El.						4.6	5.4	5.5	5.4	5.2	4.8	4.9	5.1	4.8	5.0	5.3	5.3	4.7	4.5	4.8	4.6	5.5	5.2	4.9	4.8	4.7	4.0	4.7	4.2	5.2	5.2	5.2	6.0	6.4	5.9	5.0	5.5	4.4	4.4	Feb-17	5.0	0.5	-0.6	0.0	-0.6		
	Highest El.						4.6	5.4	6.0	6.0	6.0	7.2	6.1	6.3	7.4	7.0	6.4	6.5	7.4	6.4	6.4	6.4	8.3	7.2	6.4	5.8	5.7	5.1	5.3	5.2	5.5	5.8	6.2	8.8	8.8	7.8	6.9	6.5	5.9	6.5	8.8	6.6	1.0	-0.5	0.6	0.0		
SP-14	Mean El.					4.5	4.7	4.4	4.8	4.3	4.8	4.9	4.9	4.9	5.0	5.9	5.8	5.6	4.7	4.5	4.6	4.6	4.7	4.8	4.7	4.7	4.3	4.3	4.3	4.1	5.2	5.6	4.5	5.1	4.9	4.9	4.7	4.5	4.5	5.1	Feb-98	4.8	0.4	-0.8	0.6	0.3		
	Highest El.					4.5	4.7	4.4	5.2	5.4	7.1	6.1	5.3	5.9	5.7	8.7	6.9	7.4	5.4	5.7	5.1	5.4	5.4	5.7	5.5	6.0	5.1	5.0	4.6	4.9	5.5	5.5	5.7	6.0	6.2	5.8	5.9	5.1	5.2	5.2	8.7	5.8	0.8	-3.5	0.0	-0.6		
SP-15	Mean El.					11.3	8.8	10.5	9.1	7.5	10.7	13.4	12.6	15.1	14.5	12.2	12.0	11.7	11.6	11.5	11.7	10.0	11.9	11.6	11.6	11.4	8.9	8.4	7.2	7.6	5.5	5.7	8.6	10.6	10.6	8.8	11.4	12.1	10.6	11.5	Jan-97	10.6	2.3	-0.7	0.9	0.9		
	Highest El.					11.3	12.2	10.5	11.4	9.1	12.4	19.4	19.5	19.9	20.0	16.3	13.5	12.7	12.4	12.5	12.4	12.2	12.8	12.4	12.2	12.2	11.1	12.2	10.1	10.2	5.9	6.2	12.0	12.2	12.4	10.6	12.5	12.4	12.2	12.3	20.0	12.7	3.3	-4.0	0.0	-0.5		
SP-19	Mean El.						3.6	3.6	3.1	4.5	4.4	4.7	4.6	4.3	4.4	4.5	3.8	3.4	3.7	3.5	3.4	3.9	3.6	3.6	3.5	3.1	3.6	3.7	3.6	3.0	3.6	3.4	3.4	3.5	3.7	3.8	4.3	3.4	3.2	Mar-95	3.7	0.5	-1.1	-0.2	-0.5			
	Highest El.						4.1	4.0	3.4	5.0	5.0	5.9	5.4	4.9	5.2	5.0	4.5	3.9	4.3	4.1	4.0	4.2	4.5	4.4	4.1	3.6	4.6	4.0	4.3	3.3	4.2	4.1	3.6	4.1	4.2	5.5	5.5	4.2	3.7	5.9	4.4	0.7	-1.5	-0.5	-0.7			
SP-27A	Mean El.					7.1	9.1	8.8	8.7	9.3	9.4	9.7	9.5	9.5	9.7	9.6	10.1	9.2	9.0	9.5	9.3	10.2	9.7	9.5	10.0	9.5	10.0	10.0	9.7	10.5	17.1	9.7	9.1	10.0	9.9	10.4	9.7	9.2	9.6	Jun-15	9.9	1.4	-0.2	0.4	-0.3			
	Highest El.					7.1	10.1	9.2	10.2	10.0	10.2	10.8	10.3	10.4	10.7	10.4	13.7	9.6	9.7	9.9	9.8	13.5	12.5	10.2	13.7	10.1	10.6	10.5	10.5	10.8	17.8	10.0	10.1	12.8	10.3	15.5	11.0	9.8	10.0	17.8	11.1	1.9	-0.7	0.2	-1.1			
SP-29	Mean El.					19.7	20.4	19.4	18.7	18.0		19.7	20.0	19.2	19.2	19.7	18.8	18.0	18.1	17.0	16.2	16.0	18.0	17.7	16.7	16.3	15.8	15.9	16.2	15.8	16.7	15.7	14.4	13.9	14.5	14.3	14.3	14.6	13.8	13.4	Feb-05	16.6	2.0	-6.3	-0.4	-3.2		
	Highest El.					19.7	21.7	19.4	18.7	18.0		20.9	22.1	20.2	20.5	21.3	19.9	19.1	19.6	18.1	16.7	16.4	22.2	18.7	17.4	16.9	16.1	16.6	16.9	17.1	16.9	16.8	14.7	14.3	16.7	14.8	18.0	18.2	14.3	13.6	22.2	17.8	2.3	-7.7	-0.6	-4.1		
SP-30	Mean El.					7.4	7.1	6.4	7.2	6.9	7.7	7.3	7.9	8.1	9.6	8.0	8.5	9.0	9.7	11.3	12.6	12.9	13.0	13.4	13.4	14.4	15.1	15.7	16.2	15.8	16.5	16.8	13.6	13.8	16.0	16.5	18.1	20.0	20.1	20.6	Jan-22	13.2	4.1	12.6	0.5	7.4		
	Highest El.					7.4	8.0	6.4	8.0	8.0	9.3	9.6	9.4	13.3	10.2	9.6	10.1	10.8	12.6	14.3	13.4	14.3	14.1	14.2	15.3	15.5	16.4	17.2	17.2	17.2	17.2	17.2	17.2	20.9	20.8	21.4	22.6	22.6	14.6	4.1	12.4	1.2	8.0					
Area Average	Mean El.					10.7	8.3	8.0	7.8	7.3	6.8	8.7	8.8	9.1	9.1	8.8	8.8	8.6	8.3	8.4	8.5	8.2	9.1	8.9	8.7	8.7	8.2	8.4	8.8	8.6	8.4	9.3	8.1	8.4	9.0	8.7	9.1	9.5	8.9	9.1		8.6	0.5	0.3	0.2	0.5		
	Highest El.					10.7	9.2	8.3	8.5	8.1	7.8	10.7	10.8	10.6	11.1	10.8	10.0	10.1	9.3	9.7	9.5	9.2	10.8	10.1	9.7	10.0	9.1	9.5	10.1	9.8	8.8	9.8	9.5	9.8	10.7	9.7	11.3	10.7	9.8	9.9		9.9	0.8	-1.0	0.1	0.0		
Change vs Prior	Mean El.					-2.4	-0.3	-0.2	-0.5	-0.4	1.8	0.1	0.3	0.0	-0.2	0.0	-0.2	-0.3	0.1	0.2	-0.3	0.8	-0.2	-0.2	0.0	-0.5	0.2	0.4	-0.3	-0.1	0.9	-1.3	0.3	0.6	-0.2	0.3	0.4	-0.6	0.2									
	Highest El.					-1.5	-1.0	0.2	-0.4	-0.4	2.9	0.1	-0.2	0.5	-0.3	-0.9	0.1	-0.7	0.4	-0.2	-0.3	1.7	-0.7	-0.4	0.3	-0.9	0.5	0.5	-0.3	-1.0	1.1	-0.3	0.3	0.9	-0.9	1.6	-0.6	-0.9	0.1									
BLUFF REGION																																																
SP-10	Mean El.	144.7	76.0	50.0	50.5	49.2	47.4	45.9	48.8	55.3	44.6	42.9	41.6	42.0	41.6	41.3	42.4	42.8	42.9	43.3	43.7	44.3	45.5	45.2	45.2	44.8	43.7	44.0	43.9	42.6	43.7	43.5	43.9	45.8	44.8	45.8	44.8	44.8	45.0	45.3	Dec-83	44.2	2.4	4.0	0.3	1.1		
	Highest El.	174.2	130.0	50.0	50.5	50.0	52.0	46.0	55.5	74.0	45.9	44.4	42.2	42.6	41.9	41.6	44.8	43.4	43.3	43.6	44.1	44.4	47.2	45.4	45.4	45.2	44.9	44.6	46.0	44.7	44.1	44.0	44.3	48.7	47.3	55.4	47.3	47.4	45.1	45.7	174.2	46.1	5.8	4.1	0.7	-0.4		
SP-28	Mean El.						36.4	33.7	37.5	33.7	33.6	33.7	33.0	32.7	32.2	31.9	32.6	33.2	33.1	33.0	32.9	32.9	34.9	34.7	33.3	33.1	32.8	33.1	32.8	35.2	32.8	32.8	33.4	33.4	33.3	33.4	33.4	33.3	33.4	33.3	33.2	Jan-12	33.3	0.7	1.3	-1.1	-0.1	
	Highest El.						40.5	33.8	40.0	36.0	35.2	35.2	33.1	33.1	32.4	32.2	34.9	33.6	33.2	33.3	33.0	32.9	36.1	36.0	33.6	33.1	33.1	33.4	33.8	42.0	33.7	33.6	33.4	33.5	33.6	33.6	33.6	33.6	33.7	39.1	33.3	42.0	34.2	2.0	1.1	-5.8	-0.9	
SP-32	Mean El.						75.3	79.1	72.6	76.1	90.1	85.9	92.5	92.5	94.9	76.5	84.2	79.7	88.2	70.1	89.9	91.1	99.9	100.2	102.3	102.4	104.4	105.1	102.3	104.8	106.4	105.6	35.0	24.0	34.3	34.8	25.5	29.8	41.7	36.6	Apr-96	77.6	28.6	-39.9	-5.1	-41.0		
	Highest El.						78.2	82.3	72.8	83.2	101.0	96.2	110.2	110.2	130.9	107.4	95.3	88.4	97.0	83.6	106.0	105.8	106.7	105.9	105.9	105.8	105.8	105.8	105.9	106.9	106.9	107.1	41.3	30.3	55.0	47.1	33.7	38.5	49.1	42.5	130.9	87.6	28.8	-64.9	-6.6	-45.1		
SP-34	Mean El.																																															
	Highest El.																																															
Area Average	Mean El.	144.7	76.0	50.0	50.5	49.2	53.0	52.9	53.0	55.0	56.1	54.2	55.7	56.2	49.9	58.4	58.3	60.1	55.7	60.0	60.5	65.1	64.9	65.9	66.2	66.7	67.7	58.0	56.8	55.0	54.5	34.2	31.9	33.2	34.2	31.5	33.2	36.8	35.1		52.5	12.0	-14.8	-1.7	-17.4			
	Highest El.	174.2	130.0	50.0	50.5	50.0	56.9	54.0	56.1	64.4	60.7	58.6	61.8	62.0	68.4	60.4	65.2	61.2	62.7	59.6	64.4	64.4	68.0	67.2	67.2	67.6	68.0	69.6	62.5	60.6	58.4	55.2	36.4	34.9	39.6	39.8	34.5	36.3	39.9	36.8		56.7	12.1	-23.6	-3.1	-19.9		
Change vs Prior	Mean El.		-68.7	-26.0	0.5	-1.3	3.8	-0.2	0.1	2.0	1.1	-1.9	1.5	0.1	0.5	-6.3	8.5	-0.1	1.8	-4.4	4.3	0.5	4.6	-0.1	0.9	0.3	0.5	0.9	-9.6	-1.2	-1.8	-0.5	-20.2	-2.4	1.4	0.9	-2.7	1.7	3.6	-1.7								
	Highest El.		-44.2	-80.0	0.5	-0.5	6.9																																									



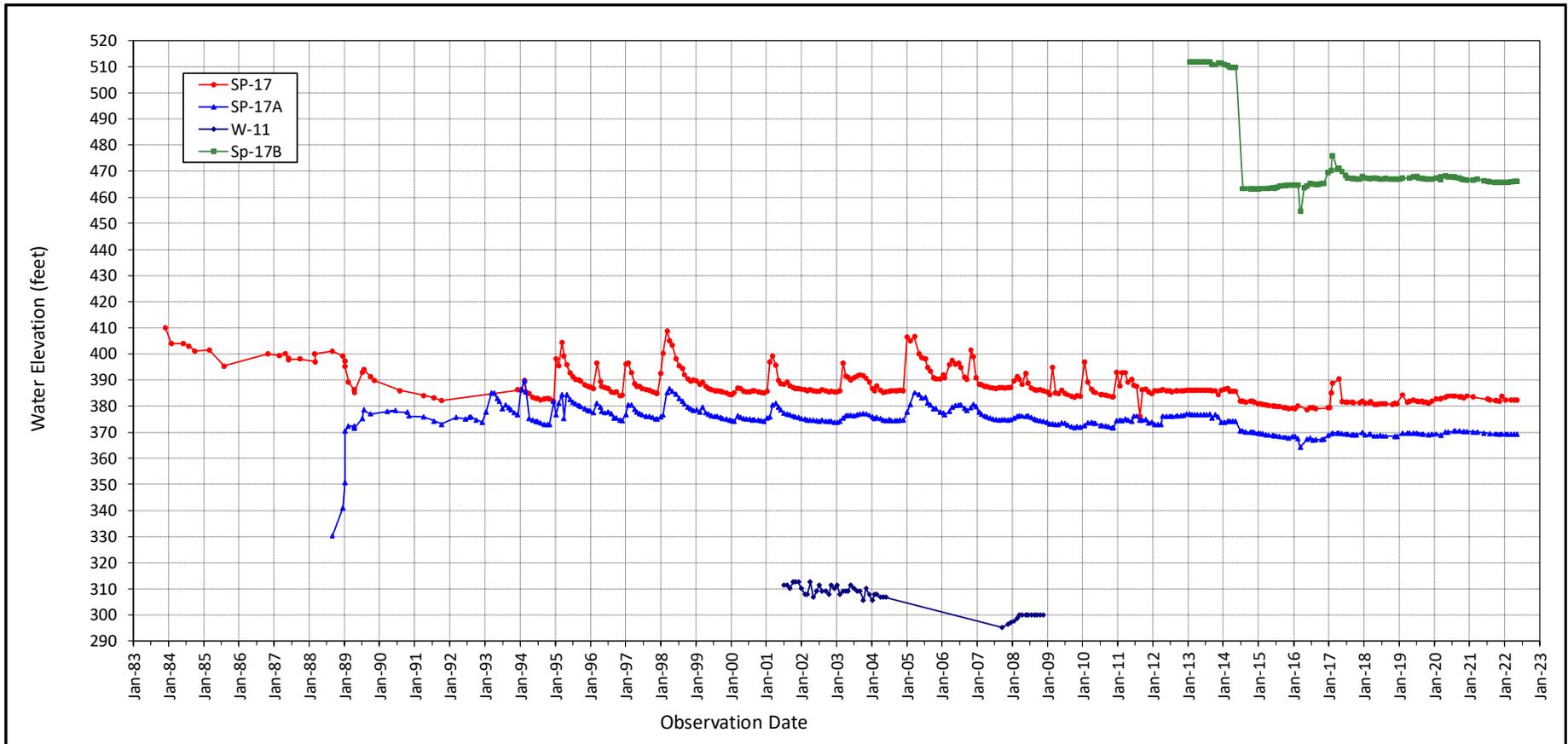
GROUNDWATER HYDROGRAPH
Headscarp Area
Big Rock Mesa Landslide Assessment District
Malibu, California



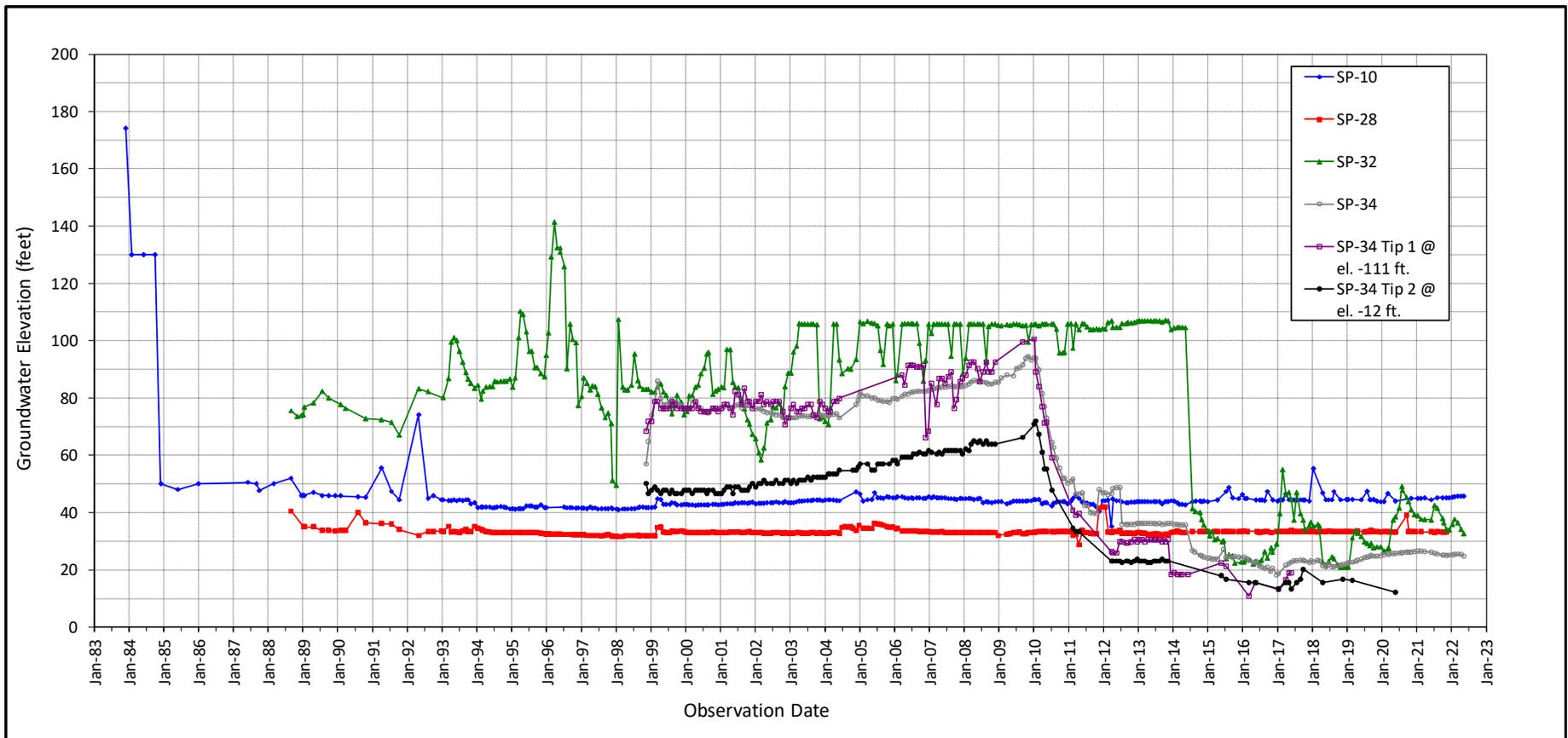
GROUNDWATER HYDROGRAPH
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



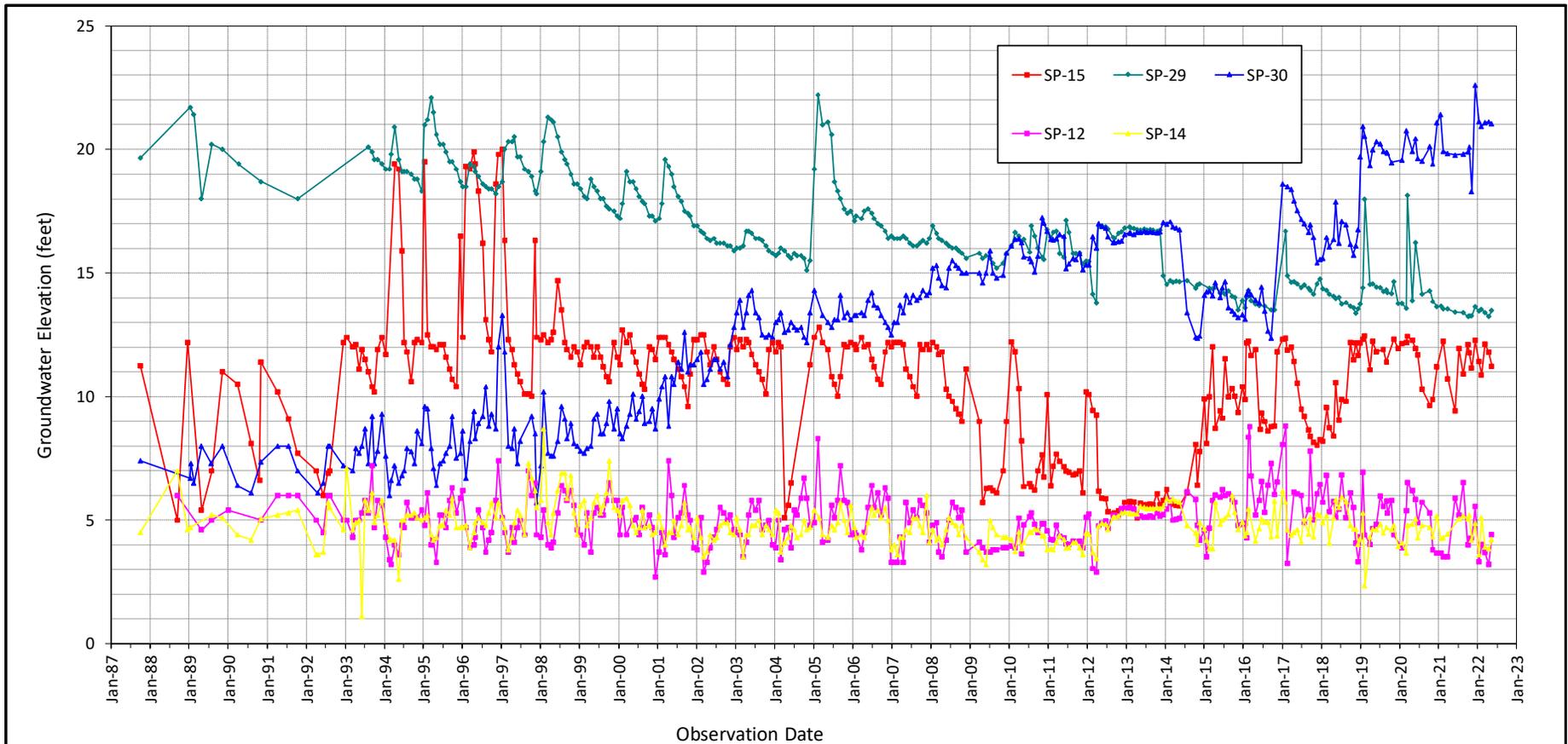
GROUNDWATER HYDROGRAPH
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



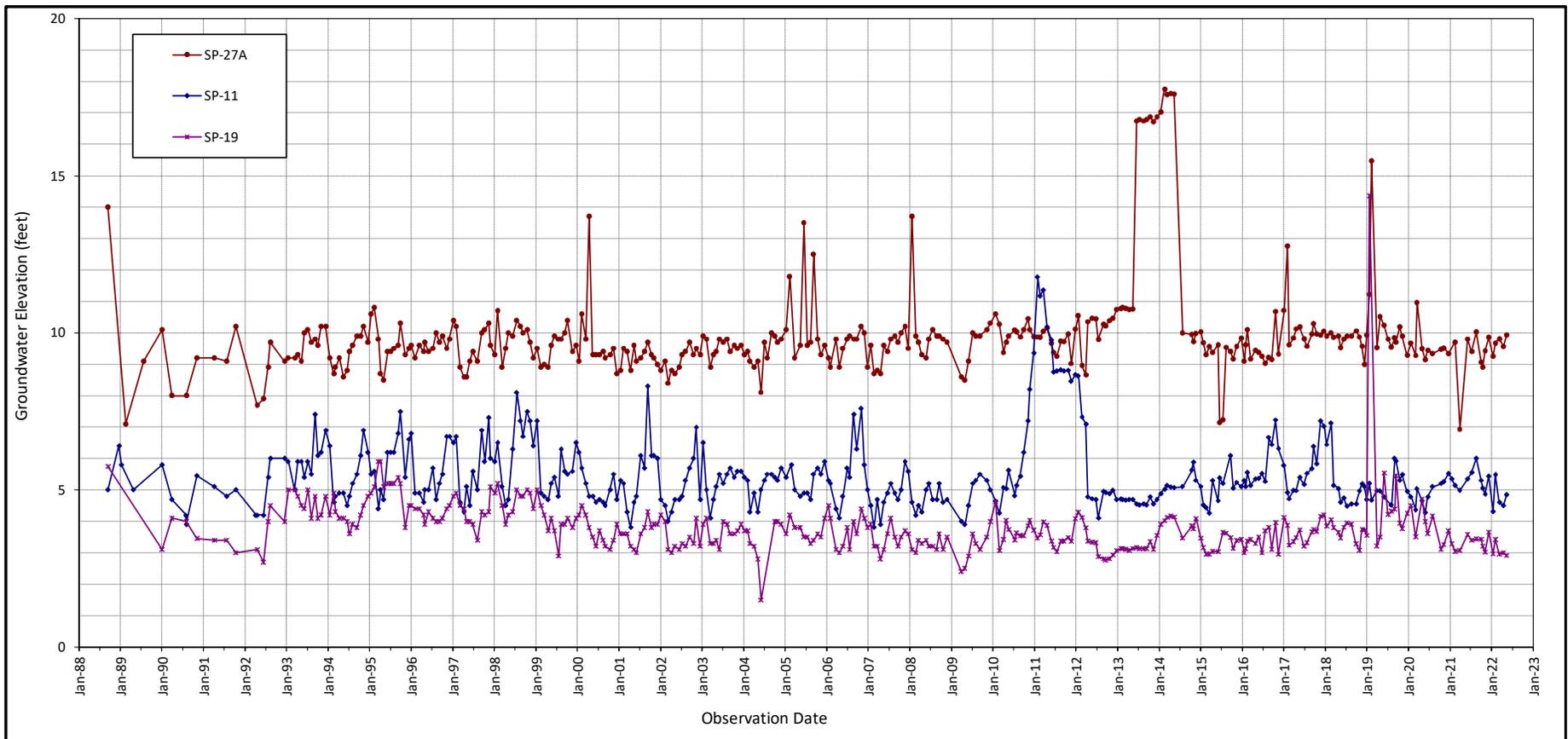
GROUNDWATER HYDROGRAPH
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



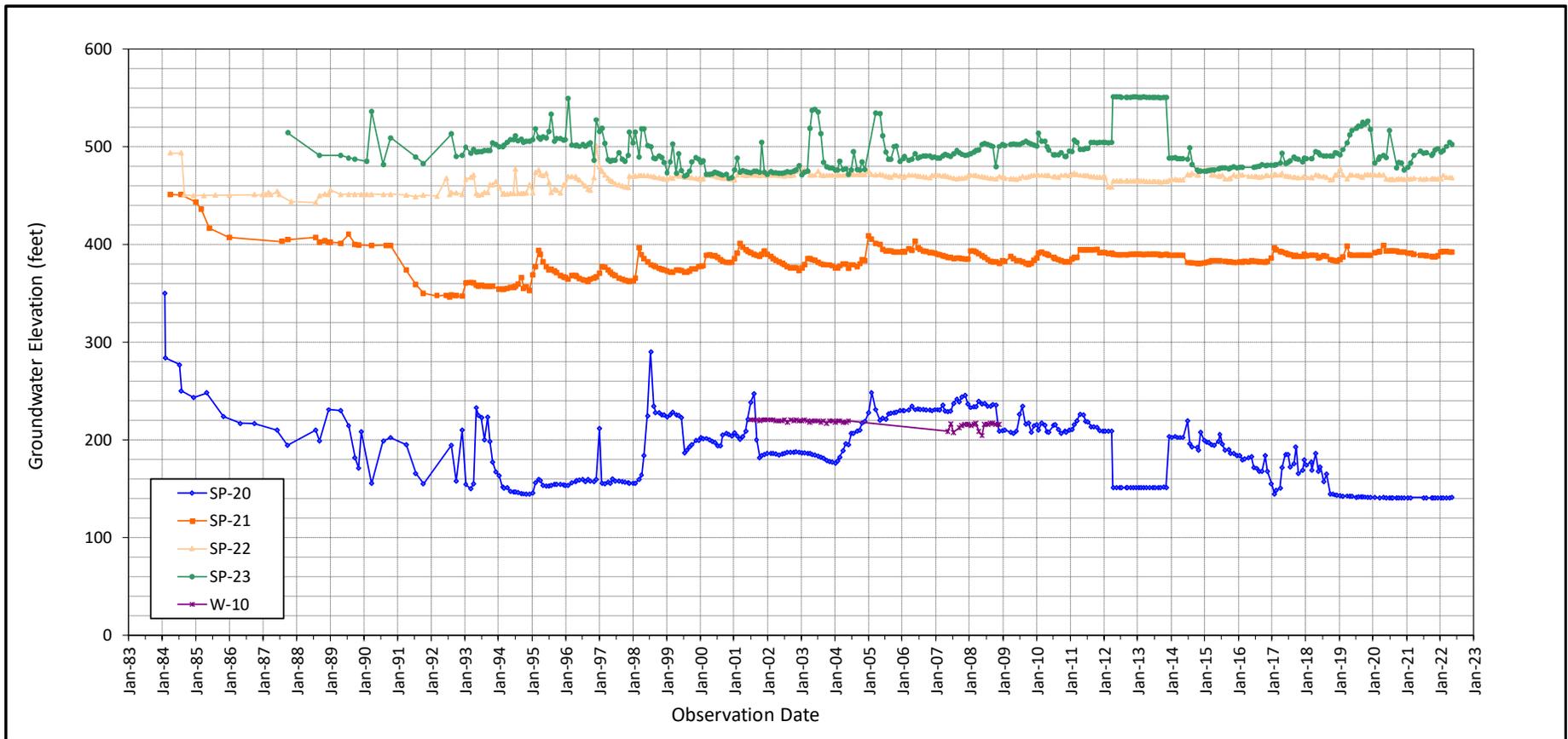
GROUNDWATER HYDROGRAPH
Bluff Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



GROUNDWATER HYDROGRAPH
Pacific Coast Highway (Western Half)
Big Rock Mesa Landslide Assessment District
Malibu, California



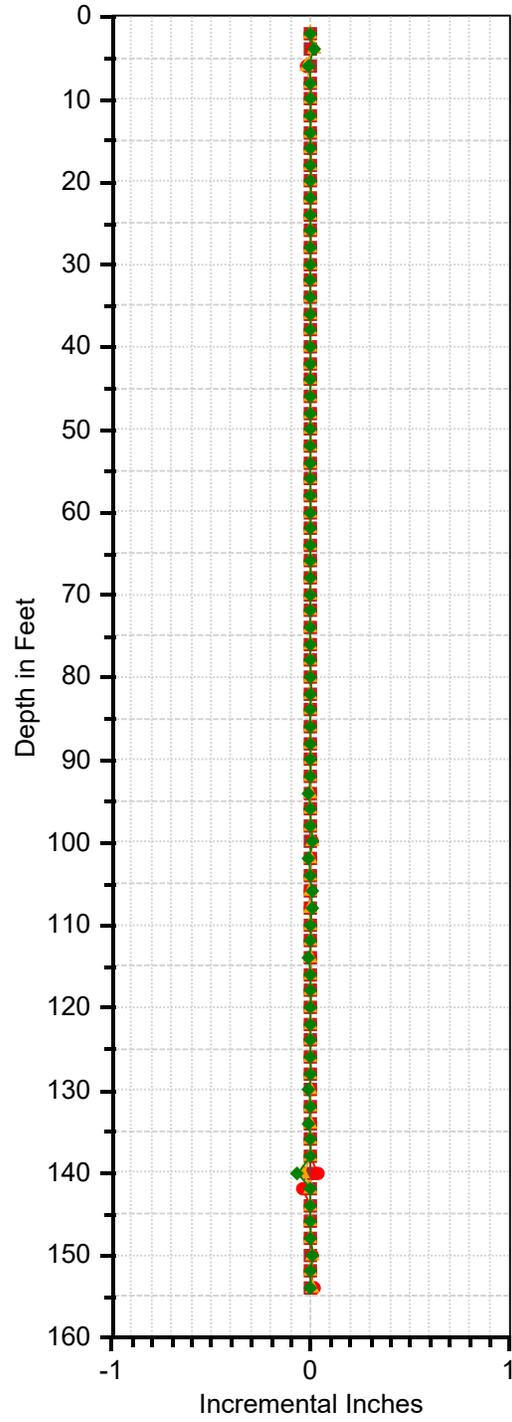
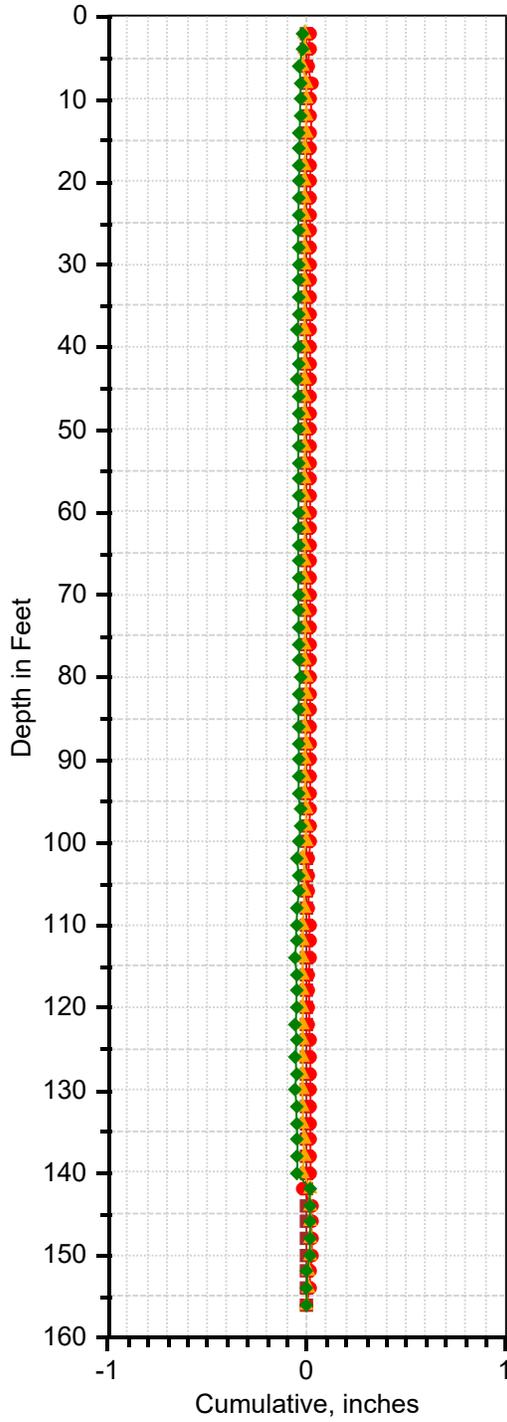
GROUNDWATER HYDROGRAPH
Pacific Coast Highway (Eastern Half)
Big Rock Mesa Landslide Assessment District
Malibu, California



GROUNDWATER HYDROGRAPH
Western Extension
Big Rock Mesa Landslide Assessment District
Malibu, California

APPENDIX B - SLOPE INCLINOMETERS

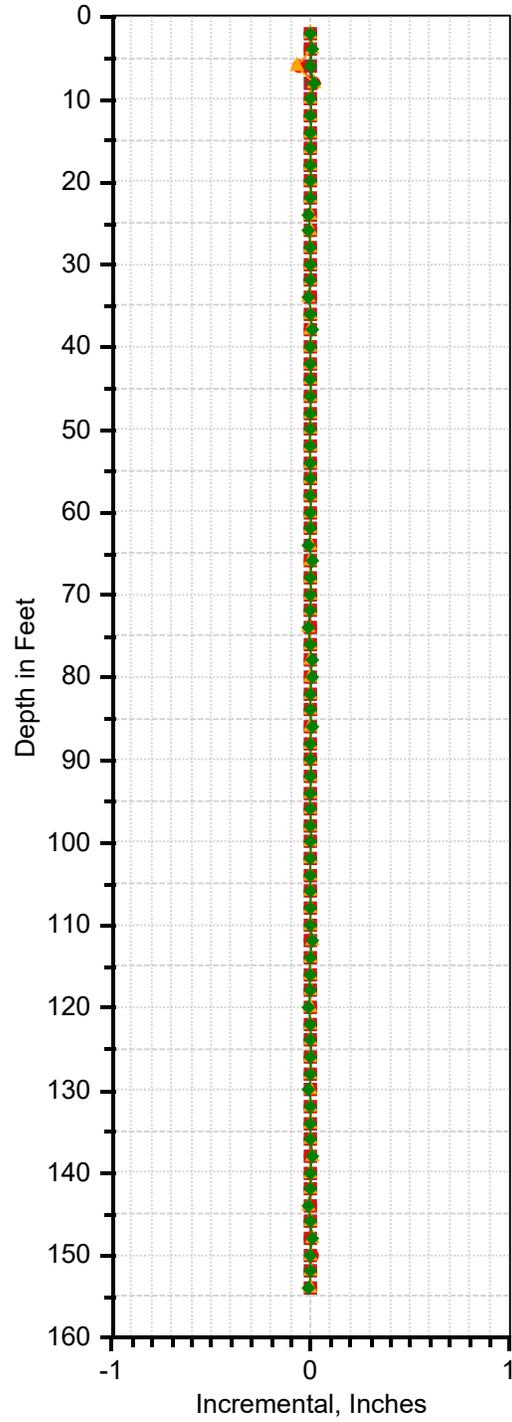
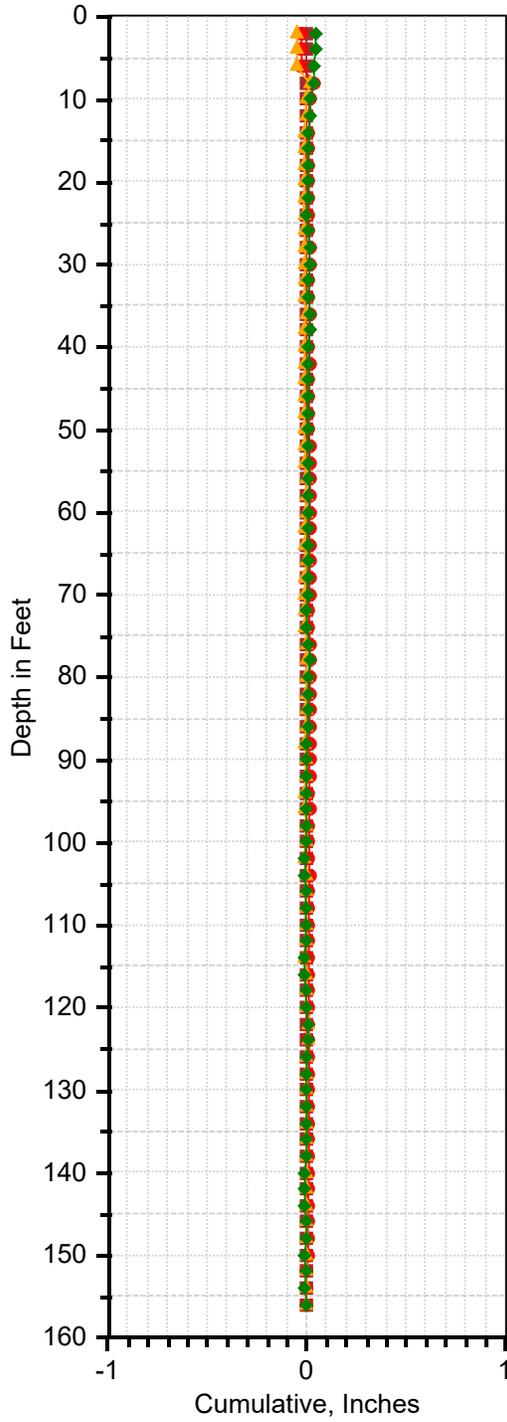
PC-1 A Direction



■ 10/30/2020 ● 7/23/2021
▲ 11/30/2021 ◆ 5/23/2022

■ 10/30/2020 ● 7/23/2021
▲ 11/30/2021 ◆ 5/23/2022

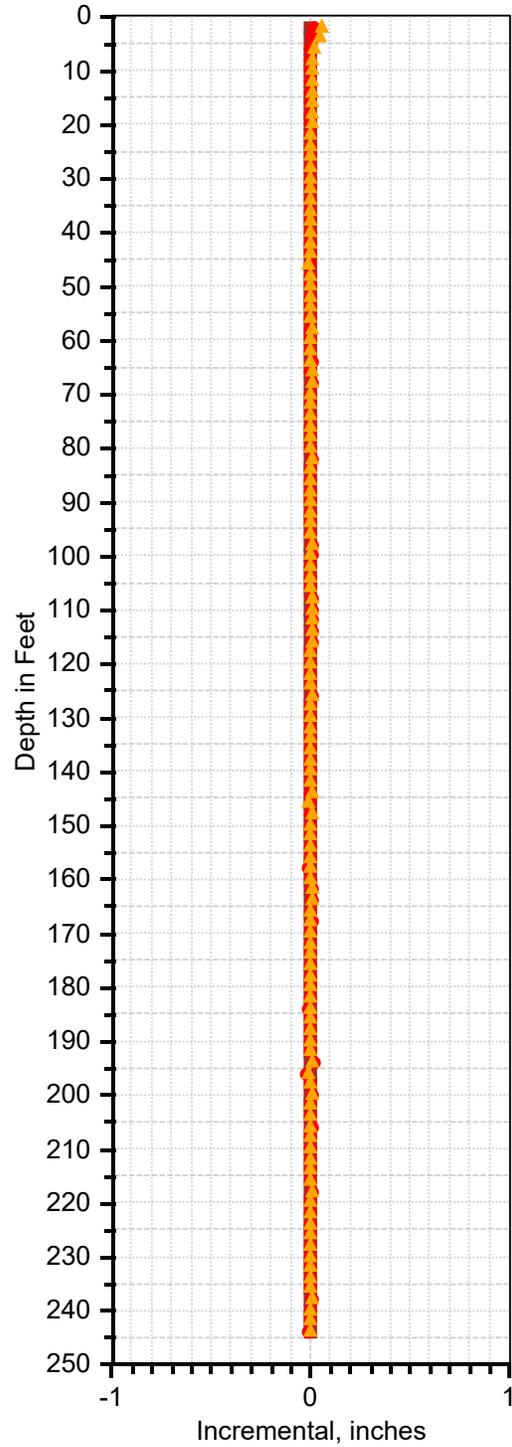
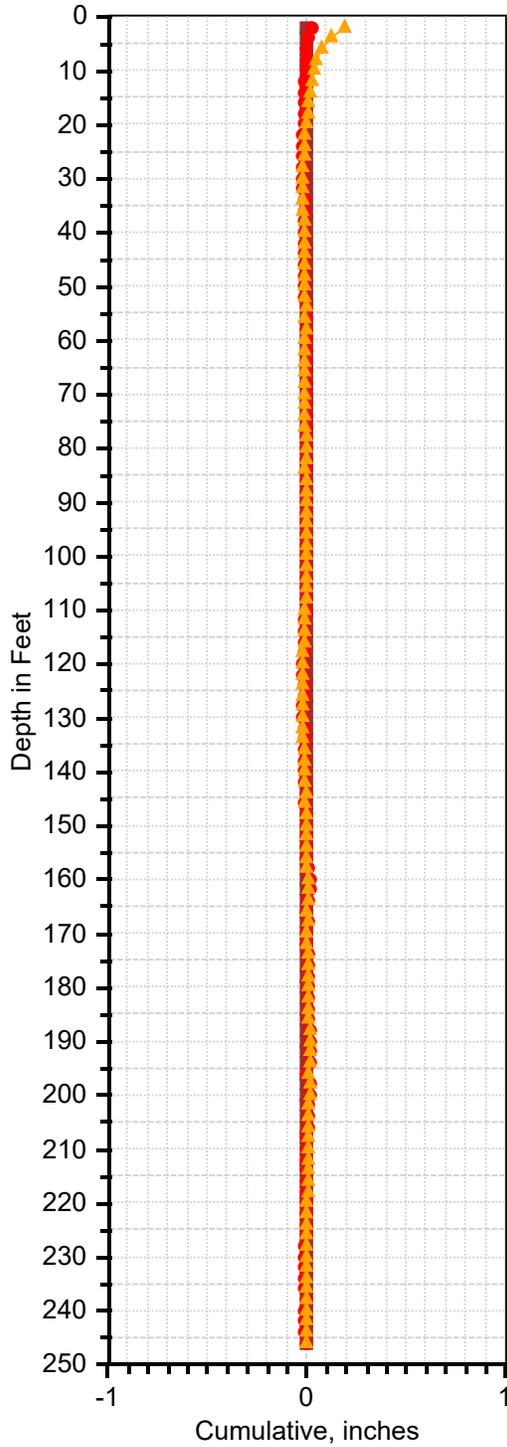
PC-1 B Direction



■ 10/30/2020 ● 7/23/2021
▲ 11/30/2021 ◆ 5/23/2022

■ 10/30/2020 ● 7/23/2021
▲ 11/30/2021 ◆ 5/23/2022

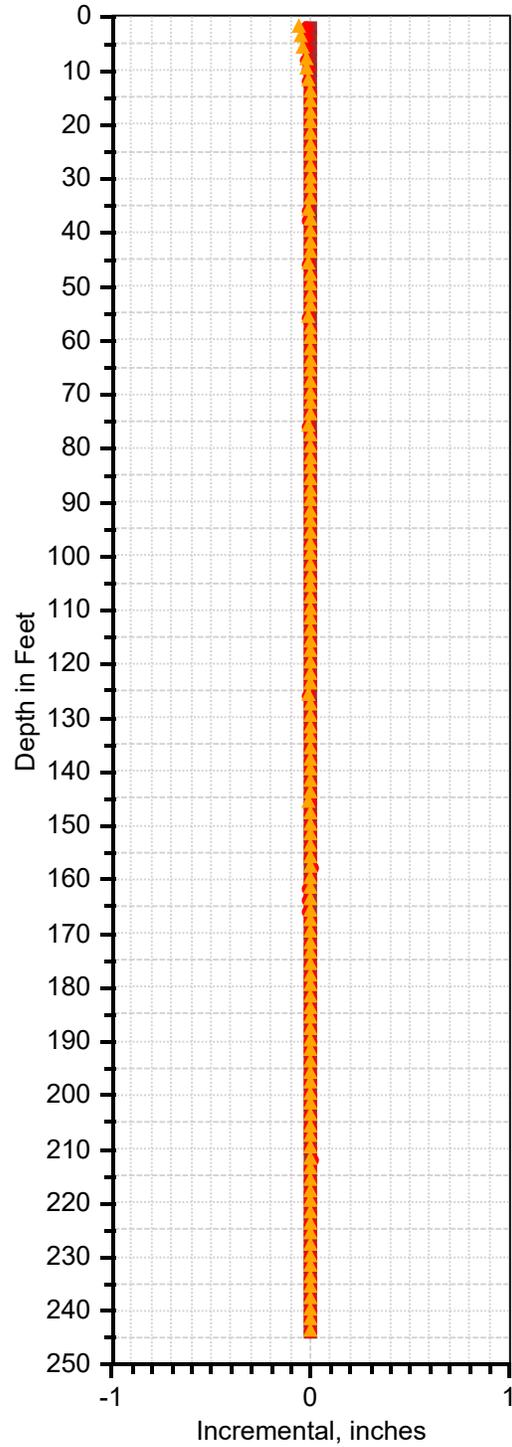
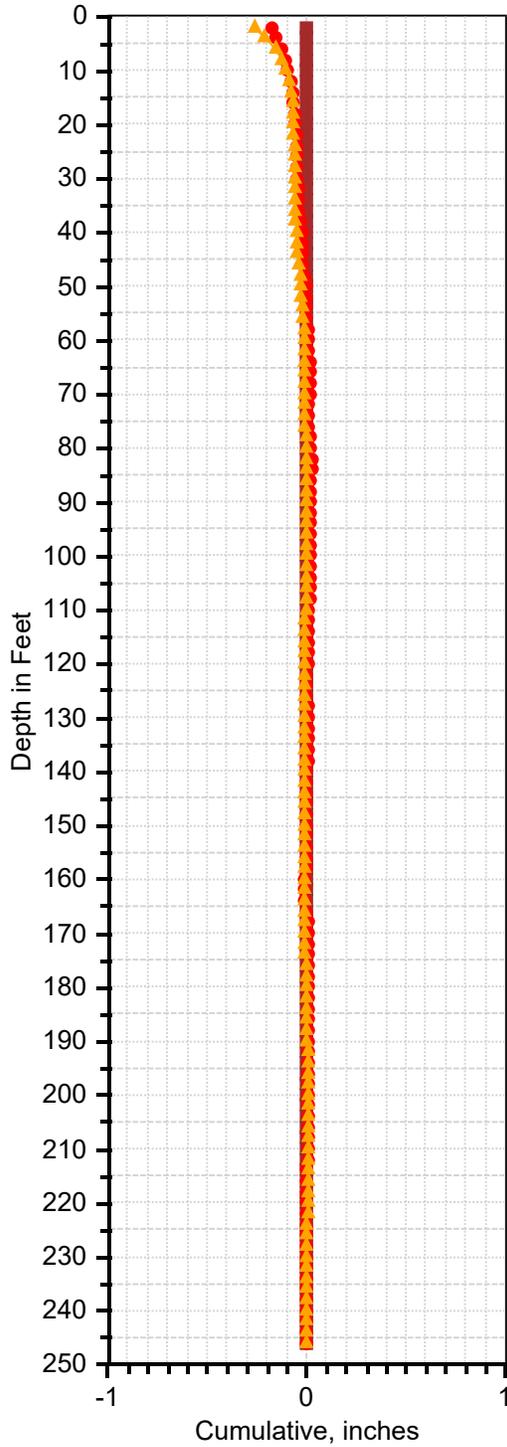
SP-3A A Direction



■ 10/21/2020 ● 11/30/2021 ▲ 5/23/2022

■ 10/21/2020 ● 11/30/2021 ▲ 5/23/2022

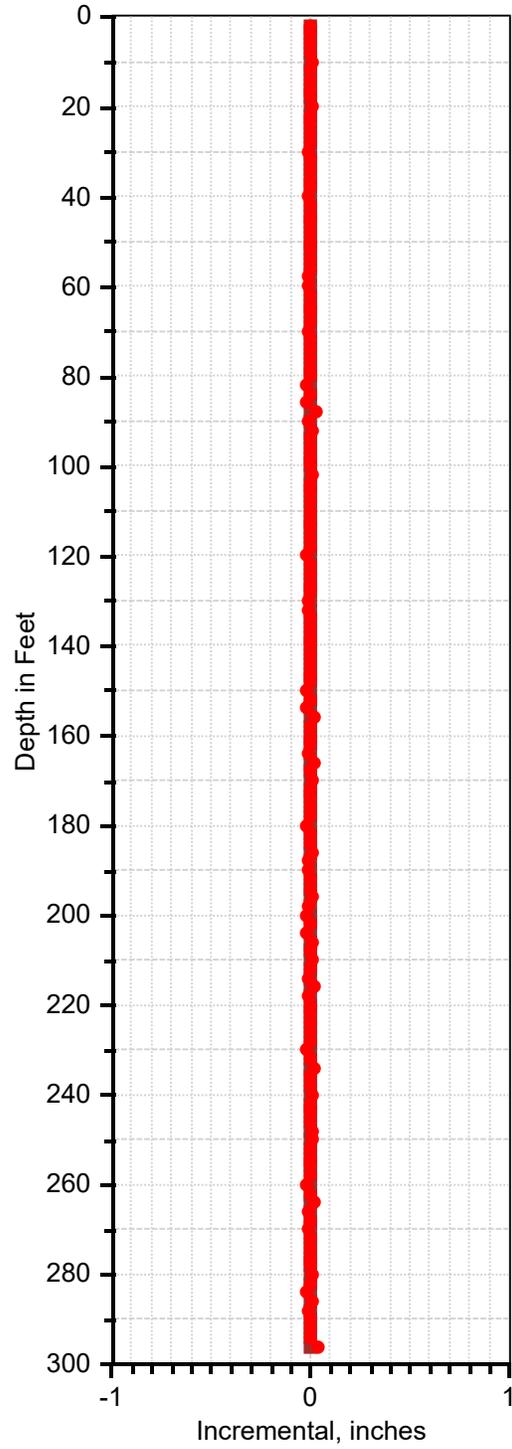
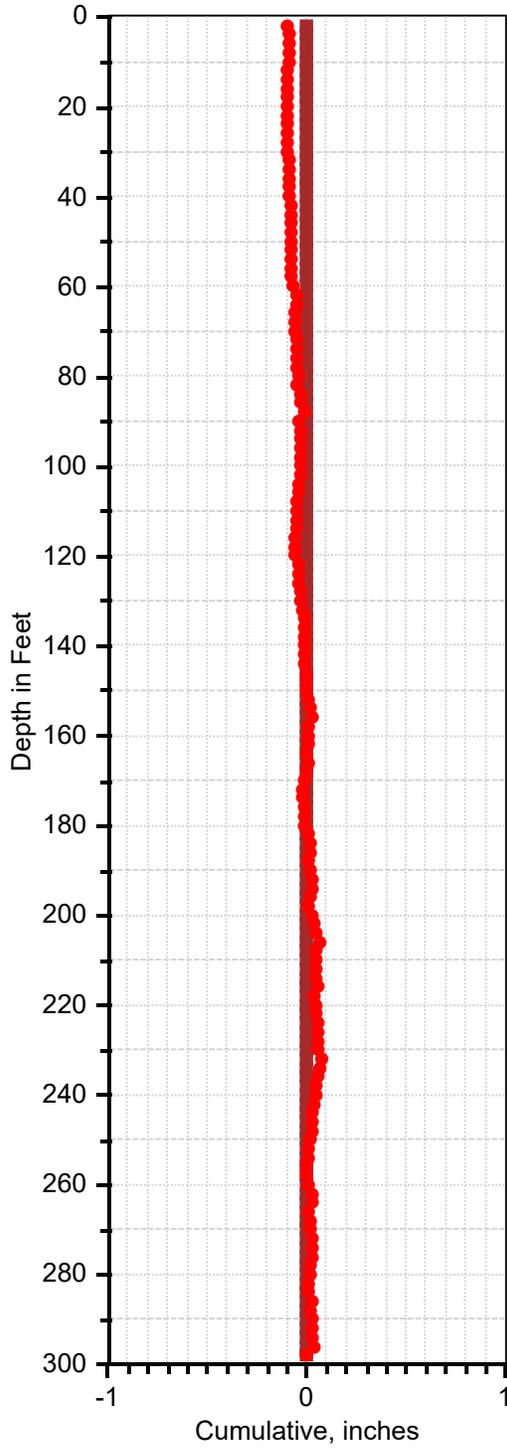
SP-3A B Direction



■ 10/21/2020 ● 11/30/2021 ▲ 5/23/2022

■ 10/21/2020 ● 11/30/2021 ▲ 5/23/2022

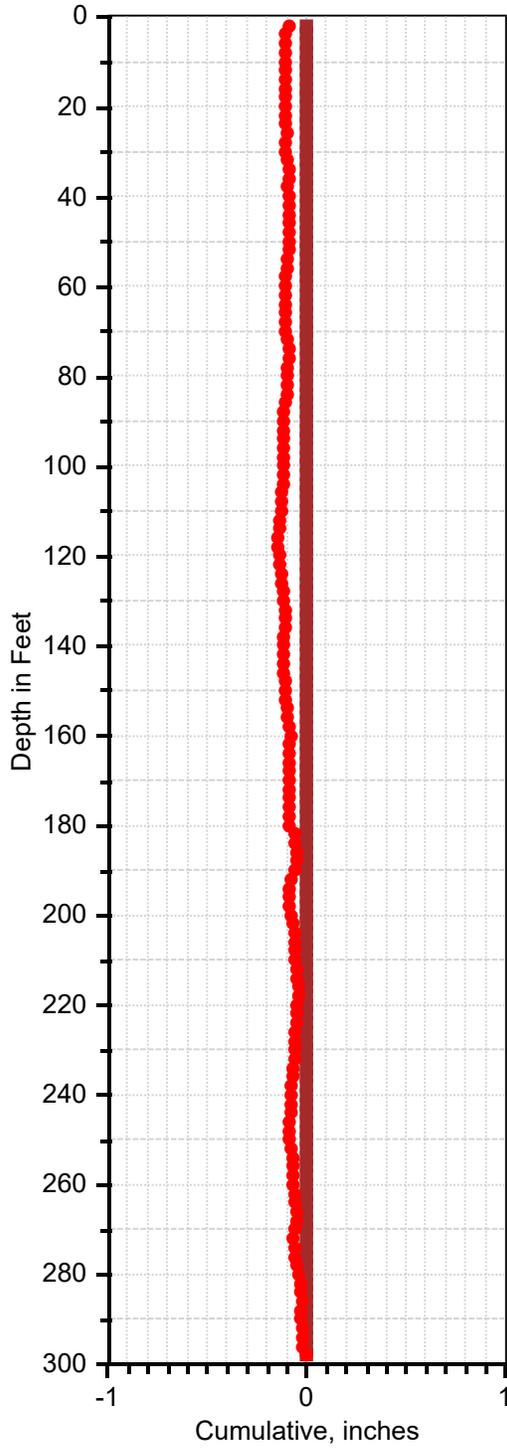
SP-9A A Direction



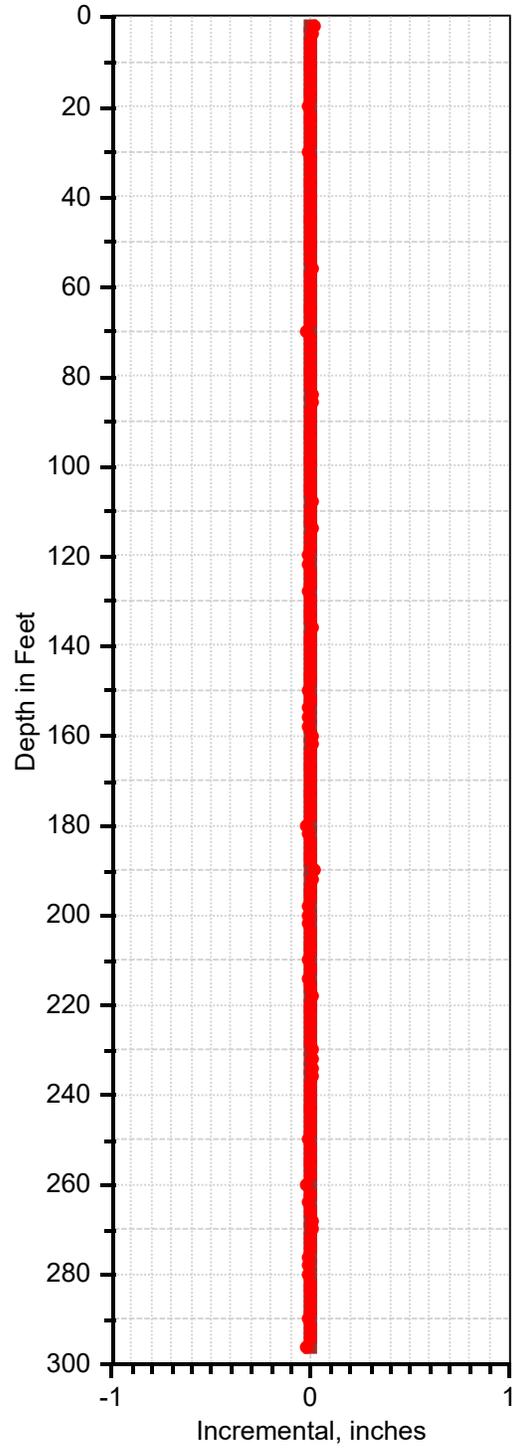
■ 7/29/2021 ● 6/22/2022

■ 7/29/2021 ● 6/22/2022

SP-9A B Direction

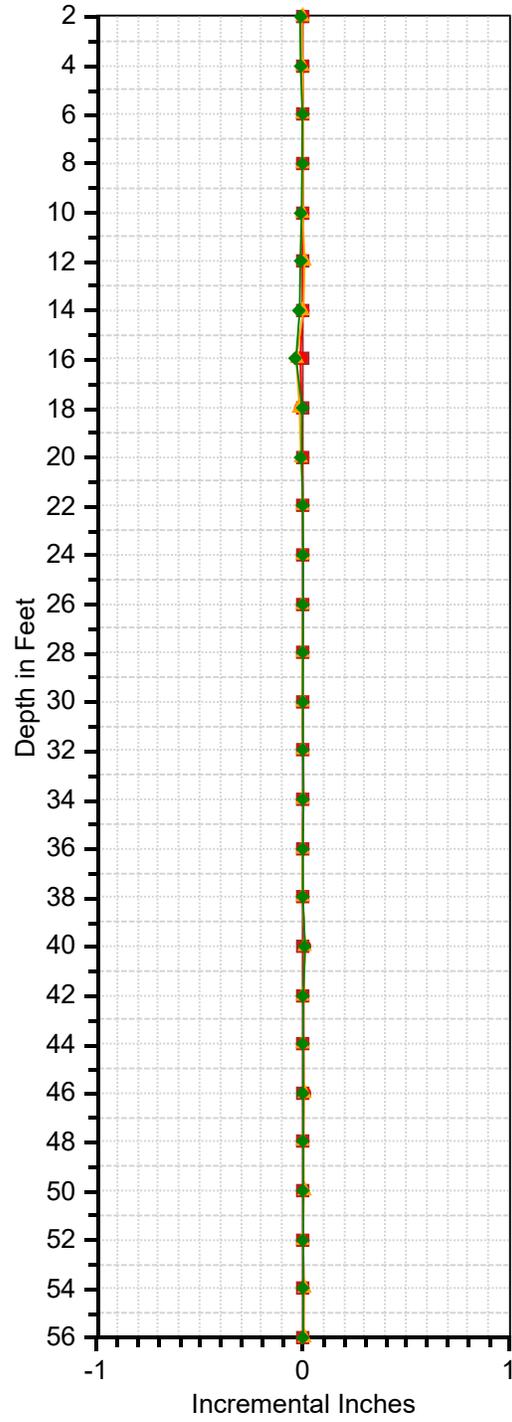
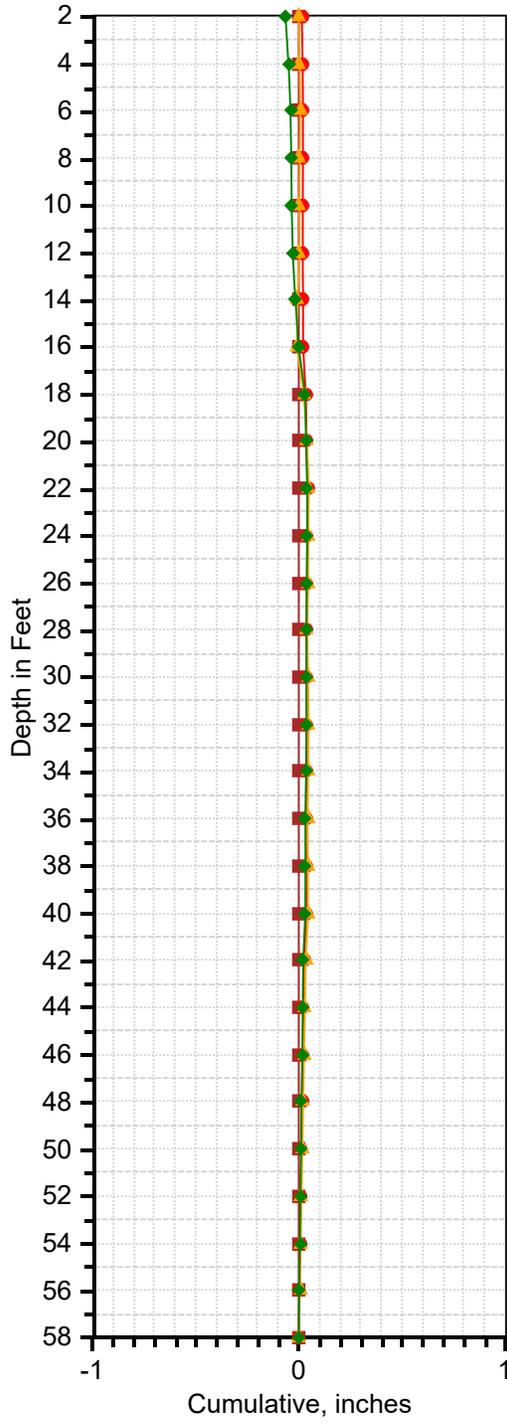


■ 7/29/2021 ● 6/22/2022



■ 7/29/2021 ● 6/22/2022

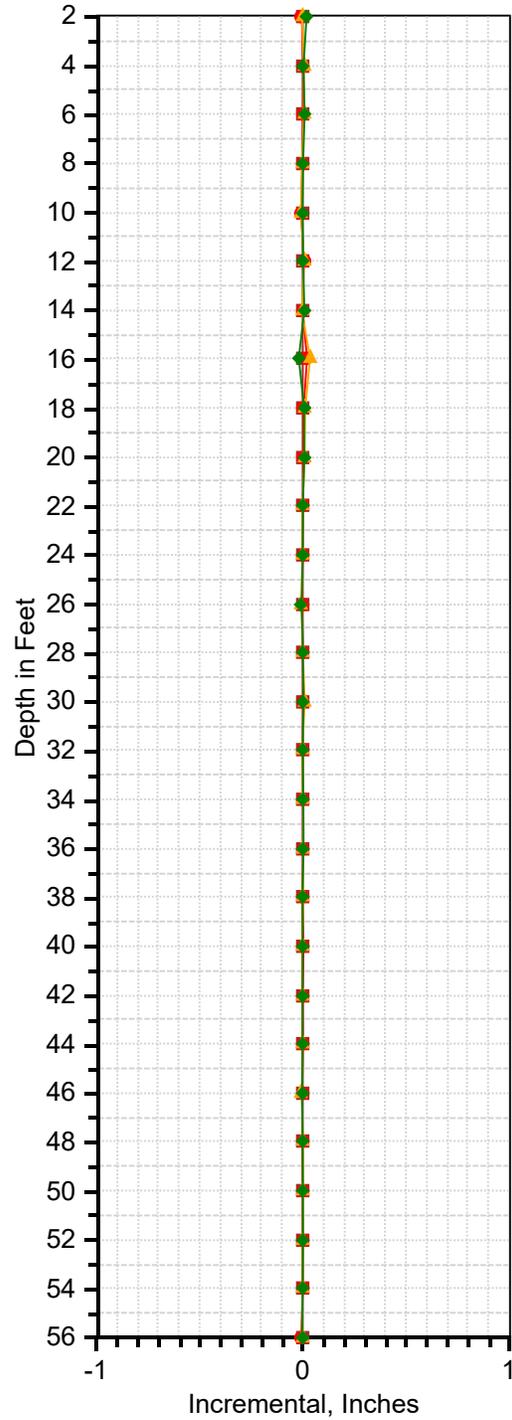
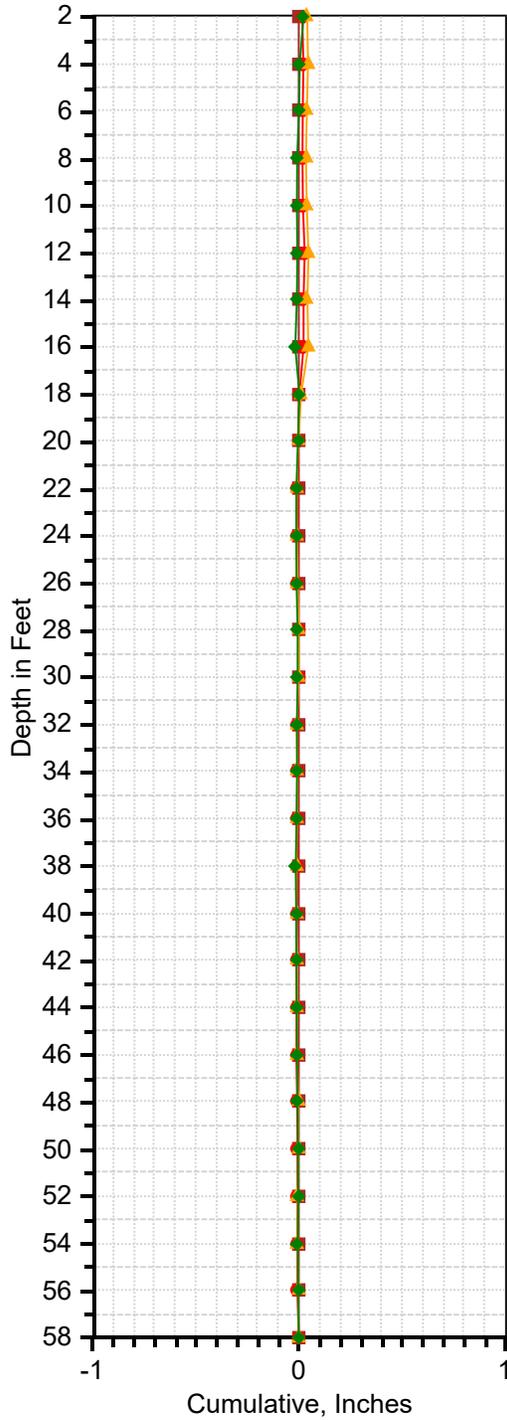
SP-11 A Direction



■ 4/6/2021 ● 9/14/2021
▲ 12/9/2021 ◆ 9/28/2022

■ 4/6/2021 ● 9/14/2021
▲ 12/9/2021 ◆ 9/28/2022

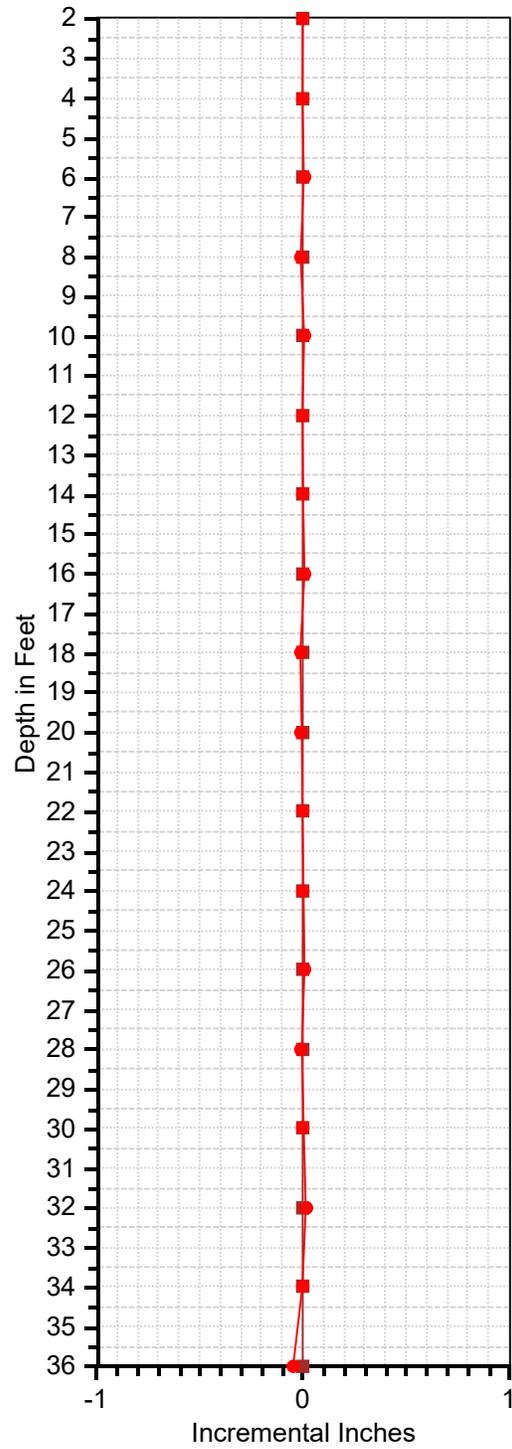
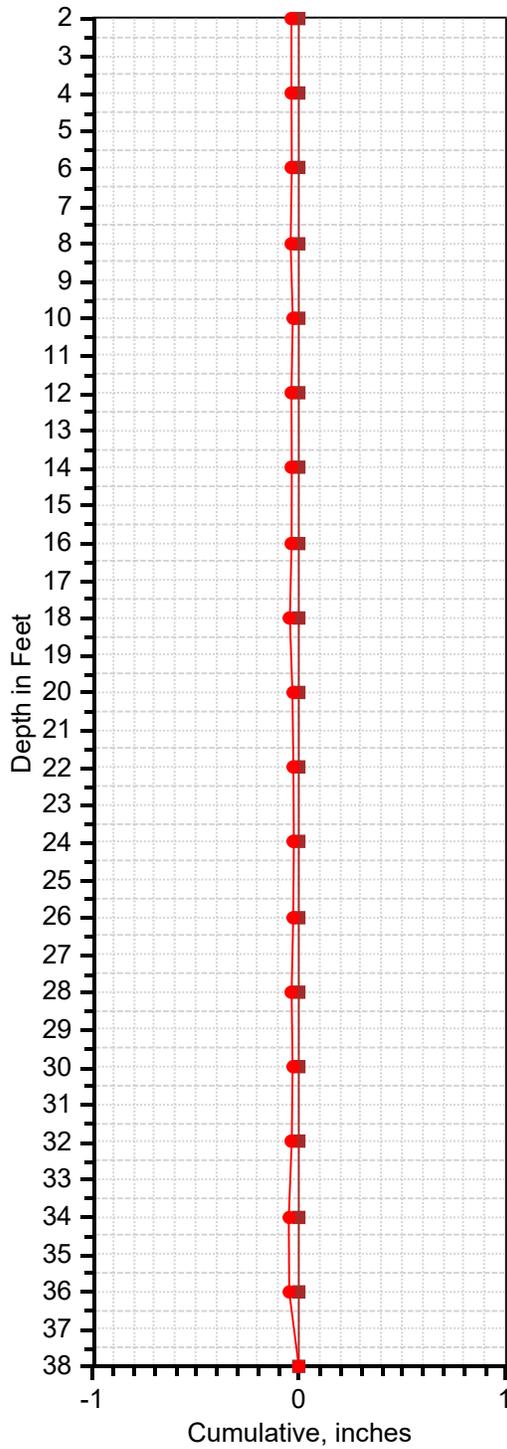
SP-11 B Direction



■ 4/6/2021 ● 9/14/2021
▲ 12/9/2021 ◆ 9/28/2022

■ 4/6/2021 ● 9/14/2021
▲ 12/9/2021 ◆ 9/28/2022

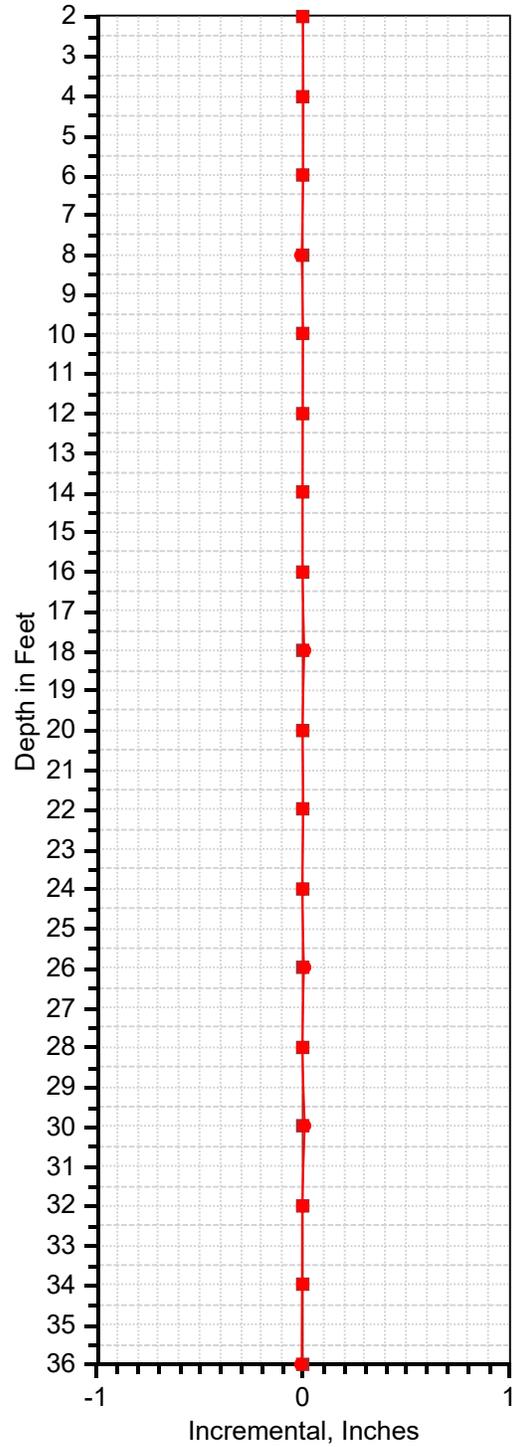
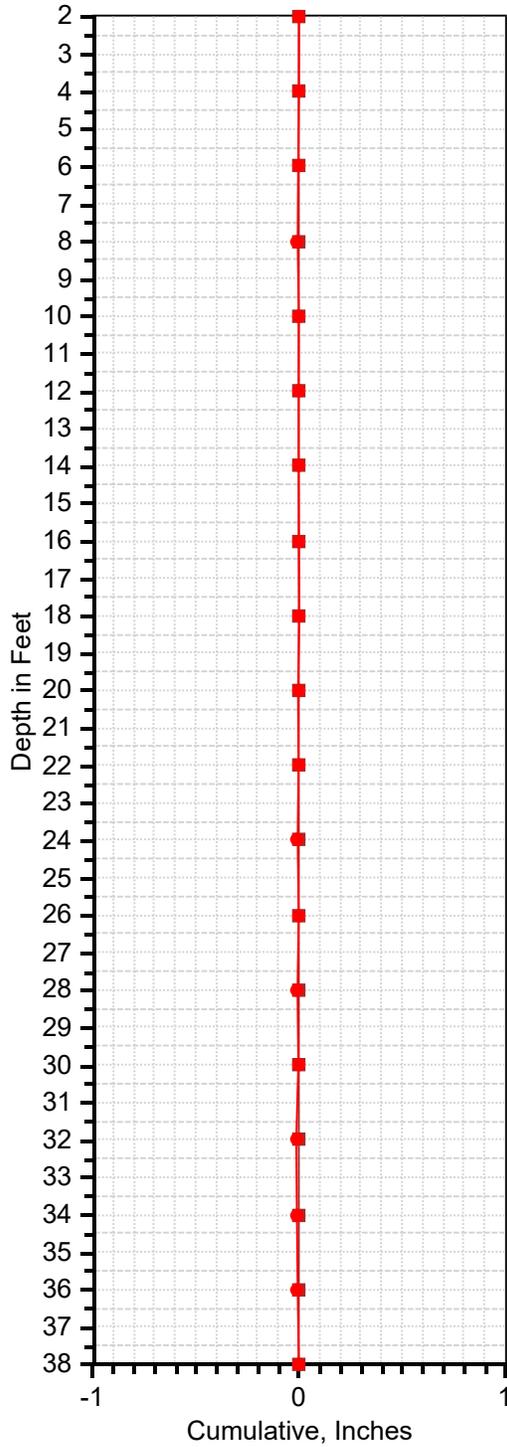
SP-12 A Direction



■ 9/14/2021 ● 6/23/2022

■ 9/14/2021 ● 6/23/2022

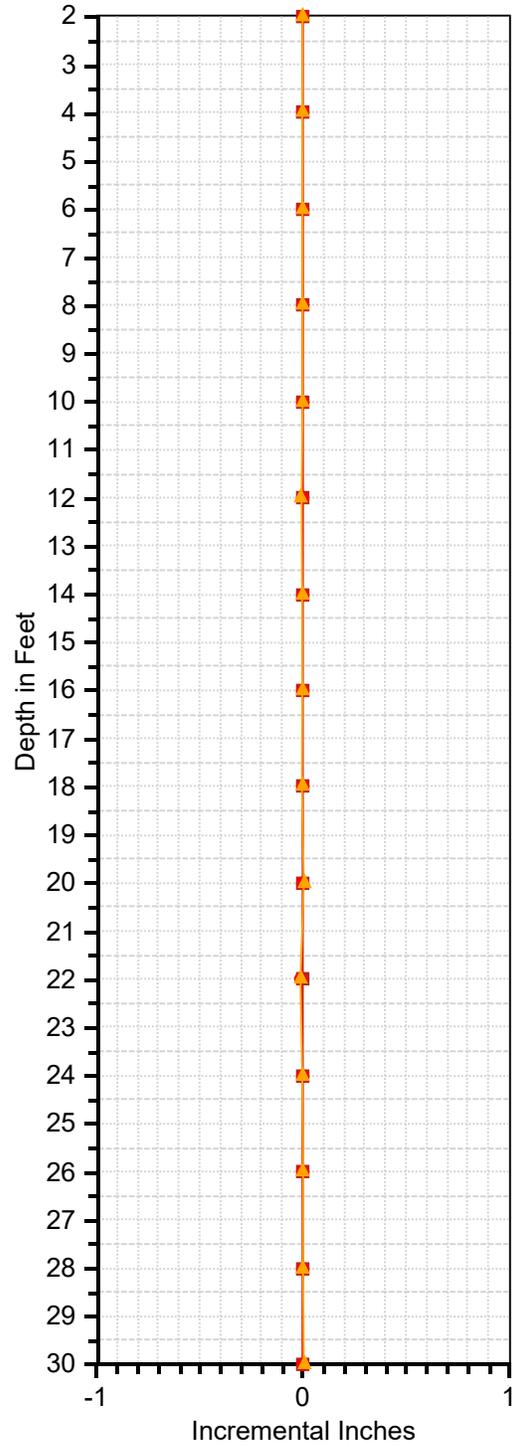
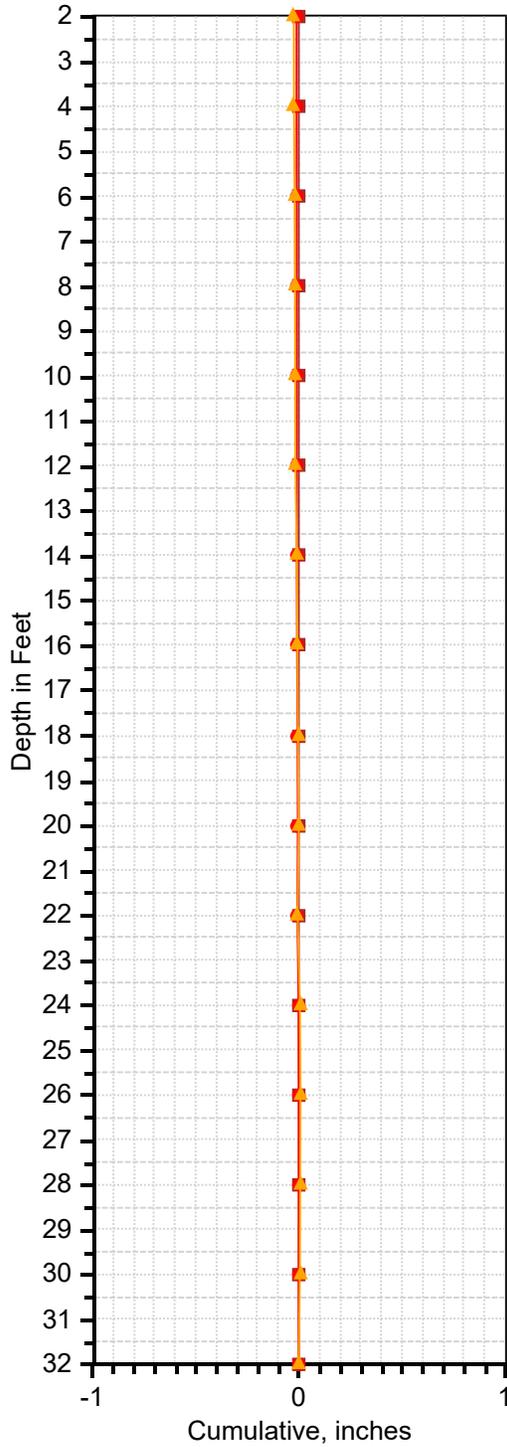
SP-12 B Direction



■ 9/14/2021 ● 6/23/2022

■ 9/14/2021 ● 6/23/2022

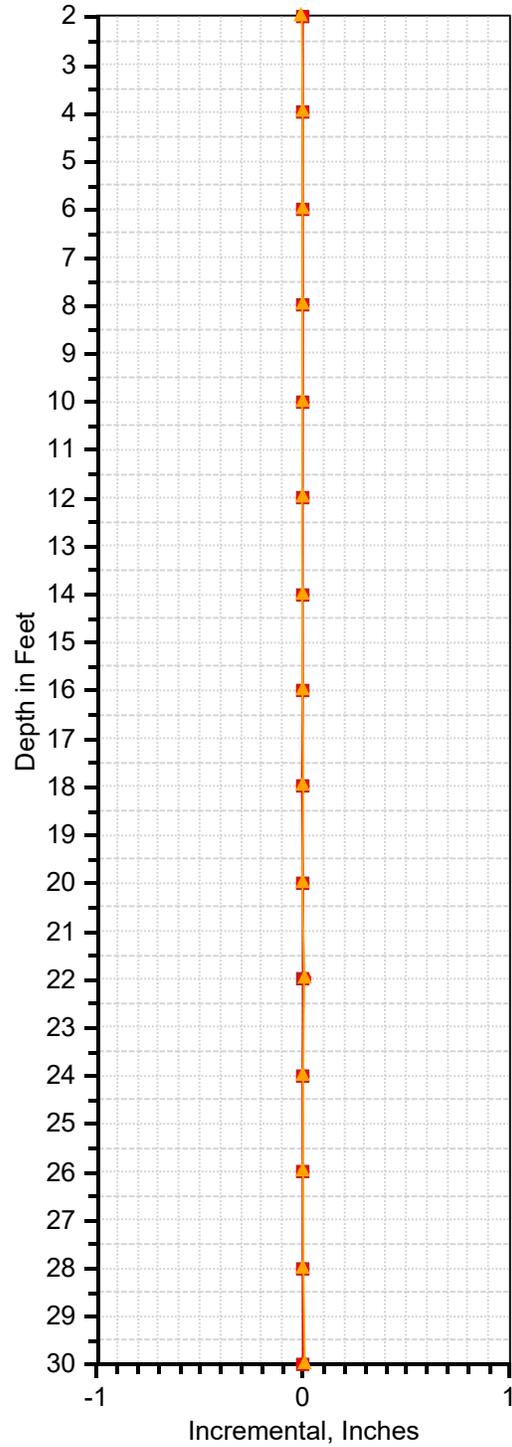
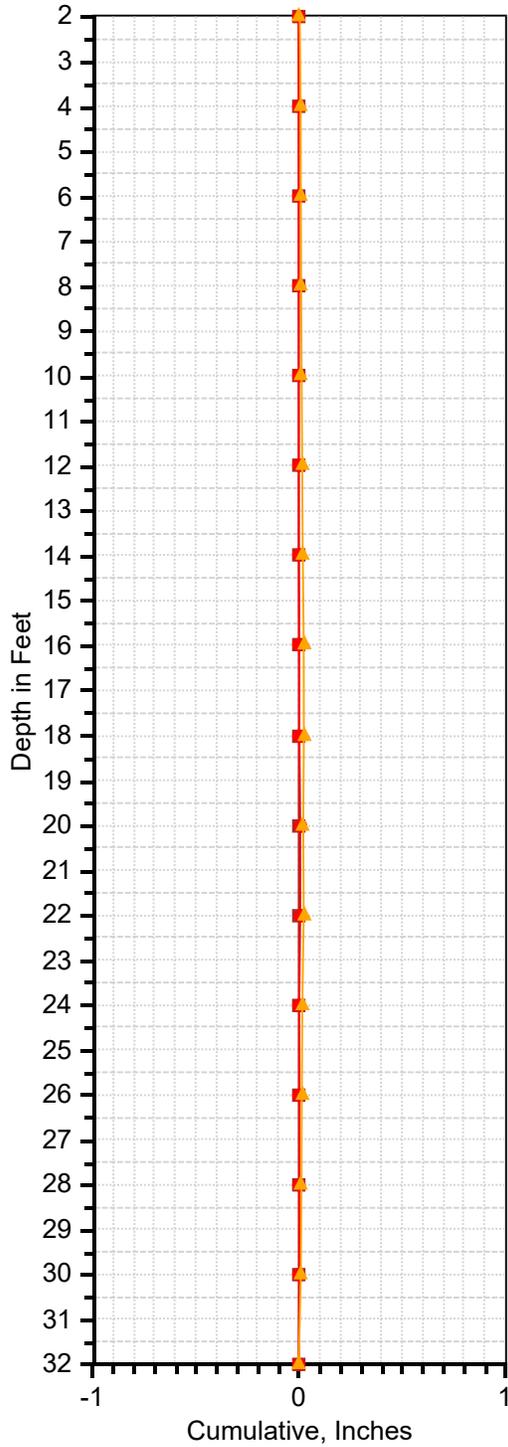
SP-14 A Direction



■ 4/7/2021 ● 9/14/2021 ▲ 6/22/2022

■ 4/7/2021 ● 9/14/2021 ▲ 6/22/2022

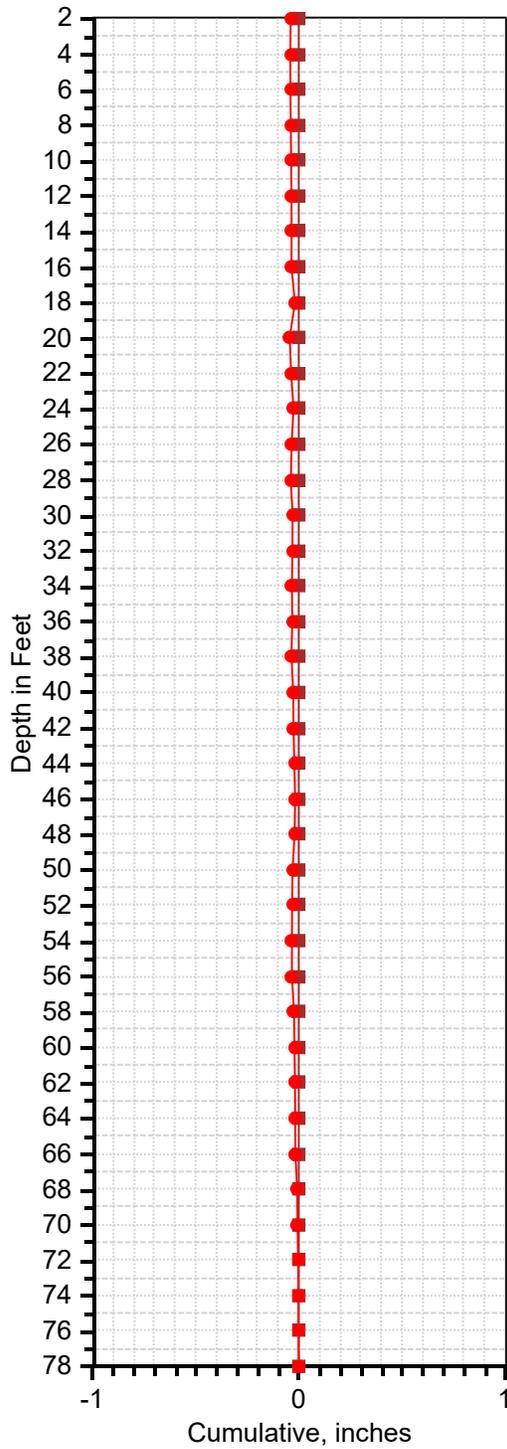
SP-14 B Direction



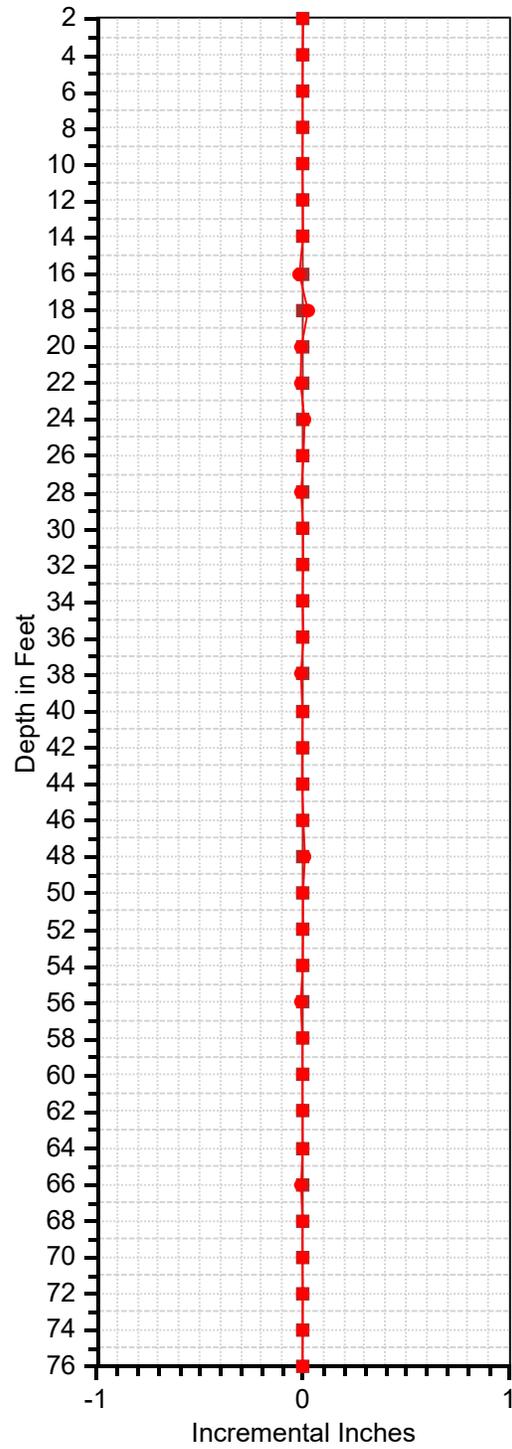
■ 4/7/2021 ● 9/14/2021 ▲ 6/22/2022

■ 4/7/2021 ● 9/14/2021 ▲ 6/22/2022

SP-15 A Direction

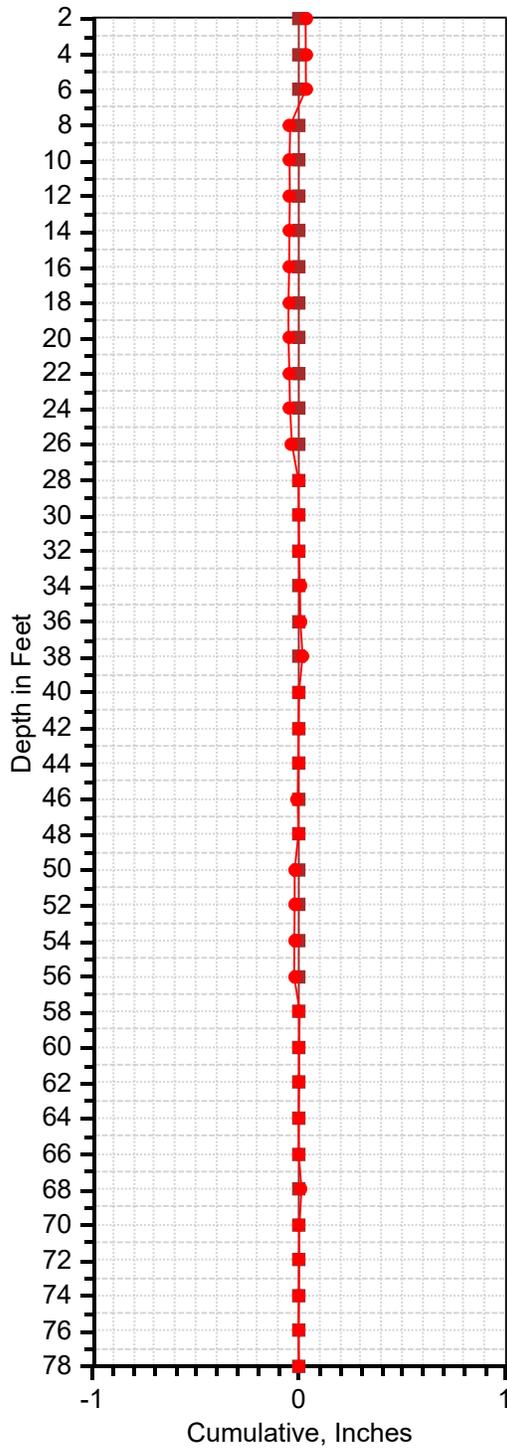


■ 9/14/2021 ● 6/23/2022

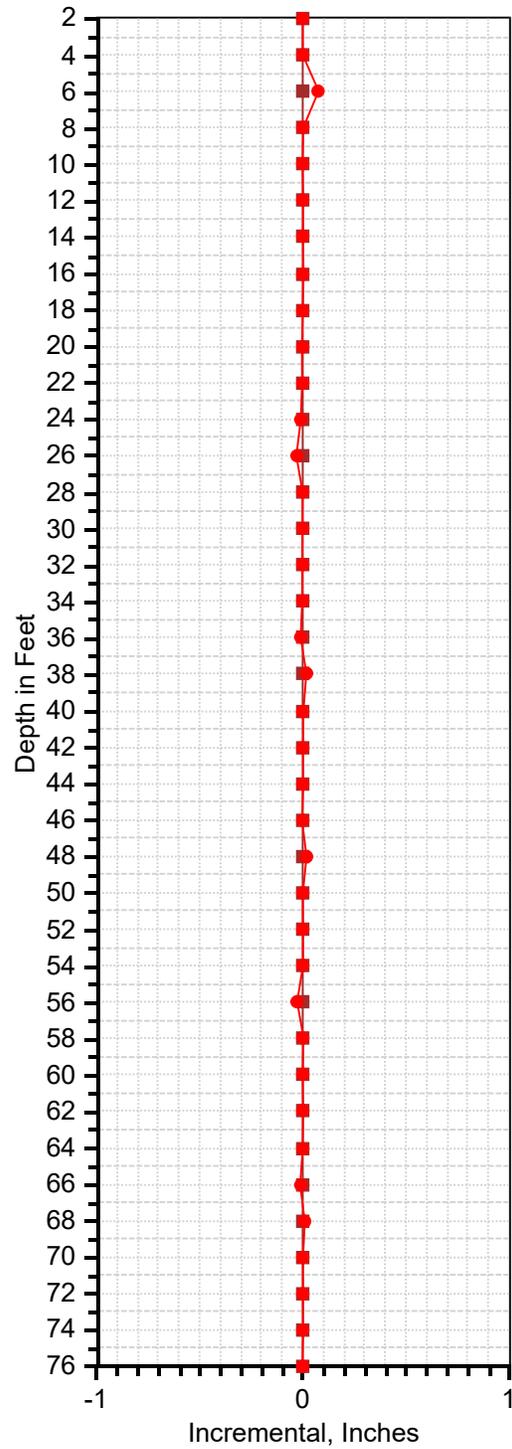


■ 9/14/2021 ● 6/23/2022

SP-15 B Direction

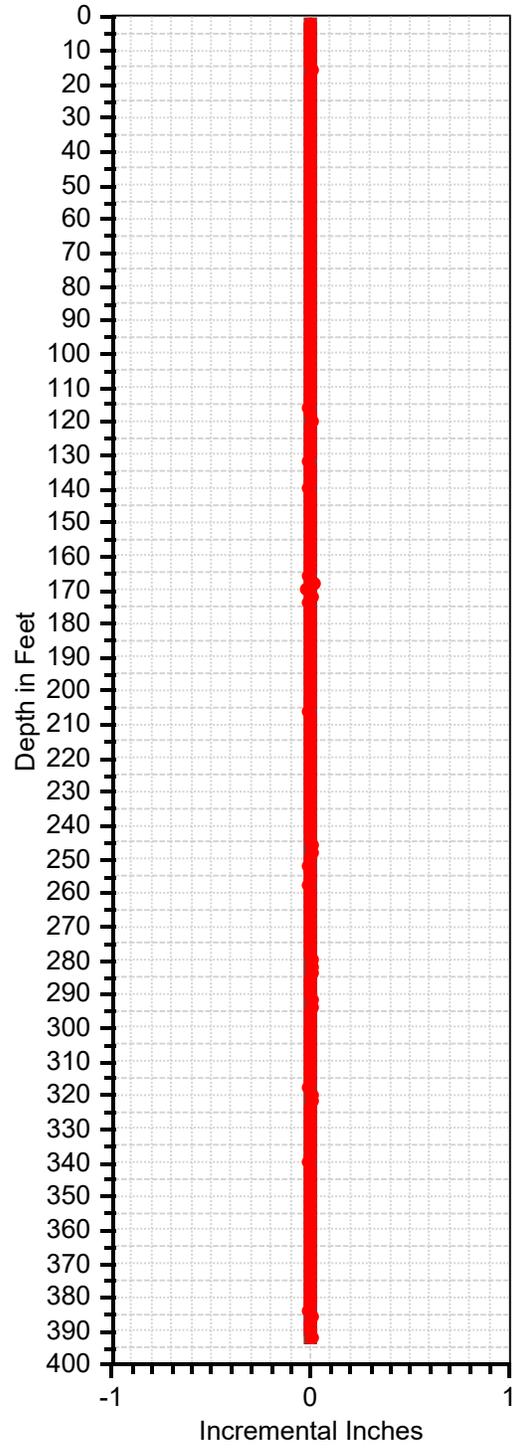
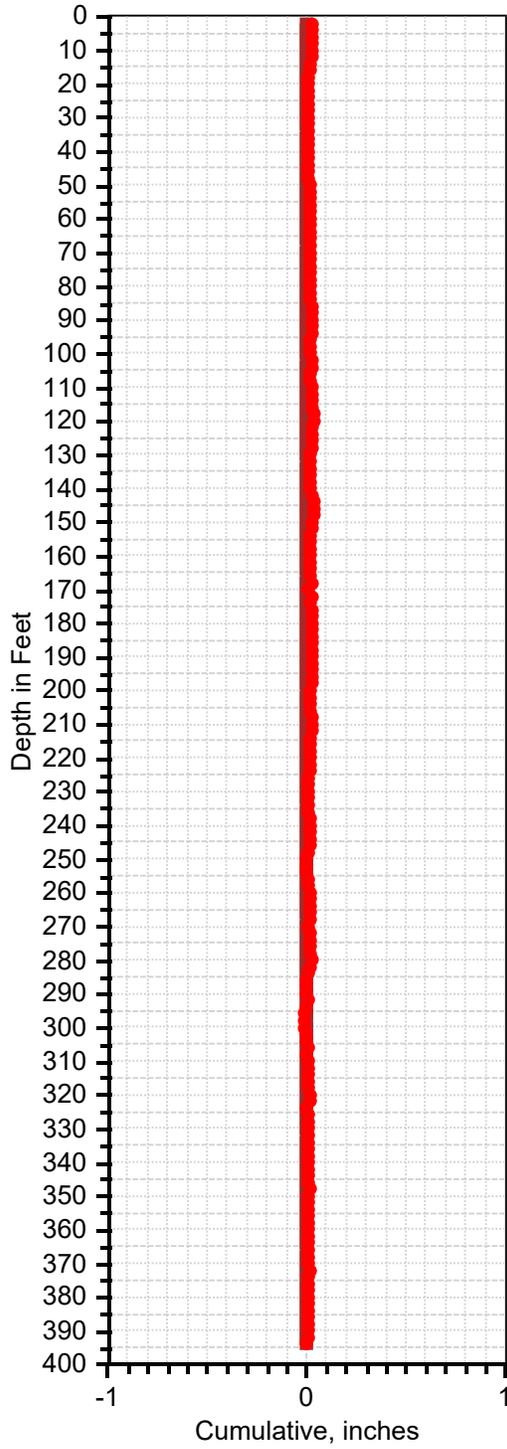


■ 9/14/2021 ● 6/23/2022



■ 9/14/2021 ● 6/23/2022

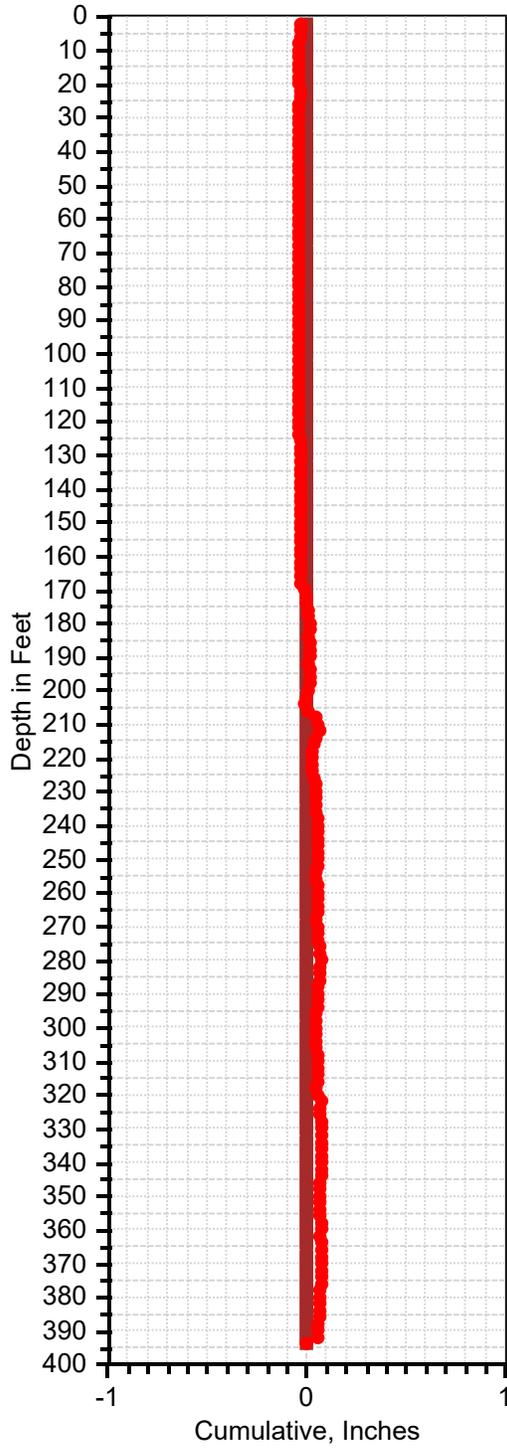
SP-16A A Direction



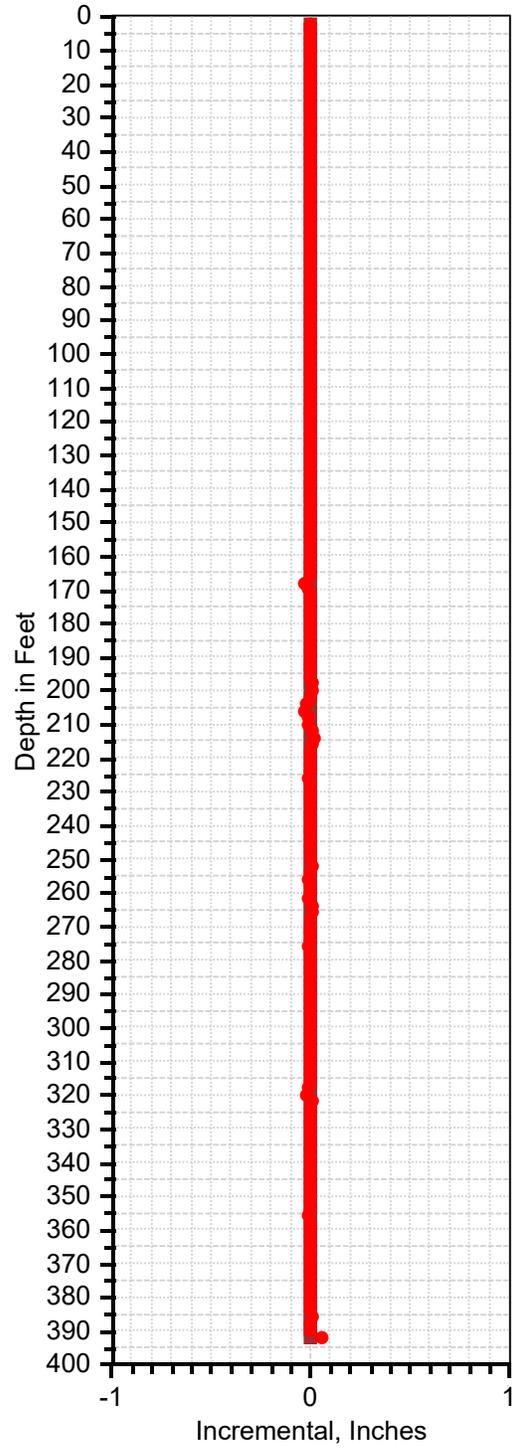
■ 7/29/2021 ● 9/28/2022

■ 7/29/2021 ● 9/28/2022

SP-16A B Direction

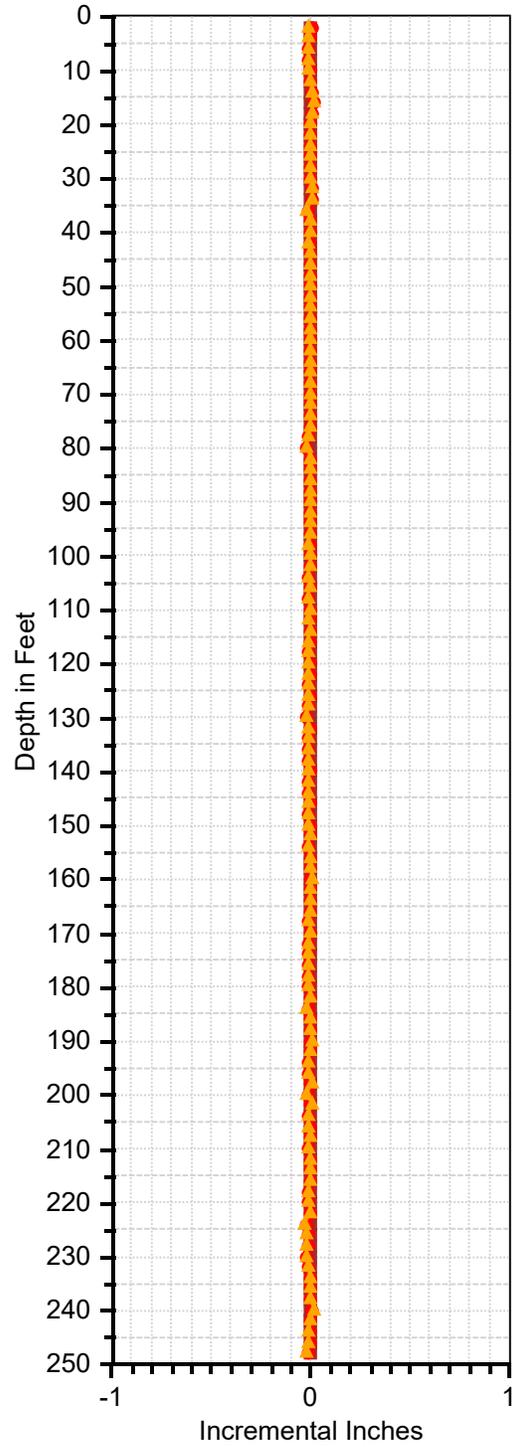
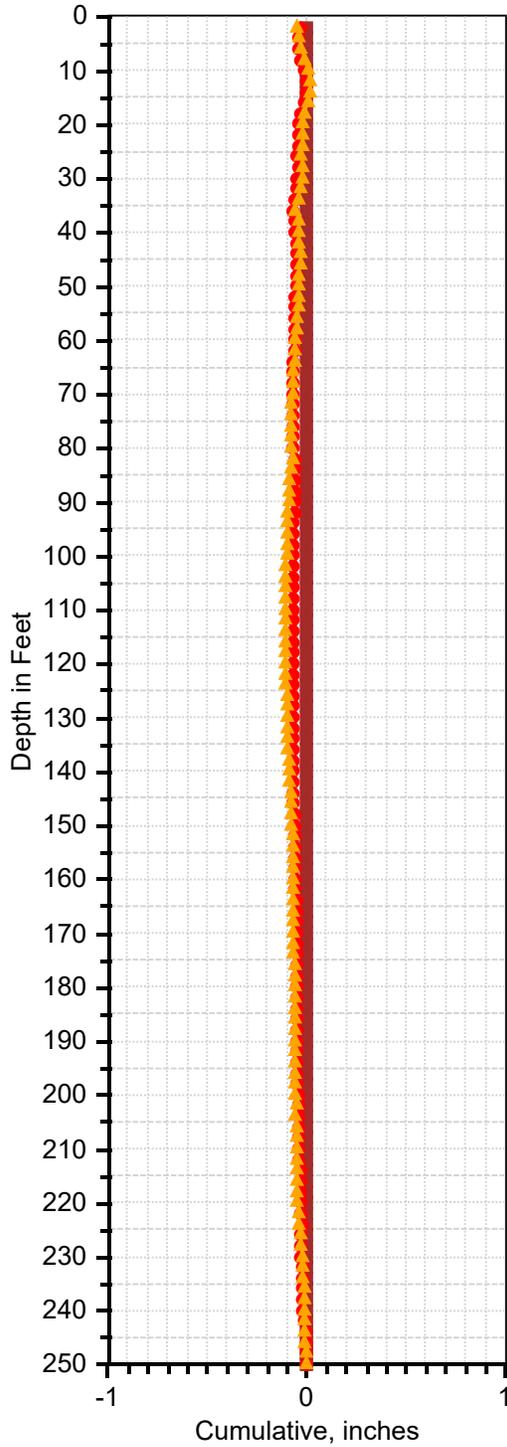


■ 7/29/2021 ● 9/28/2022



■ 7/29/2021 ● 9/28/2022

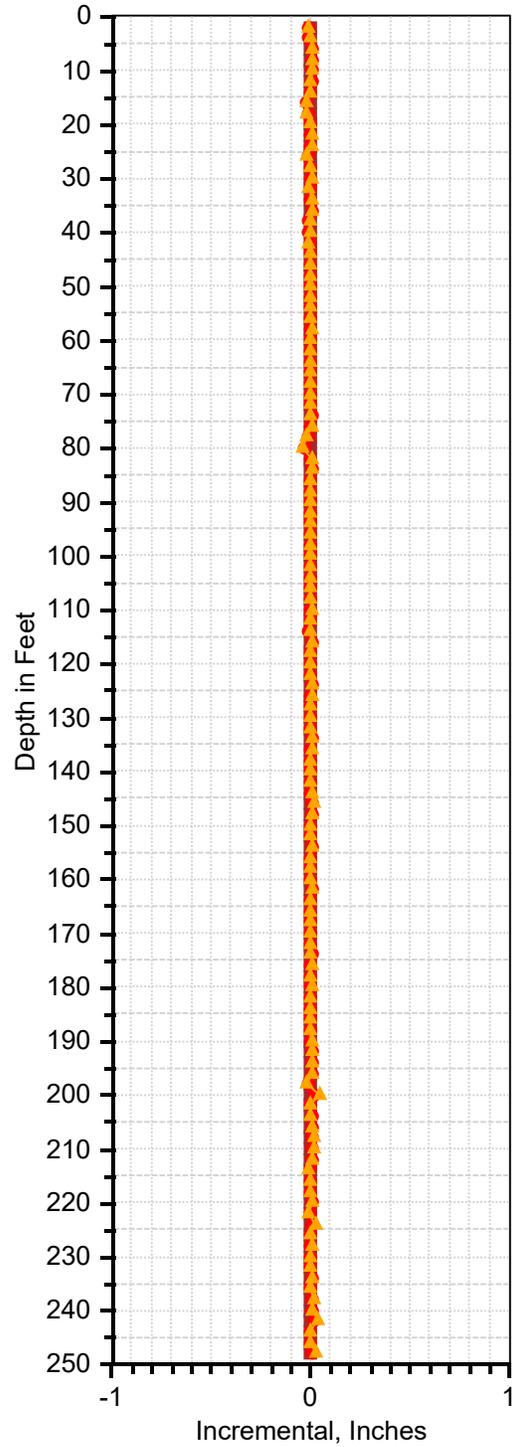
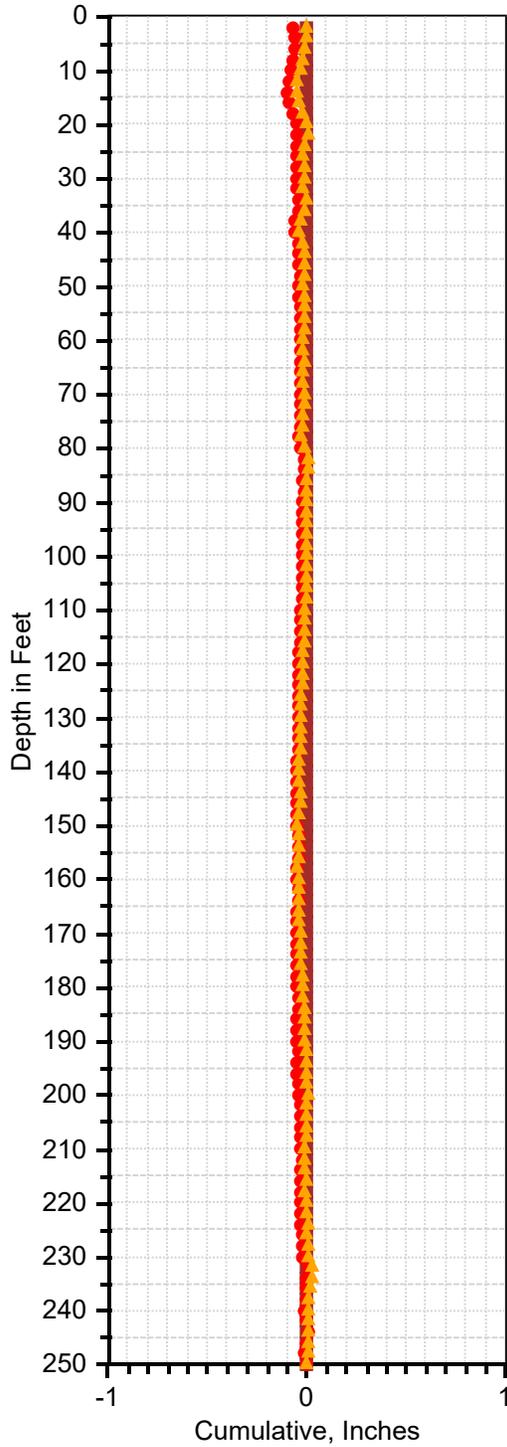
SP-17B A Direction



■ 10/29/2020 ● 7/27/2021 ▲ 6/22/2022

■ 3/30/2021 ● 7/27/2021 ▲ 6/22/2022

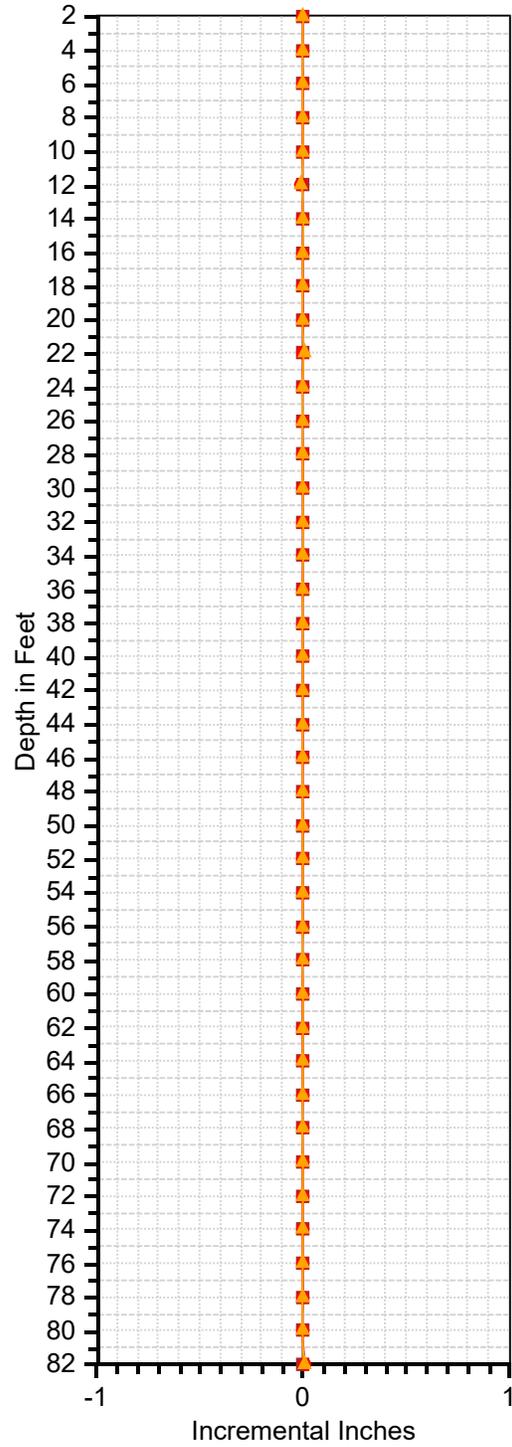
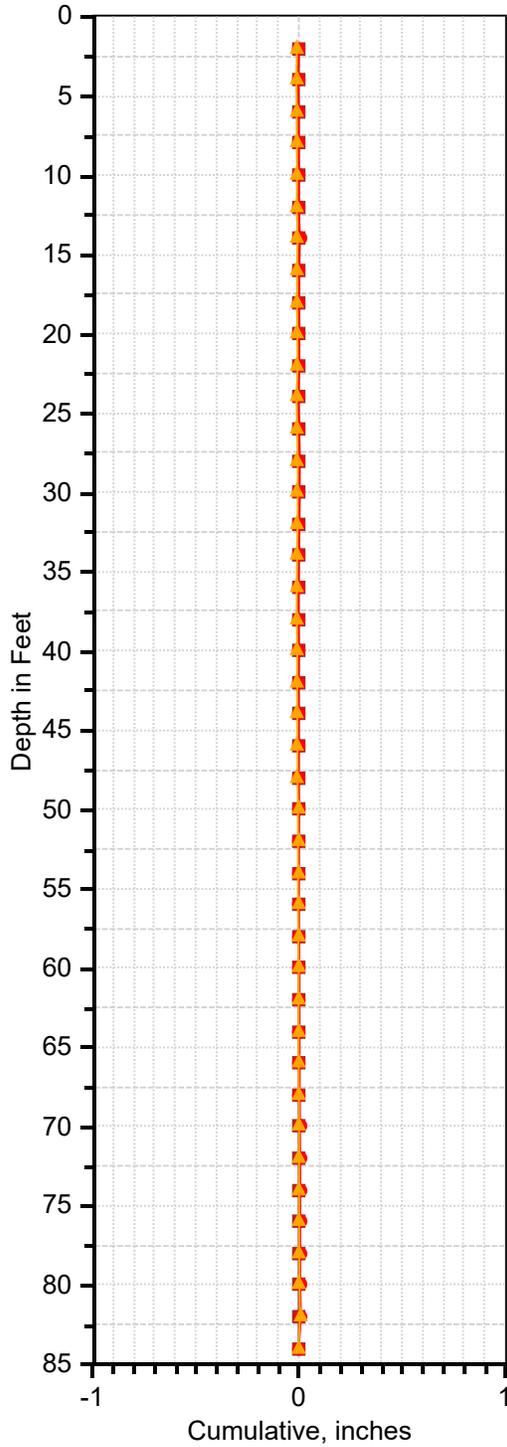
SP-17B B Direction



10/29/2020 7/27/2021 6/22/2022

3/30/2021 7/27/2021 6/22/2022

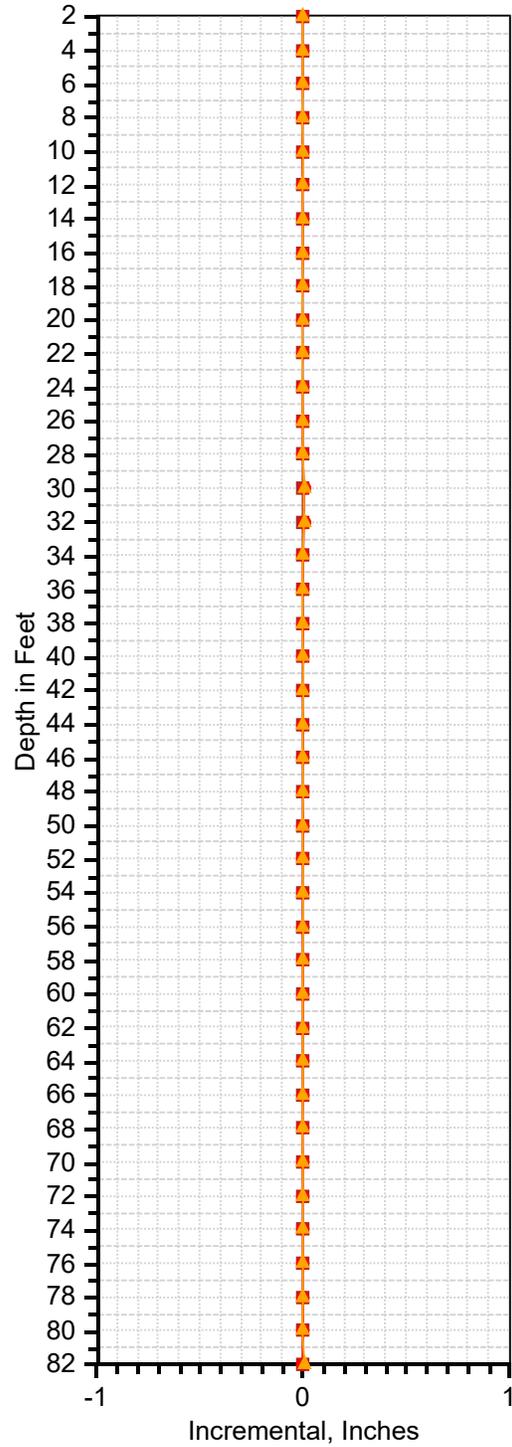
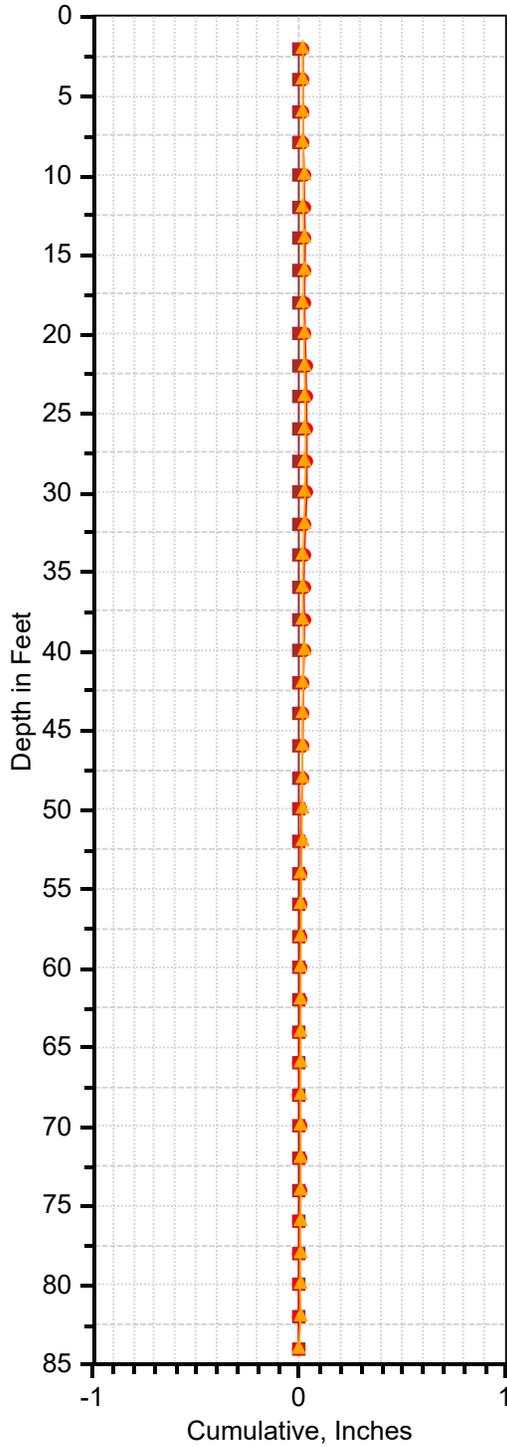
SP-19 A Direction



■ 9/14/2021 ● 5/23/2022 ▲ 6/22/2022

■ 9/14/2021 ● 5/23/2022 ▲ 6/22/2022

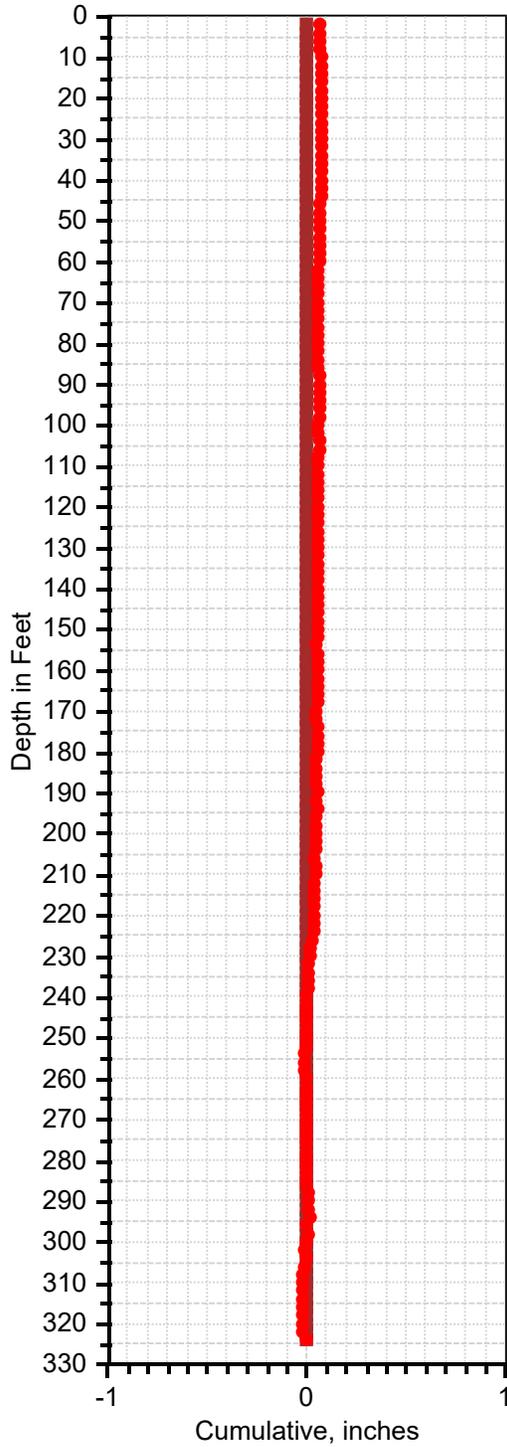
SP-19 B Direction



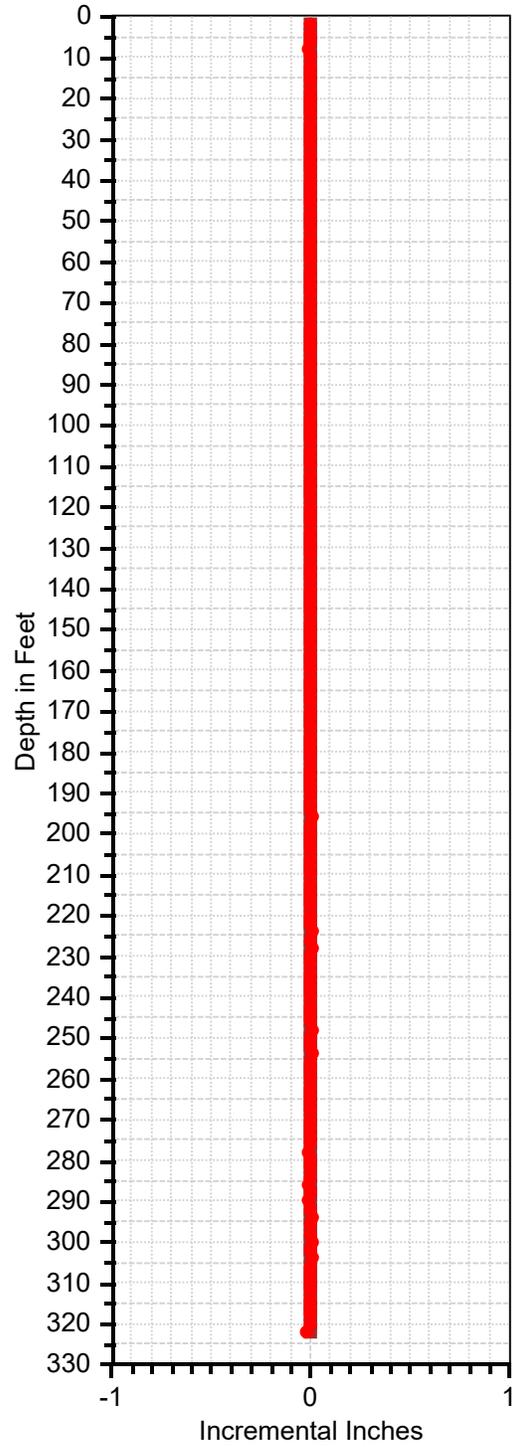
■ 9/14/2021 ● 5/23/2022 ▲ 6/22/2022

■ 9/14/2021 ● 5/23/2022 ▲ 6/22/2022

SP-20 A Direction

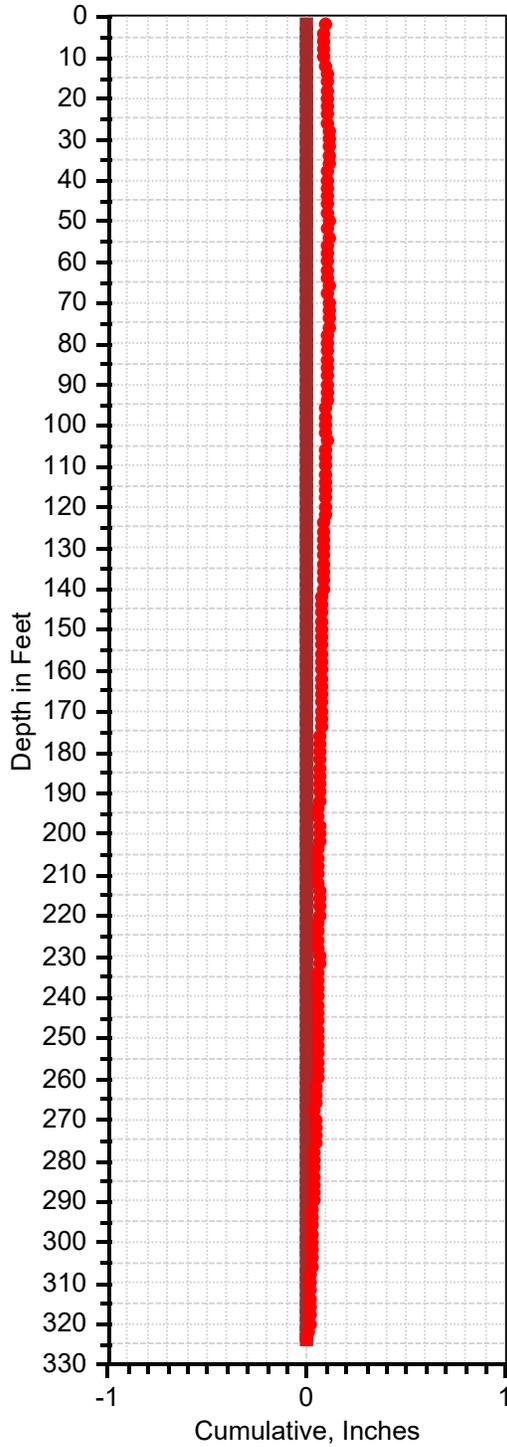


■ 9/13/2021 ● 5/26/2022

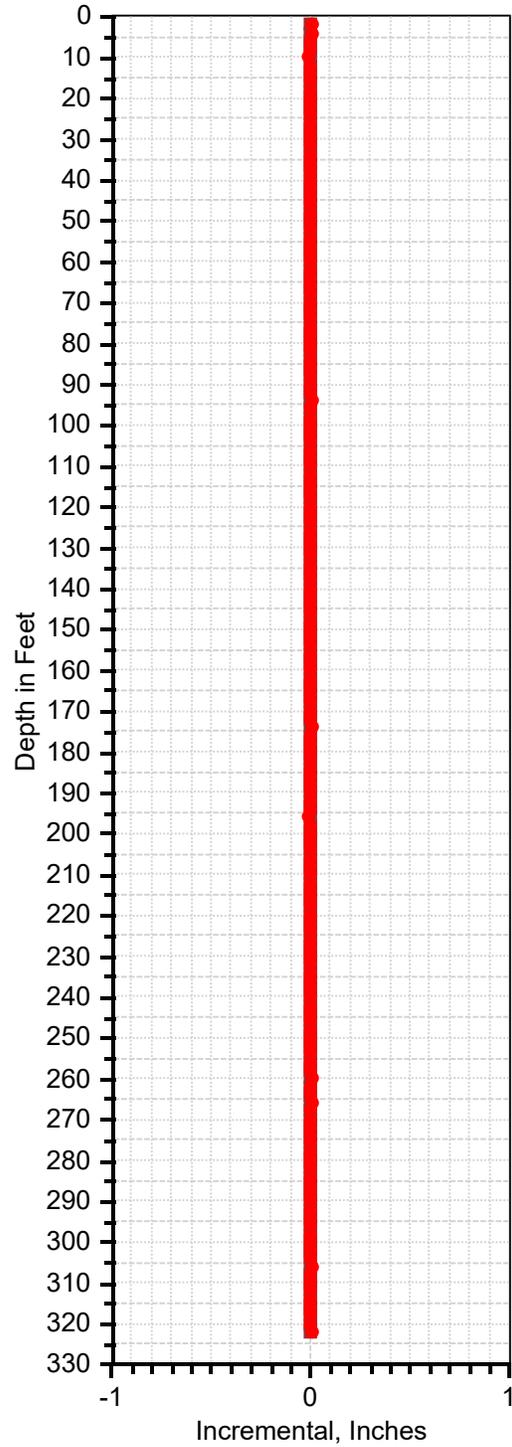


■ 9/13/2021 ● 5/26/2022

SP-20 B Direction

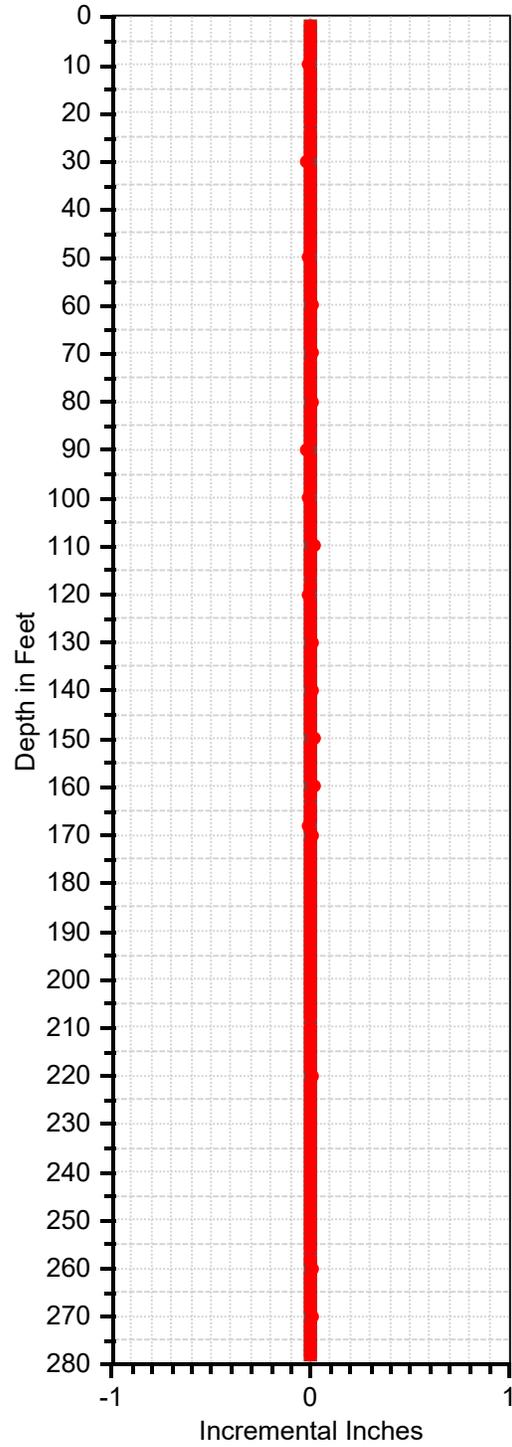
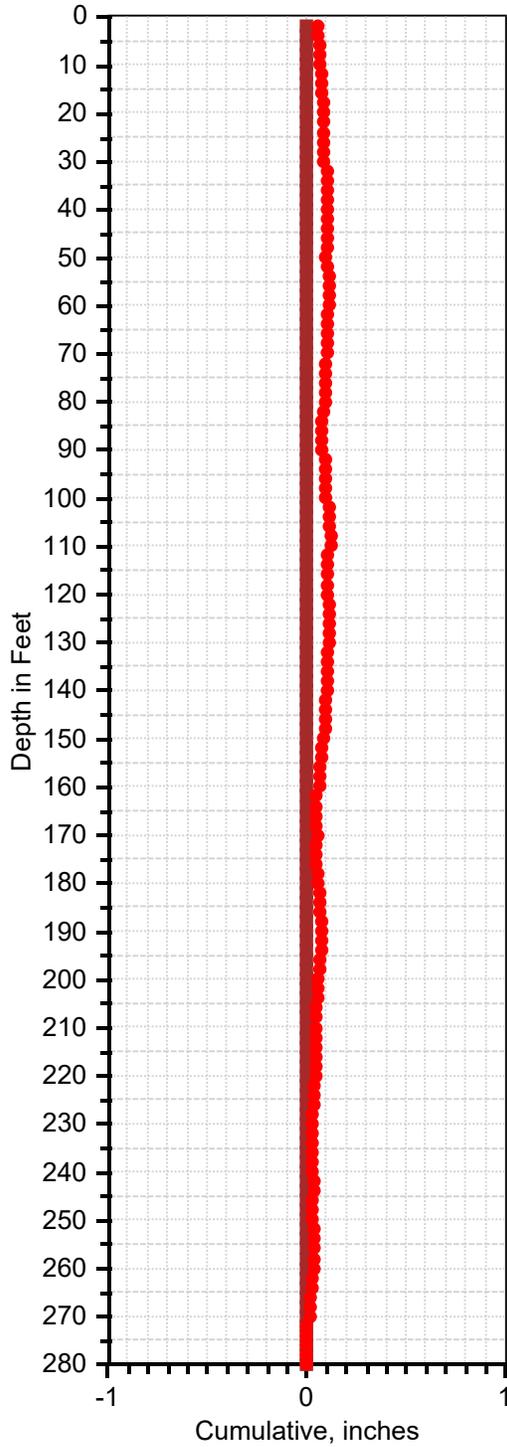


■ 9/13/2021 ● 5/26/2022



■ 9/13/2021 ● 5/26/2022

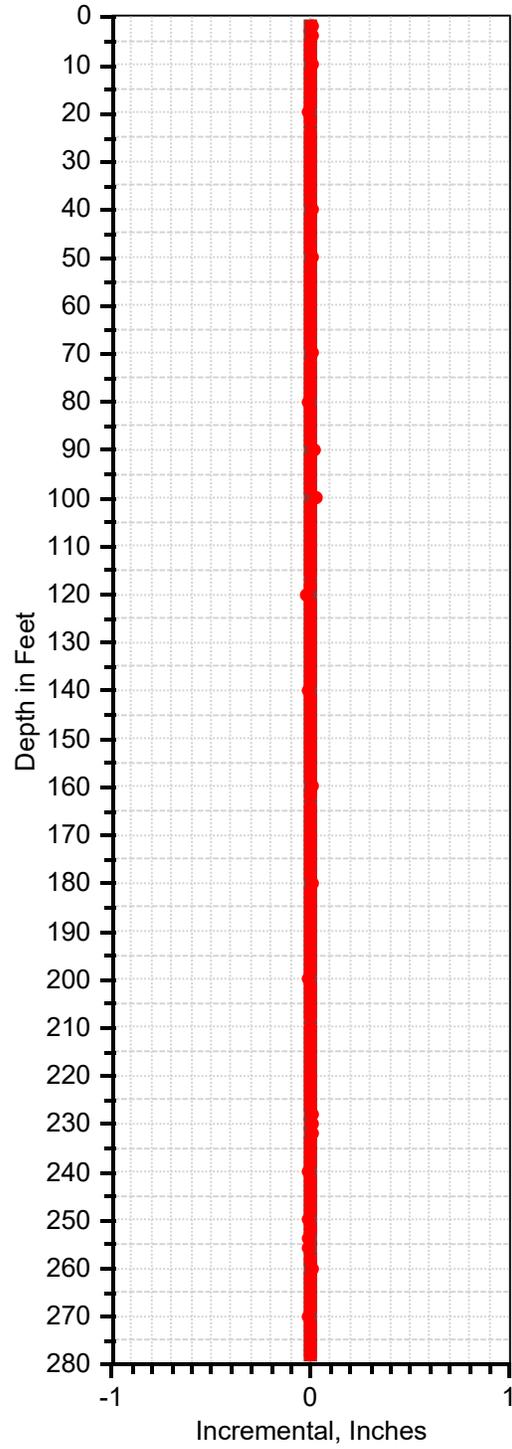
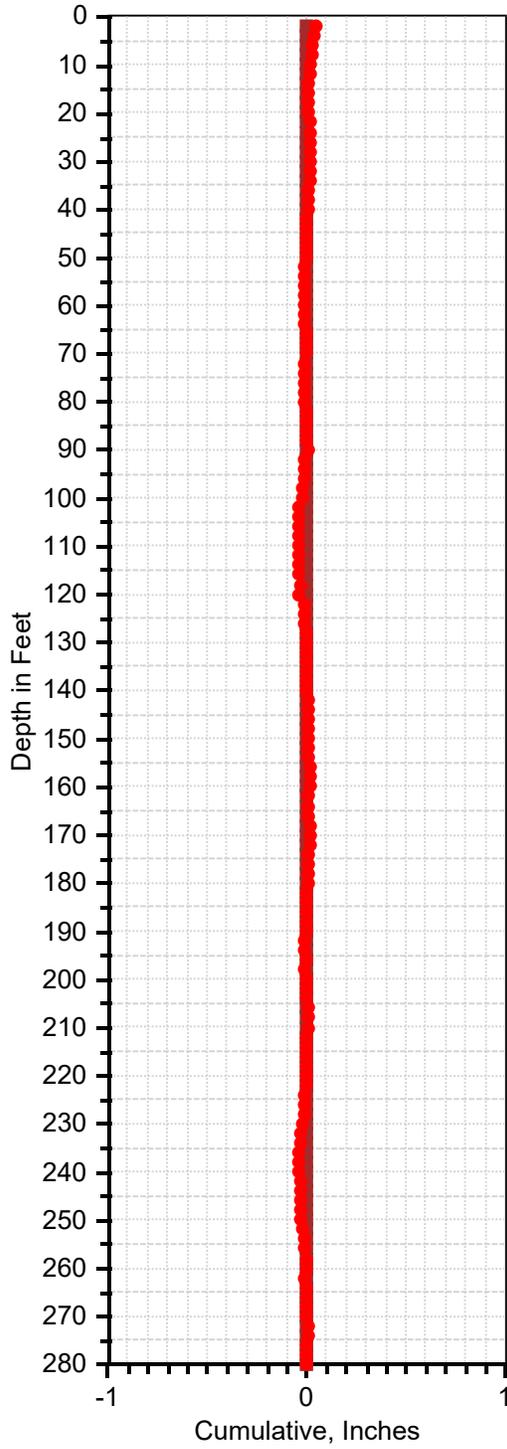
SP-21 A Direction



■ 7/30/2021 ● 6/23/2022

■ 7/30/2021 ● 6/23/2022

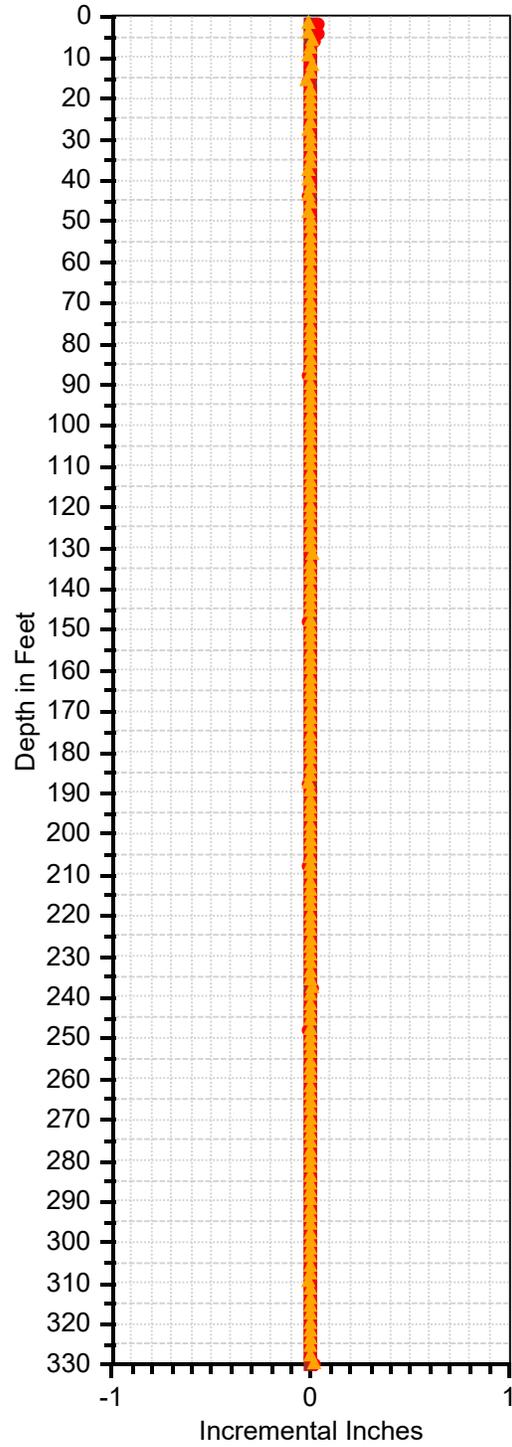
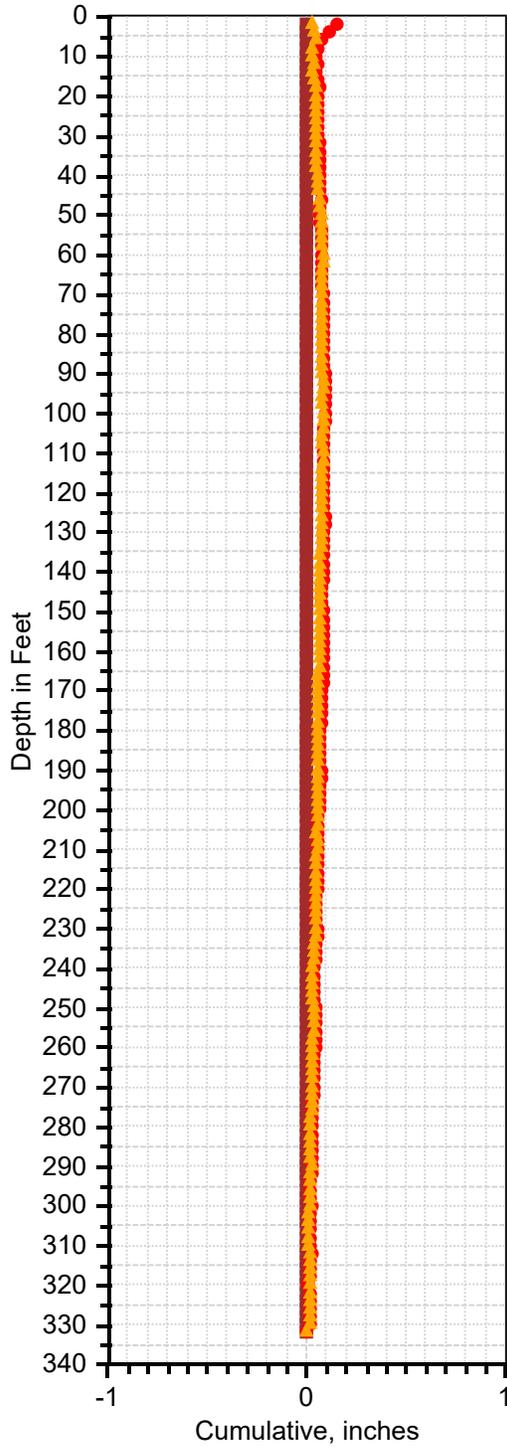
SP-21 B Direction



■ 7/30/2021 ● 6/23/2022

■ 7/30/2021 ● 6/23/2022

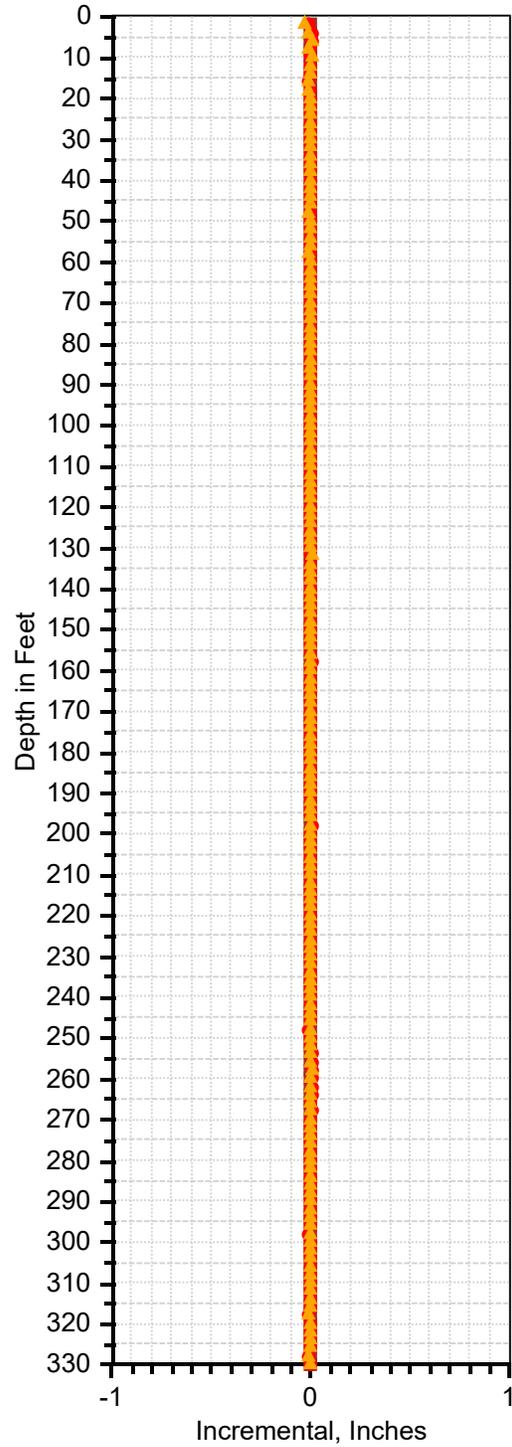
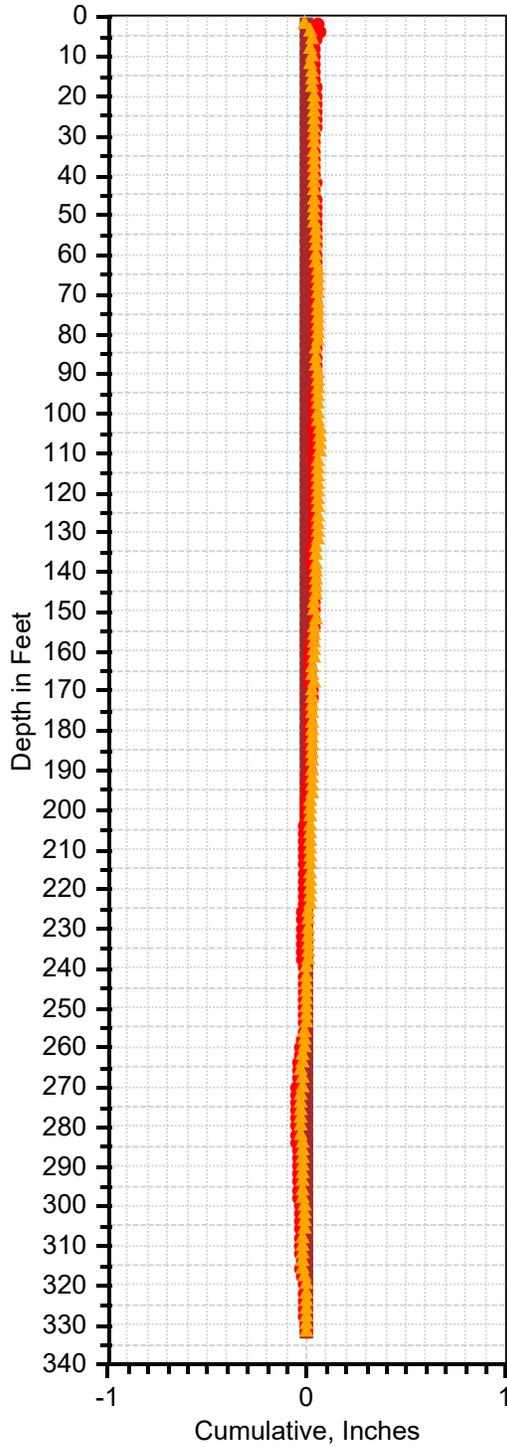
SP-22 A Direction



10/26/2020 9/13/2021 6/24/2022

10/26/2020 9/13/2021 6/24/2022

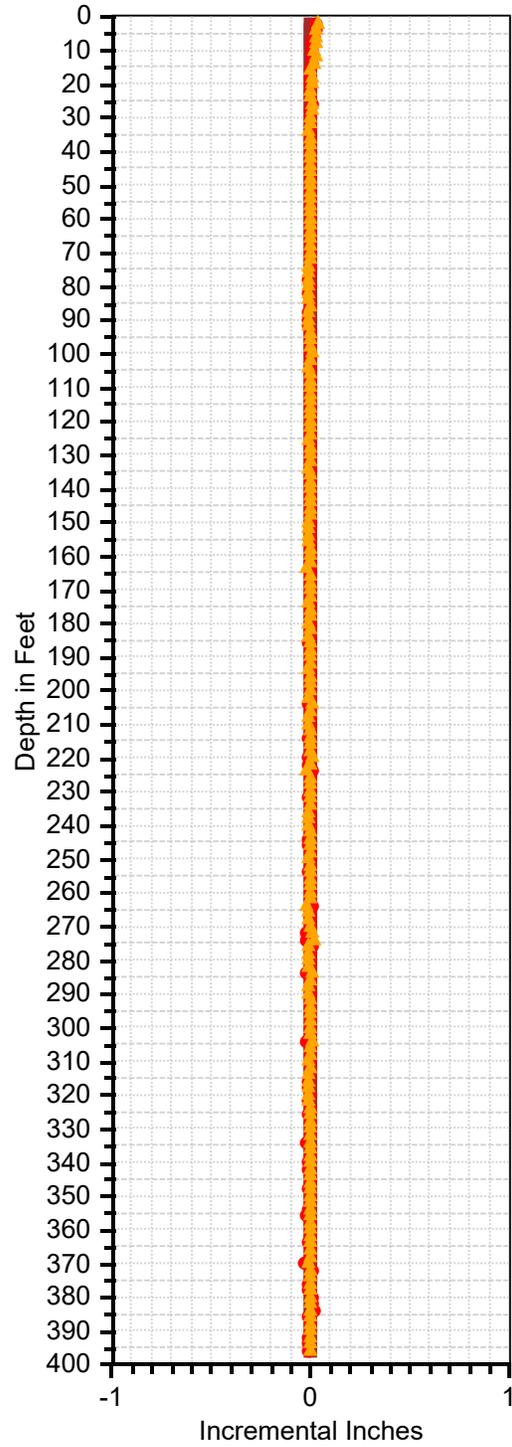
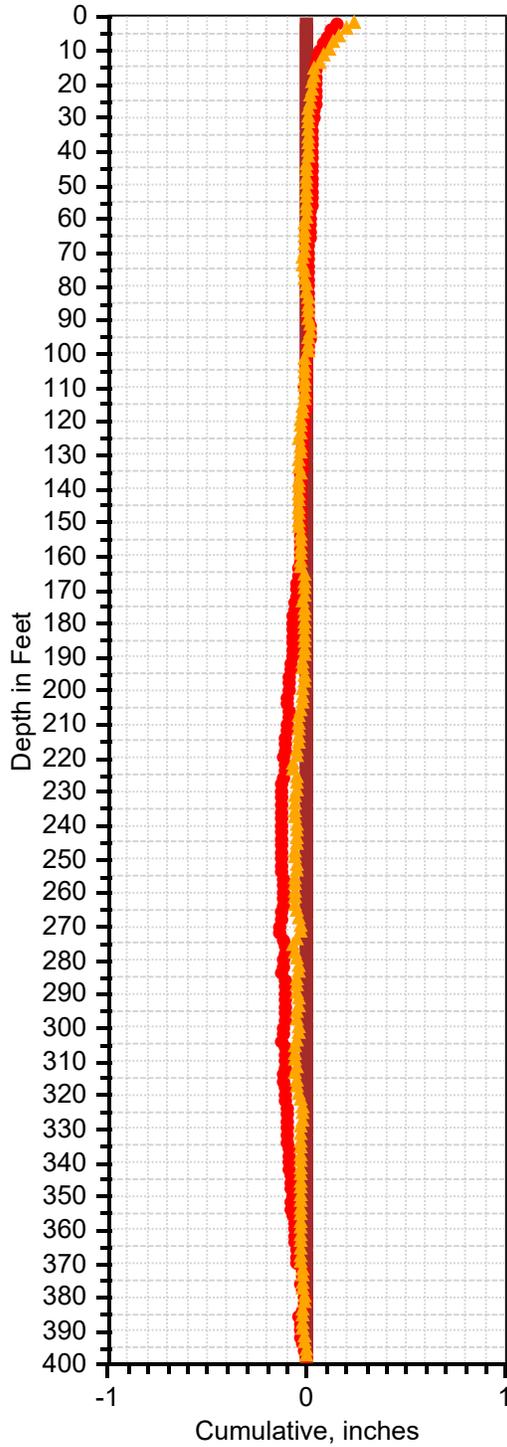
SP-22 B Direction



10/26/2020 9/13/2021 6/24/2022

10/26/2020 9/13/2021 6/24/2022

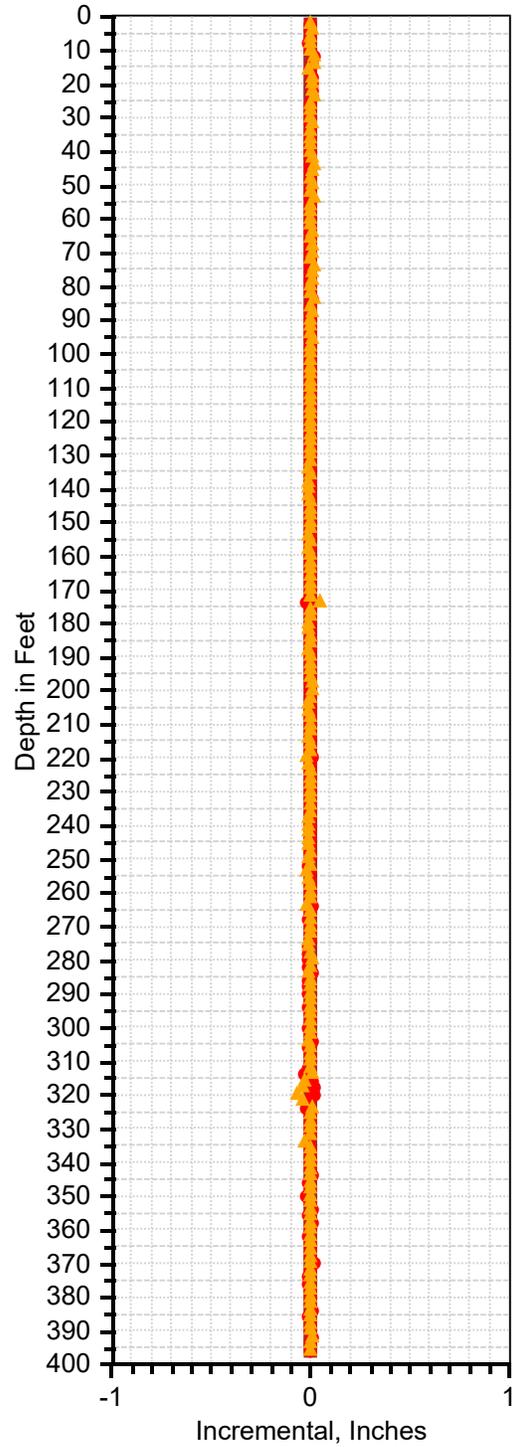
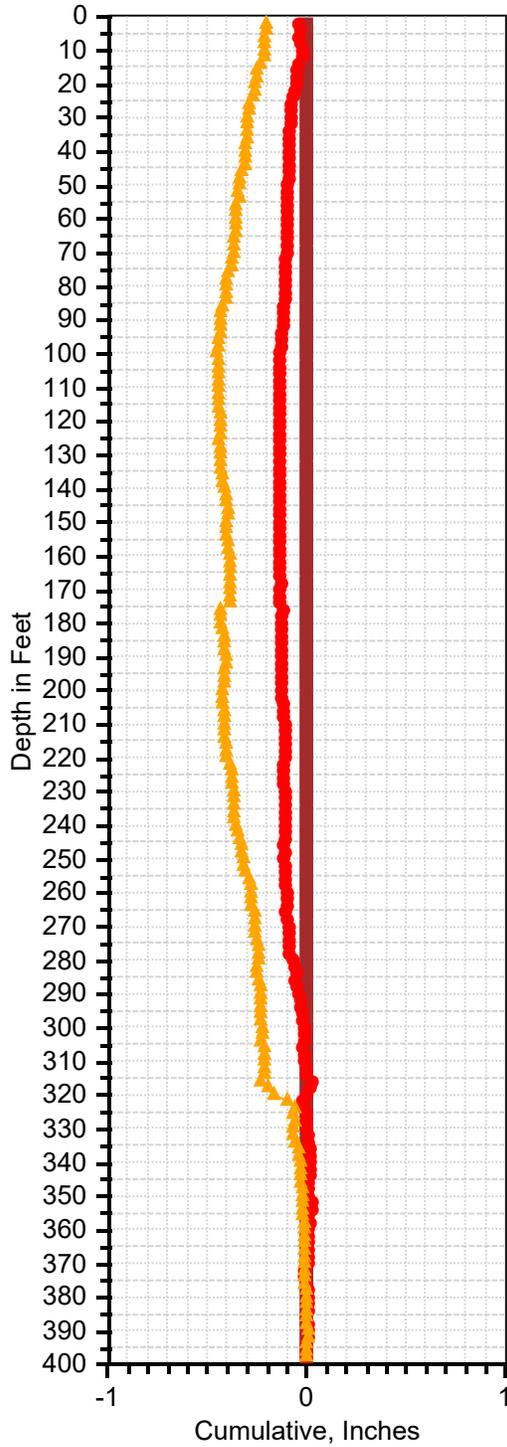
SP-23 A Direction



10/27/2020 7/30/2021 6/23/2022

10/27/2020 7/30/2021 6/23/2022

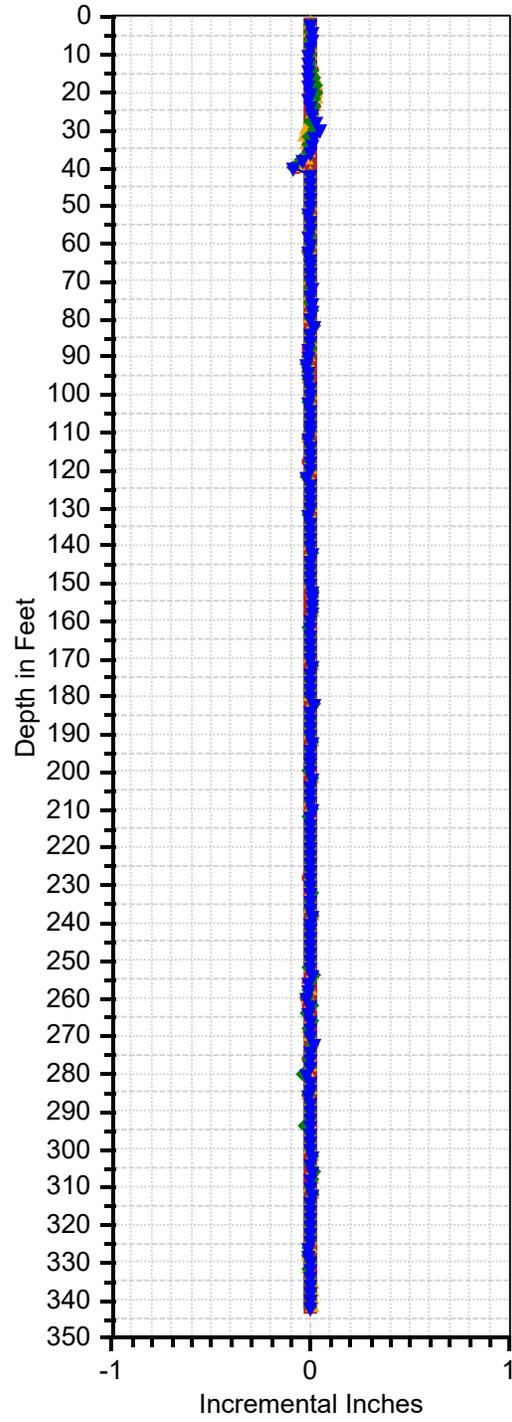
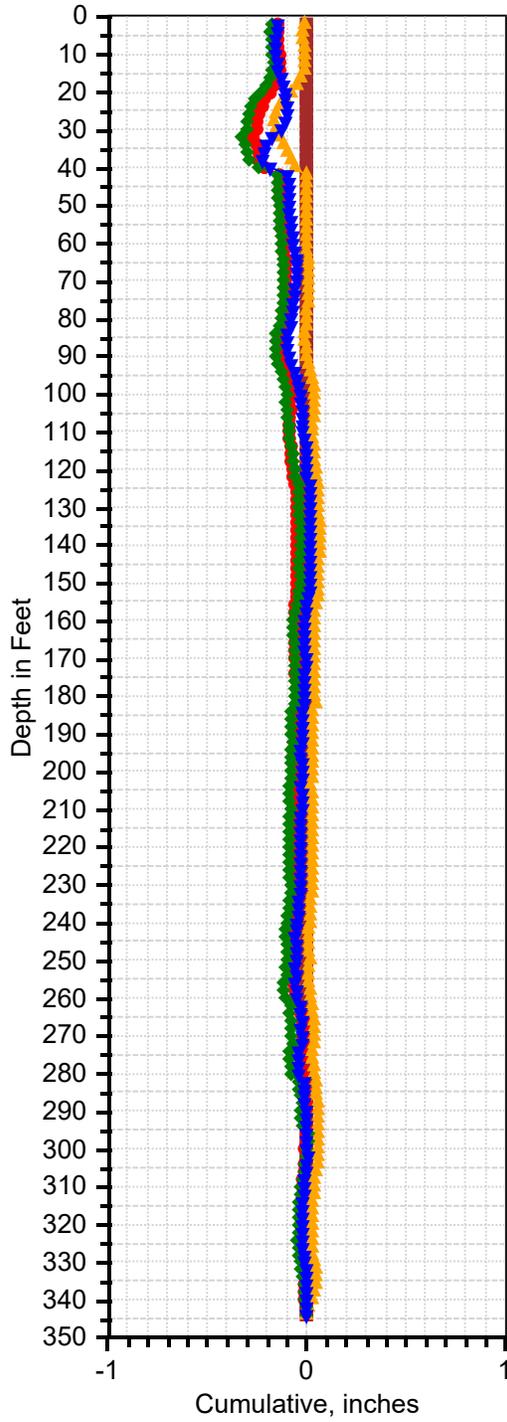
SP-23 B Direction



■ 10/27/2020 ● 7/30/2021 ▲ 6/23/2022

■ 10/27/2020 ● 7/30/2021 ▲ 6/23/2022

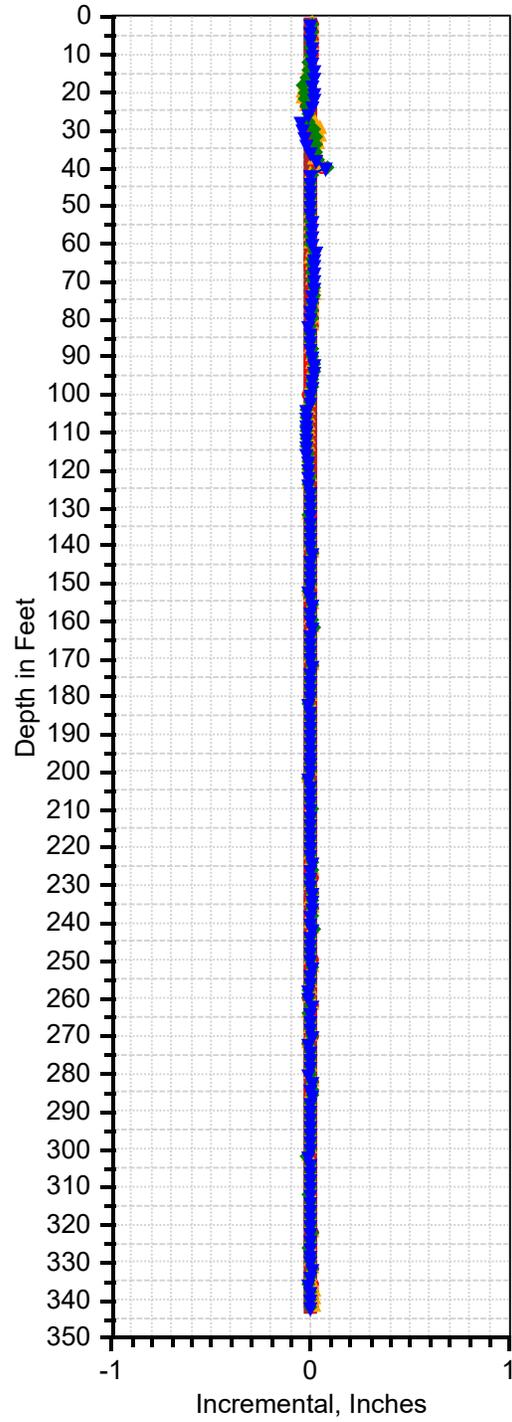
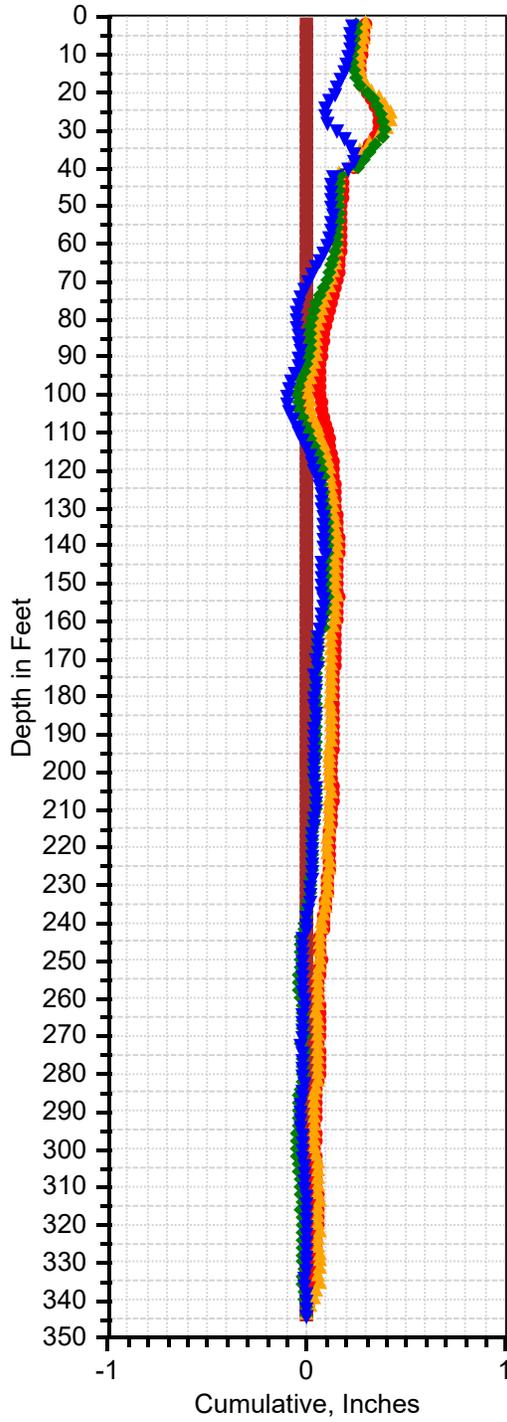
SP-26 A Direction



■ 4/9/2021 ● 8/3/2021 ▲ 10/1/2021
◆ 12/9/2021 ▼ 2/25/2022

■ 4/9/2021 ● 8/3/2021 ▲ 10/1/2021
◆ 12/9/2021 ▼ 2/25/2022

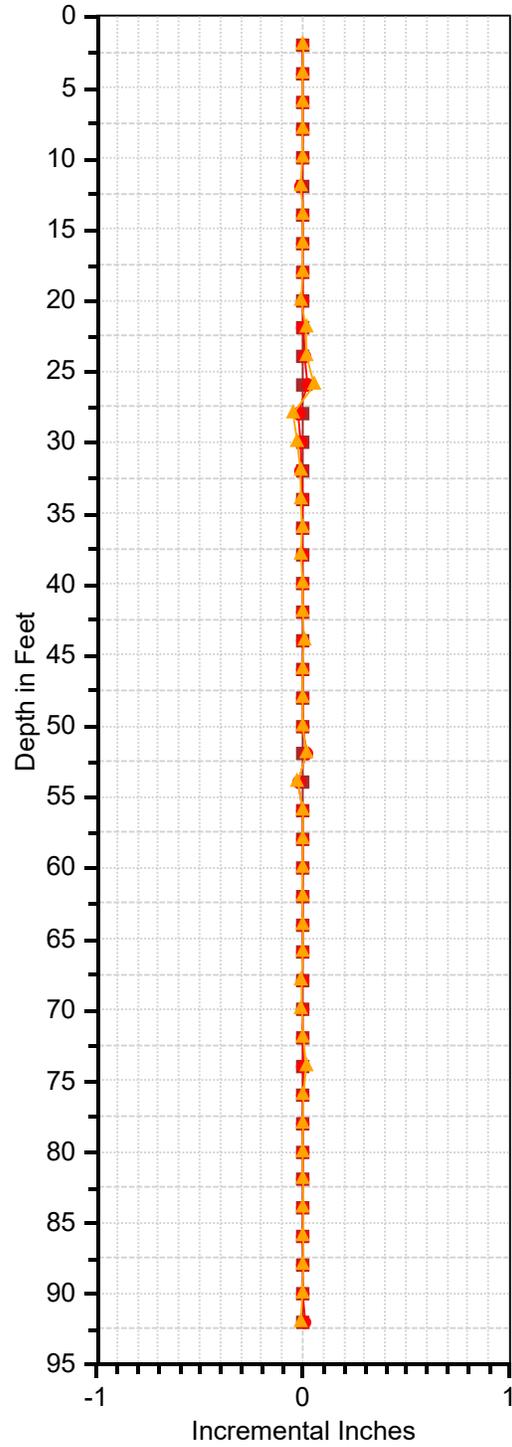
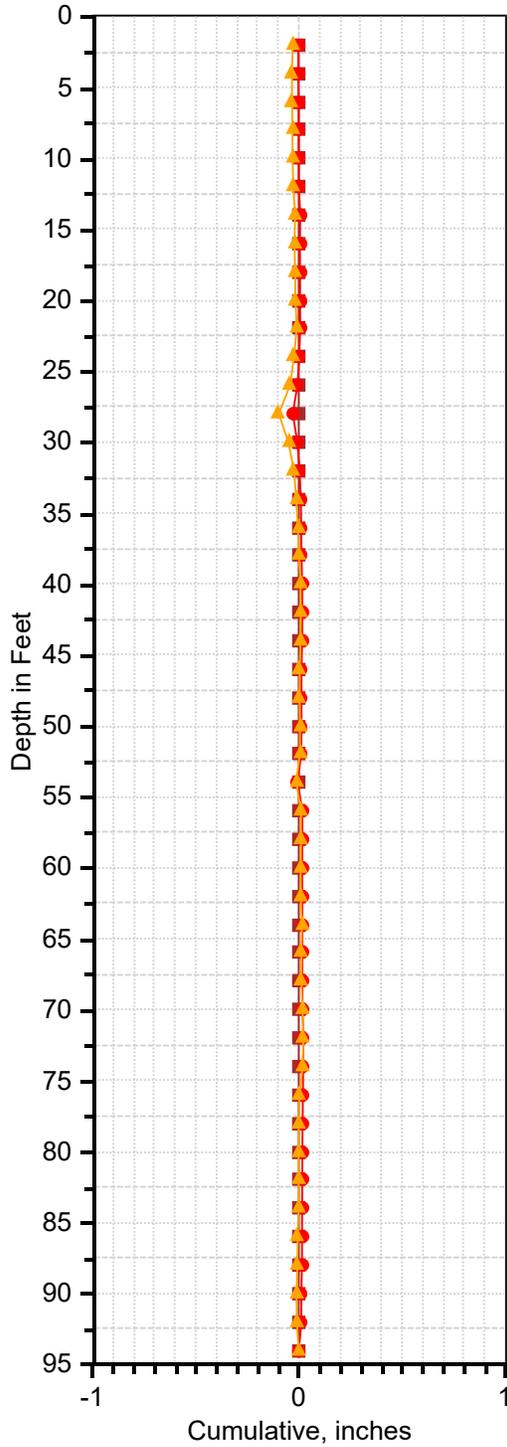
SP-26 B Direction



■ 4/9/2021 ● 8/3/2021 ▲ 10/1/2021
◆ 12/9/2021 ▼ 2/25/2022

■ 4/9/2021 ● 8/3/2021 ▲ 10/1/2021
◆ 12/9/2021 ▼ 2/25/2022

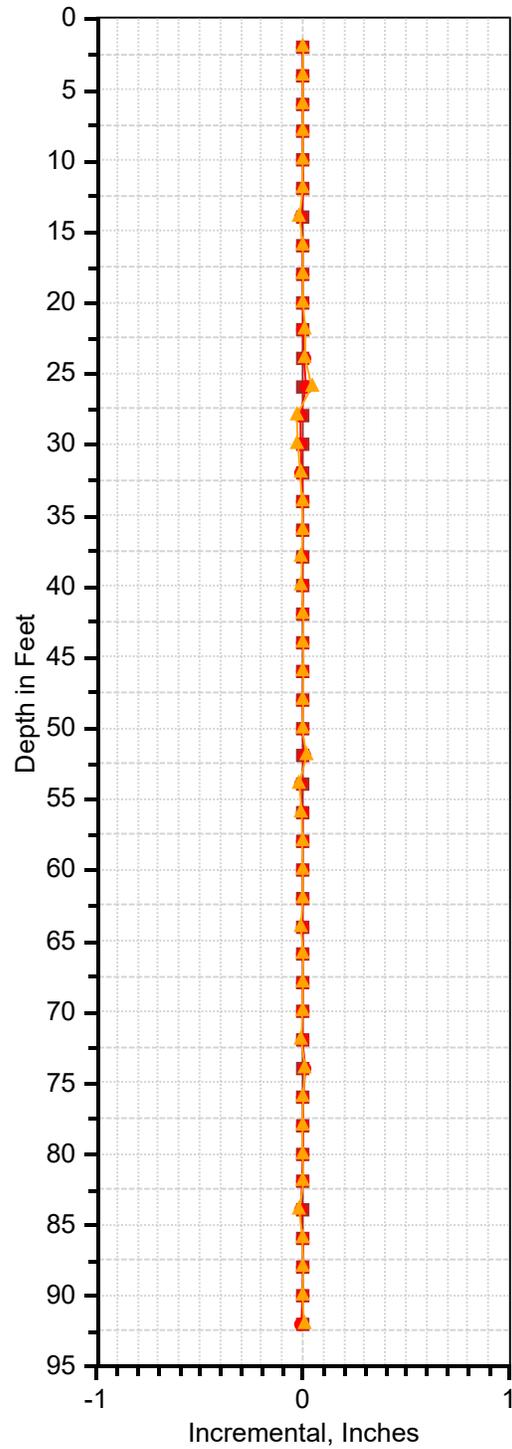
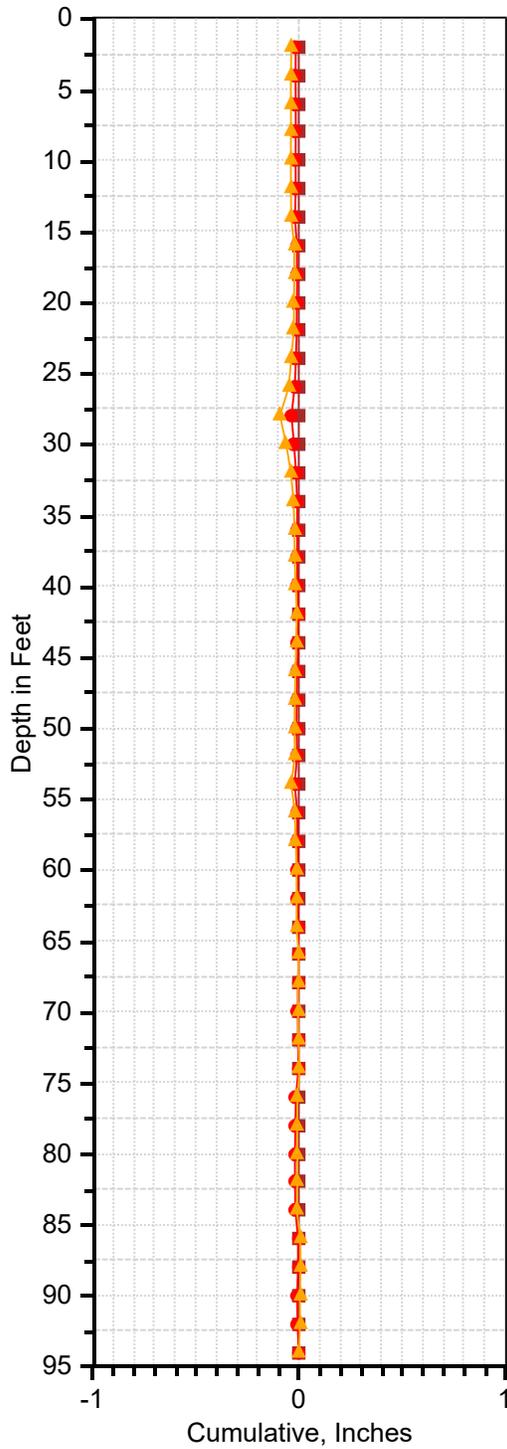
SP-27A A Direction



■ 9/14/2021
 ● 11/30/2021
 ▲ 6/22/2022

■ 9/14/2021
 ● 11/30/2021
 ▲ 6/22/2022

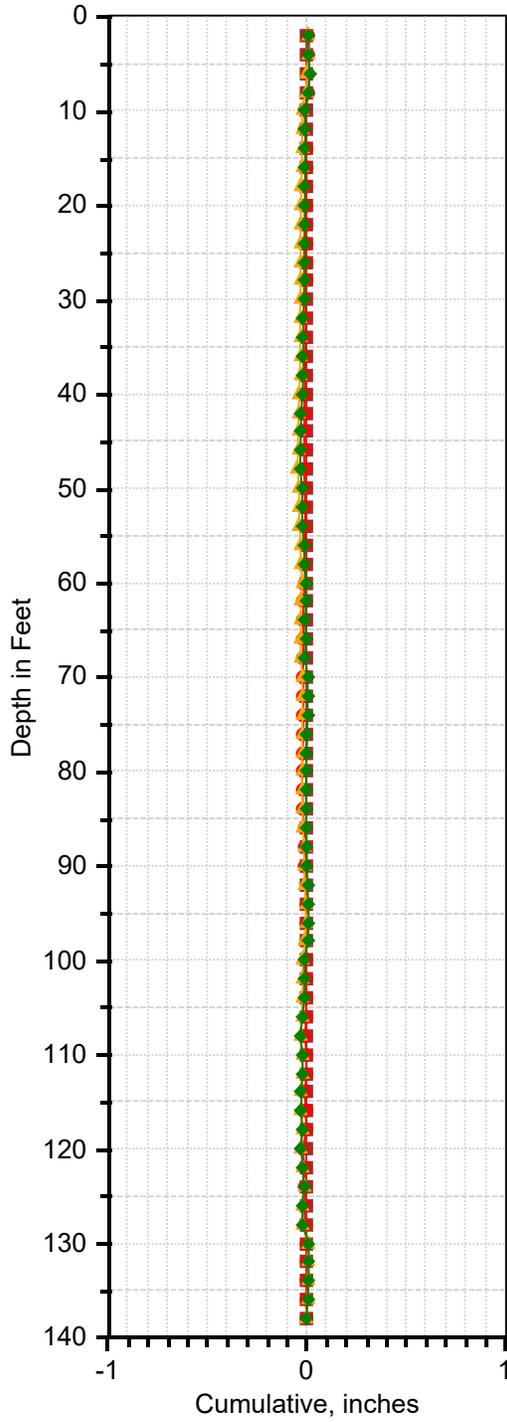
SP-27A B Direction



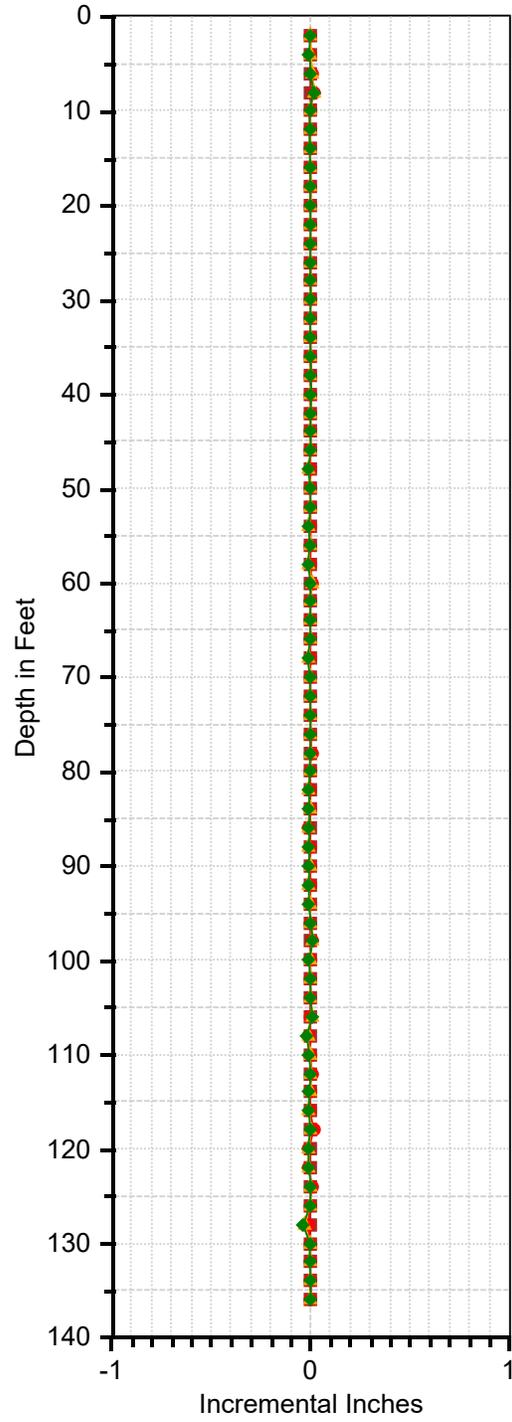
■ 9/14/2021 ● 11/30/2021 ▲ 6/22/2022

■ 9/14/2021 ● 11/30/2021 ▲ 6/22/2022

SP-29 A Direction

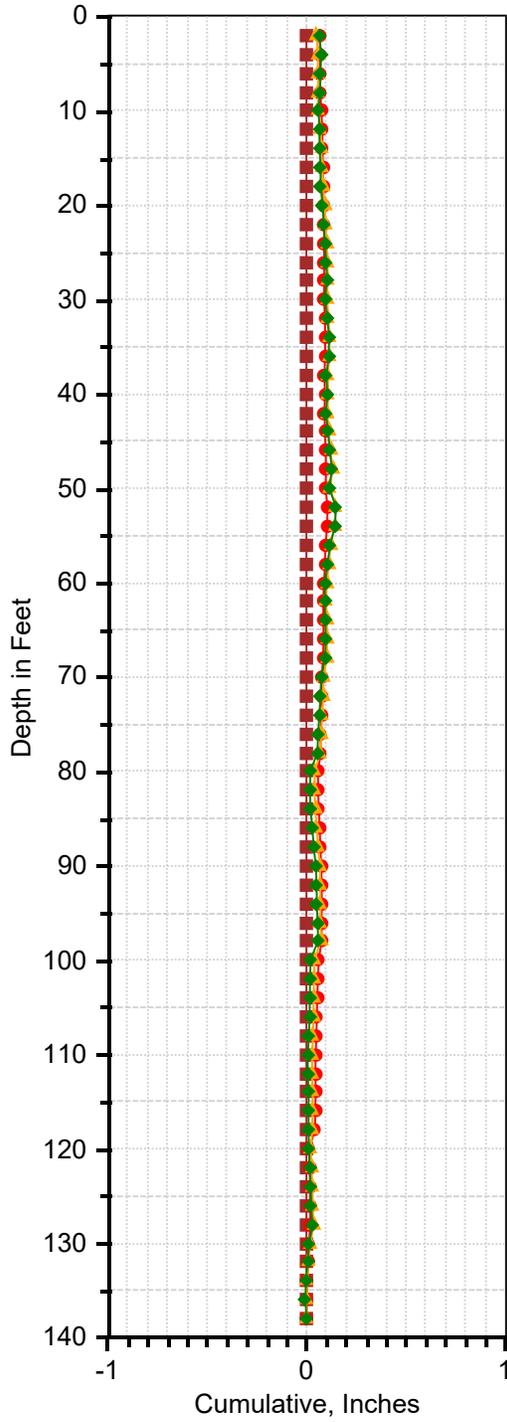


8/26/2020 4/7/2021
 11/30/2021 5/23/2022

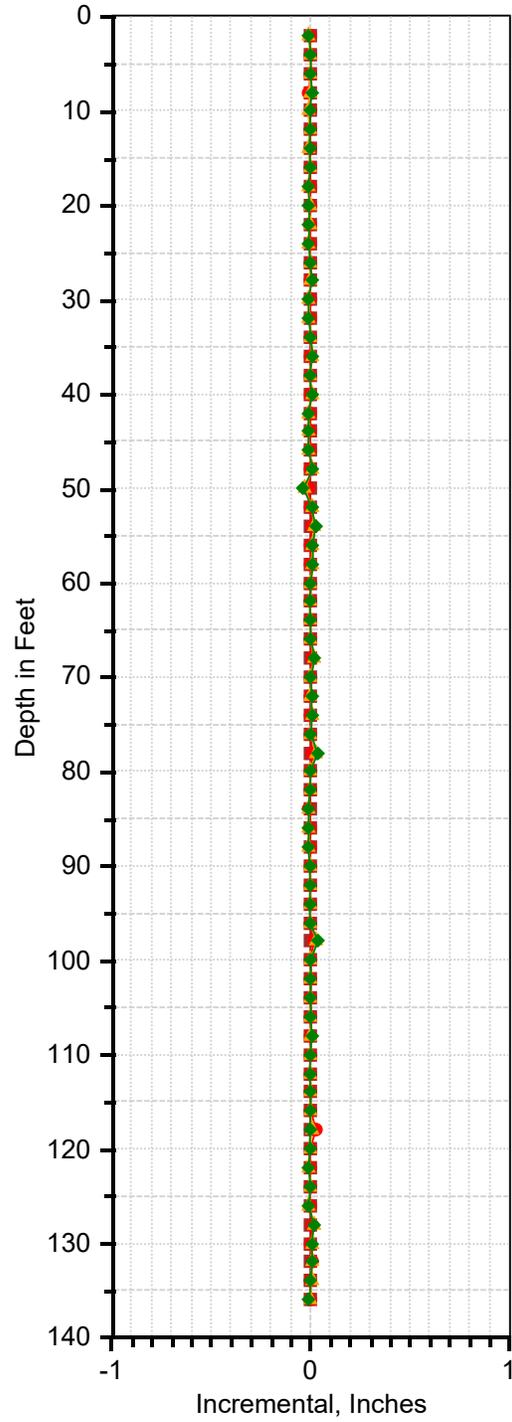


8/26/2020 4/7/2021
 11/30/2021 5/23/2022

SP-29 B Direction

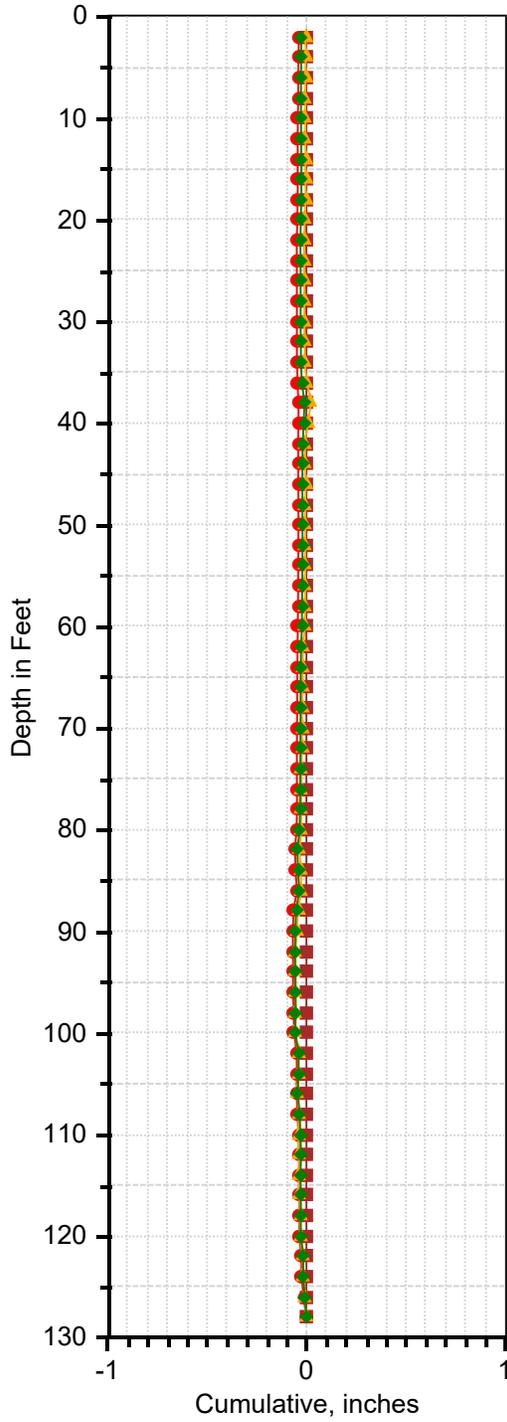


■ 8/26/2020 ● 4/7/2021
▲ 11/30/2021 ◆ 5/23/2022

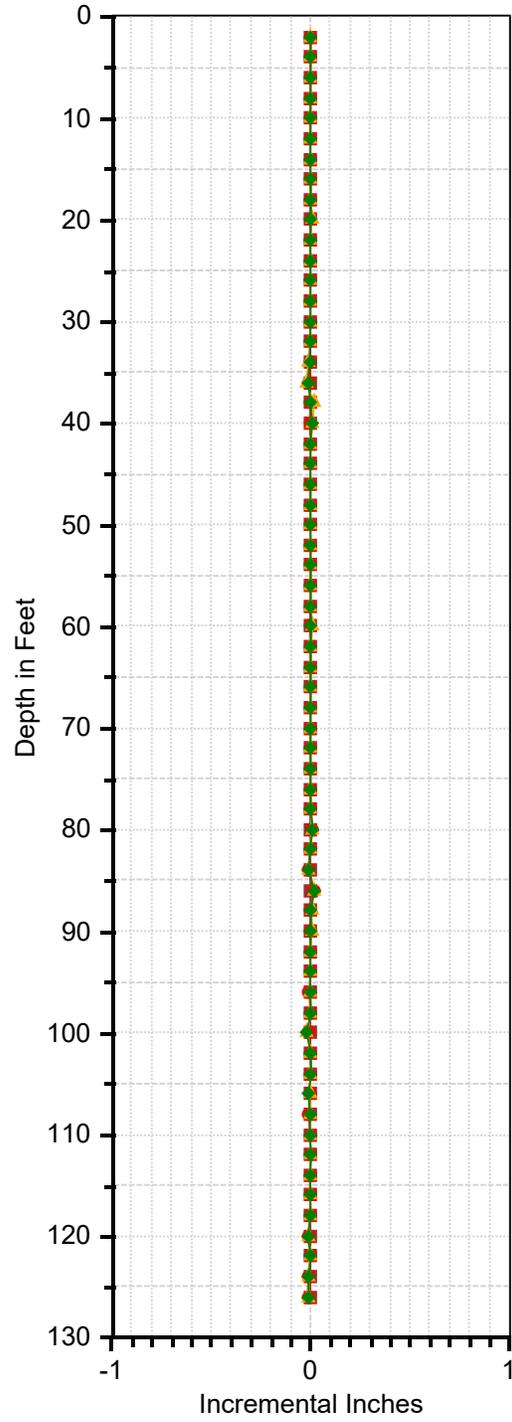


■ 8/26/2020 ● 4/7/2021
▲ 11/30/2021 ◆ 5/23/2022

SP-30 A Direction

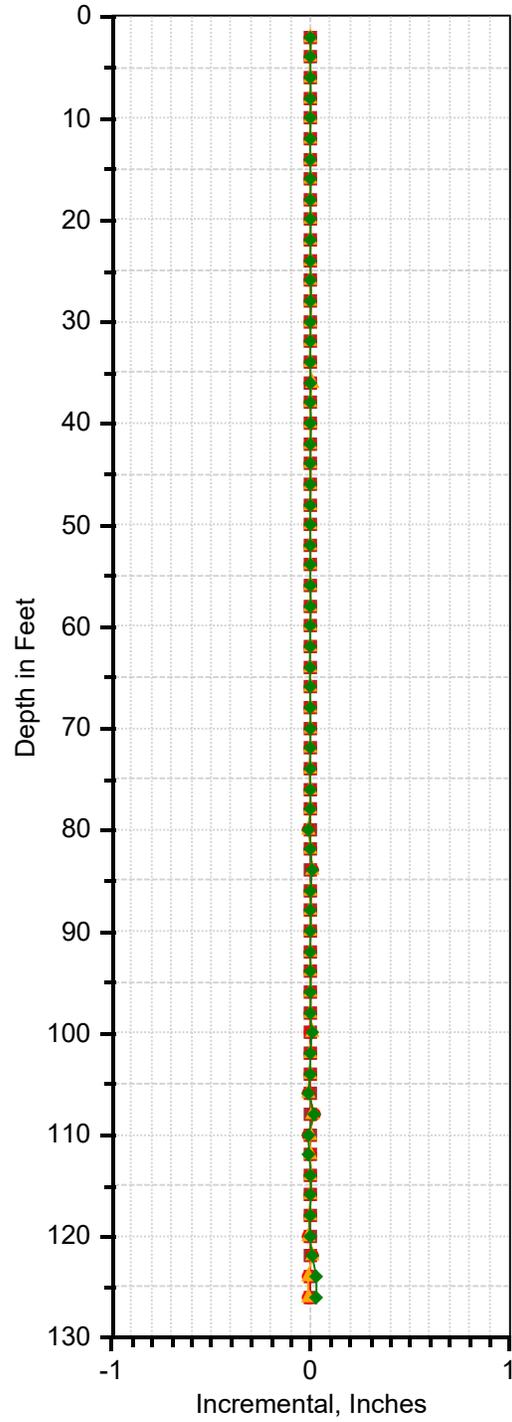
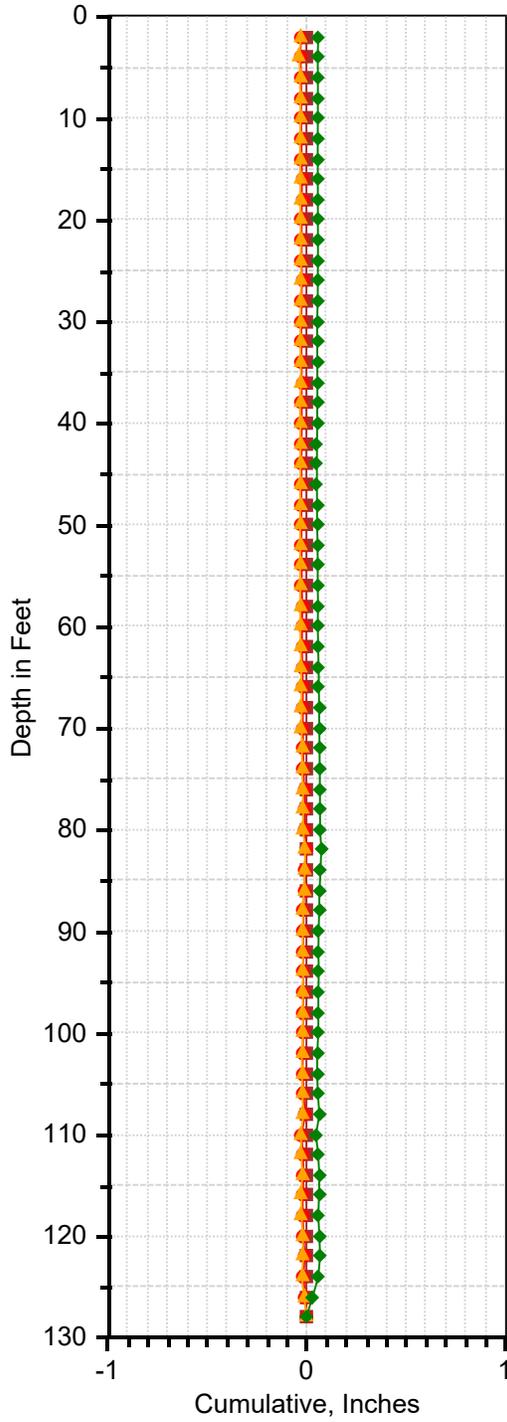


■ 10/30/2020 ● 9/14/2021
▲ 11/30/2021 ◆ 5/23/2022



■ 10/30/2020 ● 9/14/2021
▲ 11/30/2021 ◆ 5/23/2022

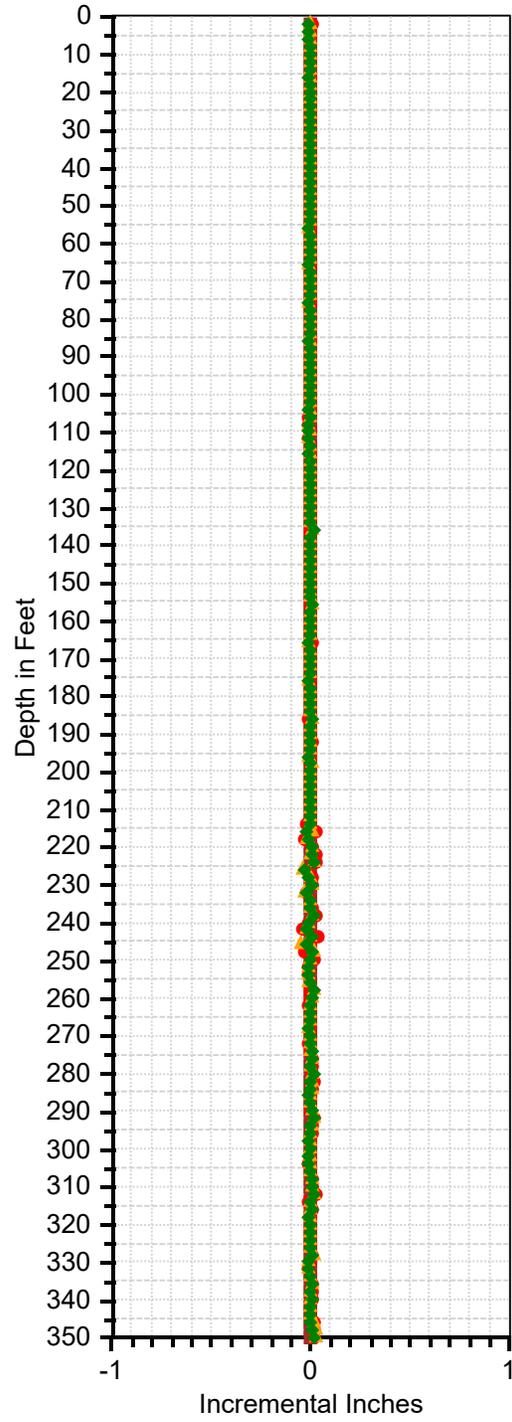
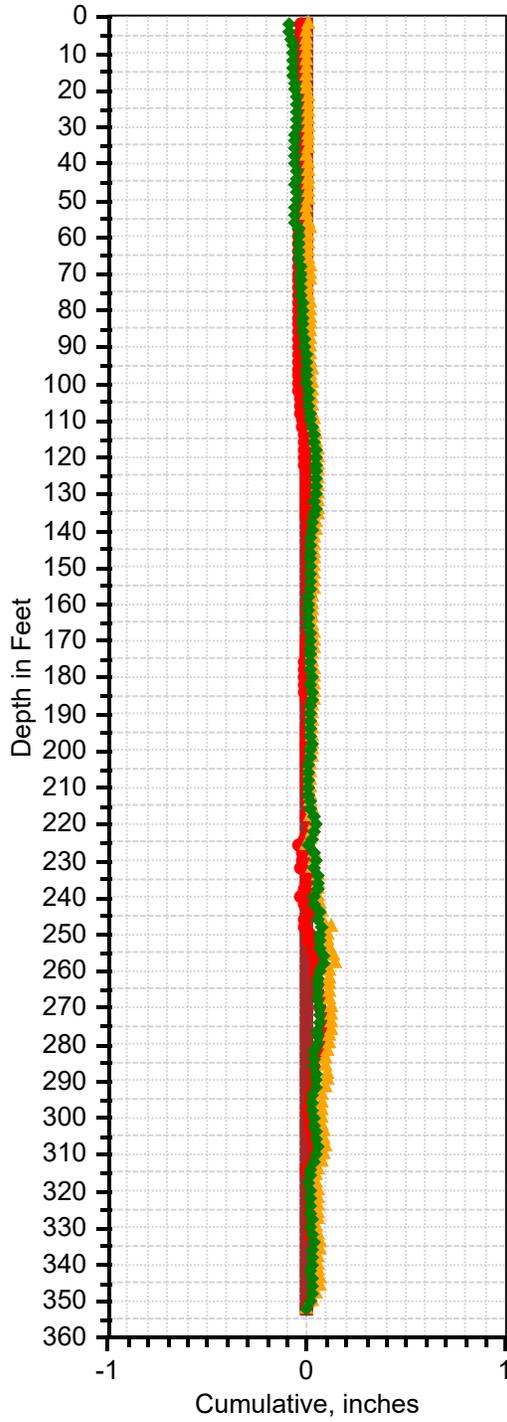
SP-30 B Direction



■ 10/30/2020 ● 9/14/2021
▲ 11/30/2021 ◆ 5/23/2022

■ 10/30/2020 ● 9/14/2021
▲ 11/30/2021 ◆ 5/23/2022

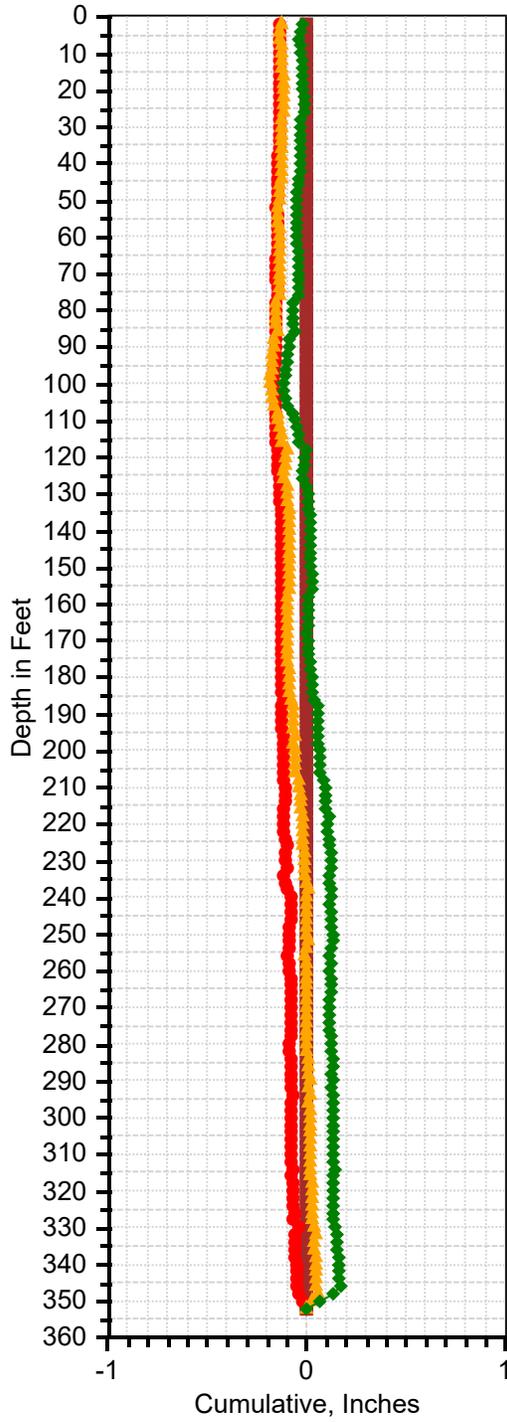
SP-32 A Direction



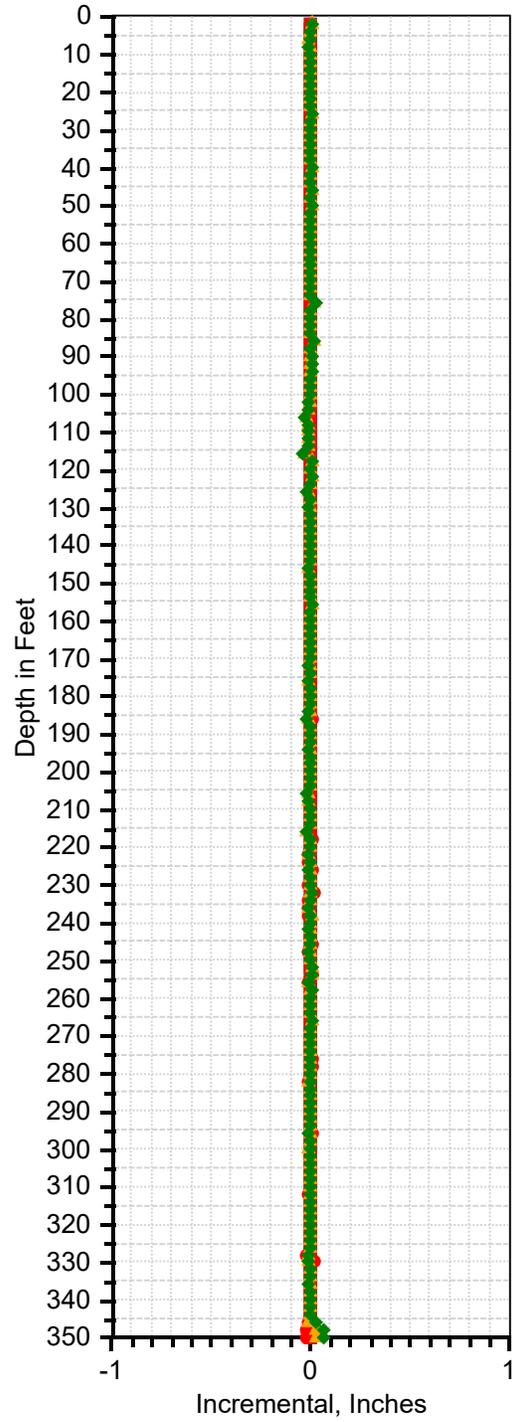
■ 9/3/2020 ● 7/29/2021
▲ 11/30/2021 ◆ 6/23/2022

■ 9/3/2020 ● 7/29/2021
▲ 11/30/2021 ◆ 6/23/2022

SP-32 B Direction

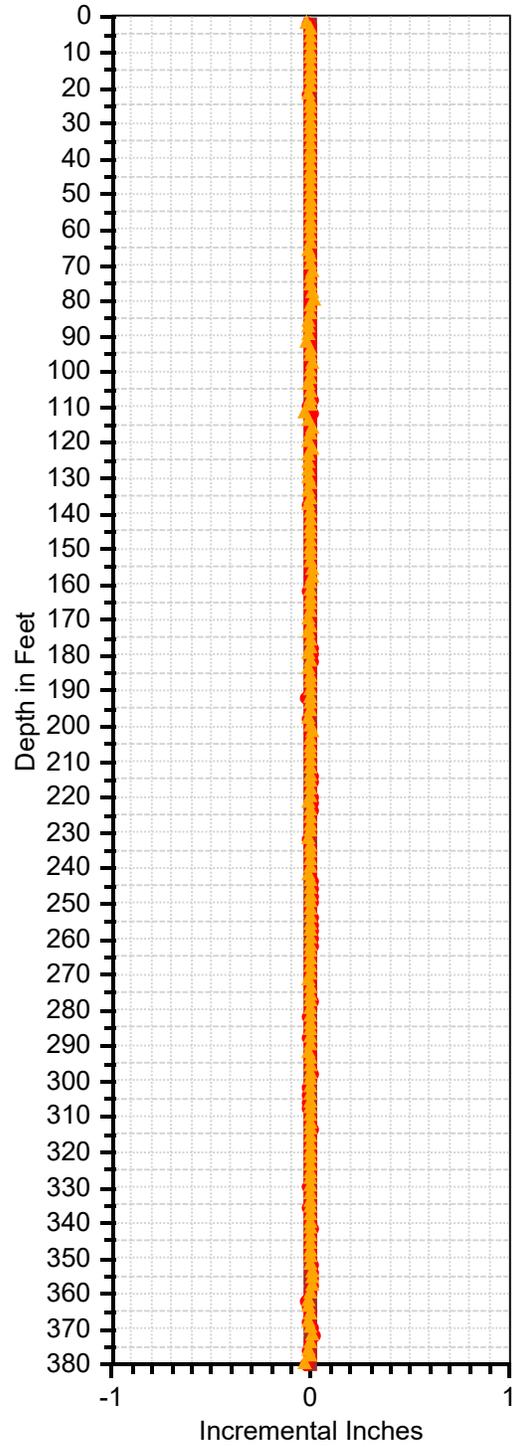
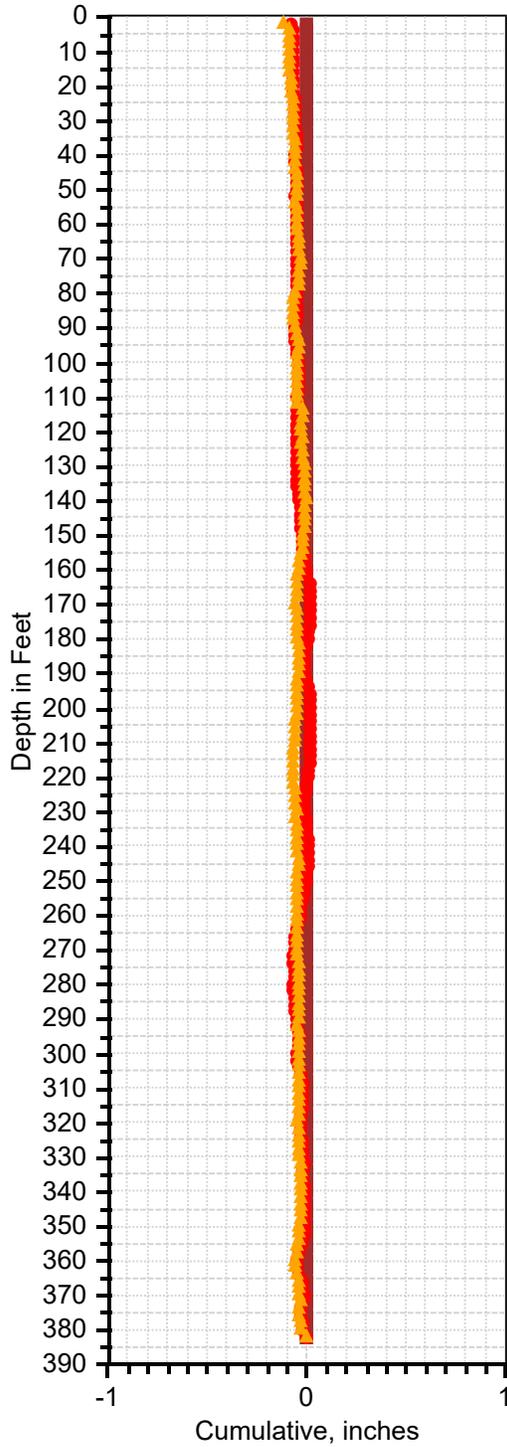


■ 9/3/2020 ● 7/29/2021
▲ 11/30/2021 ◆ 6/23/2022



■ 9/3/2020 ● 7/29/2021
▲ 11/30/2021 ◆ 6/23/2022

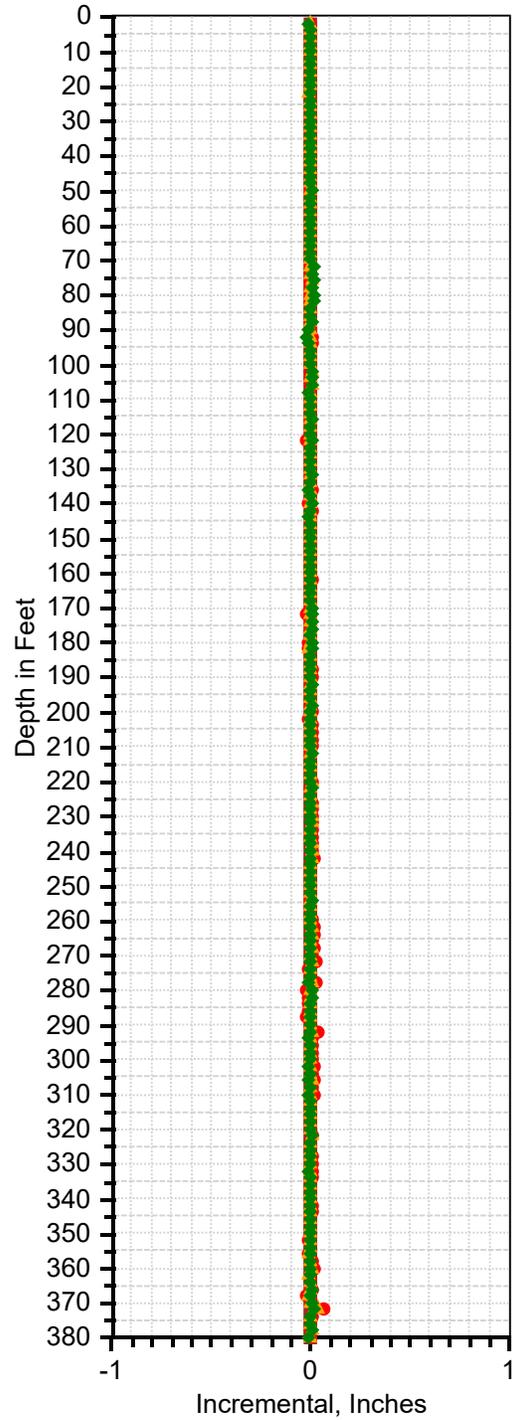
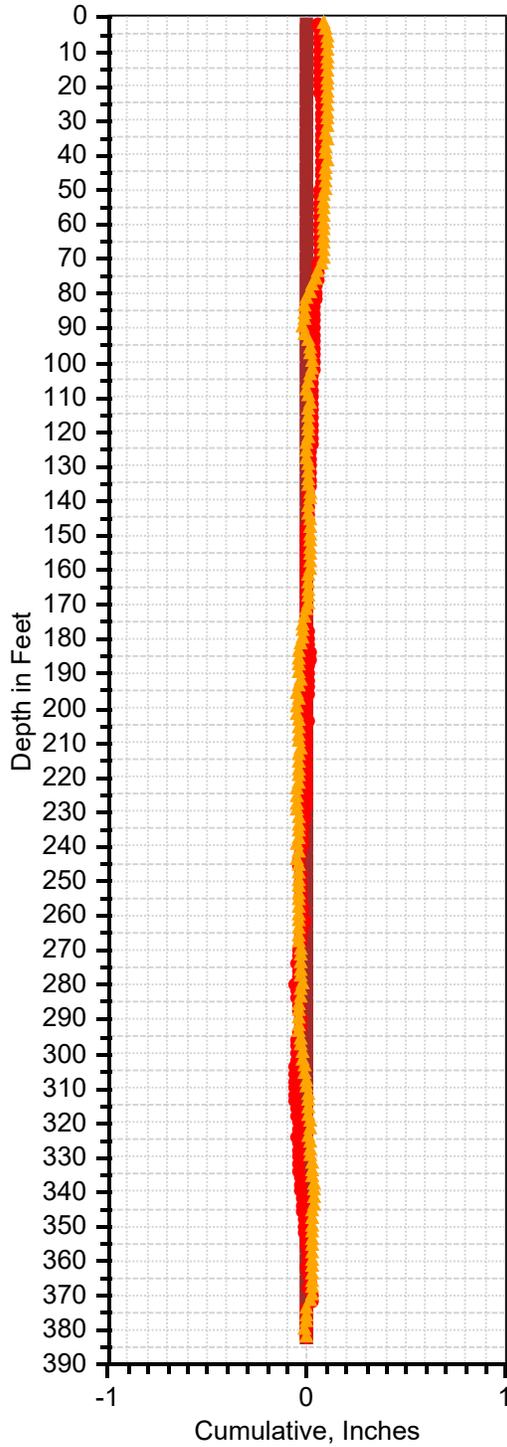
SP-34 A Direction



■ 10/29/2020 ● 7/28/2021 ▲ 5/26/2022

■ 10/29/2020 ● 7/28/2021 ▲ 5/26/2022

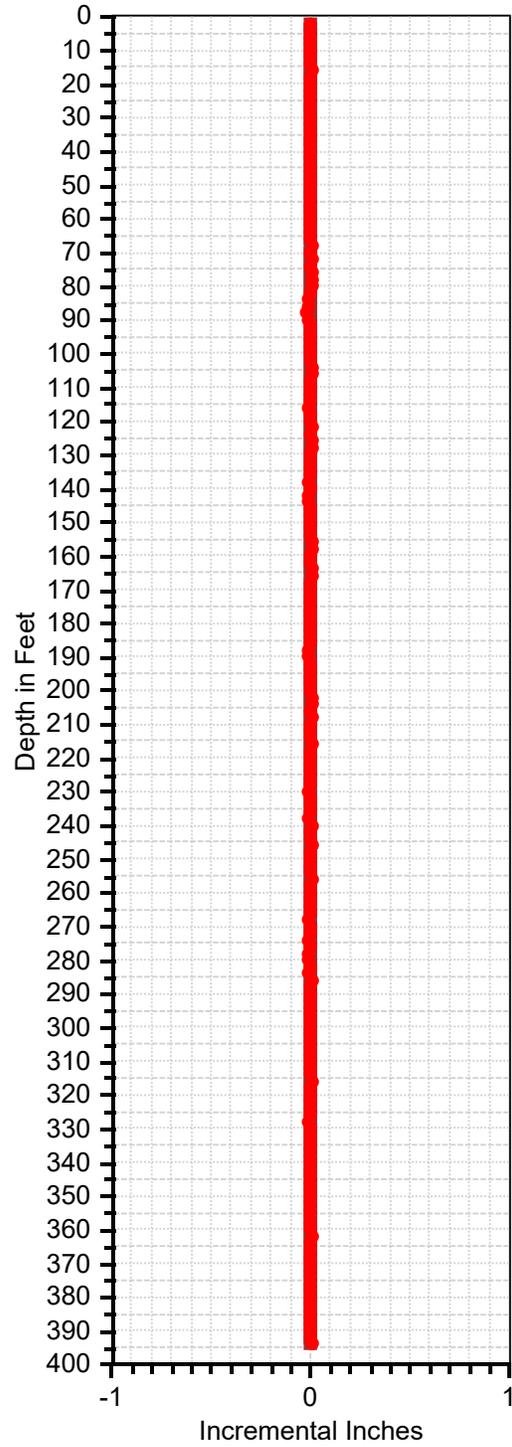
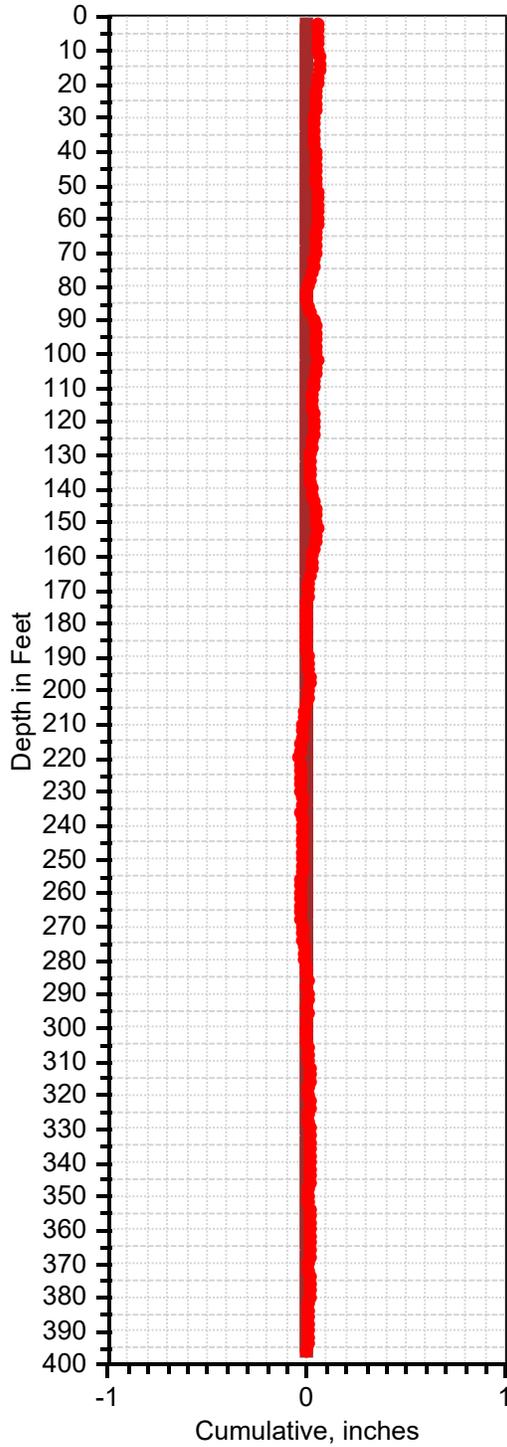
SP-34 B Direction



10/29/2020 7/28/2021 5/26/2022

10/29/2020 4/1/2021
 7/28/2021 5/26/2022

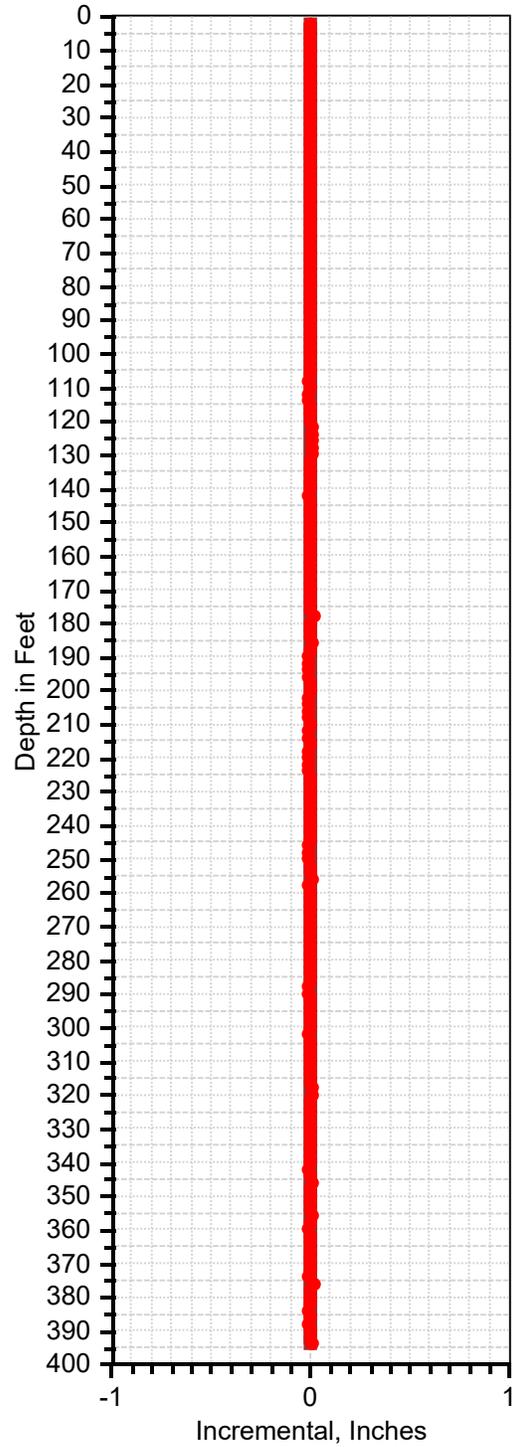
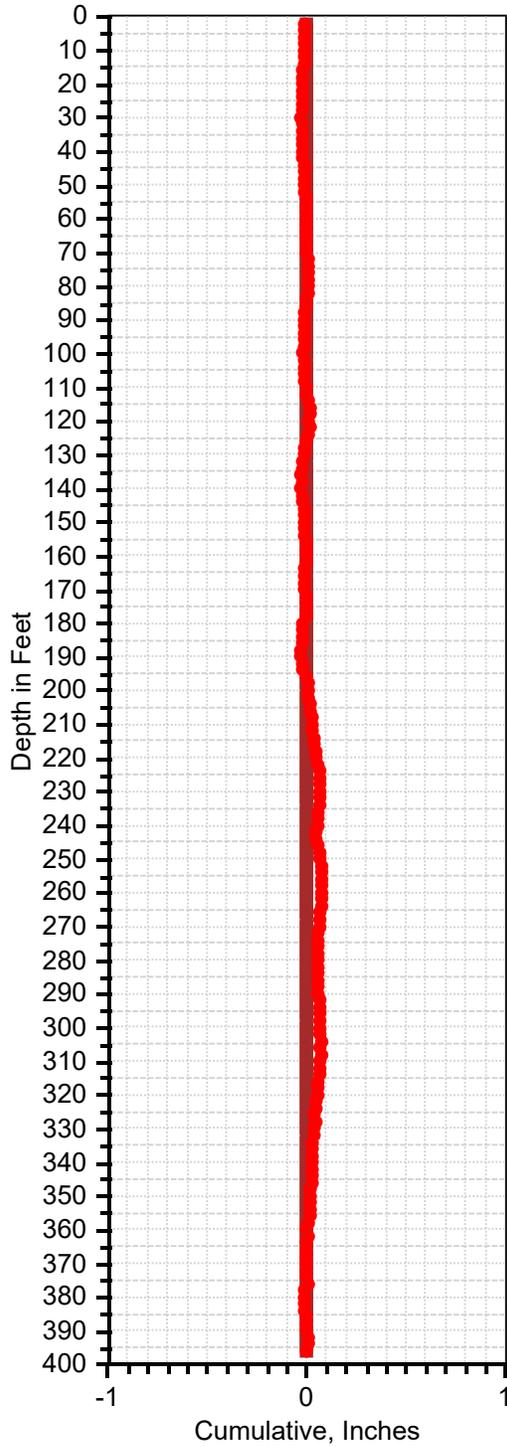
SP-35 A Direction



■ 8/6/2021 ● 6/21/2022

■ 8/6/2021 ● 6/21/2022

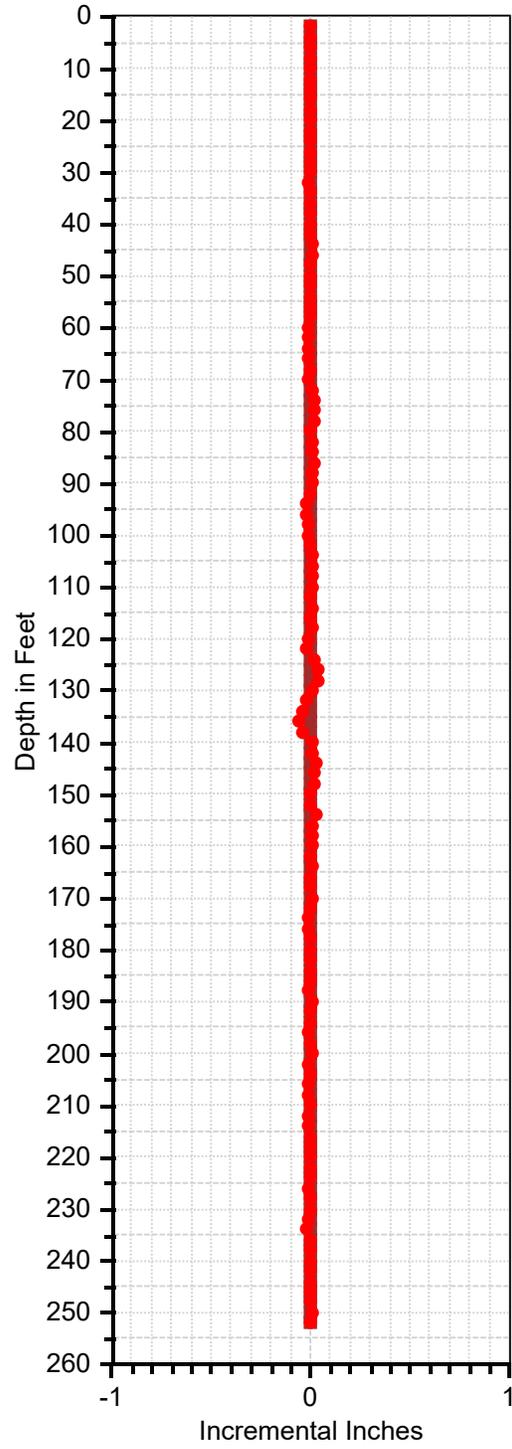
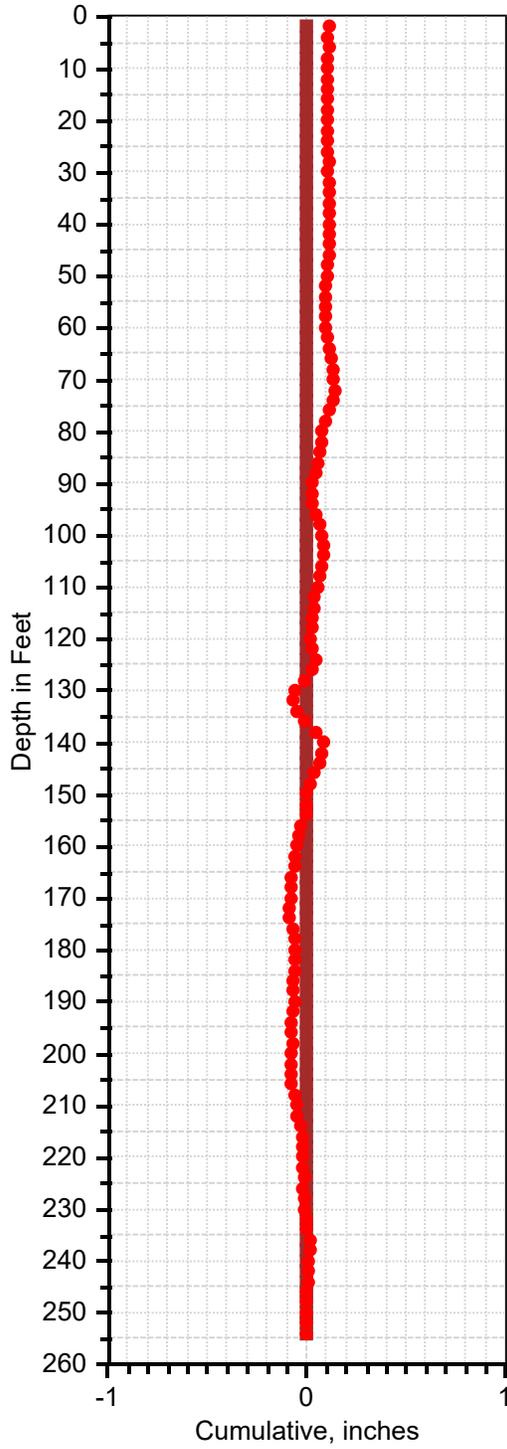
SP-35 B Direction



■ 8/6/2021 ● 6/21/2022

■ 8/6/2021 ● 6/21/2022

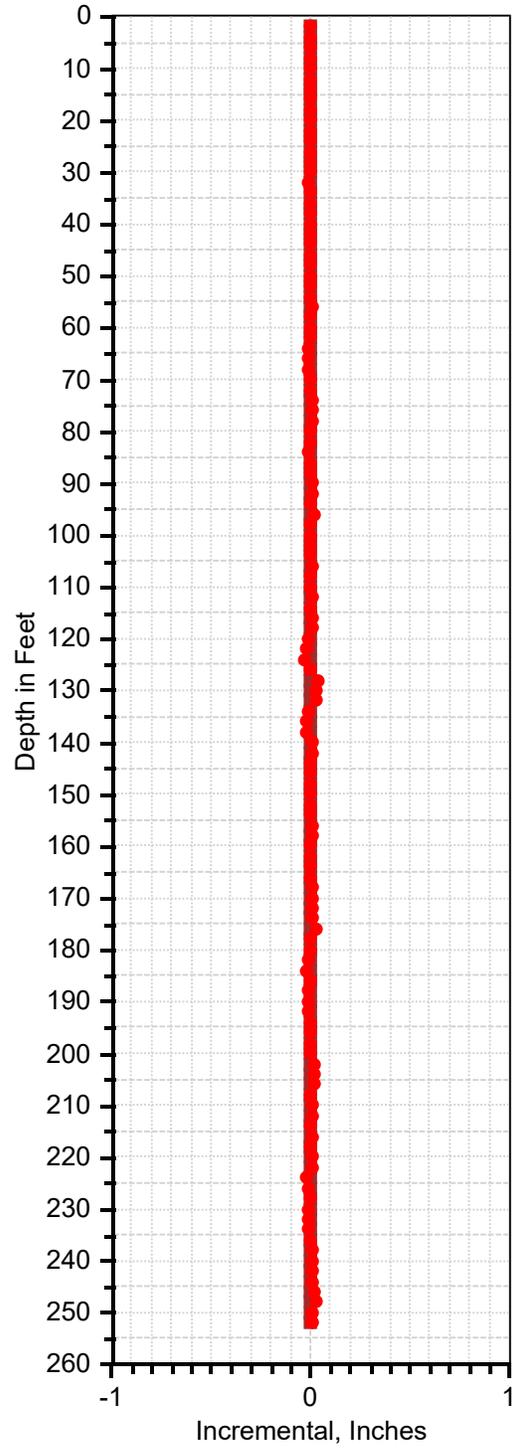
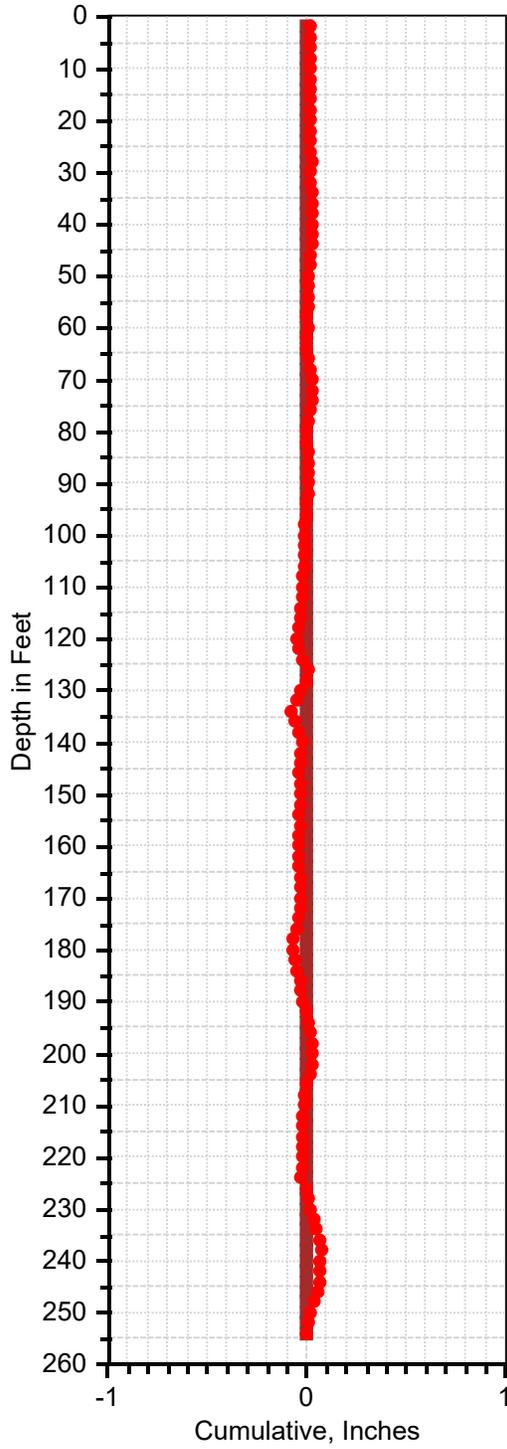
SP-36 A Direction



■ 7/27/2021 ● 6/21/2022

■ 7/27/2021 ● 6/21/2022

SP-36 B Direction



—■— 7/27/2021 —●— 6/21/2022

—■— 7/27/2021 —●— 6/21/2022

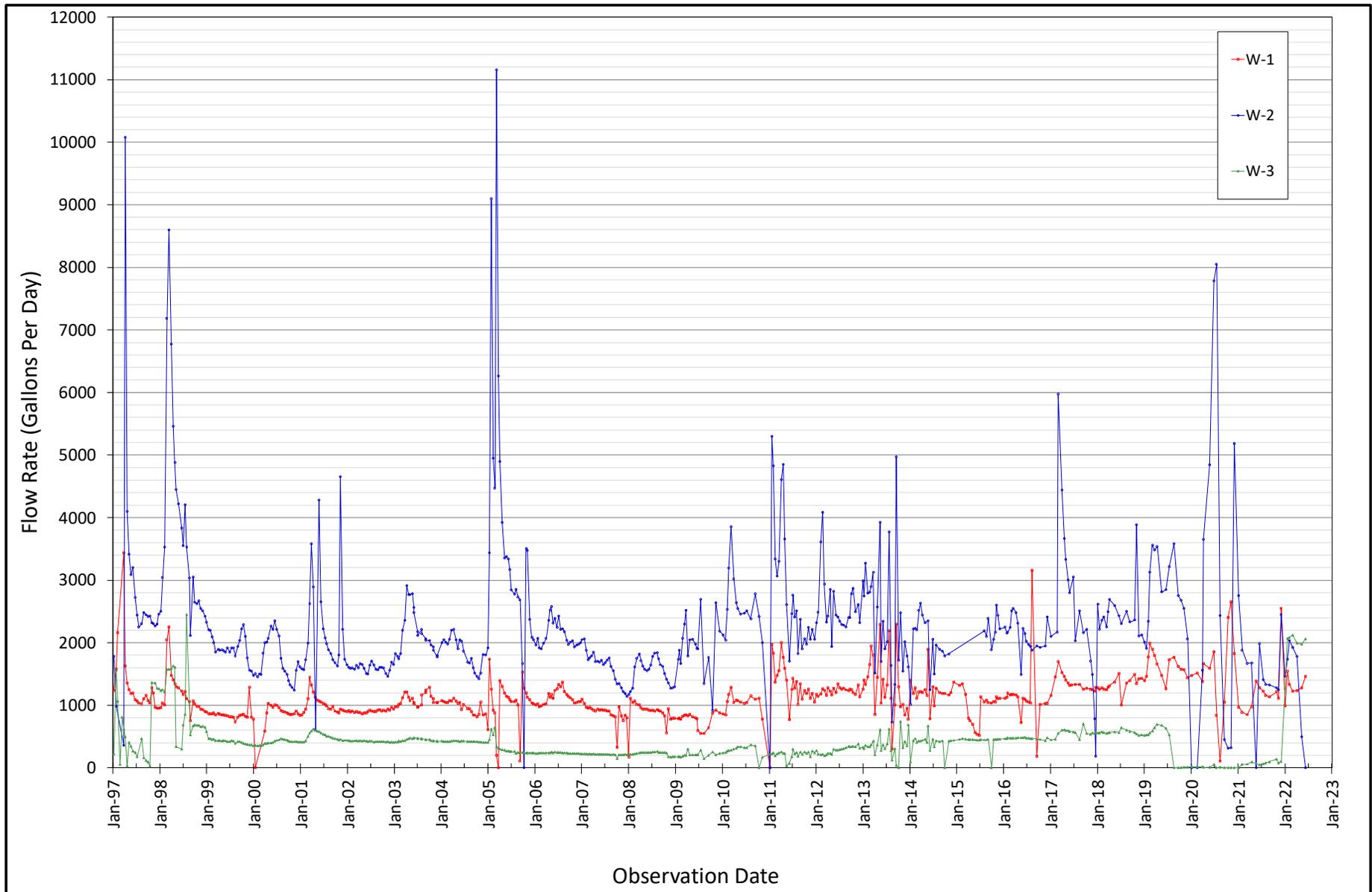
APPENDIX C - DEWATERING

SUMMARY OF DEWATERING WELL INFORMATION

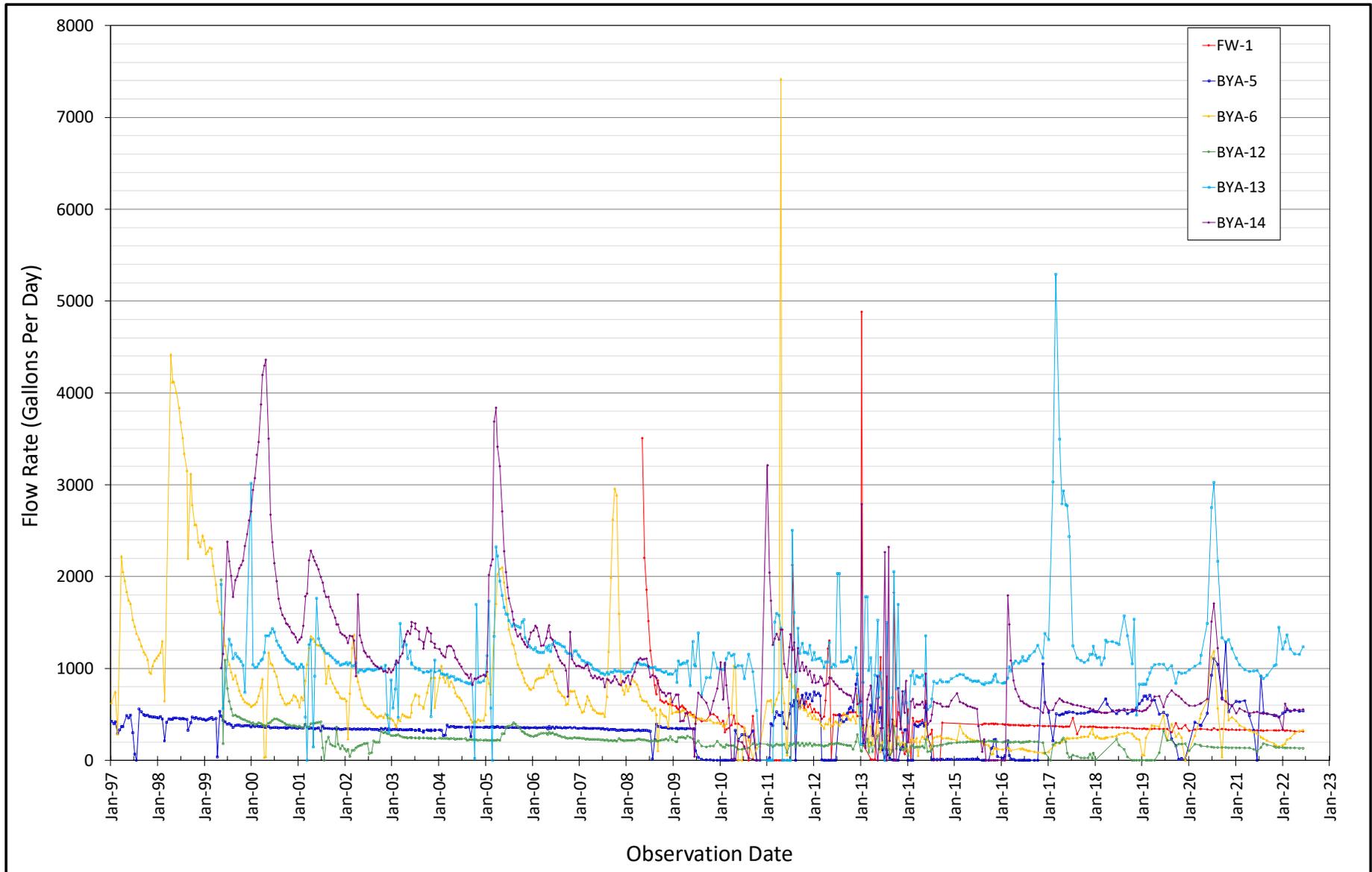
Well I.D.	DATE COMPLETED (DA Evans 1986)	TOP ELEV. (ft.)	BOTTOM ELEV. (ft.)	PUMP ELEV. (ft.)	PUMP SIZE (HP)	2021-2022 PUMPING RATE (GPD)	% of TOTAL PRODUCTION	Rank	Drainage Port	Sounding Tube Present	COMMENT
W-1	1977	210.5	-30	14.5	1.5	1,344	3%	12	3	Yes	Producing
W-2	1955	219	50	45	0.5	1,422	3%	11	3	Yes	Producing
W-3	1973	243.5	-9.5	65.5	0.75	1,089	2%	14	3	Yes	Producing, casing damage at 65.5 feet
W-4	1973	248	-10	N/A	N/A	0	0%	24	N/A	No	Non-producing, casing perforations closed due to siltation (BYA 1991)
W-5	1984	280	252	N/A	N/A	0	0%	24	N/A	No	Capped 4/4/84 (DA Evans 1986)
W-6	1983	174	80	N/A	N/A	0	0%	24	N/A	No	Non-producing, static water level at bottom of casing (BYA 1991)
W-7	1983	257	171	N/A	N/A	0	0%	24	N/A	No	Non-producing, static water level at bottom of casing (BYA 1991)
W-8	1983	287	93	98	1	4,616	10%	4	4	No	Producing
W-9	1983	282	87	N/A	N/A	0	0%	24	N/A	No	Non-producing, static water level at bottom of casing (BYA 1991), replaced with BYA-11
W-10	1983	432	192	194	N/A	0	0%	24	N/A	No	Inactive, no pump
W-11	1983	507	285	292	N/A	0	0%	24	N/A	No	Inactive, disconnected from electrical, replaced with BYA-10
W-12	1983	375	195	N/A	N/A	0	0%	24	N/A	No	Non-producing, casing sheared at 185 ft.elevation (BYA 1991)
W-13	1983	361	184	193	1	1,865	4%	8	5	No	Producing
W-14	1984	283	131	N/A	N/A	0	0%	24	N/A	No	Non-producing, static water level at bottom of casing (BYA 1991)
W-15	1984	295	121	130	N/A	0	0%	24	N/A	No	Inactive, replaced with BYA-9
W-16	1984	325	107	113	0.75	5,949	12%	3	5	Yes	Producing
W-17	1984	270	41	50	0.75	1,833	4%	9	4	Yes	Producing
W-18	1984	750	179	225	3	6,030	13%	1	6	No	Producing
BYA-1	1990	281	-164	30	1	4,364	9%	5	4	Yes	Producing, casing damage at 35 feet
BYA-2	1990	665	215	242	1.5	222	0%	22	6	No	Producing
BYA-3	1990	510	-40	29	3	1,567	3%	10	6	No	Producing
BYA-4	1990	372	-68	-28	1.5	4,235	9%	6	5	No	Producing
BYA-5	1990	189	-231	-211	1.5	548	1%	18	1	No	Producing
BYA-6	1996	220	-280	-275	0.75	229	0%	21	1	No	Producing
BYA-7	1996	240	-120	-115	0.75	912	2%	16	2	No	Producing
BYA-9	1996	295	-105	-70	5	5,986	13%	2	5	Yes	Producing, in-filled -105 to -75 feet
BYA-10	1996	510	210	215	1	659	1%	17	5A	No	Producing
BYA-11	1996	275	-125	-120	0.75	1,868	4%	7	5	No	Producing
BYA-12	1998	207	-140	-137	0.5	144	0%	23	1	No	Producing
BYA-13	1998	329	-14	-18	0.5	1,144	2%	13	3	No	Producing
BYA-14	1998	265	38	40	0.5	514	1%	19	1A	No	Producing
BYA-15	2002	429	340	300	1	0	0%	24	6	No	Producing <10 GPD, water level at pump intake, airline functioning
FW-1	2008	170			1	323	1%	20	1A	No	Producing
FW-2	2009	270	-130	-115	1.5	935	2%	15	4	No	Producing

Note:
 - Not functioning or no longer monitored dewatering well

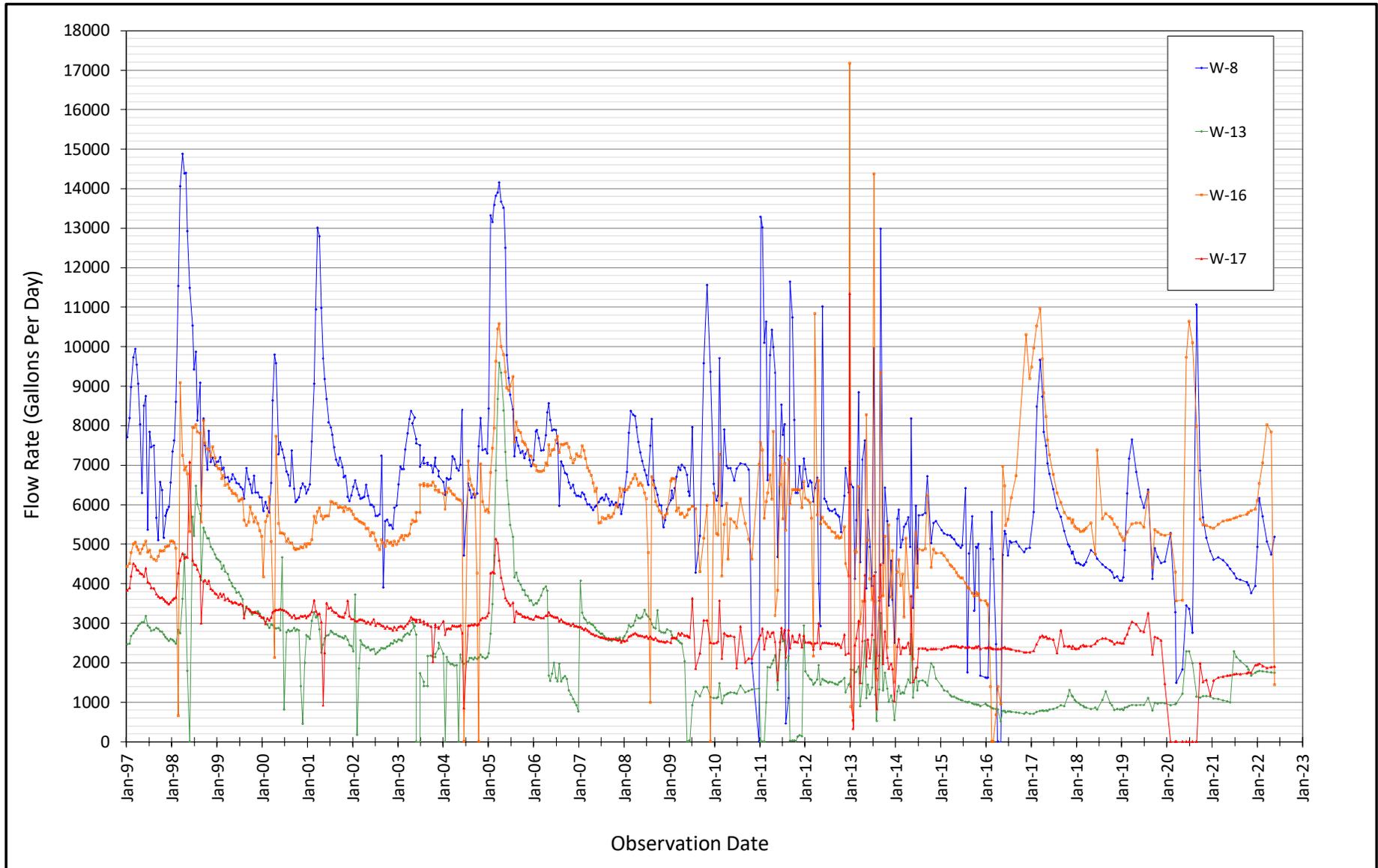
DEWATERING WELL INFORMATION



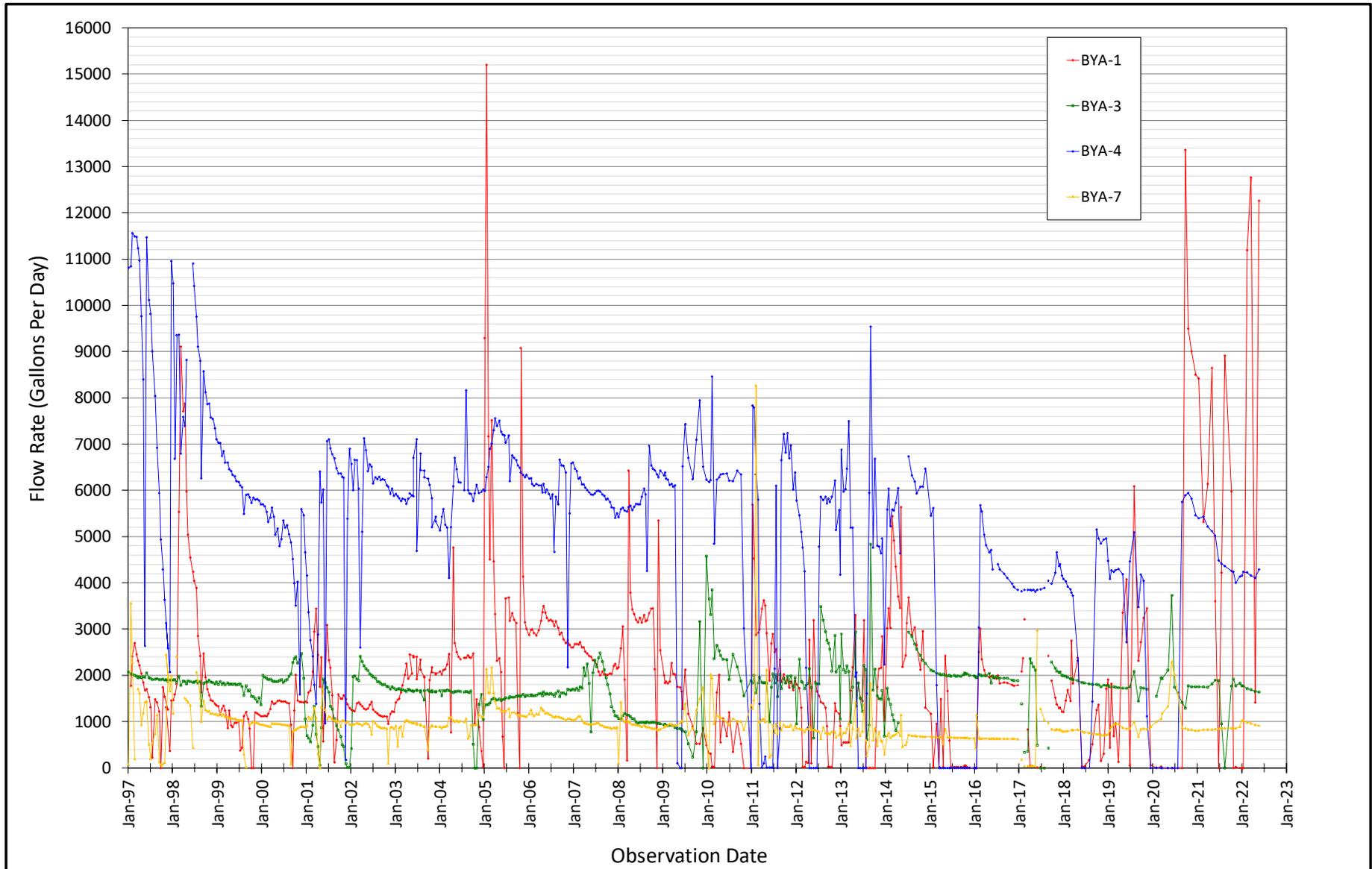
DISCHARGE RATE FOR DEWATERING WELLS
Eastern Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



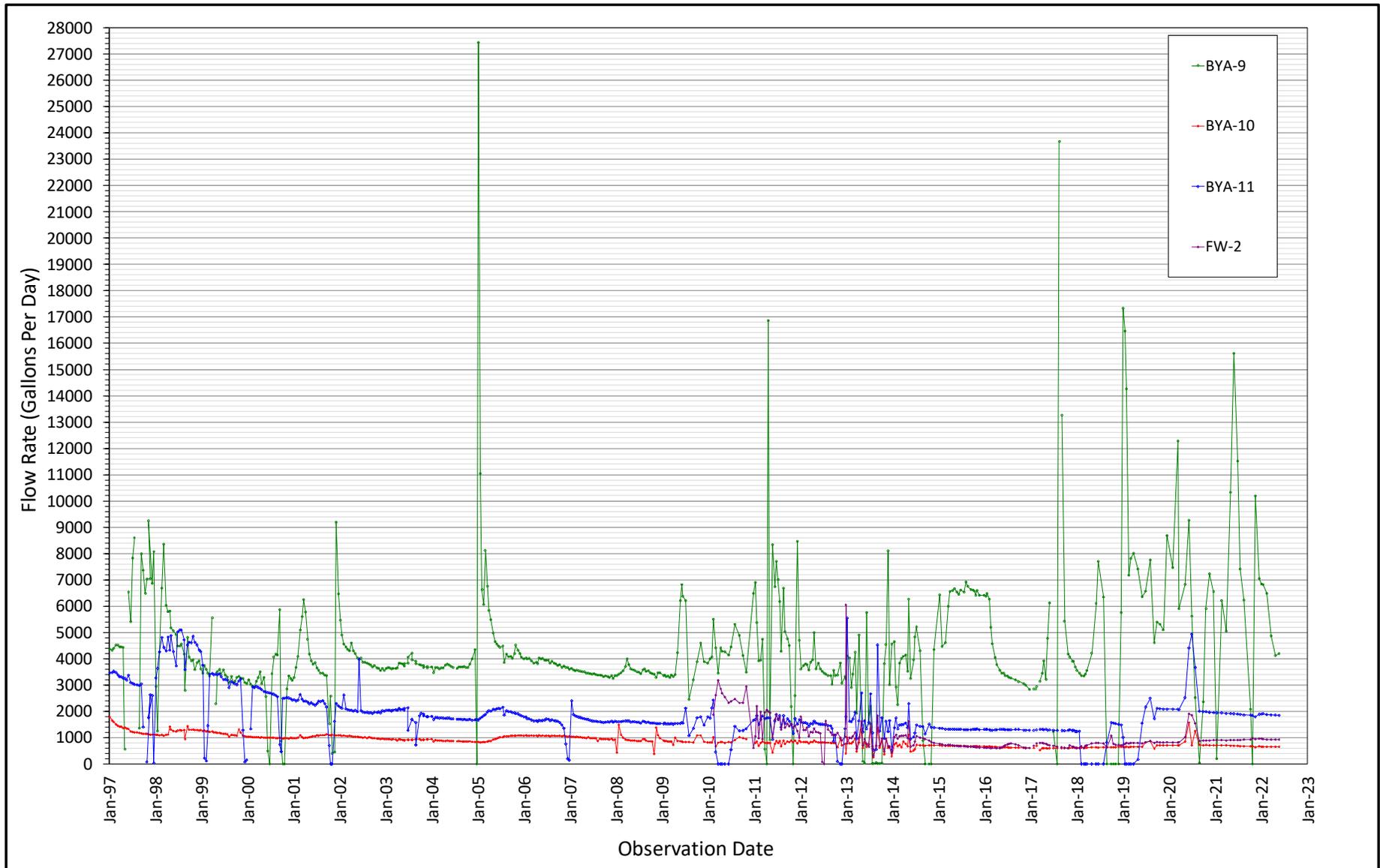
DISCHARGE RATE FOR DEWATERING WELLS
Eastern Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



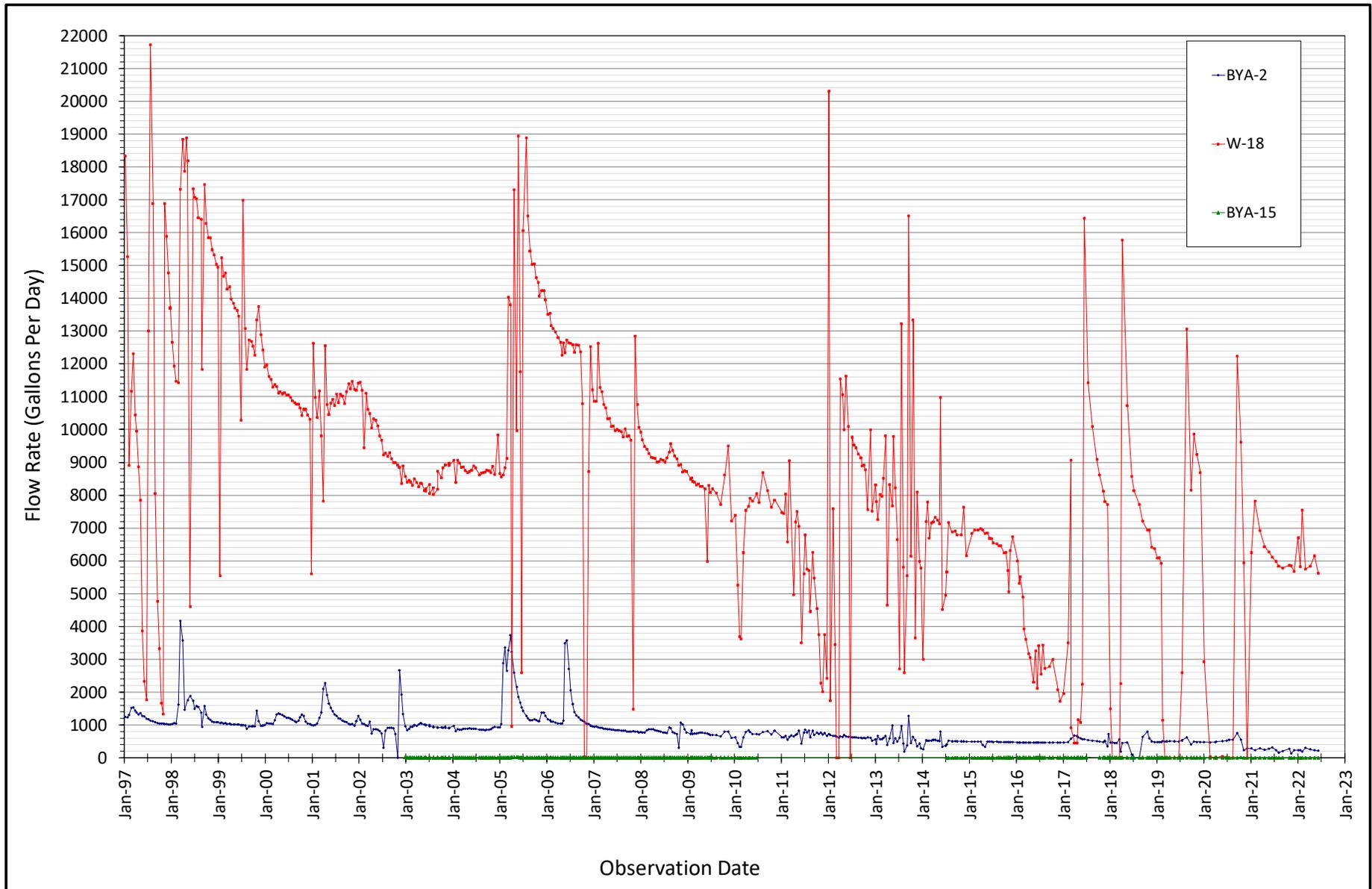
DISCHARGE RATE FOR DEWATERING WELLS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DEWATERING WELL HYDROGRAPHS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DISCHARGE RATE FOR DEWATERING WELLS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DISCHARGE RATES FOR DEWATERING WELLS
Western Extension
Big Rock Mesa Landslide Assessment District
Malibu, California

**BIG ROCK MESA LANDSLIDE ASSESSMENT DISTRICT
FY21/22 ANNUAL REPORT
MALIBU, CALIFORNIA**



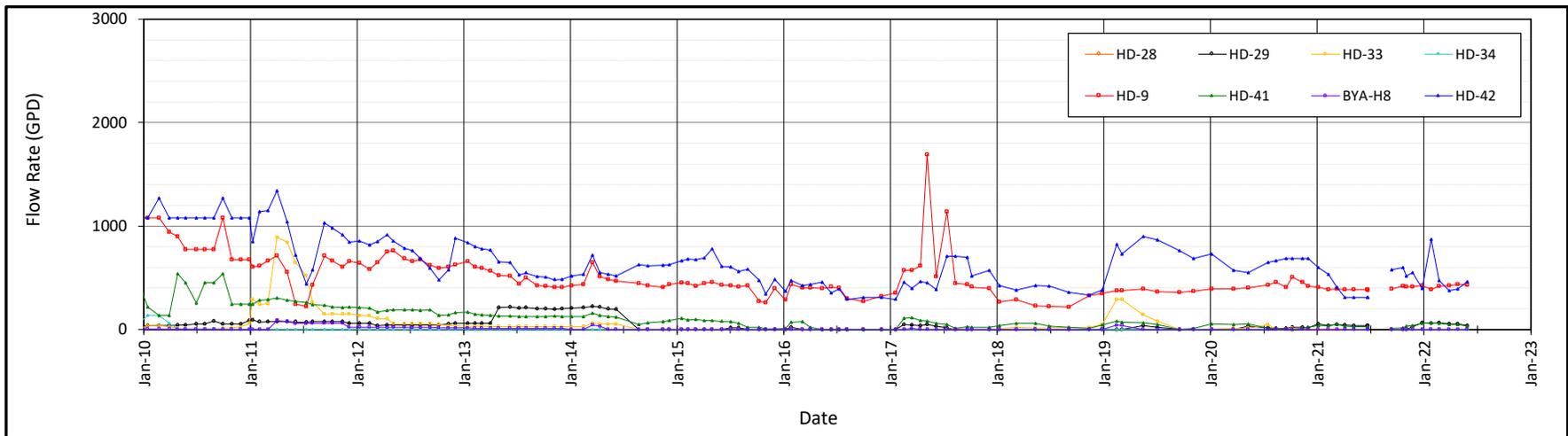
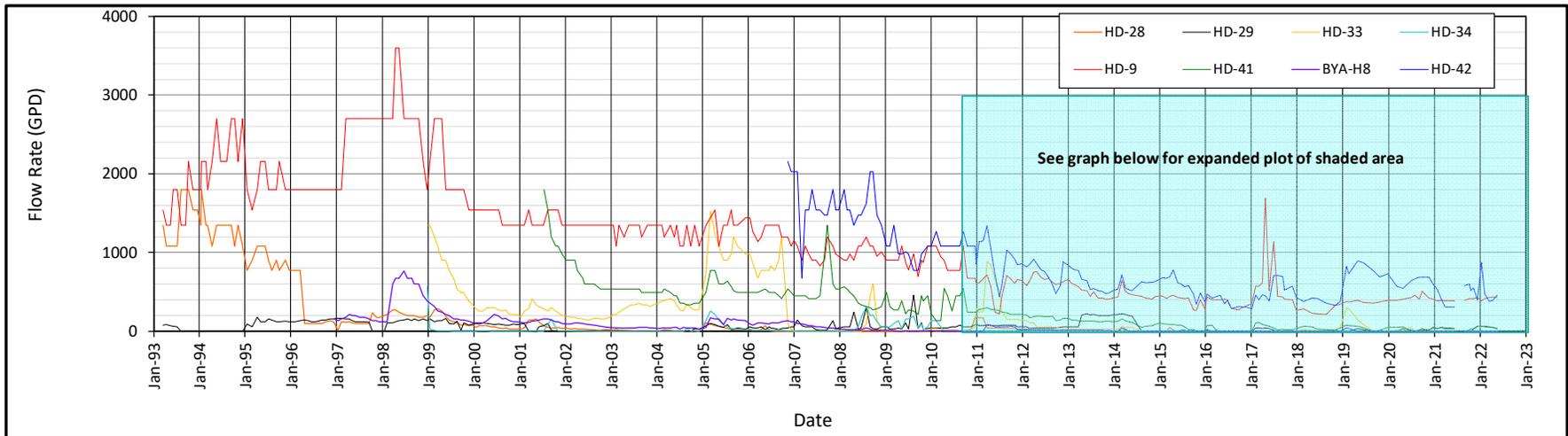
SUMMARY OF HYDRAUGER INFORMATION							
HYDRAUGER ID	INSTALLED LENGTH (ft.)	OPEN LENGTH (ft.)**	Orientation/ Slope	2021-2022 Average Flow (GPD)	% OF TOTAL PRODUCTION	Rank	INSTALLED BY
H-1	700	210**	S115W / 3	7	0.1%	22	MT
HD-4	760	10	-	612	4.7%	6	D.E.
HD-5	890	530**	-	349	2.7%	10	D.E.
HD-6	980	490**	-	26	0.2%	17	D.E.
HD-7	1160	420**	-	68	0.5%	14	D.E.
HD-9	205	205**	-	417	3.2%	8	D.E.
HD-10	990	170**	-	284	2.2%	11	D.E.
HD-11	540	540**	-	182	1.4%	12	D.E.
HD-12	690	385**	-	1821	13.8%	3	D.E.
HD-15	200	200**	-	122	0.9%	13	D.E.
HD-22	568	540**	-	738	5.6%	5	D.E.
HD-23	1280	260**	-	1331	10.1%	4	D.E.
HD-24	1030	580**	-	20	0.2%	18	D.E.
HD-25	1005	360**	-	46	0.4%	15	D.E.
HD-26	1200	410**	S37W / 1	2930	22.3%	2	D.E.
HD-28	1420	595**	-	4	0.0%	23	D.E.
HD-29	1150	450**	-	15	0.1%	19	D.E.
HD-30	1040	10**	S13W / 7	3179	24.2%	1	D.E.
HD-33	340	340	S23W / 5	7	0.1%	21	BYA
HD-41	500	500	S18E / 3	39	0.3%	16	BYA
BYA-H8	500	345**	-	0	--	--	BYA
BYA-H10	500	10**	-	14	0.1%	20	BYA
HD-42	700	700	-	554	4.2%	7	Fugro
HD-43	700	700	-	387	2.9%	9	Fugro
H-2*	Unknown	0	-	0	--	--	MT
H-3a*	Unknown	0	-	0	--	--	MT
H-3b*	Unknown	0	-	0	--	--	MT
H-3c*	Unknown	0	-	0	--	--	MT
H-4	680	115**	-	0	--	--	MT
H-5a*	Unknown	0	-	0	--	--	MT
H-5b*	Unknown	0	-	0	--	--	MT
H-6a*	100	96	-	0	--	--	CT
H-6b*	100	96	-	0	--	--	CT
H-7a*	100	100	-	0	--	--	CT
H-7b*	100	96	-	0	--	--	CT
H-7c*	50	0	-	0	--	--	CT
H-8*	Unknown	0	-	0	--	--	CT
HD-1*	350	340**	-	0	--	--	D.E.
HD-2a*	70	33	-	0	--	--	D.E.
HD-2b*	Unknown	0	-	0	--	--	D.E.
HD-2c*	460	0	-	0	--	--	D.E.
HD-3	560	90**	-	0	--	--	D.E.
HD-8*	530	170**	-	0	--	--	D.E.
HD-13*	650	14	-	0	--	--	D.E.
HD-14*	130	130**	-	0	--	--	D.E.
HD-16	575	575**	-	0	--	--	D.E.
HD-17*	750	176	-	0	--	--	D.E.
HD-18*	870	285	-	0	--	--	D.E.
HD-19*	1000	182	-	0	--	--	D.E.
HD-20*	1000	446	-	0	--	--	D.E.
HD-21*	1560	147	-	0	--	--	D.E.
HD-27*	700	327	-	0	--	--	D.E.
HD-31*	140	113	-	0	--	--	D.E.
HD-32*	835	700**	-	0	--	--	D.E.
HD-34	150	150	S40W / 10	0	--	--	BYA
HD-35*	40	40	-	0	--	--	BYA
HD-36*	150	150	-	0	--	--	BYA
HD-37*	430	50	-	0	--	--	BYA
HD-38A*	140	140	S23W / 5	0	--	--	BYA
HD-38B*	140	140	S18W / 6	0	--	--	BYA
HD-39	400	400	S15E / 5	0	--	--	BYA
HD-40*	595	595	S25W / 6	0	--	--	BYA
BYA-6a	350	20**	-	0	--	--	BYA
BYA-6b	60	60	-	0	0.0%	24	BYA
BYA-7	400	375**	-	0	--	--	BYA
BYA-H9*	550	550**	-	0	--	--	BYA
BYA-H11*	450	400**	S7E / 3	0	--	--	BYA

* Not functioning or no longer monitored hydrauger

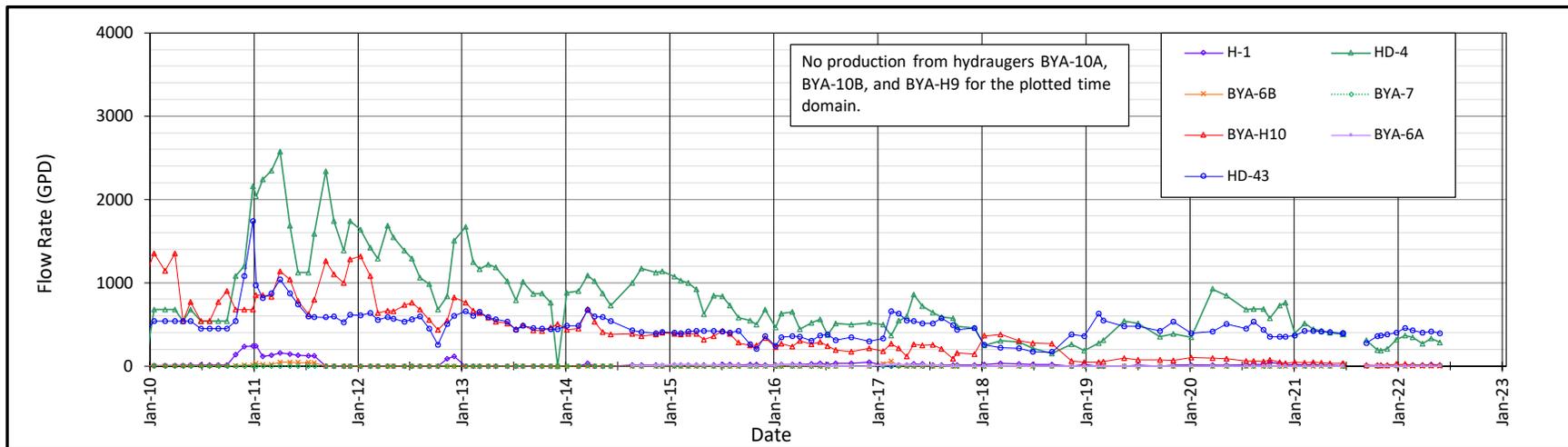
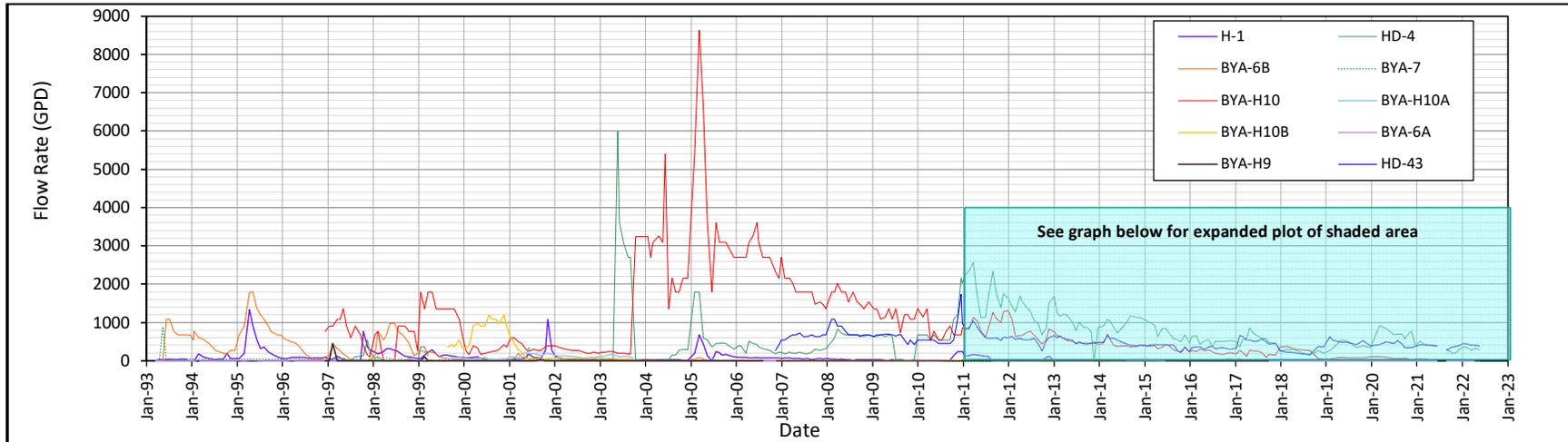
** Open Length is Measured on 10-1997 by BYA

Installed by: MT = Moore & Taber; CT = Caltrans; D.E. = D.A. Evans; BYA = Bing Yen & Associates

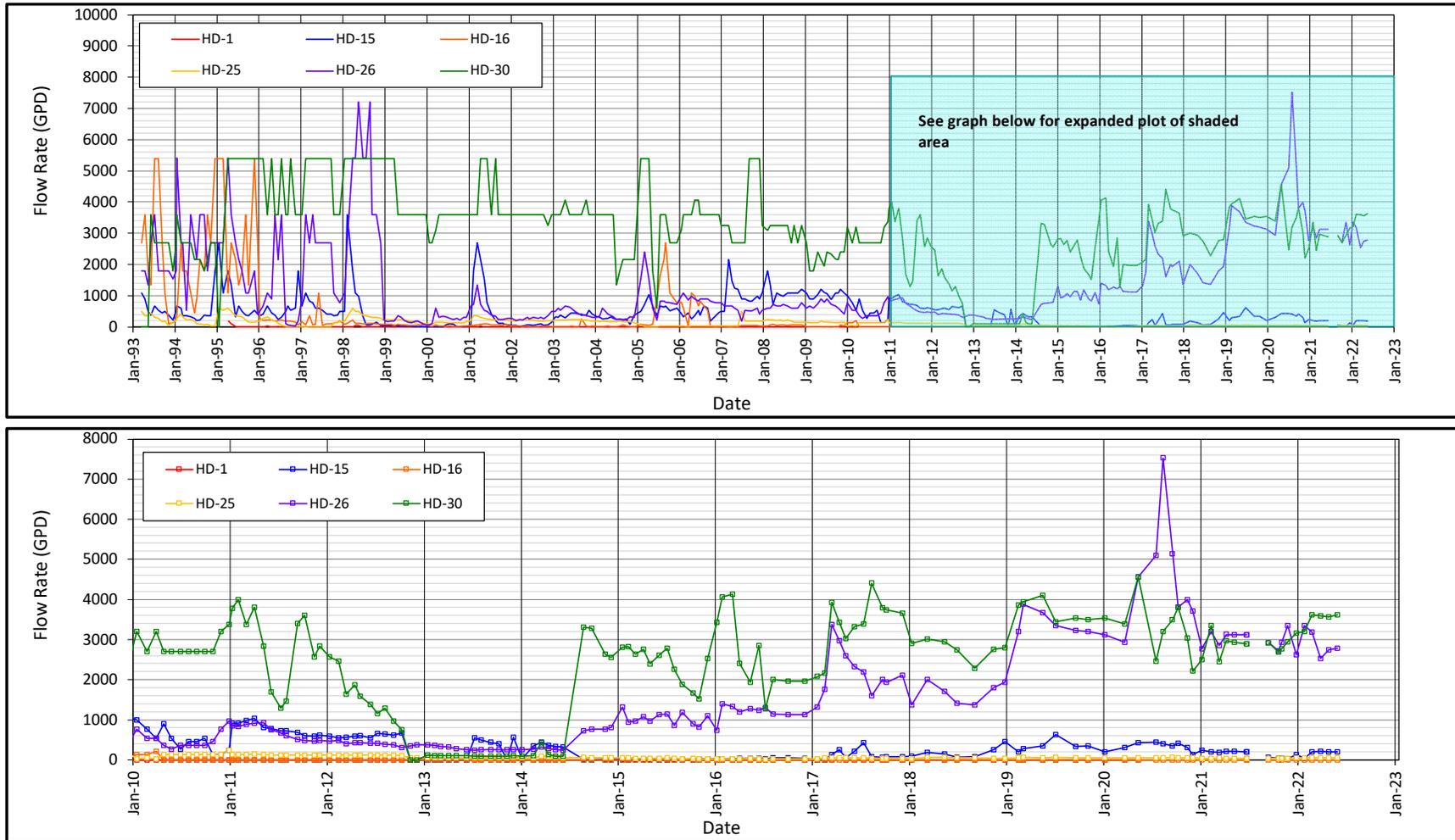
SUMMARY OF HYDRAUGER INFORMATION
Big Rock Mesa Landside Assessment District
Malibu, California



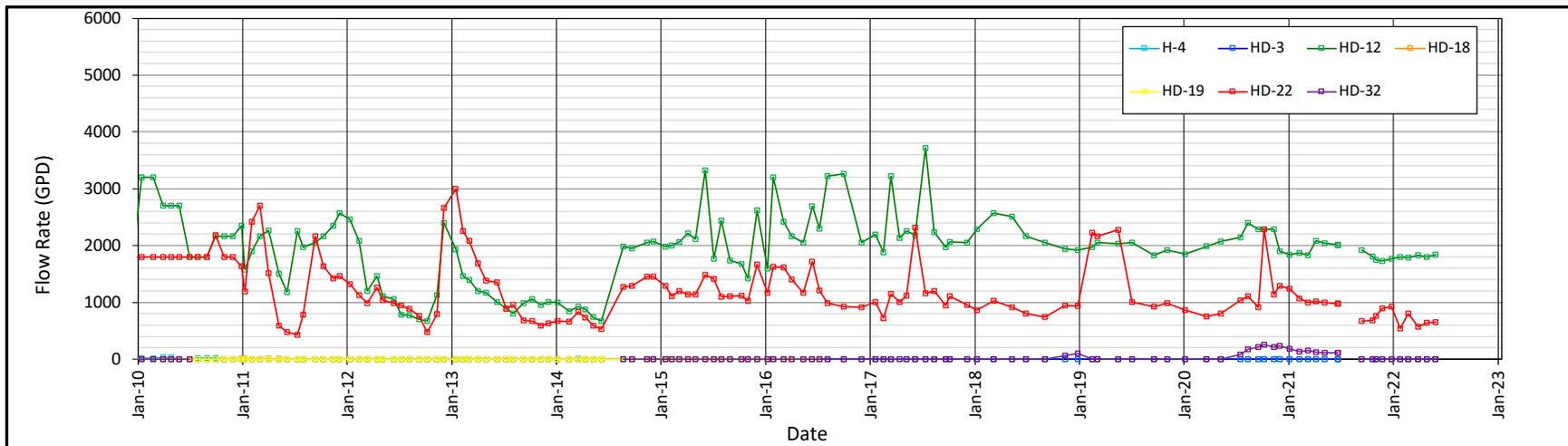
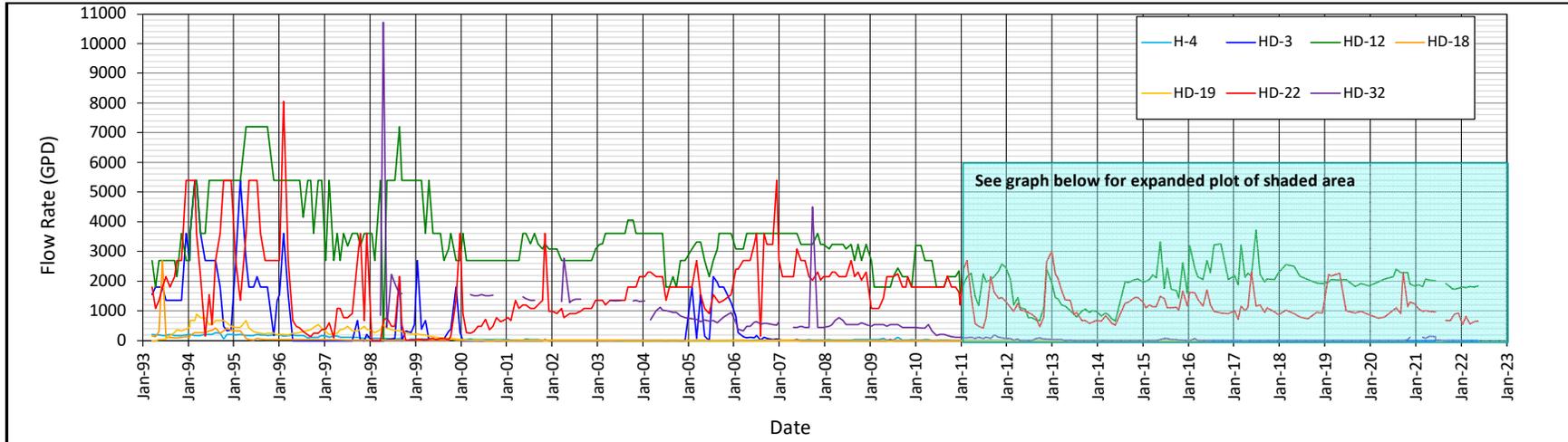
DISCHARGE RATE FOR HYDRAUGERS
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



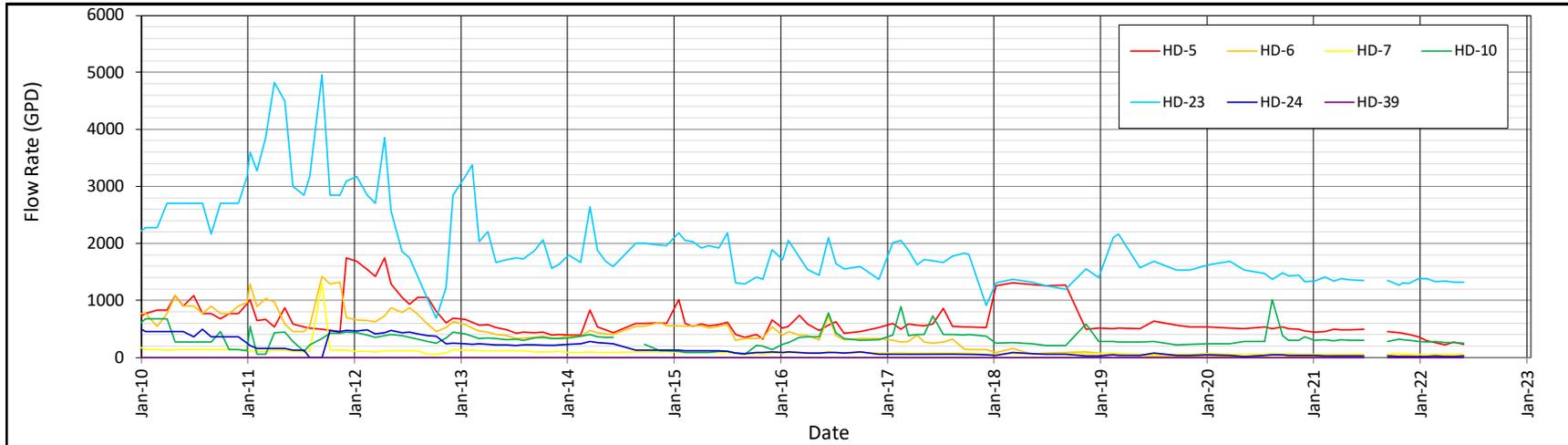
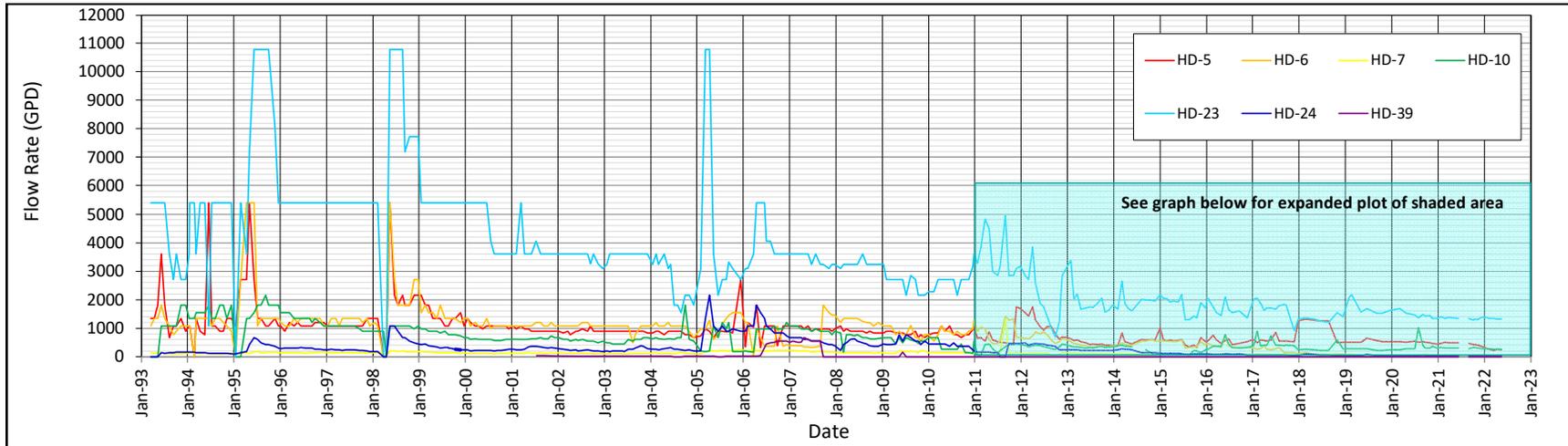
DISCHARGE RATE FOR HYDRAUGERS
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Western Extension
 Big Rock Mesa Landslide Assessment District
 Malibu, California

APPENDIX D - GROUNDWATER QUALITY

2021 Q3 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature °F	Biochemical Oxygen Demand mg/L	Surfactants (MBAS) mg/L	Oil & Grease mg/L	Settleable Solids mL/L	Sulfides mg/L	Phenols mg/L	Residual Chlorine (Field Measured) mg/L	Total Suspended Solids mg/L	Turbidity NTU	TPH Diesel µg/L	TPH Motor Oil µg/L	Bis(2-Ethylhexyl) Phthalate µg/L	Zinc µg/L	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Coliform >0.1?	Enterococcus MPN/100ml	Acute Toxicity*** % Survival	
Composited Discharge Points M-001 through M-010																							
8/12/2021	M-001	1%	8.38	76.6	7.0	ND	ND	ND	ND	ND	0.00	0.78 A10	0.50	ND	ND	ND	24J	>1600	33	No	210	-	
	M-002	3%																					
	M-003	no flow																					
	M-004	12%																					
	M-005	27%																					
	M-006	35%																					
	M-007	1%																					
	M-008	17%																					
	M-009(HD-7)	1%																					
M-010	3%																						
Discharges to M-001 (Outfall/Port #1a)																							
7/7/2021	BYA-14	100%	7.65	69.1	ND	0.044 J	ND	ND	ND	ND	0.02	ND	0.64	ND	ND	ND	11 J	<1.8	<1.8	N/A	<1	--	
9/22/2021	BYA-14	61%	7.86	76.5	7.2	ND	ND	ND	11 A10	ND	0.02	2.8 A11	38 A10	ND	ND	ND	30 J	540	<1.8	N/A	<1	--	
9/22/2021	Duplicate	--	7.86	76.5	5.60	ND	ND	ND	11 A10	ND	0.02	3.2 A11, S05	26	ND	ND	ND	11 J	540	<1.8	N/A	<1	--	
Discharges to M-002 (Outfall/Port #1)																							
7/7/2021	HD-42	45%	7.15	72.5	ND	0.025 J	ND	ND	ND	ND	0.00	ND A07	0.17	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/28/2021	HD-9	55%	8.40	77.7	1.5	ND	ND	ND A10	ND	ND	0.02	ND A11	0.5	ND	ND	ND	50	4.5	<1.8	N/A	80	--	
	BYA-6	19%																					
	BYA-5	27%																					
	BYA-12	not sampled																					
	HD-29	24%																					
	HD-9	2%																					
HD-42	20%																						
Discharges to M-003 (Outfall/Port #2)																							
7/7/2021	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
9/22/2021	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-004 (Outfall/Port #3)																							
7/7/2021	W-2	59%	7.44	74.1	ND	0.031 J	ND	ND	ND	ND	0.01	ND A07	0.26	ND	ND	ND	21 J	<1.8	<1.8	N/A	<1	--	
9/28/2021	BYA-13	41%	8.18	73.8	ND	ND	ND	ND A10	ND	ND	0.00	5.6 A11	0.44	ND	ND	ND	44 J	40	<1.8	N/A	<1	--	
	W-1	18%																					
	W-2	19%																					
	W-3	low flow																					
	BYA-13	13%																					
	BYA-H10	low flow																					
	H-1	low flow																					
	HD-30	40%																					
	HD-4	5%																					
HD-43	6%																						
Discharges to M-005 (Outfall/Port #4)																							
7/7/2021	W-8	100% down	7.42	72.7	ND	ND	ND	ND	ND	ND	0.01	ND A07	0.17	ND	ND	ND	14 J	<1.8	<1.8	N/A	4	--	
9/28/2021	W-8	26%	7.87	72.9	ND	ND	ND	ND A10	ND	ND	ND	5.8 A11	1.40	ND	ND	ND	50	33	<1.8	N/A	<1	--	
	W-17	10%																					
	BYA-1	35%																					
	BYA-7	5%																					
	FW-2	5%																					
	HD-15	1%																					
	HD-16	dry																					
	HD-25	0.2%																					
HD-26	18%																						
Discharges to M-006 (Outfall/Port #5)																							
7/7/2021	HD-22	100%	7.49	68.7	1.5	ND	ND	0.10	ND	ND	0.00	2.7	4.0	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/28/2021	W-16	vehicle	7.88	74.8	ND	ND	ND	ND	ND	ND	0.00	7.6 A11	1.8	ND	ND	ND	35 J	4.0	<1.8	N/A	89	--	
	BYA-4	52%																					
	BYA-9	pump down																					
	W-13	16%																					
	BYA-11	20%																					
	H-4	dry																					
	HD-22	9%																					
	HD-3	dry																					
HD-32	2%																						
Discharges to M-007 (Outfall/Port #5a)																							
7/7/2021	BYA-10	100%	7.66	74.1	ND	0.028 J	ND	ND	ND	ND	0.00	ND A07	0.46	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/22/2021	BYA-10	100%	7.82	73.8	ND	ND	ND	ND	ND	ND	0.05	3.2 A11	1.10	ND	ND	ND	22 J	<1.8	<1.8	N/A	<1	--	
Discharges to M-008 (Outfall/Port #6)																							
7/7/2021	HD-10	13%	7.30	73.8	1.50	0.038 J	ND	ND	ND	ND	0.00	ND	0.24	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/22/2021	HD-12	87%	9.05	71.8	ND	ND	ND	ND	ND	ND	0.00	3.6 A11	1.30	ND	ND	ND	17 J	920	4.5	No	160	--	
9/22/2021	M-008	100%																					
Discharges to M-009 (Outfall/Port #7)																							
7/7/2021	HD-7	100%	8.02	77.4	ND	ND	ND	ND	ND	ND	0.00	2.0 A07	0.15	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/22/2021	HD-7	100%	8.38	74.8	ND	0.064 J, A10	1.3 J	ND	ND	ND	0.00	3.2 A11	0.22	ND	ND	ND	18 J	<1.8	<1.8	N/A	<1	--	
Discharges to M-010 (Outfall/Port #9)																							
7/7/2021	HD-5	23%	7.65	74.3	2.4	ND	ND	ND	ND	ND	0.00	ND A07	0.14	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
7/7/2021	HD-6	10%	7.65	74.3	2.7	0.025 J	ND	ND	ND	ND	0.00	ND A07	0.31	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	HD-23	67%																					
7/7/2021	Duplicate	--	7.65	74.3	2.7	0.025 J	ND	ND	ND	ND	0.00	ND A07	0.31	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
9/22/2021	HD-5	99%	7.70	72.7	1.60	ND	ND	ND	ND	ND	0.00	2.0 A11	0.17	ND	ND	ND	19 J	<1.8	<1.8	N/A	<1	--	
	HD-6	1%																					
	HD-23	1%																					
	HD-24	1%																					
Effluent Limit (Daily Max.)																							
			---	---	30	0.5	15	0.3	1.0	1.0	0.1	75	150	100	100	11	95	10000	400		104	90	
Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1)																							
			---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Effluent Limit (Monthly Avg.)																							
			---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

-- = Not tested for
 --- = No established limit.
 ** = Acute Toxicity samples were collected on 1/21/15
 ND = none detected above laboratory
 NR = No reading taken
 J = Laboratory estimated value, below PQL and above the MDL.
 A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
 B = Indicates laboratory measurement.
 A01= Detection and quantitation limits were raised due to sample dilution
 A52 = Chromatogram not typical of diesel
 A57= Chromatogram not typical of motor oil
 A07= Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
 A11= Detection and quantitation limits were raised due to inadequate sample size received.
 D = Chromatogram not typical of motor oil
 1 = Chlorine test repeated after flow appeared to increase
 2= Area of coalescence that discharges through M-007
 S05= Sample holding time was exceeded

0.12 Exceedance of effluent limit.
0.12 Waiting for data
0.12 Exceedance Sampling Needed

2021 Q4 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature °F	Biochemical Oxygen Demand mg/L	Surfactants (MBAS) mg/L	Oil & Grease mg/L	Settleable Solids mL/L	Sulfides mg/L	Phenols mg/L	Residual Chlorine (Field Measured) mg/L	Total Suspended Solids mg/L	Turbidity NTU	TPH Diesel µg/L	TPH Motor Oil µg/L	Bis(2-Ethylhexyl) Phthalate µg/L	Zinc µg/L	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Coliform >0.1?	Enterococcus MPN/100ml	Acute Toxicity** % Survival	
Discharges to M-001 (Outfall/Port #1a)																							
10/21/2021	BYA-14	61%	7.48	68.4	3.0	0.041 J	ND	ND	9.0 A10	ND	0.00	1.4 A10	9.30	ND	ND	ND	11 J	920	<1.8	N/A	<1	--	
	FW-1	39%																					
11/16/2021	BYA-14	61%	7.41	70.2	3.3	ND	ND	ND	6.5 A10	ND	0.00	1.6 A10	18.0	ND	ND	ND	10 J	23	<1.8	N/A	<1.1	100%	
	FW-1	39%																					
12/16/2021	BYA-14	0%	7.5	65.5	8.5	ND	ND	ND	21 A10	ND	0.00	5.0 A10	52	ND	ND	ND	ND	>1600	<1.8	N/A	<1	--	
	FW-1	100%																					
Discharges to M-002 (Outfall/Port #1)																							
10/21/2021	M-002	N/A	9.34	70.2	ND	0.041 J	ND	ND	ND	ND	0.01	1.0 A10	0.2	ND	ND	ND	ND	240	<1.8	N/A	4.0	--	
11/16/2021	M-002	N/A	8.40	63.5	1.6	ND	ND	ND	ND	ND	0.00	0.86 A10	0.11	ND	ND	ND	ND	240	<1.8	N/A	20	100%	
12/16/2021	M-002	N/A	8.28	64.6	ND	ND	0.90 J	ND	ND	ND	0.00	1.9 A10	0.17	ND	ND	ND	ND	24	<1.8	N/A	2.0	--	
Discharges to M-003 (Outfall/Port #2)																							
10/21/2021	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
11/16/2021	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/16/2021	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-004 (Outfall/Port #3)																							
10/21/2021	M-004	N/A	9.05	70.7	7.6	3.2 A10	ND	ND	ND	ND	0.01	3.4 A10	1.40	ND	ND	ND	ND	>1600	540	Yes	550	--	
11/16/2021	M-004	N/A	8.80	71.1	ND	ND	ND	ND	ND	ND	0.00	0.86 A10	0.17	ND	ND	ND	ND	920	240	Yes	22	100%	
12/16/2021	M-004	N/A	8.68	69.1	1.8	ND	ND	ND	ND	0.037 J	0.00	1.7 A10	1.0	ND	ND	ND	ND	>1600	170	Yes	1700	--	
	Duplicate	N/A	8.68	69.1	1.8	ND	0.80 J	0.11	ND	ND	0.00	5.0 J	0.22	ND	ND	ND	ND	55	>1600	220	Yes	1600	--
Discharges to M-005 (Outfall/Port #4)																							
10/21/2021	M-005	N/A	9.21	70.0	1.9	0.055 J A10	ND	ND	ND	ND	0.01	1.4 A10	0.27	ND	ND	ND	ND	920	170	Yes	2000	--	
11/16/2021	M-005	N/A	8.18	70.9	1.6	ND	1.3 J	ND	ND	ND	0.01	ND	1.00	ND	ND	ND	ND	>1600	>1600	Yes	140	100%	
12/16/2021	M-005	N/A	8.44	70.2	1.7	ND	ND	ND	ND	ND	0.00	1.4 A10	0.19	ND	ND	ND	ND	>1600	240	Yes	160	--	
Discharges to M-006 (Outfall/Port #5)																							
10/21/2021	M-006	N/A	9.28	71.8	1.8	0.050 J	ND	ND	ND	ND	0.01	1.1 A10	0.13	ND	ND	ND	ND	920	540	Yes	160	--	
11/16/2021	M-006	N/A	8.42	72.3	ND	ND	ND	ND	ND	ND	0.00	1.0 A10	0.24	ND	ND	ND	ND	>1600	33	No	54	100%	
12/16/2021	M-006	N/A	9.12	73.0	ND	ND	0.75 J	ND	ND	ND	0.01	1.9 A10	0.3	ND	ND	ND	ND	>1600	130	No	550	--	
Discharges to M-007 (Outfall/Port #5a)																							
10/21/2021	BYA-10	100%	7.24	21.4	ND	0.032 J	ND	ND	ND	ND	0.00	1.0 A10	0.52	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
11/16/2021	BYA-10	100%	7.10	69.6	ND	ND	ND	ND	ND	ND	0.00	0.86 A10	0.50	ND	ND	ND	ND	<1.8	<1.8	N/A	<1.1	100%	
12/16/2021	BYA-10	100%	7.63	71.6	ND	ND	ND	ND	ND	ND	0.00	2.1 A10	0.18	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
Discharges to M-008 (Outfall/Port #6)																							
10/21/2021	M-008	N/A	9.05	71.8	ND	ND	ND	ND	ND	ND	0.02	1.1 A10	0.89	ND	ND	ND	ND	540	<1.8	N/A	150	--	
	W-18	62%																					
	BYA-2	2%																					
	BYA-3	10%																					
11/16/2021	BYA-15	No Flow	7.44	68.0	ND	0.0270 J	ND	ND A10	ND	ND	0.00	1.9 A10	2.20	ND	ND	ND	26 J	2.0	<1.8	N/A	<1.1	100%	
	HD-10	3%																					
	HD-11	2%																					
	HD-12	21%																					
	HD-13	No Flow																					
12/16/2021	M-008	N/A	8.41	71.4	ND	0.025 J	0.85 J	ND	ND	ND	0.02	1.3 A10	0.32	ND	ND	ND	ND	>1600	4.5	No	280	--	
Discharges to M-009 (Outfall/Port #7)																							
10/21/2021	HD-7	100%	8.54	75.6	ND	ND	ND	ND	ND	ND	0.02	1.4 A10	0.12	ND	ND	ND	ND	<1.8	<1.8	N/A	1.0	--	
11/16/2021	HD-7	100%	8.14	75.2	ND	ND A10	ND	ND	ND	ND	0.00	3.0 A10	0.17	ND	ND	ND	ND	<1.8	<1.8	N/A	<1.1	100%	
12/16/2021	HD-7	100%	8.23	74.8	ND	ND	ND	ND	ND	ND	0.02	4.0 A10	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
Discharges to M-010 (Outfall/Port #9)																							
10/21/2021	HD-5	99%	8.21	73.0	ND	ND	ND	ND	ND	ND	0.02	1.2 A10	0.13	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	HD-6																						
	HD-23	1%																					
11/16/2021	HD-5	99%	7.62	69.8	2.70	ND	ND	ND	ND	ND	0.00	1.0 A10	0.16	ND	ND	ND	ND	2.0	<1.8	N/A	1.0	100%	
	HD-6																						
	HD-23	1%																					
	HD-24	100%	7.62	69.8	5.50	ND	ND	ND	ND	--	0.00	3.0 A10	2.30	ND	ND	ND	ND	33	<1.8	N/A	<1.1	100%	
12/16/2021	HD-5	99%	7.89	72.3	7.8	ND	ND	ND	ND	ND	0.01	2.1 A10	0.13	ND	ND	ND	ND	24	<1.8	N/A	<1	--	
	HD-6																						
	HD-23																						
	HD-24	1%																					
Effluent Limit (Daily Max.)																							

Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1)																							

Effluent Limit (Monthly Avg.)																							

-- = Not tested for
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 ** = Acute Toxicity samples were collected on 1/21/15
 ND = none detected above laboratory
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 A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
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 A01= Detection and quantitation limits were raised due to sample dilution
 A52 = Chromatogram not typical of diesel
 A57= Chromatogram not typical of motor oil
 A07= Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
 A11= Detection and quantitation limits were raised due to inadequate sample size received.
 D = Chromatogram not typical of motor oil
 1 = Chlorine test repeated after flow appeared to increase
 2= Area of coalescence that discharges through M-007
 S05= Sample holding time was exceeded

0.12 Exceedance of effluent limit.
 Waiting for data
 Exceedance Sampling Needed

2022 Q1 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity**
Discharges to M-001 (Outfall/Port #1a)																						
1/18/2022	BYA-14 FW-1	60% 40%	6.99	69.4	9.1	ND	ND	ND	18 A10	ND	0.01	2.60 A10	63 A10	ND	ND	ND	13 J	240	<1.8	N/A	<1	--
2/16/2022	BYA-14 FW-1	60% 40%	7.06	70.5	9.4	ND	ND	ND	2.8 A10	ND	0.00	0.71 A10	41 A10	ND	ND	ND	ND	140	<1.8	N/A	<1	--
3/31/2022	BYA-14 FW-1	60% 40%	--	--	9.9	0.037 J	ND	ND	4.7 A10	ND	--	1.20 A10	53	ND	ND	ND	ND	540	<1.8	N/A	<1	--
Discharges to M-002 (Outfall/Port #1)																						
1/18/2022	M-002	N/A	7.72	65.8	1.6	0.030 J	ND	ND	ND	ND	0.00	2.10 A10	0.21	ND	ND	ND	ND	70	<1.8	N/A	20	--
2/16/2022	M-002	N/A	8.12	64.4	1.6	ND	ND	ND	ND	ND	0.00	ND A10	0.17	ND	ND	ND	ND	920	<1.8	N/A	9.8	--
3/30/2022	M-002	N/A	7.80	69.4	ND	ND	ND	ND	ND	ND	0.00	0.62 A10	1.80	ND	ND	ND	ND	130	<1.8	N/A	<1	--
Discharges to M-003 (Outfall/Port #2)																						
1/18/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/16/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3/31/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharges to M-004 (Outfall/Port #3)																						
1/18/2022	M-004	N/A	7.85	69.1	ND	ND	ND	ND	ND	ND	0.00	3.40 A10	1.20	ND	ND	ND	ND	1600	<1.8	N/A	130	--
2/16/2022	M-004	N/A	8.17	68.9	1.6	0.026 J	ND	ND	ND	ND	0.00	ND A10	0.29	ND	ND	ND	ND	920	4	No	71	--
3/30/2022	M-004	N/A	7.90	71.1	1.5	ND	ND	ND	ND	ND	0.00	ND A10	0.29	ND	ND	ND	ND	920	4.5	No	17	--
Discharges to M-005 (Outfall/Port #4)																						
1/18/2022	M-005	N/A	8.09	68.9	ND	0.030 J	ND	ND A10	ND	ND	0.00	1.30 A10	0.19	ND	ND	ND	ND	>1600	<1.8	N/A	100	--
	Duplicate	N/A	8.09	68.9	1.8	ND A10	ND	ND	ND	ND	0.00	1.10 A10	0.26	ND	ND	ND	ND	1600	33	No	90	--
2/16/2022	M-005	N/A	8.49	67.5	2.4	0.032 J	ND	ND	ND	ND	0.00	0.71 A10	0.29	ND	ND	ND	ND	920	920	Yes	2000	--
3/31/2022	M-005	N/A	--	--	1.8	ND	ND	ND	ND	ND	--	ND A10	0.95	ND	ND	ND	ND	240	23	No	36	--
Discharges to M-006 (Outfall/Port #5)																						
1/18/2022	M-006	N/A	8.20	71.4	6.8	0.140 A10	ND	ND	ND	ND	0.00	2.30 A10	1.40	ND	ND	ND	ND	>1600	920	N/A	53	--
2/16/2022	M-006	N/A	8.62	69.8	ND	ND	ND	ND	ND	ND	0.00	ND A10	0.54	ND	ND	ND	ND	920	46	No	50	--
	Duplicate	N/A	8.62	69.8	1.5	ND	ND	ND	ND	ND	0.00	1.00 A10	0.59	ND	ND	ND	ND	920	58	No	27	--
3/31/2022	M-006	N/A	--	--	2.2	0.11	ND	ND A10	ND	ND	--	0.83 A10	0.39	ND	ND	ND	ND	>1600	240	N/A	340	--
Discharges to M-007 (Outfall/Port #5a)																						
1/18/2022	BYA-10	100%	7.02	71.2	2.4	ND	ND	ND	ND	ND	0.00	2.00 A10	0.63	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
2/16/2022	BYA-10	100%	7.93	70.3	1.6	ND	ND	ND	ND	ND	0.00	ND A10	0.60	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
3/30/2022	BYA-10	100%	7.10	76.6	2.7	ND	ND	ND A10	ND	ND	0.00	1.40 A10	1.50	ND	ND	ND	130	<1.8	<1.8	N/A	<1	--
	Duplicate	100%	7.20	73.9	3.1	ND	ND	ND A10	ND	ND	0.00	1.00 A10	0.22	ND	ND	ND	81	<1.8	<1.8	N/A	<1	--
Discharges to M-008 (Outfall/Port #6)																						
1/18/2022	M-008	N/A	7.15	66.0	1.9	ND	ND	ND	ND	ND	0.00	1.40 A10	0.22	ND	ND	ND	ND	920	<1.8	N/A	2	--
2/16/2022	M-008	N/A	7.87	66.2	ND	0.035 J	ND	ND	ND	ND	0.00	ND A10	0.42	ND	ND	ND	ND	920	21	No	39	--
3/30/2022	M-008	N/A	8.10	68.5	ND	ND	ND	ND	ND	ND	0.00	2.20 A10	0.15	ND	ND	ND	ND	>1600	220	N/A	260	--
Discharges to M-009 (Outfall/Port #7)																						
1/18/2022	HD-7	100%	7.15	69.8	ND	ND A10	ND	ND	ND	ND	0.04	6.60 A10	0.31	ND	ND	ND	ND	4.5	<1.8	N/A	<1	--
2/16/2022	HD-7	100%	7.86	75.7	1.5	ND	ND	0.10	ND	ND	0.00	9.00 A10	0.14	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
3/30/2022	HD-7	100%	7.40	77.2	1.6	ND	0.80 J	ND	ND	ND	0.00	ND A10	0.39	ND	ND	ND	ND	<1.8	<1.8	N/A	1.0	--
Discharges to M-010 (Outfall/Port #9)																						
1/18/2022	HD-5 HD-6 HD-23 HD-24	100% 0%	7.62	68.0	ND	0.043 J	ND	ND	ND	0.092	0.00	3.10 A10	0.5	ND	ND	ND	ND	170	<1.8	N/A	<1	--
2/16/2022	HD-5 HD-6 HD-23 HD-24	100% 0%	7.60	77.0	1.7	0.032 J	ND	ND	ND	0.017 J	0.00	ND A10	0.18	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
3/30/2022	HD-5 HD-6 HD-23 HD-24	100% 0%	7.30	75.7	7.0	ND	ND	ND	ND	ND	0.00	ND A10	0.27	ND	ND	ND	ND	14	<1.8	N/A	<1	--
Effluent Limit (Daily Max.)																						
Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1)																						
Effluent Limit (Monthly Avg.)																						

- = Not tested for
 - = No established limit.
 - ** = Acute Toxicity samples were collected on 1/21/15
 - ND = none detected above laboratory
 - NR = No reading taken
 - J = Laboratory estimated value, below PQL and above the MDL.
 - A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
 - B = Indicates laboratory measurement.
 - A01= Detection and quantitation limits were raised due to sample dilution
 - A52 = Chromatogram not typical of diesel
 - A57= Chromatogram not typical of motor oil
 - A07= Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
 - A11= Detection and quantitation limits were raised due to inadequate sample size received.
 - D = Chromatogram not typical of motor oil
 - 1 = Chlorine test repeated after flow appeared to increase
 - 2= Area of coalescence that discharges through M-007
 - S05= Sample holding time was exceeded
- | | |
|--|------------------------------------|
| | 0.12 Exceedance of effluent limit. |
| | Waiting for data |
| | Exceedance Sampling Needed |

2022 Q2 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity***
Discharges to M-001 (Outfall/Port #1a)																						
4/21/2022	BYA-14	60%	7.81	72.9	10	ND	ND	ND	3.5 A10	0.11	0.00	ND A10	45 A10	ND	ND	ND	ND	920	<1.8	No	<1	--
	FW-1	40%																				
5/19/2022	BYA-14	60%	8.03	70.7	2.4	0.034 J	ND	ND	6.7 A10	ND	0.00	1.2 A10	2.3	ND	ND	ND	ND	130	7.8	No	--	--
	FW-1	40%																				
6/16/2022	BYA-14	60%	8.45	73.9	14	0.024 J	ND	ND	2.9 A10	ND	0.00	0.75 A10	66 A10	ND	ND	--	50	540	<1.8	No	<1	--
	FW-1	40%																				
	Duplicate	60%	8.45	73.9	13	ND	ND	ND	3.0 A10	ND	0.00	0.88 A10	63 A10	ND	ND	--	12 J	540	<1.8	No	<1	--
		40%																				
Discharges to M-002 (Outfall/Port #1)																						
4/21/2022	M-002	N/A	8.37	62.6	1.7	ND	ND	ND	ND	ND	0.00	ND A10	0.14	ND	ND	ND	ND	1600	6.1	No	210	--
5/19/2022	M-002	N/A	8.52	65.4	ND	0.026 J	ND	ND	ND	ND	0.00	ND A10	0.28	ND	ND	ND	ND	49	<1.8	No	--	--
6/16/2022	M-002	N/A	8.54	69.3	2.0	ND	ND	ND	ND	ND	0.00	ND A10	0.14	530 A52	4700 A57	--	ND	>1600	<1.8	N/A	1100	--
Discharges to M-003 (Outfall/Port #2)																						
4/21/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/19/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/16/2022	M-003	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharges to M-004 (Outfall/Port #3)																						
4/21/2022	M-004	N/A	8.13	66.9	2.0	0.130	ND	ND	ND	ND	0.00	0.88 A10	0.46	ND	ND	ND	ND	170	<1.8	No	2.0	--
5/19/2022	M-004	N/A	8.60	67.1	1.7	0.034 J	ND	ND	ND	ND	0.00	ND A10	0.58	ND	ND	ND	ND	>1600	>1600	N/A	--	--
6/16/2022	M-004	N/A	8.59	70.3	3.2	ND	ND	ND	ND	0.10	0.00	3.2 A10	1.70	ND	ND	--	ND	>1600	350	N/A	>2400	--
Discharges to M-005 (Outfall/Port #4)																						
4/21/2022	M-005	N/A	8.43	67.5	1.9	ND A10	ND	ND	ND	ND	0.00	ND A10	0.42	ND	ND	ND	ND	920	27	No	52	--
5/19/2022	M-005	N/A	8.64	68.0	1.6	ND	ND	ND	ND	ND	0.00	0.89 A10	1.5	ND	ND	ND	10 J	>1600	>1600	N/A	--	--
6/16/2022	M-005	N/A	8.69	71.6	2.1	ND A10	ND	ND	ND	ND	0.00	1.8 A10	0.54	ND	ND	--	ND	920	130	Yes	390	--
Discharges to M-006 (Outfall/Port #5)																						
4/21/2022	M-006	N/A	8.49	67.5	1.9	ND	ND	ND	ND	ND	0.00	ND A10	0.25	ND	ND	ND	ND	920	110	Yes	29	--
5/19/2022	M-006	N/A	8.70	67.8	ND	ND	ND	ND	ND	ND	0.00	0.56 A10	0.20	ND	ND	ND	ND	1600	240	Yes	--	--
6/16/2022	M-006	N/A	8.81	70.3	2.2	ND	ND	ND	ND	ND	0.00	ND A10	0.20	ND	ND	--	ND	>1600	920	N/A	130	--
Discharges to M-007 (Outfall/Port #5a)																						
4/21/2022	BYA-10	100%	8.11	70.3	1.6	ND	ND	ND	ND	ND	0.00	1.9 A10	0.78	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
5/19/2022	BYA-10	100%	8.10	70.2	2.4	0.024 J	ND	ND	ND	ND	0.00	ND A10	1.1	ND	ND	ND	ND	<1.8	<1.8	N/A	--	--
6/16/2022	BYA-10	100%	8.22	72.3	1.9	ND	ND	ND	ND	ND	0.00	0.62 A10	0.55	ND	ND	--	ND	<1.8	<1.8	N/A	1.0	--
Discharges to M-008 (Outfall/Port #6)																						
4/21/2022	M-008	N/A	8.74	63.1	4.4	ND	ND	ND A10	ND	ND	0.00	ND A10	0.20	ND	ND	2.2 J	ND	920	540	Yes	5.2	--
	Duplicate	N/A	8.74	63.1	3.4	ND	ND	ND	ND	ND	0.00	ND A10	0.17	ND	ND	2.4 J	ND	920	920	Yes	7.5	--
5/19/2022	M-008	N/A	9.22	67.3	ND	ND	ND	ND	ND	0.12	0.00	ND A10	0.68	ND	ND	ND	ND	>1600	>1600	N/A	--	--
6/16/2022	M-008	N/A	8.35	70.7	3.10	ND	ND	ND	ND	ND	0.00	ND A10	0.14	ND	ND	--	ND	280	2.0	No	<1	--
Discharges to M-009 (Outfall/Port #7)																						
4/21/2022	HD-7	100%	8.21	77.4	ND	ND	ND	ND	ND	ND	0.00	1.9 A10	0.48	ND	ND	ND	ND	1.8	<1.8	N/A	1.0	--
5/19/2022	HD-7	100%	8.79	64.6	ND	0.034 J	ND	ND	ND	ND	0.00	ND A10	0.15	ND	ND	ND	14 J	<1.8	<1.8	N/A	--	--
6/16/2022	HD-7	100%	8.30	71.6	2.1	ND	ND	ND	ND	ND	0.00	1.5 A10	0.20	ND	ND	--	ND	<1.8	<1.8	N/A	1.0	--
Discharges to M-010 (Outfall/Port #9)																						
4/21/2022	HD-5	100%	7.94	72.5	5.3	ND	ND	ND	ND	ND	0.00	1.8 A10	0.52	ND	ND	ND	ND	2.0	<1.8	N/A	3.0	--
	HD-6																					
	HD-23																					
	HD-24																					
5/19/2022	HD-5	100%	8.33	67.3	5.9	0.037 J	ND	ND	ND	ND	0.00	4.3 A10	0.62	ND	ND	ND	ND	<1.8	<1.8	N/A	--	--
	HD-6																					
	HD-23																					
	HD-24																					
6/16/2022	Duplicate	100%	8.33	67.3	5.6	ND	ND	ND	ND	0.12	0.00	1.0 A10	0.38	ND	ND	ND	ND	<1.8	<1.8	N/A	--	--
		0%																				
6/16/2022	HD-5	100%	8.46	72.3	7.8	ND	ND	ND	ND	ND	0.00	1.2 A10	0.15	ND	ND	--	ND	<1.8	<1.8	N/A	<1	--
	HD-6																					
	HD-23																					
	HD-24																					
Effluent Limit (Daily Max.) --- 30 0.5 --- 15 0.3 1.0 1.0 0.1 75 150 100 100 11 95 10000 400 --- 104 90 Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1) --- Effluent Limit (Monthly Avg.) --- 20 --- 10 0.1 --- --- --- 50 50 --- --- 5.9 47 1000 200 --- 35 ---																						

-- = Not tested for
 --- = No established limit.
 ** = Acute Toxicity samples were collected on 1/21/15
 ND = none detected above laboratory
 NR = No reading taken
 J = Laboratory estimated value, below PQL and above the MDL.
 A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
 B = Indicates laboratory measurement.
 A01= Detection and quantitation limits were raised due to sample dilution
 A52 = Chromatogram not typical of diesel
 A57= Chromatogram not typical of motor oil
 A07= Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
 A11= Detection and quantitation limits were raised due to inadequate sample size received.
 D = Chromatogram not typical of motor oil
 1 = Chlorine test repeated after flow appeared to increase
 2= Area of coalescence that discharges through M-007
 S05= Sample holding time was exceeded

0.12 Exceedance of effluent limit.
 Waiting for data
 Exceedance Sampling Needed