TERMINAL 30 2022 ANNUAL SITE PERFORMANCE REPORT – YEAR 3

Terminal 30 Site

February 2024



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2022 Annual Terminal 30 Site Performance Report

Port of Seattle Terminal 30 Site

Project number: 60681370

February 2024

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Revision His	tory				
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Acronyms and Abbreviation

µg/L	microgram per liter
AECOM	AECOM Technical Services, Inc.
AS	air sparging
BTEX	benzene, toluene, ethyl-benzene, and total xylenes
CAP	Cleanup Action Plan
CD	Consent Decree
CMP	Groundwater Compliance Monitoring Plan
cPAH	carcinogenic polynuclear aromatic hydrocarbon
CPOC	conditional point of compliance
COI	contaminant of interest
COC	contaminant of concern
CRETE	CRETE Consulting
CUL	cleanup level
DO	dissolved oxygen
DTW	depth to water
T30 or Site	Terminal 30
EC	equivalent carbons
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
EPA	United States Environmental Protection Agency
ft	foot/feet
H2K	H2K Solutions Inc.
IHS	indicator hazardous substance
LCS/LCSD	laboratory control sample/ laboratory control sample duplicate
LNAPL	light non-aqueous phase liquid
MDL	method detection limit
MRL	method reporting limit
MS/MSD	matrix spike/ matrix spike duplicate
NAD83	North American Datum of 1983 (horizontal)
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NOC	notice of construction
ORP	oxidation-reduction potential
PID	photoionization detector
Port	Port of Seattle
PPMV	parts per million by volume
PSCAA	
	Puget Sound Clean Air Agency
QA QAPP	quality assurance
	Quality Assurance Project Plan
QC	quality control
RI/FS	Remedial Investigation/Feasibility Study
REL	remediation level
RPD	relative percent difference
scfm	standard cubic feet per minute
SOP	standard operating procedure
SVE	soil vapor extraction
TEF	toxicity equivalency factor
TEQ	toxic equivalent concentration
TPH	total petroleum hydrocarbons
TPH-Dx	total petroleum hydrocarbons – diesel and lube oil range
TPH-Gx	total petroleum hydrocarbons – gasoline range
VOC	volatile organic compound
WAC	Washington Administrative Code

1. Introduction

In 2019 the Port of Seattle (Port), under the oversight of Washington State Department of Ecology (Ecology), completed construction of the selected cleanup action alternative at the Terminal 30 project site (T30, Site), located at 1901 East Marginal Way South in Seattle, Washington (Figure 1), to satisfy requirements of the Consent Decree (CD) between Ecology and the Port, filed July 19, 2017 (Ecology, 2017). Details of the construction action are documented in the Construction Completion Report (CRETE, 2020a). The selected cleanup action remedy for the T30 site includes an Air Sparging/Soil Vapor Extraction (AS/SVE) system, free product recovery, and compliance monitoring. The construction of the cleanup remedy was completed from July 6, 2019, through November 9, 2019, and cleanup elements included the installation of 3 horizontal SVE wells, 7 vertical SVE wells, 27 AS wells, 10 light non-aqueous phase liquid (LNAPL) recovery wells, an AS/SVE system, and a vapor treatment thermal oxidizer. The purpose of the AS/SVE system is to reduce contaminant mass in shallow groundwater within, and downgradient of, the sheen area. Groundwater flows generally west towards the East Waterway, as shown in Figure 1 of Pacific Groundwater Group's (PGG) 2016 Tidal Study, included as Appendix B of the RI/FS (PGG, 2016), and also included in Appendix A of the Groundwater Compliance Monitoring Plan (CMP) within Appendix E of the Engineering Design Report (EDR) (CRETE 2018). The purpose of free product recovery is to reduce free product thickness to a sheen (less than 0.01 feet). The footprint of the cleanup action is shown on Figure 2.

On September 17, 2021, remedial system operation and compliance monitoring were transferred from CRETE Consulting, Inc (CRETE) to AECOM Technical Services, Inc. (AECOM) by the Port. This annual report (Annual Report) was prepared by AECOM on behalf of the Port and was completed using data collected by AECOM in 2022. This represents the third year of monitoring, referenced as Year 3 in this Annual Report. This Annual Report is based on the monitoring requirements in the CMP and Quality Assurance Project Plan (QAPP) included as Appendix E of the Engineering Design Report (CRETE, 2018). This Annual Report provides the operation and monitoring results for site cleanup actions conducted during Year 3, including performance and confirmational sampling data associated with the operation and monitoring of the AS/SVE system. Groundwater data is compared against site cleanup levels (CULs) and remediation levels¹ (RELs), while AS/SVE system vapor data is compared against criteria identified in the Puget Sound Clean Air Agency (PSCAA) notice of construction (NOC) worksheet (Puget Sound Clean Air Agency, 2019).

¹ The EDR and CMP explain how groundwater CULs and RELs were developed for the site.

2. Site Monitoring

The site cleanup action monitoring plan is detailed in the CMP and summarized briefly in this section. Monitoring includes AS/SVE system performance monitoring, PSCAA vapor compliance sampling, free product gauging and removal, and groundwater sampling.

The AS/SVE system operation and maintenance activities include system checks and collection of PSCAA vapor samples to verify that oxidizer destruction efficiency is above the acceptable limits.

Free product-related activities in Year 3 included product thickness gauging at 19 wells and product removal at 8 wells across the site (Figure 3, Table 6). Groundwater monitoring was completed at 13 wells in Year 2 and included depth to water (DTW) gauging, free product gauging, and groundwater sampling. The groundwater monitoring wells are also shown on Figure 3 and are grouped as follows:

- Performance Monitoring Wells (within the AS/SVE field zones): MW-59, RW-11A, and MW-89
- Performance Monitoring Wells (downgradient of AS/SVE field zones): MW-36A, RW-9, MW-39A, and MW-42
- Interior Monitoring Wells²: RW-1, RW-5A, MW-93
- Conditional Point of Compliance (CPOC) Monitoring Wells: MW-45A, MW-46B, MW-58A, MW-86B, and MW-92
- Shoreline Water Quality Monitoring Wells: MW-84A, MW-85A, MW-86B, and MW-87A
- Free Product Gauging: MW-59, RW-12, RW-101-110, MW-36, MW-39A, MW-89, and MW-93
- Interior Monitoring Wells (Gauging Only): MW-35, MW-36, MW-54, and MW-64

Samples from groundwater monitoring wells are analyzed for the site Indicator Hazardous Substances (IHSs) (Table 1). Samples are collected from performance, select Interior, CPOC, and shoreline water quality monitoring wells according to the compliance monitoring phase and sampling plan. Water quality samples are not collected from free product gauging wells, monitoring wells with free product present, and interior monitoring wells listed above as gauged only. The frequency of groundwater monitoring varies by well group and by compliance monitoring phase (Table 2 and Table 3). Compliance monitoring is divided into three sequential phases:

- Baseline Monitoring A full round of compliance well gauging and sampling that occurred shortly before or during start-up of the AS/SVE system and initiation of free product recovery activities (completed in October 2019 and summarized in the 2020 Annual Report).
- Performance Monitoring (current monitoring phase) Compliance well gauging and sampling that occurs during and for 2 years following the completion of AS/SVE system operation and free product recovery, to determine whether rebound occurs and further cleanup actions are needed to achieve RELs.
- Confirmational Monitoring Long-term compliance well gauging and sampling that occurs once RELs and CULs have been achieved in performance and CPOC monitoring wells.

Table 3 illustrates the monitoring schedule by compliance monitoring phase.

2.1 Site Monitoring Methods

Samples were collected in accordance with the CMP and QAPP (CRETE, 2018). This section provides an overview of sampling and product gauging and recovery methods and discusses any deviations from the CMP.

2.1.1 PSCAA Vapor Sampling Methods

Vapor samples are collected from two dedicated sampling ports on the treatment system. The influent port is located upstream of the thermal oxidizer and captures vapor concentrations prior to treatment. The effluent port is located on

² MW-38 was removed from the Interior Monitoring Well network due to subsurface blockage in 2020 and it was decommissioned in 2021. More information is included in Section 2.2.

the downstream side of the oxidizer and captures vapor concentrations after treatment is complete. Samples are collected with laboratory-provided summa canisters, which when opened create a negative pressure, drawing the sample stream into the sample canister. Tubing is utilized to connect the sampling port to the sample canister.

Data from the vapor samples are used to evaluate oxidizer performance and destruction efficiencies, which are calculated by comparing the pre- and post-treatment concentrations of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOC) including benzene, toluene, ethylbenzene, and total xylenes (BTEX). The results of these sampling efforts are discussed in Section 3.2.

2.1.2 Free Product Gauging and Removal Methods

Free product removal is completed using a vacuum truck. The vacuum truck uses a multi-lobed positive displacement blower to create a vacuum in the attached holding tank. This tank vacuum in turn pulls fluids through the attached hoses and/or piping. During removal, a down-well "stinger" or pipe is inserted into the well to the target level just below the measured bottom of free product. Prior to 2021 a drum vacuum was used for these removals, but the method was revised to vacuum truck due to its increased efficiency removing fluids (oil and water) from the target wells. Free product removal activities completed during 2022 were in accordance with standard operating procedure (SOP) 505 from the Operation Maintenance & Monitoring Plan (CRETE, 2020b).

2.1.3 Groundwater Sampling Methods

Groundwater samples were collected using the Environmental Protection Agency (EPA) Low-Flow Groundwater Sampling Procedure (US EPA, 2017), detailed in the CMP. Groundwater wells were gauged prior to purging. This information was used to verify that no free product was present and to determine the inlet placement depth for the groundwater sampling tubing. The inlet was maintained near the mid-point of the saturated well screen interval. For wells with significant tidal influence, the inlet was placed at least 2 feet from the bottom of the well. During purging field parameters (temperature, specific conductance, and pH) were measured to determine when conditions had stabilized, indicated by recording three consecutive field parameter measurements measured in 2-minute intervals or greater. Groundwater samples were collected with low-flow pumping rates (~100 to 200 mL/min) to minimize volatilization of constituents. All water samples were collected from the pump discharge lines directly into appropriate laboratory-provided sample containers. Samples submitted for dissolved analyses were field filtered using a 0.45-micron in-line disposable filters. Sampling equipment was either decontaminated between monitoring wells (such as the water level tape) or new dedicated materials were used (such as tubing and gloves).

A subset of wells at T-30 are sufficiently tidally influenced that they require sampling at specific times to reduce tidal influence on groundwater chemistry. Best practice per the Tidal Study (PGG, 2016) includes sampling at the tidal lag times to ensure a representative sample. Below is a summary tidal lag times³. Note that the Shoreline Water Quality Monitoring Wells listed below were not required to be sampled during this reporting period:

- CPOC Monitoring Well MW-58A: between 70 and 130 minutes after low-low tide
- CPOC Monitoring Well MW-86B: between 130 and 190 minutes after low-low tide
- Performance Monitoring Well MW-89: between 130 and 190 minutes after low-low tide
- Shoreline Water Quality Monitoring Wells (MW-84A, MW-85A, MW- 87A): between 130 and 190 minutes after low-low tide
- All other CPOC, performance, and interior monitoring wells have limited tidal influence and do not require coordinating sampling time with tidal lag.

2.2 Site Monitoring Deviations from the CMP

Deviations from the groundwater CMP included the following:

• The CMP does not require LNAPL gauging outside of recovery and sampling events. LNAPL gauging was executed on a monthly basis throughout Year 3.

³ Low-low tide is as measured at National Oceanic and Atmospheric Administration (NOAA) Tide Station ID: 9447130

• LNAPL recovery events were executed on a bimonthly schedule from January through December, and a change to a quarterly recovery frequency was approved by Ecology via e-mail on December 7, 2022.

There were no other deviations from the CMP during the reporting period.

3. AS/SVE System Performance

This section summarizes the AS/SVE system performance for Year 3. The AS/SVE system equipment requires routine maintenance, which was performed by Port of Seattle Marine Maintenance staff (Marine Maintenance) on a monthly basis. The system also requires routine performance monitoring and adjustments to achieve optimal VOC removal and destruction. AECOM performed these on a biweekly basis throughout Year 3.

Performance monitoring field forms are included in Appendix A. A layout of the AS/SVE system components is included on Figure 2.

3.1 System Operation

The SVE system ran for 7,113 hours during this reporting period, an operation rate of 82%. Since startup, it operated for over 22,532 hours at year-end (Table 4). The AS system operated for 5,609 hours in Year 3, an operational rate of 65%. This was up from the previous annual record of 3,181 hours set in Year 2 (a 36% operational rate). As described in Section 3.4, resolving the faulty pressure sensor and determining the maximum operational pressure of the compressor were the primary reasons for this operational improvement. The sparge system has a cumulative total of 12,264 hours since startup.

3.2 System Performance – Field Data

The data from the biweekly system performance inspections are available in Table 4. The work performed include recording flow rates, operating temperatures, pressure and vacuum levels, and VOC concentrations in the oxidizer influent and effluent via photoionization detector (PID). Mass removal rates and estimate destruction efficiency were calculated based on PID readings and the SVE flowrate. The analytical data from Table 5 are used for the VOC concentrations for the days that a sample was taken; for the non-sampling site visits, the concentration is an adjustment of the PID reading based on the ratio of the most recent lab datum to its associated PID reading. This is further explained in Note 4 of Table 4.

For this reporting period, the influent removal rate ranged from 0.7 (January 21 and September 14, 2022) to 12.9 pounds (lb) per day (February 17, 2022) (see Table 4 and Figure 5). Figure 6 shows the cumulative VOC mass removal to the end of the reporting period and the beginnings of an asymptotic leveling out of VOC removal. In the three months of 2019 after system startup the average VOC removal was 423 lb/month. In the seven months of operation in 2020 the system averaged removals of 552 lb/month. In 2021, the average removals dropped to 280 lb/month. This year the average removal rate decreased further to 87.6 lb/month. Per Figure 5, with a few outlier exceptions, this downward trend has been in effect since mid-February of 2021. The cumulative VOC mass removal from startup through the end of this reporting period, as calculated with the field data, is 9,882 lb.

The PSCAA permit sets thresholds for the oxidizer destruction efficiency and SVE blower flowrate. The destruction efficiency requirements are applied to the laboratory results, but the field data are used to monitor operation between sampling events. The destruction efficiency should be at least 97% if the influent concentration is between 200 and 2,000 parts per million by volume (ppmv) TPH. If the concentration is less than 200 ppmv, then the destruction efficiency requirement reduces to ≥90%. Finally, if the oxidizer inlet concentration of TPH is below 10 ppmv, the destruction efficiency requirements are waived (Puget Sound Clean Air Agency, 2019). The system operated with an average destruction rate of 96% during Year 3, with only one lapse: on September 2, the influent was measured at 12.0 ppmv TPH, and the oxidizer effluent at 2.8 ppmv TPH, yielding a calculated destruction efficiency of 81%. As shown in Table 4, with the exception of this instance, all field measurements in the reporting period were above 92% destruction efficiency.

The SVE flowrate is not permitted to exceed 375 standard cubic feet per minute (scfm), and all readings from this reporting period fell below this limit (Puget Sound Clean Air Agency, 2019). The 2022 flow rates ranged from 161 scfm (March 31, 2022) to 262 scfm (October 13, 2022), with an average of 212 scfm (Table 4).

3.3 Soil Vapor Gas Sampling

Soil gas samples were collected on a quarterly basis throughout the reporting period. This was done to demonstrate compliance with PSCAA destruction efficiency requirements and to track system operation to optimize mass removal (Puget Sound Clean Air Agency, 2019). Gas samples were collected at both the thermal oxidizer inlet and outlet in 1-liter summa cannisters. The samples were delivered to Friedman and Bruya, Inc., located in Seattle, Washington, for analysis of petroleum hydrocarbons by method MA-APH and BTEX by method TO15. The MA-APH method provides data for three petroleum subgroups (EC 5-8 aliphatics, EC 9-12 aliphatics, and EC 9-10 aromatics) that are summed for a TPH estimate. These are the TPH concentrations reported in Table 5. The destruction efficiency of the oxidizer is calculated by comparing the inlet and outlet TPH concentrations. The PSCAA permit requirements are outlined above in Section 3.2.

Soil vapor samples were collected on: 03/31/2022, 06/29/2022, 09/14/2021, and 12/09/2021. The analytical data for all samples are presented in Table 5 and are incorporated, with field data, in Figure 5 and Figure 6. Vapor sampling field forms are provided in Appendix B. Laboratory analytical reports are provided in Appendix C.

The destruction efficiencies in 2022, as calculated by analytical data, ranged from 93.6% (September 14, 2022) to 98.9% (June 29, 2022). The September 14 influent sample was 8 ppmv, and being below 10 ppmv, had no destruction efficiency requirement. The other three influent samples were below 200 ppmv and all exceeded the 90% destruction efficiency minimum.

Laboratory results for the influent samples indicate that 331 lb of TPH were extracted from the subsurface in 2022, with 7,707.6 lb extracted cumulatively since startup. These values are 66% and 22% lower, respectively, than the totals calculated with adjusted field data (Table 4). In the three months of operation in 2019 after system startup the average lab-analyzed TPH removal was 604 lb/month. In the seven months of operation in 2020 the system averaged removals of 412 lb/month. In 2021, removals to 223 lb/month. The average removal in 2022 dropped again to 34.5 lb/month.

The PSCAA permit dictates that a control device for extracted soil vapor is not needed once non-treated removal rates drop below contaminant of concern (COC) thresholds for two consecutive months (see Table 5). These thresholds, with the exception of TPH (2.74 lb/day), have been met for all COCs since system startup. During this reporting period, all four analytical calculations, and 12 of the 21 field calculations, resulted below that 2.74 lb/day TPH threshold.

3.3.1 Quality Assurance

All samples were delivered to Friedman & Bruya Inc. located in Seattle, Washington. Laboratory reports were reviewed and reporting flags, when applicable, were accepted and are included in Table 5. Per the Summary Data Quality Reviews in Appendix D, all laboratory quality assurance metrics were achieved for this project, the method reporting limits (MRLs) met the project needs for all analytes, and all data were determined to be usable. Laboratory reports and chain-of-custody forms are provided in Appendix C.

3.4 System Maintenance

Notable system maintenance performed during Year 3 are summarized below. They are documented in Table 4. Note that the thermal oxidizer was updated to a catalytic oxidizer on March 19, 2020, and was operating as such throughout this reporting period. Routine machinery maintenance was completed by Marine Maintenance, which included changing oil, greasing components, checking and replacing filters, checking and replacing belts, and checking levels in moisture separator tanks.

- Air sparge system:
 - The pressure switch replaced in November 2021 did not provide long-term resolution to the high-pressure alarm shutdowns occurring during normal-pressure scenarios. The issue was ultimately resolved at the end of March when the switch was taken offline and not replaced. Once done, the sparge system was able to operate as intended and zone sparging was re-instituted at 5- hour intervals to the five sparging zones. The system is still protected from high pressures with the mechanical pressure relief valve that was installed during initial system construction.

- Repeated sparge compressor motor overload alarms at relatively low pressures led to an analysis of amp draw by AECOM engineers. The results pointed to wear-down within the compressor motor. No further action was taken as the capability of the compressor was still acceptable.
- SVE system:
 - Extended freezing temperatures mid-December resulted in freezing pipes at both the moisture separator sight glass and the transfer pipe between the separator and the large water storage tank. A pipe union and float sensor broke as a result. The broken union was repaired the day it was discovered, but the replacement float sensor had still not arrived by the end of the reporting period.
- General:
 - The system was down for 19 days from April to May due to lapsed propane invoice payments and termination of deliveries. The lack of propane until resolved prevented operation of the oxidizer.
 - Alarm notifications ceased in early June due to a software update issue. H2K was not able to resolve the issue within the reporting period. The result was extended downtime following system shutdowns for the latter half of the year.
 - Various rotameters and gauges replaced throughout the year due to normal wear and tear.

4. Free Product Gauging and Recovery

Free product gauging and recovery events have been executed in accordance with the CMP since January 2020, shortly after system startup. Events were completed on a monthly schedule until November 2020, when the product recovery frequency was reduced from monthly to bimonthly. Product gauging has been maintained on a monthly schedule since then, with recovery events occurring on a bimonthly basis until October 2022, when they were adjusted to a quarterly schedule. Year 3 began with 19 wells in the gauging/recovery protocol and ended with nine. The other ten wells were terminated with data showing at least one year's worth of product gauging results at less than 0.01 ft.

4.1 Free Product Gauging

As shown in Figure 7 and Figure 8, LNAPL thickness trends in 2022 were generally stable or decreasing. LNAPL was thickest in the recovery wells at the southernmost end of the AS and SVE wellfield, farthest away from the remediation system (see Figure 2). Gauging was not completed in March due to scheduling conflicts, and the event was postponed until April. Free product thicknesses and maxima since startup are reported in Tables 6 and 7 and summarized below. See section 4.3 for further information of recovery well termination.

- MW-35 LNAPL thickness ranged from 0.0-0.05 ft (multiple and 2/17/22, respectively). This is down from a historical max of 0.52 ft on 10/8/20.
- MW-59 LNAPL thickness ranged from 0.0-1.36 ft (multiple and 2/17/22, respectively). This is down from a historical max of 2.19 ft on 1/9/20.
- RW-1 LNAPL thickness ranged from 0.03-0.10 ft (4/14/22 and 9/8/22, respectively). This is down from a historical max of 0.59 ft on 6/19/20.
- RW-12 LNAPL thickness ranged from 0.01-0.38 ft (6/20/22 and 12/8/22, respectively). This is down from a historical max of 0.78 ft on 3/12/20 and 5/16/20.
- RW-103 LNAPL thickness ranged from 0.00-0.60 ft (multiple and 4/14/22, respectively). This is down from a historical max of 1.74 ft on 9/10/20.
- RW-106 LNAPL thickness ranged from 0.00-2.09 ft (6/20/22 and 11/10/22 respectively). The 2022 maximum is also the historical maximum for the well (previously 1.55 ft on 9/10/20).
- RW-107 LNAPL thickness ranged from 0.00-1.45 ft (6/20/22 and 1/18/22, respectively). This is down from a historical max of 2.49 ft on 10/8/20.
- RW-110 LNAPL thickness ranged from 0.0-0.02 (multiple and 2/14/22, respectively). The prior historical max had been 0.46 ft on 7/28/20.

LNAPL was measured for, but not encountered in, the following wells during 2021:

- MW-36 (historical max of 1.0 ft on 6/19/20). This well was retired from regular gauging following the November event, with four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-36A (historical max 0.04 ft during baseline sampling on 10/16/19). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-39A (historical max of 0.35 ft on 5/16/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-89 (historical max of 2.39 ft during baseline sampling on 10/16/21). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-93 (historical max of 1.04 ft during baseline sampling on 10/16/21). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-101 (historical max of 0.09 ft on 7/8/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.

- RW-102 (historical max of <0.01 ft on 10/8/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-104 (historical max of .01 ft on 11/11/21).
- RW-105 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-108 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-109 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.

LNAPL thickness was also measured at each groundwater sampling well during the groundwater sampling events (discussed in Section 5).

4.2 Free Product Removal

LNAPL removal activities transitioned from bi-monthly to quarterly following the September 2022 recovery event. Throughout the reporting period, LNAPL removal was conducted using a vacuum truck as discussed in Section 2.1.2. Table 6 provides a summary of the data collected during the free product removal events since the baseline in October 2019. Approximately 115 gallons of free product were removed in the 5 bi-monthly/quarterly events executed in Year 3. Approximately 850 gallons of free product have been removed cumulatively since removals began in January 2020. These volumes are approximations due to the difficulties inherent in measuring a precise volume from the holding tank of the vacuum truck. Detailed gauging tables providing results of the removal events are included Appendix E.

As shown in Figure 9, the volume of LNAPL recovered varies from month to month and there were no clear trends in LNAPL removal from Year 2. The average removal volume was 23 gallons per event, with a range of 10-49 gallons (Table 6). The maximum removal occurred in December and the minimum was in July. The average removal volume for 2022 was down from the 2021 average of 45 gallons per event. Figure 10 shows the cumulative LNAPL recovery since system startup. The LNAPL thickness trends on a well-by-well basis are described above in Section 4.1 and shown in Figure 7 and Figure 8.

4.3 Free Product Recovery Termination

Free product recovery at an individual well can be terminated when product thickness has been reduced to less than a measurable thickness of 0.01 ft for a period of one year. This recovery termination criterion will result in sequential removal of recovery wells from recovery events as the area with measurable free product shrinks. Wells RW-101 through RW-110 will be left in place for one year after the last well meets the termination criteria, after which they will be decommissioned consistent with Washington Administrative Code (WAC) 173-160.

During 2022, several wells continued to be monitored on a monthly basis despite achieving the requisite year without measurable product. This included MW-36A, MW-39A, MW- 89, MW-93, RW-101, RW-105, RW-108, and RW-109. Each of these were terminated from the monitoring/recovery protocol in 2022 (see Section 4.1).

5. Groundwater Sampling

During Year 3, two groundwater performance monitoring events were conducted. The first performance monitoring event was completed on April 14, 2022, for the performance wells within AS/SVE system radius of influence. The second was on October 13, 2022, and included the performance wells both within and downgradient of the AS/SVE system radius of influence, the interior wells, and the CPOC wells. Table 2 includes a summary of the sampling program and Table 3 includes the monitoring schedule.

Groundwater samples were collected and analyzed consistent with the protocols outlined in the CMP. Water quality parameters including temperature, pH, specific conductance, turbidity, dissolved oxygen (DO) and oxidation-reduction potential (ORP) were measured and recorded continually during purging until stable, representative conditions were met prior to sampling.

This section provides an overview of groundwater sampling activities at the wells shown on Figure 3 and Figure 4. Construction information and all analytical results and field parameters since system startup are summarized in Tables 8 through 12.

5.1 Performance Monitoring Wells

Per Tables 2 and 3, the spring semiannual sampling event included Performance Monitoring Wells RW-11A, and MW-89. The fall annual sampling event included Performance Monitoring Wells RW-11A, MW-89, MW-36A, MW-39A, RW-9, and MW-42. The Performance Monitoring Wells were analyzed for TPH in the gasoline range (TPH-Gx) via NWTPH-Gx, TPH in the diesel and lube oil range (TPH-Dx) via NWTPH-Dx, and BTEX by EPA Methods 8021B and 8260. Groundwater results are summarized on Table 8 and Figure 4. TPH-Dx data are also shown on Figure 11. Copies of Year 3 sampling field notes are included in Appendix F and laboratory reports are provided in Appendix G.

MW-59 is also a Performance Monitoring Well, but per the CMP it only qualifies for sampling once four consecutive quarters of gauging data are collected free product detection <0.01 ft (Table 2, Note 2). The presence of free product is assumed to indicate TPH concentrations above site cleanup goals. As shown in Table 6, MW-59 continued to have free product detected >0.01 in Year 3 and was not sampled during the reporting period. On Figure 11, wells with free product encountered during sampling, or those not sampled due to recent LNAPL encounters, are shown with an arbitrary TPH-Dx concentration of 3,000 micrograms per liter (μ g/L). This value is used only to represent free product and does not reflect actual TPH concentrations in these wells.

As shown in Table 8 and Figure 4, neither of the samples taken during the April 2022 event (RW-11A and MW-89) were found to have COC concentrations above CULs. COC concentrations also did not exceed CULs for any of the six Performance Monitoring wells sampled during the October 2022 event.

RW-11A had a TPH-Dx concentration above the CUL during baseline sampling (1,100 μ g/L) but has not had a concentration in excess of the CUL since. It has not been above site CULs for any other COC.

MW-89 COC concentrations have not exceeded any CUL since the TPH-Dx rebound in October 2021. It has not exceeded site CULs for any other COC.

RW-9 concentrations exceeded the TPH-Dx CUL in 2019 (1,200 μ g/L), stayed below in 2020 (450 μ g/L), and rebounded above again in 2021 (1,590 μ g/L). In 2022 it fell back below to 200 μ g/L. It has not been above site CULs for any other COC.

MW-36A had free product present during baseline sampling and was not sampled until September 2020. At that event TPH-Dx was measured in excess of the CUL (560 μ g/L). Results in 2021 were below the CUL (404 μ g/L), and they stayed below in 2022 (180 μ g/L). It has not been above site CULs for any other COC.

MW-39A had free product present during baseline sampling and was not sampled until September 2020. At that event TPH-Dx was measured in excess of both the CUL and REL (2,270 μ g/L). TPH-Dx levels rose further during the 2021 sampling (3,520 μ g/L). Results in 2022 dropped down below the CUL, at 110 μ g/L.

MW-42 exceeded cleanup levels for both TPH-Gx and benzene during the baseline sampling. All COCs were measured below CULs during the September 2020 and October 2021 events. This trend continued through 2022.

5.2 Interior Monitoring Wells

The Interior monitoring wells are located upgradient (east) of the AS/SVE system, within the original "sheen area" with <0.1 ft product thickness (Figure 2 and Figure 3). Interior monitoring wells are sampled for TPH-Gx, -Dx, and BTEX, and are used to track long-term reductions in contaminant mass that are not associated with operation of the AS/SVE system. With MW-38 decommissioned in 2021 and RW-1 with continued LNAPL presence, the only Interior wells sampled in 2022 were MW-93 and RW-5A.

MW-93 did not have any COCs present above CULs in 2022. When it was last sampled in 2020, it had 8,600 µg/L of TPH-Dx, well above the CUL and REL.

RW-5A did not have any COCs present above CULs in 2022. It has not exceeded a CUL historically.

In addition to sampling the above wells, MW-35, MW-36, MW-54, MW-64 are Interior Monitoring Wells that are gauged, but not sampled, on a biannual basis. MW-35 and MW-36 have been gauged regularly as LNAPL-impacted wells, but MW-54 and MW-64 have not. There was no record of prior gauging of either well, in fact. Neither one had free product present on 10/13/22. MW-64 was also gauged on 6/20/22 and did not have product present then either.

5.3 CPOC Monitoring Wells

The CPOC monitoring wells are located downgradient of the Performance and Interior wells, between the source area and the East Waterway. CPOC wells are sampled for the full suite of IHSs (TPH-Gx, -Dx, BTEX, and PAHs) to monitor potential risk to the East Waterway. None of the five wells sampled in 2022 - MW-45A, MW-46B, MW-58A, MW-86B, and MW-92 - had COCs above their CULs. MW-86B is the only CPOC well to historically have a CUL exceedance, and it occurred during baseline sampling in 2019. All subsequent samples have been below the CULs. See Table 9 and Table 10.

5.4 Shoreline Water Quality Monitoring Wells

The Shoreline Water Quality Monitoring Wells are located along the T30 apron nearest to the East Waterway (Figure 3). During baseline sampling in 2019, these wells were sampled and analyzed for the full suite of IHSs listed in Table 1 (TPH-Gx, -Dx, BTEX, and PAHs). They are not a part of the ongoing sampling plan outside of contingent actions have not been sampled since (see Appendix I and CMP sections 6.5-6.6). The baseline analytical results are summarized in Tables 9 and 10.

5.5 Quality Assurance

The groundwater CMP includes quality assurance protocols, also detailed in the QAPP. For each groundwater sampling event, at least one duplicate sample and one set of MS/MSD samples were collected to assess field and laboratory precision. This precision is determined by the relative percent difference (RPD) between the original sample and it's duplicate, with an allowable tolerance of +/- 35%. As shown in the Summary Data Quality Reviews in Appendix H, the RPDs were within the project goals for all samples.

Laboratory reports and chain-of-custody forms are provided in Appendix G. The April 2022 samples were hand delivered to Friedman & Bruya Inc. located in Seattle, Washington. Laboratory reports were reviewed and reporting flags, when applicable, were accepted; these are included in Tables 8-10. Precision and accuracy were assessed during data validation using the MS/MSD results and were acceptable in each case. Sampling precision was assessed during data validation using the field duplicate results. Per the Summary Data Quality Reviews in Appendix H, laboratory quality assurance metrics were achieved for this project, the MRLs met the project needs for all COCs, and all data were determined to be usable.

6. Conclusion

This report presents the results of the third year of compliance monitoring at the T-30 Cleanup site. Key take-aways from the Year 3 reporting period include:

- As calculated with biweekly PID data from the field (Table 4), the AS/SVE system extracted over 964 lb TPH during the reporting period, for a cumulative total of 9,882 lb TPH removed since system startup. These values are lower when calculated with quarterly laboratory data (Table 5), which show the system extracted over 331 lb TPH during the reporting period and 7,708 lb TPH since system startup.
- LNAPL recovery events recovered an estimated 115 gallons of free product during the reporting period, continuing the downward trend year over year. Average removal volumes in Year 3 (23 gal per event) were nearly 50% lower than those of Year 2 (45 gallons per event). A cumulative total of 849 gallons have been recovered since removal activities began (Table 6).
- COCs were not measured above the CUL or REL at any well sampled in Year 3 (Table 8). Free product was still present in MW-59 and RW-1, preventing sampling.
- The SVE and oxidizer systems were successfully monitored and maintained through the reporting period (Table 4).
- The cleanup actions demonstrate significant mass recovery in soil vapor and free product removal and decreasing IHS concentrations in several monitoring wells. Similar cleanup actions will continue into Year 4.

6.1 CMP Modifications and Recommendations

Data collected from the performance monitoring wells were evaluated and used to make decisions regarding AS/SVE system operation. The flow chart in Figure 5 of the CMP (included for reference in Appendix I) provides guidance on decision making criteria. There are no planned modifications or recommendations to the CMP.

6.2 Recommended AS/SVE Adjustments for Year 4

As stated in the Cleanup Action Plan (CAP), the overall goal of the AS/SVE system is to reduce contaminant mass in the sheen area and downgradient of the sparge wells. The AS/SVE system is not intended to reduce contaminant concentrations in groundwater upgradient of the AS/SVE system. The AS/SVE system will be operated until performance monitoring wells within and downgradient of the AS/SVE field zones (RW-9, RW-11A, MW-42, MW-39A, MW-36A, MW-59, and MW-89) achieve RELs, or if the AS/SVE system is no longer significantly removing contaminant mass⁴. The two performance wells that exceeded RELs during 2021 (MW-39A and MW-59) have since been measured below the RELs and CULs, and the system removal rates look as if they are starting to taper off. Continued operation of the AS/SVE system is planned for Year 4 (2023). The following are recommendations to improve AS/SVE performance:

- Continue to monitor, analyze, and improve AS compressor operation (e.g., runtime and total flow).
- Monitor influent vapor concentrations and evaluate vapor emission control alternatives.
- Troubleshoot water entrapment in the SVE piping/manifold to improve vapor extraction performance.

6.3 Schedule and Reporting

The groundwater monitoring frequencies are provided on Tables 2 and 3. The monitoring schedule will be adjusted as needed based on the performance of the AS/SVE system and timeline of monitoring wells achieving COC remediation levels. Free product will be gauged at least quarterly until termination criteria are achieved. Schedule revisions will be documented in quarterly progress reports.

⁴ The statement "the AS/SVE system is no longer significantly removing contaminant mass" has not been defined. This standard will need to be negotiated, if necessary, at a future time. This could involve analysis of vapor extraction concentrations, groundwater dissolved oxygen concentrations, performance well groundwater concentrations, or other similar measure.

Annual reports will continue to be prepared for Years 4 and 5. Reports will be submitted to Ecology following the end of the annual monitoring cycle.

After 5 years of system operation, an evaluation report will be prepared that will include a summary of the five preceding annual reports and discussions about longer term trends in the groundwater data. The CMP will be reviewed and updated by addendum (with Ecology review) if changes to the monitoring program are appropriate.

7. References

CRETE (CRETE Consulting). 2018. Engineering Design Report. December 20, 2018.

- CRETE. 2020a. Construction Completion Report, Terminal 30 Cleanup Project. February 27, 2020.
- CRETE. 2020b. Terminal 30 Cleanup Project Operation Maintenance & Monitoring Plan. March 2020.
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- Ecology (Washington State Department of Ecology). 2017. Consent Decree and Cleanup Action Plan. July 19, 2017.
- PGG (Pacific Groundwater Group). 2016. Port of Seattle Terminal 30 Revised 2013 Remedial Investigation/Feasibility Study. January 11, 2016.
- PSCAA (Puget Sound Clean Air Agency). 2019. Notice of Construction (NOC) Worksheet. NOC No. 11885. August 20, 2019.
- US EPA (U.S. Environmental Agency). 2017. Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. September 19, 2017.

Tables

PORT OF SEATTLE - TERMINAL 30 Table 1 Indicator Hazardous Substances

Constituent (BTEX, SVOC, TPH)	Constituent (PAH)
BTEX Compounds	PAH Compounds (filtered)
Benzene	Acenaphthene
Toluene	Acenaphthylene
Ethylbenzene	Anthracene
Xylenes (total)	Benzo[a]anthracene
Semivolatile Organic Compounds	Benzo[a]pyrene
2-Methylnaphthalene	Benzo[b]fluoranthene
Petroleum Hydrocarbons	Benzo[g,h,i]perylene
TPH, gasoline range organics	Benzo[k]fluoranthene
TPH, diesel range organics	Chrysene
TPH, heavy oils	Dibenzo[a,h]anthracene
	Fluoranthene
	Fluorene
	Indeno[1,2,3-cd]pyrene
	Naphthalene
	Phenanthrene
	Pyrene
	Naphthalene

PORT OF SEATTLE - TERMINAL 30 Table 2 Compliance Monitoring Frequency and Analytes

		Compliance Monitoring Phase	
Well Network	Baseline Sampling	Performance Monitoring*	Confirmational Monitoring
	Groundwater Samplin		
Performance Monitoring Wells – Within (MW-59**, RW-11A, MW- 89** ^b)	Single Event -	Every 6 Months - <u>Sampled: 4/2020, 9/2020,</u> <u>4/2021, 10/2021, 4/2022, &</u> <u>10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx)	
Performance Monitoring Wells – Downgradient (MW-36A, RW-9, MW-39A ^{**^b,} MW-42)	<u>Sampled: 10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx)	Every Year - <u>Sampled: 9/2020, 10/2021, &</u> <u>10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx)	None Scheduled
Interior Monitoring Wells -	Single Event -	Every 2 Years -	Every 5 Years
(MW-38 ^a , MW-93, RW-1, RW-5A)	Sampled: 10/2019 (NWTPH-G/BTEX, NWTPH-Dx)	<u>Sampled: 9/2020 & 10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx)	(NWTPH-G/BTEX, NWTPH-Dx)
Interior Monitoring Wells, Gauging Only -	Single Event - Gauged: 10/2019	Every 2 Years Gauged: 9/2020 & 10/2022	Every 5 Years
(MW-35, MW-36, MW-54, MW-64)	(Free Product Gauging)	(Free Product Gauging)	(Free Product Gauging)
CPOC Monitoring Wells	Single Event - Sampled: 10/2019	Every 2 Years - Sampled: 9/2020 & 10/2022	Varies – See Table 3
(MW-45A, MW-46B, MW-58A, MW-86B***, MW-92)	(NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene)	(NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene)	(NWTPH-G/BTEX, NWTPH- Dx, PAHs, 2- methylnaphthalene)
Shoreline Water Quality Monitoring Wells (MW-84A, MW-85A, MW-86B***, MW-87A)	Single Event <u>- Sampled:</u> <u>10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene)	None Scheduled	None Scheduled
	Free Product Recovery and (Gauging (See Note 2)	
Free Product Gauging Wells (MW-59**, RW-12, New Recovery Wells [RW-101 to 110], MW-36, MW-39A**, MW-89**, MW-93)	Single Event (Free Product Gauging)	Quarterly at minimum (Free Product Gauging)	None Scheduled

Notes:

1. This schedule can be modified based on data collected during system performance.

2. For all monitoring wells, the measurement of free product in a well will trigger free product removal activities. Free product gauging (and removal, if free product is present) will occur quarterly for a minimum of 4 consecutive quarters.^c

- * Performance monitoring will continue for the duration of AS/SVE system operation plus 2 years, at which time confirmational monitoring will be initiated.
- ** MW-59, MW-39A, and MW-89 will become Performance Monitoring Wells once free product has not been present for four consecutive quarters.^{b,d}
- ***MW-86B is both a CPOC Well and a Shoreline Water Quality Well.
- ^a A below-grade obstruction was observed in MW-38 on 9/18/20 and the well was decomissioned on May 6, 2021.
- ^b MW-89 qualified in October of 2020. MW-39A qualified in August of 2021.
- ^c Per the CMPT, wells qualify for perfomance monitoring analyses once 4 quarters of free product gauging result in product thicknesses of <0.01 ft. If product is encountered during sampling, the well is not to be sampled.
- ^c The original version of Table 2 in the CMP had a typo in the ** note, stating that only two quarters of clean data were required to transition to Performance Monitoring Wells. The text of the CMP stated the duration as four quarters, and the note has been revised.

PORT OF SEATTLE - TERMINAL 30 TABLE 3 Compliance Monitoring Schedule

Post AS/SVE Startup Years:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	22	27	32
Post AS/SVE Shutdown Years:						<u> </u>	1	2	3	4	5	6	7	8	9	10	11	12	17	22	27
Confirmational Monitoring Years									1	2	3	4	5	6	7	8	9	10	15	20	25
	Baseline	Perfo	rmanc	e Mon	itoring	Perio	d		Confi	rmatio	nal Mo	onitorii	ng Per	iod							
CPOC Wells	Once	Biann	ual						Annua	a/				Biann	ual			Every	5 year	s	
MW-45A	Х	Х		Х		Х		Х	Х	X	Х	Х	Х	Х		Х		Х	Х	Х	Х
MW-46B	Х	Х		Х		Х		Х	Х	Х	Х	Х	Х	Х		Х		Х	Х	Х	Х
MW-58A	Х	Х		Х		Х		Х	Х	Х	Х	Х	Х	Х		Х		Х	Х	Х	Х
MW-86B	Х	Х		Х		Х		Х	Х	Х	Х	Х	Х	Х		Х		X	Х	Х	Х
MW-92	Х	Х		Х		Х		Х	Х	Х	Х	Х	Х	Х		Х		Х	Х	Х	X
Performance Wells																					
Within	Once	Semia	annual						None												
MW-59	Х	XX	XX	XX	XX	XX	XX	XX													
MW-89	Х	XX	XX	XX	XX	XX	XX	XX													
RW-11A	Х	XX	XX	XX	XX	XX	XX	XX													
Downgradient	Once	Annua	a/						None												
MW-36A	Х	Х	X	Х	Х	Х	Х	Х													
MW-39A	Х	Х	Х	Х	Х	Х	Х	Х						I				i			
MW-42	Х	Х	Х	Х	Х	Х	Х	Х					1					i			
RW-9	Х	Х	Х	Х	Х	Х	Х	Х													
Interior Wells	Once	Biann	ual						Every	5 year	rs										
MW-38 ¹	X	X		X		X		X					X					X	X	X	X
MW-93	Х	Х		Х		Х		Х					Х					Х	Х	Х	Х
RW-1	Х	Х		Х		Х		Х					Х					х	Х	Х	Х
RW-5A	Х	Х		Х		Х		Х					Х					Х	Х	Х	Х

Notes:

The monitoring frequency for the Shoreline water quality monitoring wells and free product gauging wells are not shown on this table.

1. A below-grade obstruction was observed in MW-38 on 9/18/20 and the well was decomissioned on May 6, 2021.

Abbreviations and Formatting:

AS/SVE = air sparge/soil vapor extraction

CPOC = Conditional Point of Compliance

				0	perating Para	meters						Mass R	temoval				Mass Remo	val	
	- F			Calculated	0.10						Calculated			Calcul	ated		Calculate		
			Cumulative	Cumulative	Period SVE	SVE	SVE	SVE	SVE	SVE Discharge	SVE Discharge	Oxidizer Fire	Oxidizer	Oxidizer	Period	Mass	Period	Cumulative	
		SVE Blower	SVE Blower	SVE Blower	Blower	Inlet	Inlet	Inlet	Inlet	Total VOC PID	Total VOCs ^{3,4}	Box	Discharge Total	Discharge Total	Destruction	Removal	Mass	Mass	
		Hr Meter ²	Runtime ²	Runtime	Runtime	Vacuum	ΔΡ	Temp	Flow Rate ¹			Temp ⁸	VOC PID ⁷	VOCs ^{3,4,6}	Efficiency ⁷	Rate ⁵	Removal ^b	Removal ⁹	
	Time	(Hours)	(Hours)	(Days)	(Days)	(In. H ₂ O)	(In. H ₂ O)	(°F)	(scfm)	(ppmv)	(μg/m³)	(F)	(ppmv)	(μg/m³)	(%)	(Lb/Day)	(Lb)	(Lb)	Comments/Notes
9/19/2019 9/20/2019		9.9 33.9		START 1.0	NA 1.0	35.0 35.0	0.25	72 68	98 99	198	0 238.228		NM	NA 4,903	NA	0.0	0.0	0.0	SVE Start; Oxidizer Start
9/23/2019		105.9		4.0	3.0	35.0	0.25	68	99	212	255,073		NM	4,903	NA	2.1	6.8	8.9	
9/24/2019		129.9		5.0	1.0	30.0	0.25	70	99	215	258,682		NM	4,903	NA	2.3	2.3	11.2	
9/25/2019	9:20	153.9		6.0	1.0	34.0	0.25	66	99	218	262,292		NM	4,903	NA	2.3	2.3	13.5	
	9:00	176.1		6.9	0.9	38.0	0.25	66	98	405	487,285		NM	4,903	NA	4.3	4.0	17.5	
9/28/2019		227.5		9.1	2.1	46.0	0.25	65	97	440 463	529,396		NM NM	4,903	NA	4.6	9.9	27.5	
	9:35 9:25	272.5 296.6		10.9 11.9	1.9	56.0 54.0	0.25	62 61	96 97	463	557,069 587,148		9.4	4,903	NA 99	4.8	9.1	36.5 41.6	
10/2/2019		320.6		12.9	1.0	44.0	0.25	62	98	427	513,755		8.7	4,538	99	4.5	4.5	46.2	
10/3/2019	8:50	344.1		13.9	1.0	50.0	0.25	61	97	457	549,850		NM	4,538	NA	4.8	4.7	50.9	
10/4/2019		371.0		15.0	1.1	55.0	0.25	66	96	469	564,288		7.9	4,121	99	4.9	5.5	56.4	
10/7/2019		443.4 464.4		18.1	3.0	61.0	0.25	65	95	466 487	560,678 585,945		5.2	2,712	100	4.8	14.5	70.9	
	9:05 10:07	464.4		20.0	1.0	70.0	0.25	60 60	95 94	487	585,945		8.8 7.0	4,590	99 99	5.0 5.0	4.4	75.2 80.5	
10/10/2019		513.7		20.0	1.0	69.0	0.25	61	95	517	622.040		4.1	2.139	100	5.3	5.4	85.8	
	9:33	585.7		24.0	3.0	78.0	0.5	60	132	550	661,745		8.3	4,329	99	7.9	23.6	109.4	
10/14/2019	9:39	608.9		25.0	1.0	81.0	0.5	61	131	558	671,370		NM	4,329	NA	7.9	7.7	117.1	
	12:25	632.9		26.0	1.0	82.0	0.75	64	160	667	802,516		5.4	2,817	100	11.6	11.6	128.7	
10/23/2019		826.5 848.8		34.0 35.0	8.1	86.0 93.0	1	60 57	185 224	662 637	796,500		8.8	4,590	99 99	13.2 15.5	106.7 14.4	235.4 249.7	Lab Data
10/24/2019 10/25/2019	9:35 9:50	848.8 873.0		35.0	0.9	93.0 90.0	1.5	57 58	224 243	637 752	766,421 904,785		7.7	4,016 3,286	99 100	15.5 19.8	14.4	249.7 269.7	
10/23/2019		946.1		39.0	3.0	85.0	2.5	56	243	793	954.116		7.3	3,200	100	25.2	76.7	346.4	
10/29/2019		969.6		40.0	1.0	82.0	2.5	56	295	823	990,211		7.7	4,016	100	26.3	25.7	372.1	
10/30/2019		995.7		41.1	1.1	81.0	2.5	56	295	744	895,160		6.7	3,495	100	23.8	25.9	398.0	
11/1/2019		1,045.1		43.1	2.1	79.0	2.5	56	296	734	883,128		6.1	3,182	100	23.5	48.4	446.4	
11/4/2019		1,120.3		46.3	3.1	80.0	2.75	55	311	660	794,094		4.8	2,504	100	22.2	69.5	515.9	
11/6/2019 : 11/8/2019		1,162.5		48.0 50.0	1.8	86.0 86.0	2.75	56 55	307 308	670 628	806,125 755,592		4.9	2,556	100	22.3 20.9	39.2 40.8	555.1 595.9	
11/8/2019		1,209.5		54.0	4.1	92.0	2.75	56	290	654	735,392		3.6	1,878	100	20.5	83.3	679.2	
	9:30	1,329.6		55.0	1.0	91.0	2.5	56	291	631	759,202		7.0	3,651	100	19.9	19.0	698.2	
11/15/2019	12:40	1,377.6		57.0	2.0	91.0	2.75	56	305	614	738,748		3.7	1,930	100	20.3	40.5	738.7	
11/25/2019	10:52	1,477.2		61.1	4.2	89.0	2.75	50	308	546	656,932		7.5	3,912	99	18.2	75.5	814.2	SVE & oxidizer down on 11/19/19 at 12:23 due to low propane. Restarted on 11/25/19 at 10:00.
11/26/2019	10:25	1,500.8		62.1	1.0	88.0	2.75	50	308	621	747,170		4.4	2,295	100	20.7	20.3	834.5	
11/27/2019	10:40	1,524.8		63.1	1.0	88.0	2.75	50	308	541	650,916		5.6	1,705	100	18.0	18.1	852.6	Lab Data is questionable and not used in calculations. Destruction Efficiency Based on PID.
12/2/2019	9:53	1,644.2		68.1	5.0	88.0	2.75	50	308	424	510,145		4.0	1,218	100	14.1	70.4	922.9	
12/3/2019	14:00	1,671.1		69.2	1.1	84.0	2.75	50	310	508	611,211		4.5	1,370	100	17.0	19.1	942.1	SVE system shutdown on 12/3/19 between 12:13 and 13:45 due to power outage.
12/6/2019		1,738.4		72.0	2.8	89.0	2.75	50	308	477	573,913		4.8	1,461	100	15.9	44.5	986.6	
12/9/2019		1,810.3		75.0	3.0	98.0	2.75	50	303	469	564,288		4.4	1,340	100	15.4	46.1	1,032.7	
12/16/2019 : 12/18/2019 :	10:47	1,979.9		82.1 84.1	7.1	99.0 94.0	2.5	50 50	289 291	507 442	610,008 531.802		4.0	1,218	100	15.8 13.9	27.6	1,144.7	
12/20/2019		2,027.4		86.0	2.0	94.0	2.5	50	260	734	883.128		4.6	1,401	100	20.7	40.8	1,172.2	
	12:02	2,148.9		89.1	3.1	96.0	2	50	260	662	1,381,000		4.9	1,125	100	32.2	99.7	1,312.7	Lab Data. Re-sample for 11/27/19.
12/26/2019	9:38	2,218.6		92.0	2.9	90.0	2.25	50	278	375	782,289		6.6	1,515	100	19.6	56.8	1,369.4	Empty water storage tank on 12/24/19.
1/3/2020		2,416.1		100.3	8.2	88.0	2	50	263	486	1,013,846		4.9	1,125	100	24.0	197.2	1,566.7	
	10:25	2,507.7		104.1	3.8	85.0	1.75	50	247	617	1,287,125		5.1	1,171	100	28.6	109.1 40.7		Empty water storage tank on 1/7/20.
1/9/2020 1/15/2020 1/15/2020		2,556.2		106.1	2.0	81.0 84.0	1.75	50 50	249	432	901,196 188,970	-	4.3	987 340	100	20.1	40.7	1,716.5	Lab Data
	11:32	2,750.6		112.1	2.1	84.0	1.5	50	229	353	188,970	-	6.0	296	100	4.1	8.4	1,740.0	Lab Data. Started air sparging.
1/21/2020				114.2	4.1	86.0	1.75	50	247	465	248,926		3.3	163	100	5.5	22.4	1,770.8	1
1/22/2020	15:12	2,873.1		119.3	1.0	92.0	1.75	50	244	522	279,440		2.6	128	100	6.1	6.4	1,777.3	
1/23/2020		2,893.3		120.1	0.8	93.0	1.5	50	226	564	301,924		5.0	246	100	6.1	5.2	1,782.4	Empty water storage tank on 1/23/20.
1/27/2020		2,992.2		124.3	4.1	88.0	1.75	50	246	492	263,380		2.5	123	100	5.8	24.0	1,806.4	Empty water storage tank on 1/27/20.
	9:36 13:25	3,059.8		127.1	2.8	93.0	1.75	50 50	244	549	293,894	-	5.9 6.1	291	100	6.4	18.2	1,824.6	Empty water storage tank on 1/30/20. Empty water storage tank on 2/5/20.
2/6/2020				132.2	2.1	84.0	1.75	50	242	638	304,600		2.8	138	100	7.0	34.2	1,858.8	Linply water stilldge tallk till 2/3/20.
	12:05	3,350.2		139.2	4.8	75.0	1.5	50	232	462	247,321		4.9	1,090	100	5.2	24.9	1,898.7	Collected lab air sample. Sample suspect. Lab data not used in calculations.
	9:34	3,418.1		142.0	2.8	69.0	1.5	50	234	450	240,897		5.6	1,246	99	5.1	14.4	1,913.0	Empty water storage tank on 2/13/20. AS system off from 2/13/20 @ 09:00 to 2/14/20 @ 09:00.
																			211/20 @ 05:00 to 2/14/20 @ 05:00 to 2/14/20 @ 05:00 to 2/14/20 @ 05:00.
2/17/2020	9:40	3,490.3		145.0	3.0	72.0	1.5	50	233	462	247,321		4.1	912	100	5.2	15.6	1,928.6	
2/20/2020	13:45	3,566.4		148.2	3.2	40.0	0.75	52	172	377	201,818		6.3	1,401	99	3.1	9.9	1,938.6	Empty water storage tank on 2/20/20. Approximately 12" in tank. Turned down vacuum to SVE
	\rightarrow																		well field to reduce water extracted.
2/26/2020	13:34	3.710.3		154.2	6.0	42.0	1	56	198	377	201.818		NT	1.401	NA	3.6	21.5	1.960.1	Started pulsing AS system. Zones 4 & 5 ON. Pulsing every 8 hours between Zones 1, 2, and 3. AS
		.,																,	system down between 08:24 on 2/27/20 and 10:00 on 2/27/20 due to PSH Alarm.
2/28/2020	10:23	3,755.2		156.1	1.9	50.0	1.25	51	220	377	201.818		NT	1.401	NA	4.0	7.5	1.967.5	AS system down between 18:49 on 2/27/20 and 09:00 on 2/28/20 due to PSH Alarm. Pulsing AS
												-		-,				-,	system with Zone 5 ON. Pulsing every 6 hours between Zones 1, 2, 3, and 4.
3/6/2020		3,923.5		163.1	7.0	50.0	1	52	196	401	214,666		NT	1,401	NA	3.8	26.6	1,994.1	
	14:30	4,046.3		168.2	5.1	50.0	1.25	52	219	360	192,717		5.7	1,268	99	3.8	19.5	2,013.6	Collected Lab air sample. Inlet concentration lab data suspect. Need to re-sample upon start up.
3/12/2020	10:15	4,066.0		169.0	0.8	50.0	1.25	51	220	318	170,234		7.5	1,668	99	3.4	2.8	2,016.3	Collected Lab air sample. Inlet concentration lab data suspect. Need to re-sample upon start up. Lab data not used in calculations.
3/19/2020	14:15	4,211.6		175.1	6.1	50.0	1.25	52	219	284	152,033		3.5	779	99	3.0	18.2	2,034.5	System off for 6.5 hours on 3/19/20 to install catalyst in oxidizer.
3/24/2020		4,325.4		179.8	4.7	50.0	1.25	56	219	319	170,769		3.1	690	100	3.4	15.9	2,050.4	System on to 0.5 hours on 5/15/20 to instance anyst in oxidizer.
8/17/2020	9:59	4,334.7		180.2	0.4	69	1	79	186	147	78,693		1.3	289	100	1.3	0.5	2,050.9	Measurement within 2-hours after system re-start since 3/24/2020. SVE wells being turned on o
																			at a time.
8/17/2020 :		4,336.9		180.3	0.1	63	1	79	188	141	75,481		0.5	111	100	1.3	0.1		All SVE wells except HSVE-1 and HSVE-2 turned on.
	7:26	4,356.2		181.1 181.2	0.8	61 63	1	79 79	188 210	193 318	103,532 170.234		0.5	111 334	100	1.8 3.2	1.4	2,052.5	All SVE wells except HSVE-1 and HSVE-2 turned on. Extracting at all SVE wells except HSVE-1 (partially open).
8/18/2020		12570									1/0,234		1.2	354	100	J.2	0.2	2,052.7	LEAU ACUITE ACAIL SVE WEILS EXCEPT HSVE-1 (DARUARIY ODEN).
	8:54	4,357.8 4,410.7		181.2	2.2	62	1.25	82	210	389	208.028		0.4	89	100	3.9	8.6	2,061.3	Readings prior to individual SVE well adjustments

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7/2/2021 10:00 4,628.8 11,431.7 475.9 16.0 80 1.5 80 2.4 80.4 253,926 1.0 2,763 99 5.1 81.8 80.16.8 adjust participation of SVE manifold (hoses an inter-structure) fluids out of SVE manifold (hose an inter-structure) fluids out of SVE manifold (hoses an inter-structure	
Image: Note of the state of the st	
7/19/2021 14:06 5:024.6 11:287.5 492.4 10.5 81 1.5 83 223 81.8 257,000 1.0 5:700 98 5.2 85.0 8,101.8 Collected lags as amples. Air sparge system still OF(blo as a sparge system still OF(blo 8/5/2021 8/26/2021 7:22 5:423.6 12:275.5 5:09.0 16.6 77 1.5 78 225 106.5 334,603 1.4 7,980 98 6.8 112.8 8,214.6 Air sparge system still OF(blo as a sparge system still OF(blo asparge system still OF(blo as a sparge syste	and sumps) and then re-adjusted SVE flo
8/5/2021 7.22 5,42.6 12,226.5 509.0 16.6 77 1.5 78 225 106.5 334,603 1.4 7,980 98 6.8 112.8 8,214.6 Air sparge re-started 7/24/21 8/26/2021 14:25 5,935.1 12,738.0 530.3 21.3 77.0 1.5 77 226 66.4 251,000 0.0 4,070 98 5.1 108.6 8,323.2 Collected lab gas samples. Air sparge bleeder valw wide wide wide wide wide wide wide wid	
\$\ \ \ 2\ \ 2\ \ 3\ \ 3\ \ 3\ \ 3\ \ 3\	lower to be re-installed).
8/L/40/L1 14:25 5:95.1 12,78:0 5:93.1 12,78:0 5:93.1 12,78:0 13.1 17.0 1.5 17.1 226 06.4 251,000 0.0 4,070 98 5.1 108:0 8,352.2 wells need inspected, maybe claned/r-developed.AS fit 9/30/2021 13:05 6,640.2 13,443.1 559.7 29.4 7.8 15.5 6,62 29.9 56.0 269,500 680 0.9 3,030 99 5.5 108.0 8,452.2 wells need inspected, maybe claned/r-developed.AS fit 9/30/2021 13:05 6,640.2 13,443.1 559.7 29.4 7.8 6.2 229 56.0 269,500 6.09 9.9 3,030 99 5.5 108.0 8,452.2 wells need inspected, maybe claned/r-developed.AS fit 9/30/2021 13:05 6,640.2 13,443.1 559.7 29.4 7.00 15.6 6.00 9.9 3,030 99 5.5 10.6 8,452.2 wells need inspected, maybe claned/r-developed.AS fit 9/30/2021 10.00 10.441.4 10.5 10.5 6.00 <td></td>	
9/30/2021 13.05 6,6402 13,443.1 559.7 29.4 78.0 1.5 6.2 2.9 56.0 269.50 680 0.9 3,030 99 5.5 162.7 8,485.9 Accomparison of system operations from CRET system	
9/30/2021 13:05 6,640.2 13,443.1 559.7 29.4 78.0 1.5 62 229 56.0 269,500 680 0.9 3,030 99 5.5 162.7 8,485.9 samples. PAH alarms continue to shut down the AS system cause.	flow meters need cleaned.
	ETE. See Footnote 6. Collected lab gas
10/6/2011 15/20 6 785 5 13 588 4 565 8 61 780 15 65 2079 144 8 669 850 689 25 8.417 09 143 965 9772 Data down to a final day t	
	unstigning processo switch like to serve
	unctioning pressure switch likely cause.
10/14/2021 9-03 6,972.3 13,775.2 573.6 7.8 7.8 7.8 7.0 1.5 60 229.0 100.2 482,213 684 1.9 6,397 99 9.9 77.3 8,649.6 PAH alarms continue to shut down the AS system. Malfur	unctioning pressure switch likely cause
10/21/2021 14:30 7,14.7 13,944.6 580.6 7.1 76.0 1.5 60 229.7 117.6 108,510 680 2.6 1,900 98 2.2 15.8 8,665.4 Collected lab gas samples. PAH alarms continue to shut d	down the AS system. Malfunctioning
Line line line line line line line line l	
10/28/2021 14:15 7.398 14:112.7 587.6 7.0 80.0 2.0 60 263.6 28.6 26.389 664 0.5 365 99 0.6 4.4 8.669.8 SVE Blower off from 10/21/2021 until 10/28/2021. Could	id be result of low PID measurement. PA
10/28/2021 14:15 /,309.8 14;112.7 587.6 7.0 80.0 2.0 60 2.05.6 28.6 20;389 664 0.5 365 99 0.6 4.4 6,609.8 alarms continue to shut down the AS system. Malfunction	oning pressure switch likely cause.
11/5/2021 14:30 7,502.7 14,305.6 595.7 8.0 84.0 2.0 55 263.3 50.6 46,689 681 6.6 4,823 90 1.1 8.9 8,678.7 PAH alarms continue to shut down the AS system. Malfur	unctioning pressure switch likely cause.
11/11/2021 21.21 7,654.1 14,457.0 602.0 6.3 86.0 1.5 54 227.5 109.7 101,221 680 2.5 1,827 98 2.1 13.1 8,691.8 PAH alarms continue to shut down the AS system. Malfur	unctioning pressure switch likely cause.
11/18/2021 12:30 7.807.8 14.610.7 608.4 6.4 8.60 1.5 5.0 228.4 47.6 103.250 6.86 1.0 1.020 9.9 2.1 13.6 8.705.3 Collected lab gas samples. Replacement AS Compressor of	pressure switch installed on 11/17/21 b
Marine Maintenance.	
11/23/2021 16:0 7,932.0 14,734.9 613.5 5.2 86.0 2.0 50 263.7 87.5 189,798 682 0.9 918 100 4.5 23.3 8,72.6 No new PAH alarms since the pressure switch replaceme	
12/1/2021 15:55 8,122.9 14,925.8 621.5 8.0 85.0 1.5 55 227.6 19.4 42,081 652 1.1 1,122 97 0.9 6.9 8,735.5 No new PAH alarms since the pressure switch replaceme	nent.
12/10/2021 14:15 8,337.3 15,140.2 630.4 8.9 86.0 1.5 50 228.4 399.3 866,129 676 0.0 0 100 17.8 158.9 8,89.4 No new PAH alarms since the pressure switch replacement	
12/17/2021 15:17 8,499.7 15,302.6 637.2 6.8 88.0 1.5 50 227.7 42.5 92,188 676 0.6 612 99 1.9 12.8 8,907.2 No new PAH alarms since the pressure switch replaceme	
12/22/2021 12:15 8,6169 15,419.8 642.1 4.9 90.0 1.5 50 227.0 55.3 109,700 682 0.7 1,250 99 2.2 10.9 8,918.1 Collected lab gas samples. No new PAH alarms since the g	
1/5/2022 12:41 8,697.9 15,500.8 645.5 3.4 84.0 1.0 50 187.1 52.8 104,741 684 1.2 2,143 98 1.8 5.9 8,924.0 AS bleed value closed 100% to try to increase airflow to s	subsurface.

					perating Para	meters						Mass F	temoval				Mass Remo		
			Cumulative	Calculated		0.0	SVE	SVE	SVE		Calculated	Out diama F	Ordellaur	Calcul			Calculate	•	
		SVE Blower	Cumulative SVE Blower	Cumulative SVE Blower	Period SVE Blower	SVE Inlet	SVE Inlet	SVE	SVE Inlet	SVE Discharge Total VOC PID	SVE Discharge	Oxidizer Fire Box	Oxidizer Discharge Total	Oxidizer Discharge Total	Period Destruction	Mass Removal	Period Mass	Cumulative Mass	
		Hr Meter ²	Runtime ²	Runtime	Runtime	Vacuum	AP	Temp	Flow Rate ¹	Total VOC PID	Total VOCs ^{3,4}	Temp ⁸	VOC PID ⁷	VOCs ^{3,4,6}	Efficiency ⁷	Rate ⁵	Removal ⁶	Removal ⁹	
Date	Time	(Hours)	(Hours)	(Days)	(Days)	(In. H ₃ O)	(In. H ₂ O)		Flow Rate (scfm)	(ppmv)	((F)	(ppmv)		(%)	(Lb/Day)	(Lb)	(Lb)	Comments/Nates
Date	mile	(HOUIS)	(Hours)	(Days)	(Days)	(III. H ₂ O)	(III. H ₂ O)	(°F)	(sciiii)	(ppinv)	(µg/m³)	(F)	(ppinv)	(µg/m³)	(70)	(LD/Day)	(LD)	(LU)	
1/21/2022	13:47	9,005.0	15,807.9	658.2	12.8	85.0	1.5	54	227.9	16.3	32,335	672	0.3	536	98	0.7	8.5	8,932.5	New AS PAH alarm on 1/12/22, the first since the pressure switch replacement. AS bleed valve opened up to relieve pressure on 1/13/22. Despite that, PAH alarms continue to shut down the AS system.
2/17/2022	20:20	9,499.3	16,302.2	678.8	20.6	80.0	1.0	50	188.2	383.2	760,163	675	7.9	14,107	98	12.9	264.9	9,197.5	Last AECOM visit under the initial short term service directive. PAH alarms continue to shut down the AS system.
3/31/2022	11:50	10,460.2	17,263.1	718.9	40.0	78.0	0.8	63	161.5	17.0	101,000	697	0.4	1,900	98	1.5	58.7	9,256.2	First AECOM visit under the new service directive. Oxidizer and SVE ON on arrival but AS system OFF due to a PAH alarm. Alarm cleared and AS restarted at 10:50. Collected lab gas samples. AS pressure switch tested and determined to be manifunctioning. Switch taken offline to prevent further false alarm shut-downs.
4/12/2022	15:45	10,736.6	17,539.5	730.4	11.5	82.0	1.0	52	187.3	10.5	62,382	708	0.3	1,425	98	1.1	12.1	9,268.3	AS Compressor working as desired since disconnection of pressure switch. Zone sparging re- instituted at 5/5/5/4.5/4.5-hr intervals.
4/28/2022	15:59	11,021.7	17,824.6	742.3	11.9	74.0	1.0	60	188.1	38.5	228,735	670	0.7	3,325	99	3.9	46.0		4.15.22. Rotameters cleaned for improved reading and operation; vacuum gauges replaced on SVC45, 7, 4, 9, and -10 (gauges should have been 0° H,O with system off but were reading from 7-27 ° H,O). 4.18.22 - Oxidizer magnehelic gauge replaced. 4.28.22 - Systems ON on arrival operating with zone sparging. Water continues to impede accurate readings of several SVE rotameters.
5/13/2022	15:11	11,337.5	18,140.4	755.4	13.2	78.0	1.5	60	229.0	34.7	206,159	668	0.4	1,900	99	4.2	55.8	9,370.1	**
6/21/2022	17:55	11,824.4	18,627.3	775.7	20.3	74.0	1.3	72	212.0	24.3	144,371	672	1.6	7,600	95	2.8	55.8	9,425.9	System down 5/25/22-6/13/22 due to lapsed invoices and lack of propane. Water continues to impede accurate readings of several SVF contameters. SVE-5 rotameter gets stuck and needs replacing, AS VFD had a motor overload error code flashing (A2010), but the system was operational. AS zone numines were adjusted at EOD to add a 30-minute overlap during each transition. If the VFD motor overloads were happening during the zone transitions, this should help avoid them moving forward. Alarm notifications went inactive "6/8/22 due to outdated telemetry software, fix pending.
7/7/2022	17:09	12,206.1	19,009.0	791.6	15.9	76.0	1.0	64	186.8	13.0	77,235	625	1.0	4,750	94	1.3	20.6	9,446.5	6/29/22- collected lab gas samples. No other system readings taken. 7/722- system were 0N on arrival operating with zone sparging. No system downtime this period. Sparge VFD had the motor overload error code flashing again (A2010) but the system was still running. AS Zones 2 and 4 were analyzed for breakthrough pressures and valves positions were adjusted for optimal flow distribution. At EOD, PLC was rewired so that the zones on the HM control the same-named zones in the field. Zone 1 and 2 runtimes swapped at EOD. Alarm notifications have been inactives ince ~68/22 due to outdated telemetry software, fix pending.
7/22/2022	16:10	12,556.2	19,359.1	806.2	14.6	74.0	1.0	78	184.9	12.1	71,888	681	0.9	4,275	94	1.2	17.4	9,464.0	Systems were ON on arrival operating with zone sparging. No system downtime this period. Rotameters for several SVE wells have observable signs of usage wear and tear. Water in the SVE lines continues to make accurate readings difficult. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending.
8/5/2022	14:45	12,679.6	19,482.5	811.4	5.1	85.0	1.0	80	181.5	49.6	294,682	677	2.5	11,875	96	4.8	24.7	9,488.7	Systems ON on arrival operating with zone sparging. The systems only operated for ~1/3 of the period due to several oxidizer alarms that did not trigger notifications due to the telemetry software issue (fix pending). Rotameters for several VS wells have observable signs of usage wea and tear. Water in the SVE lines continues to make accurate readings difficult.
8/19/2022	15:15	13,014.8	19,817.7	825.3	14.0	74.0	1.0	82	184.2	29.3	174,076	695	2.7	12,825	93	2.9	40.3	9,529.0	Systems were ON on arrival operating with zone sparging. No system downtime this period. Alarr notifications have been inactive since "6/8/22 due to outdated telemetry software, fix pending. Rotameters for several SVE wells have observable signs of usage wear and tear. Water in the SVE lines continues to make accurate readings difficult. AS Zone 1 well valve positions were optimized for desired flow distribution.
9/2/2022	14:55	13,294.7	20,097.6	837.0	11.7	72.0	1.5	82	226.3	12.0	71,294	661	2.8	13,300	81	1.5	16.9	9,545.9	Dxidizer and SVE systems ON upon arrival. Sparge system was OFF on arrival due to a Sparge Blower TAH alarm from 14.48 on 8/31/22. Alarm notifications have been inactive since "5/8/22 due to outdated telemetry software, fix pending. AS system restarted at 15:00. Water in the SVE lines continues to make accurate readings difficult.
9/14/2022	9:54	13,567.8	20,370.7	848.4	11.4	72.0	1.5	84	225.9	4.5	32,570	664	0.5	2,070	94	0.7	7.5	9,553.4	Systems ON on arrival operating with zone sparging. No alarms triggered this period (no downtime), but alarm notifications were inactive. During O&M, the AS bleed value was closed to vent excess air through the pressure relief value on an as-needed basis instead. SVE-5, 6, and 8 were pumped out until dry using a peristaltic pump; ~4 gallons total extracted from the manifold and stub ups.
09/30/2022	13:10	13,953.2	20,756.1	864.4	16.1	78.0	1.5	72	226.4	56.5	408,934	694	5.7	23,598	94	8.3	133.7	9,687.1	Systems ON on arrival operating with zone sparging. Sparger TAH alarms occurred on 9/14, 9/15, and 9/20, likely due to the bleed wake adjustment made on 9/14/2. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending, The PRV discharges hotter air into the AS endosure than the bleed valve does, likely impacting the compressed air temperatures. The bleed valve was re-opened ~1/2.turn on 9/20/22, resolving the issue for the rest of the period. Water was once again visible in SVE-6 and -8, despite dewatering last visit. Water also visible in SVE-9 (not dewatered last visit).
10/13/2022	15:13	14,261.6	21,064.5	877.3	12.9	78.0	2.0	68	262.4	9.3	67,311	667	0.7	2,898	96	1.6	20.4	9,707.5	SVE ON on arrival, but AS OFF due to a VFD motor overtemp fault. The fault occurred on 10/4/22 but was not resolved prior to the 10/13 site visit. System was shut down after O&M for the groundwater sampling asympling event in the evening of October 13, 2022. Both systems were restarted following sampling ato 15:0 n 01/4/22. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending.
10/26/2022	16:00	14,564.8	21,367.7	889.9	12.6	83.0	1.5	58	227.7	21.6	156,336	682	0.7	2,898	98	3.2	40.4	9,747.9	10/17/22 - AS VFD motor overtemp alarm, triggered 10/14/22, was resolved by MM and the system was restarted. 10/19/22 - AS VFD motor overtemp alarm, triggered 10/18/22, was resolved by AECOM during VFD troubleshooting. If backpressure is too high, the VFD sends excessive amps to the motor and faults out. Biled valve increased to 1 full turn open to relieve pressure. 10/26/22 - Systems ON on arrival. Measured amps in each wire in and out of the VFD. Based on results, ABB tech support believes the motor is having issues, not the VFD. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending.

				0	perating Para	meters						Mass I	Removal				Mass Remo	val	
				Calculated							Calculated			Calcul			Calculated		
			Cumulative	Cumulative	Period SVE	SVE	SVE	SVE	SVE	SVE Discharge	SVE Discharge	Oxidizer Fire		Oxidizer	Period	Mass	Period	Cumulative	
		SVE Blower	SVE Blower	SVE Blower Buntime	Blower Runtime	Inlet	Inlet	Inlet	Inlet	Total VOC PID	Total VOCs ^{3,4}	Box Temp ⁸	Discharge Total VOC PID ⁷	VOCs ^{3,4,6}	Destruction	Removal	Mass	Mass	
0	Time	Hr Meter ² (Hours)	Runtime ² (Hours)			Vacuum	ΔP	Temp	Flow Rate ¹ (scfm)	()	3.				Efficiency ⁷	Rate ⁵	Removal ⁶	Removal ⁹	Comments/Notes
Date	Time	(Hours)	(Hours)	(Days)	(Days)	(In. H ₂ O)	(In. H ₂ O)	(°F)	(scrm)	(ppmv)	(µg/m³)	(F)	(ppmv)	(µg/m³)	(%)	(Lb/Day)	(Lb)	(Lb)	Comments/Notes
11/10/22	15:05	14,923.3	21,726.2	904.8	14.9	85.0	1.5	53	228.1	42.6	308,329	681	0.8	3,312	99	6.3	94.4		All systems ON on arrival. Sparge Zone 5 active. Systems ran continuously since last visit. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending.
11/23/22	15:35	15,228.3	22,031.2	917.6	12.7	86.0	1.8	53	246.0	8.8	63,692	669	1.1	4,554	93	1.4	17.9	9,860.3	All systems ON on arrival. Sparge Zone 5 active. Systems ran nearly continuously since last visit. Pilot SVE dewatering piping upgrade was successfully used to dewater SVE-8. SVE header PID readings taken for the first time with new brake bleeder mini knockout tank. ~65% of total mass removal due to bKVF-2 via PID measurements. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending.
12/09/22	10:45	15,572.4	22,375.3	931.9	14.3	96.0	1.8	50	242.8	11.8	49,650	685	1.0	660	99	1.1	15.5	9,875.8	12/8/22: System restarted following LNAPL recovery event and storage tank vac-out. System had shut down due to a Moisture Separator high level alarm at 14:22 on 12/7/22. 12/9/22: All systems ON on arrival. Sparge Zone 4 active. ~74% of total mass removal due to HSVI 2 via PID measurements.
12/29/22	15:47	15,730.0	22,532.9	938.5	6.6	>100	1.7	<50	237.8	10.1	42,497	670	1.2	792	98	0.9	6.0	9,881.8	12/19/22: System restarted following vac-out of the storage tank by MM. System had shut down on 12/15/22 at 21:03 due to a Moisture Separator high level alarm. 12/28/22: System restarted at 16:00 by MM. System was down due to an oxidizer alarm triggered at 9:40 on 12/21/22. Cause unknown. 12/29/22: System OFF on arrival due to a Moisture Separator high level alarm triggered at 18:26 on 12/28/22. A broken union was discovered on the water transfer pipe, presumed due to the freezing temperatures on 12/27/22. Union repaired while on site. Bottom moisture separator filds switch also discovered to be broken, also likely due to freezing. Immediate repair not possible, an normal automatic draining capability disabiled as a result. The system was run for several hours under supervision to collect readings but was shut down prior to departure.

Footnotes:

1. Standard flow (scfm) is calculated using differential pressure, pressure, and temperature as recorded in the field per the equation below (as identified with green highlighting in the table). The PSCAA permit requires the SVE flowrate to be less than or equal to 375 scfm.

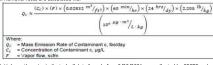
tot Tube Flov	v Equation fo	or Any Gas	Notes:
(SCFM) = 12	28.8 x K x D^	2 x SQRT ((P x delta P)/(T +460) x Ss)	From Dwyer Bulletin F-50
Q	SCFM	Flow in standard cubic feet per minute	See Table for Calculation from Gauge Reading
К	0.67	Flow Coefficient for 3 and 4-inch pipe	From Dwyer Bulletin F-50
D	3.79	Inside Diameter of Pipe measured in inches	SVE Sch. 80 PVC Pipe Inside Diameter
Т	50	Degrees Fahrenheit	Average Temp of Extracted Air
delta P	0.4	Differential Pressure read on Magnehelic Gauge	See Table for Gauge Reading (in H2O)
v	-3.0	Pressure (vacuum psig) inside pipe	Field Measurements Recorded as in H20. Conversion is 1.00 in H20 = 0.0361 psig
Р	11.7	Static Line Pressure (psia) = 14.7 + V	PSIA plus Vacuum. Calculate Vacuum as a Negative Number.
Ss	1.00	Specific Gravity (SG) of Air at 60 degrees F	SG is Unitless

2. On 12/03/20, the blower hour meter was reset after an extended power outage and changeover to generator power

3. The TPH concentration is the sum of APH EC5-8 aliphatics. APH EC9-12 aliphatics, and APH EC9-10 aromatics. If one of these was not detected, a conservative approach of 1x the reporting limit was used in the calculation.

4. For dates with laboratory data, the Total VOC Concentration equals the laboratory TPH concentration. For dates without laboratory data, the Total VOC Concentration is calculated by adjusting the PID measurement with a correction factor. This correction factor is calculated by dividing the laboratory-measured TPH concentration from the most recent sampling event by the field-collected PID measurement from the same day.

5. Removal rates are calculated via



6. Unless otherwise indicated, all data from before 9/30/2021 was collected by CRETE and was not reviewed or validated by AECOM.

7. Destruction efficiency is calculated with the Total VOC Oxidizer Outlet Concentration and the Total VOC Oxidizer Inlet Concentration. The PSCAA permit dictates that:

At all times during operation of the SVE system, the abatement device shall meet the following requirements, as applicable: a) ≥98.5% control efficiency if inlet TPH ≥2,000 ppmv, measured as hexane or its equivalent; or

b) ≥97% control efficiency if inlet TPH ≥200 ppmv and <2,000 ppmv, measured as hexane or its equivalent; or

c) ≥90% control efficiency if inlet TPH <200 ppmv, measured as hexane or its equivalent; or

d) ≤10 ppmv at the outlet of the control device, measured as hexane or its equivalent.

8. The PSCAA permit states that: The minimum operating temperature at the fire box of the thermal oxidizer shall be at least 1,400°F, on an hourly average. When the thermal oxidizer was retrofitted to a catalytic oxidizer on 3/19/20, the minimum operating temperature became 600°F. The hourly requirement is met by the shut-down alarm programmed if the temperature drops below the permitted

threshold.

9. This calculation was revised by AECOM to use the mass removal rate from the single day's data rather than the average with the previous visit as CRETE had done.

Abbreviations, Symbols, and Notes:

-- = not analyzed or not applicable ΔP = Differential Pressure H₂O = Water Hr = Hour °F = Degrees Fahrenheit In. = Inch Lb = pound ppmv = Parts per million volume scfm = Standard Cubic Feet Per Minute µg/m³ = micrograms per cubic meter

Red values indicate approximated values or averaged values as placeholder for data not recorded in the field. Blue values indicate data collected by CRETE but input by AECOM, or calculated by AECOM with data previously collected by CRETE.

Image: Properties in the state in															.2										1
Image Image <th< td=""><td></td><td>5</td><td></td><td></td><td></td><td></td><td>ratory SVE E</td><td>Discharge R</td><td>lesults</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Laboratory</td><td>Oxidizer D</td><td>ischarge R</td><td>sults</td><td></td><td>-</td></th<>		5					ratory SVE E	Discharge R	lesults	1										Laboratory	Oxidizer D	ischarge R	sults		-
Norme Norma Norme Norme <th< td=""><td></td><td></td><td>Calculated</td><td></td><td>Calcul</td><td>ated</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Calculate</td><td>ed</td><td>700</td><td>700</td><td>Calcu</td><td>lated</td><td>_</td><td></td><td></td><td></td><td>Calculated</td><td>-</td></th<>			Calculated		Calcul	ated	-							Calculate	ed	700	700	Calcu	lated	_				Calculated	-
here here <th< td=""><td></td><td>Cumulative</td><td>Period SV/E</td><td>SV/E Inlot</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>тры</td><td></td></th<>		Cumulative	Period SV/E	SV/E Inlot																				тры	
Impart														Ethud	Total										
Date Date <th< td=""><td></td><td></td><td></td><td></td><td>2</td><td>70117.8</td><td></td><td></td><td></td><td></td><td>70112.9</td><td>. 9</td><td> 9</td><td>· · · ,</td><td></td><td></td><td></td><td>2</td><td>70.178</td><td></td><td> </td><td>. ,</td><td></td><td></td><td></td></th<>					2	70117.8					70112.9	. 9	9	· · · ,				2	70.178			. ,			
1071/09 101						-				/									-				, .	,	-
11277030 910 97				1							· · · · / · · //	1	(lbs/day)		1							(μg/m³)			
Display Bit Display Di							160	1				0.0027	0.120	0.003	0.008			,							
1 1/1200 1 1.1 2 1.0 7.9 1 4.2 1 2.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Lab Data is questionable and not used in calculations. See Note 5.</td></t<>							-		-																Lab Data is questionable and not used in calculations. See Note 5.
211/200 1919 270 17	1 .1			260								0.0075	0.018	0.001	0.002	838.3	-/		0.3						<u> </u>
MADD MaD	1/15/2020	112.13	23.00	229	188,970	46.2	23	730	17	51	3.89	0.0005	0.015	0.000	0.001	89.6	1,902.9	340	0.1	2.6	60	1.4	4.2	99.8	
31/1700 100 0.0	2/11/2020	139.18	27.05	232	94,970	23.2	12	730	17	51	1.98	0.0003	0.015	0.000	0.001	53.7	1,956.5	1,090	0.3	2.6	150	3.5	10.5	98.9	
add/y dist isis add/s isis	3/12/2020	169.00	29.83	220	641	0.2	1	62	1	4	3.36					100.3	2,056.8	515	0.1	0.96	57	1.3	3.9	99.7	
10717000 29.69 29.69 29.60 43.60 29.60 13 45.70 20.70 13.8 14.90 35.70 13.8 14.90 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 15.70 20.70 2	8/26/2020	189.43	20.43	134	2,101,500	513.9	260	680	97	251	25.26	0.0031	0.008	0.001	0.003	516.0	2,572.9	6,570	1.6	11	660	15	45	99.7	System was off line March 24 - August 17, 2020 due to the Covid 19 Pandemic
111112000 27.20	9/29/2020	223.18	33.75	243.2	1,460,900	357.2	120	680	56	118	31.94	0.0026	0.015	0.001	0.003	1,078.1	3,650.9	9,570	2.3	11	660	15	45	99.3	
12/16/200 22/5 22.66 22.65 13.50 21.6 20.65 13.50 23.70 <	10/27/2020	249.87	26.69	263.1	394,000	96.3	270	16,000	370	1,120	9.32	0.0064	0.378	0.009	0.026	248.7	3,899.7	5,250	1.3	4.5	260	6.1	18.1	98.7	
12/16/200 29:7. 29:6 29:7. 29:6 29:7. 29:6 29:7. 29:6 29:7. 29:6 29:7. 29:6 31:7. 29:6 31:7. 29:6 31:7. 29:6 31:7. 29:6 31:7. 29:6 31:7. 29:7. 21:7. 29:6 31:7. 29:7. 21:7. 29:6 31:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. 21:7. 29:7. <td>11/18/2020</td> <td>272.09</td> <td>22.22</td> <td>264.0</td> <td>452,000</td> <td>110.5</td> <td>140</td> <td>8,100</td> <td>190</td> <td>560</td> <td>10.73</td> <td>0.0033</td> <td>0.192</td> <td>0.005</td> <td>0.013</td> <td>238.5</td> <td>4,138.1</td> <td>14,400</td> <td>3.5</td> <td>12</td> <td>680</td> <td>16</td> <td>47</td> <td>99.0⁵</td> <td></td>	11/18/2020	272.09	22.22	264.0	452,000	110.5	140	8,100	190	560	10.73	0.0033	0.192	0.005	0.013	238.5	4,138.1	14,400	3.5	12	680	16	47	99.0 ⁵	
12/12/101 32.1/2 25.98 27.7 24.00 25.9 8.00 9.0 1.00 0.001 0.001 0.001 0.001 5.55.4 3.10 0.10 0.001 0.001 5.55.4 3.00 0.10 0.001 0.001 5.55.4 3.00 0.10 0.001 0.001 5.55.4 3.00 0.20 0.001 0.001 5.55.4 3.00 0.20 0.001	12/16/2020	295.75	23.66	229.5	1.151.000	281.5	73	2.600	61	181	23.75	0.0015	0.054	0.001	0.004	561.8	4.699.9	9.170	2.2	4.8	280	6.5	31.5		
217/201 32.59 90.86 20.75 66.850 13.85 60 70 83.0 500 70 83.0 500 70 83.0 500 70 83.0 500 70 28.0 500 70 28.0 90.0<		321.72						3.000	69	209	18,92	0.0018	0.061	0.001	0.004	491.4	5,191.3			4.8	280	-	53.3		1
3232202 384.49 31.31 227.3 56.300 137.7 440 85.00 100 157 140 85.00 100																									
4(19)202 (40)29 22.80 22.70 (41,00) 160 160 150 130 0.029 0.109 0.009 0.109 0.009 0.109 12.10 12.30 1		384.49															5,921.6								
5/20/2021 435.64 27.35 22.70 403.900 10.9 17 680 27.4 47.9 68.9 0.001 25.05 6.66.9 7.00 1.7 1.5 87 69 23.3 98.8 5 hyder restarted on \$//12 with regaired on \$//12 with rega		408.29																							AS blower shut down due to oil leak
61/B/O21 459:92 24.27 22.27 421.00 102 140 8.100 190 560 6.10 13.1 4.5 260 6.1 13.1 99.8 A system down since 6/15/21 for blower servicing. 7/19/2021 492.40 32.48 223.1 257.000 6.8 150 6.000 0.115 0.000 0.112 167.4 6.69.0 1.4 5.10 30.0 6.9 20.9 97.8 A system down since 6/15/21 for blower servicing. 7/19/2021 590.7 29.38 225.7 25.100 6.1 15.0 6.00 1.00 0.011 0.001 0.12 193.2 7.033.3 0.70 1.0 4.8 0 0.5 0.0000 0.11 0.002 0.007 1.9 1.0 4.8 0 0.20 0.007 0.000 1.0 4.8 0.20 0.5 1.9 1.0 4.8 0.20 0.5 1.9 1.0 4.8 0 0.5 1.9 1.0 1.0 1.0		435.64																							
7/19/2021 492.40 32.48 223.1 257.00 62.8 150 8.00 20.00 5.15 0.000 0.012 167.4 6.840.1 5.00 1.4 5.1 30.0 6.9 20.9 97.8 A system down since (15/21 for blower servicing. 8/26/2021 530.34 37.94 225.7 251.00 6.14 15.9 0 5.00 0.181 0.001 0.012 19.32 7.033.3 4.070 1.0 4.8 2.80 6.5 1.5.5 0 A system means since (15/21 for blower servicing. 9/30/2021 559.72 29.38 22.5 65.00 1.5.5 0.010 0.010 0.000 162.7 7.196.0 3.030 0.7 1.9 1.0 2.6 7.7 0 9.8 Asstem means since (15/21 and blower servicing. 10/21/2021 559.72 29.38 28.95 1.55 9.30 0.51 0.001 0.007 0.000 0.600 4.68 7.42.9 1.90 1.0 1.0 2.6 7.5 9.85 9.41 9.41 9.41 9.41 9.41 9.41																									
2 5 3 3.4 3 7.9 2 25.7 2 5 1.00 6 1.4 1 5 0 8 0.00 0 0.00 0.11 0.000 0.01 1 9.3 7.033.3 4.070 1.0 4.8 0 1 9.5 0 4.8 9 9.8 A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system A System estanted 7/4/1.P APH alms continue to shut down the AS system PSH alms continue to shut down the AS system		492.40			257.000		150			600	5.15	0.0030													
8/22/212 530.5 3/94 22.5. 530.0 6.1 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150 0 150																									
9/30/2021 559.7 29.8 28.8 28.9 6.9 8.8 9.90 10 9.0 5.50 10.00 <td>8/26/2021</td> <td>530.34</td> <td>37.94</td> <td>225.7</td> <td>251,000</td> <td>61.4</td> <td>150 U</td> <td>J 8,900 L</td> <td>J 200 U</td> <td>J 610 U</td> <td>5.09</td> <td>0.0030</td> <td>0.181</td> <td>0.004</td> <td>0.012</td> <td>193.2</td> <td>7,033.3</td> <td>4,070</td> <td>1.0</td> <td>4.8 L</td> <td>280 U</td> <td>6.5 L</td> <td>19.5 U</td> <td>98.4</td> <td></td>	8/26/2021	530.34	37.94	225.7	251,000	61.4	150 U	J 8,900 L	J 200 U	J 610 U	5.09	0.0030	0.181	0.004	0.012	193.2	7,033.3	4,070	1.0	4.8 L	280 U	6.5 L	19.5 U	98.4	
9/30/2021 559.72 9.38 28.8 28.8 19.9 9.59 10.9 10.9 10.9															-				-						
Image: Relation in the state in therel in therest, state in the state in the state in the state in	9/30/2021	559.72	29.38	228.5	269.500	65.9	83 U	4.900 1	J 110 I	340 U	5.54	0.0017	0.101	0.002	0.007	162.7	7.196.0	3.030	0.7	1.9 L	110 U	2.6 1	7.7 U	98.9	
10/12/12/12 58.61 20.90 22.97 108,510 26.5 6.0 340 0 2.4 0 0.00 0.00 4.6.8 7.242 1.00 0 2.5 1.0 0 2.5 0 9.8 PAt alarms continue to shut down the AS system. Malfunctioning pressure switch likely cause. 11/18/201 608.37 27.75 22.84 103.50 2.5 7.5 3.00 1.5 0.000 2.6 7.3017 1.00 0.5 1.9 0 0.5 0 9.9 PAt alarms continue to shut down the AS system. Malfunctioning pressure switch likely cause. 11/18/201 608.37 27.75 22.84 103.070 2.5 0 7.5 7.3017 1.00 0.2 1.9 0 0.5 1.9 0 0.5 0 9.90 PAt alarms continue to shut down the AS system. Malfunctioning pressure switch likely cause. 11/18/201 608.37 27.75 22.84 10.907 2.68 0.700 2.68 7.3077 1.60 0.8 1.8 1.8 1.10 0 2.5 9 9 PA system AD ADdieer maning smoothy income AD PA system AD AD AD	-,,				,			.,									.,	-,					1		
10/21/2021 50.501 2.5.7 106,510 2.6.5 6.0 3.40 0 1.0 2.4 0 0.00 0.00 4.6.8 7,242.9 1.00 0.5 1.0 0 2.5.7 0 9.6.7 9.6.7 9.6.7 9.6.7 9.6.7 0 9.6.7 0 1.0 0 2.5.7 0 9.6.7																									
11/18/201 608.37 27.75 228.4 103,250 25.2 7.5 340 1 1 24 10 2.1 0.000 0.000 58.9 7,301.7 1,02 0.2 1.9 10 10 2.6 10 57.9 58.4 0 11.1 24 10 2.1 0.000 0.000 58.9 7,301.7 1,02 0.2 1.9 10 10 2.6 10 58.4 0 10.1 10.2 89.0 58.4 10.0 10.0 10.2 10 10.0 2.6 10 10.2 10.2 10.0 10.0 10.2 10.0	10/21/2021	580.61	20.90	229.7	108,510	J 26.5	6.0	340 L	J 10	24 U	2.24	0.0001	0.007	0.000	0.000	46.8	7,242.9	1,900	0.5	1.9 L	110 U	2.5 L	7.5 U	98.2	
11/18/2021 608.37 27.75 228.4 103.250 25.2 7.5 800 11 1 24 0 21.2 0.000 5.00																									
Alternation	11/18/2021	608.37	27.75	228.4	103.250	25.2	7.5	340 I	11	24 UI	2.12	0.0002	0.007	0.000	0.000	58.9	7.301.7	1.020	0.2	1.9 L	110 U	2.6 1	7.9 U	99.0	
12/22/02 64.08 3.71 22.70 10.90,700 26.8 56.9 1.300 7.65 1.000 7.65 7	,,								· ·- ·	1							.,	-,			1		1		
12/2/20/1 642/08 3.5/1 22.7/0 105,00 2.6 3.5/1 22.7/0 105,00 2.6 10 0 2.5 0 7.5 7.37/2 1.5 0 10 0 2.5 0 7.5 7.37/2 1.5 0 9.8.9 pressure switch replacement. 3/31/2022 718.88 76.80 161.5 101,000 2.4.7 13 0 790 18 0 0.001 112.6 7.488.8 1,900 0.5 1.9 10 0 2.5 0 7.5 0 98.9 pressure switch replacement. 3/31/2022 718.88 76.80 161.5 101,000 2.4.7 13 0 7.5 4 0.001 112.6 7.488.8 1,900 0.5 1.9 110 0 2.6 7.8 7.9 98.9 Condition and PIO readings withereade AA Sectament at 10.50.5 Sample collected but biweeky system Coll data at 12.50.5 Sample collected but biweeky system coll data at 12.50.5 Sample collected but biweeky system coll data at 12.50.5 Sample collected but biweeky system coll data at 12.50.5 Sample collected but biweeky system coll data at 12.50.5 Sample																									
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3/3/2022 78.88 76.80 161.5 101,000 24.7 13 0 96 147 0.000 0.01 112.6 7,489.8 190 0.5 1.9 110 2.6 0 7.9 98.1 cleared and AS restarted at 10:50. Sample taken at 6/29/2022 775.72 56.84 212.0 73.100 17.9 15 0 20 60 0 1.3 0.000 0.001 112.6 7,489.8 1900 0.5 1.9 110 2.6 0 7.9 98.1 cleared and AS restarted at 10:50. Sample taken at 6/29/2022 775.72 56.84 212.0 73.100 17.9 15 0 80 0.01 79.2 7,569.0 800 0.2 1.9 10 2.6 0 7.8 0 98.1 Gardia data at			<u> </u>		1			1							1			<u> </u>							
6/29/2022 775.72 56.84 212.0 73,100 J 17.9 15 U 870 U 20 60 U 1.39 0.000 0.01 79.2 7,569. 800 0.2 1.9 U 10 U 2.6 U 78. U 98.9 Sample collected but biveekly system readings with respected after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alarm from 6/25/22 Sample scaleted after 30 min A mirval due to a THA alar	3/31/2022	718.88	76.80	161.5	101,000	J 24.7	13 U	J 790 L	J 18 U	J 54 U	1.47	0.0002	0.011	0.000	0.001	112.6	7,489.8	1,900	0.5	1.9 L	110 U	2.6 L	7.9 U	98.1	
6/29/2022 75.7c 56.8c 21.2c 73.10c 1 7.9c 1 8.7c 1 8.0c 0.01 0.000 0.01 79.2c 7,56.9c 800 0.2c 1.9c 1 10 2.6c 1 8.0c 1 8.0c 1 8.0c 1 10.0c 1 10.						-									-			-	-						
6/29/2022 775.72 56.84 212.0 73,100 J 17.9 15 U 870 U 20 60 U 1.39 0.000 0.01 79.2 7,569. 80 0.2 1.9 U 10 U 2.6 U 7.8 U 98.9 runtime and PID readings within expected range (18.4 ppmv intake; 0.7 ppm discharge). Zone 5 active. 9/14/2022 948.37 72.64 225.9 32,570 J 8.0 6.1 U 30 U 8.3 U 25 U 0.66 0.0001 0.007 0.000 0.001 48.1 7,617.1 2,070 0.5 2.1 U 120 U 2.8 U 8.4 U 93.6 All systems ON on arrival. Zone 4 active. 12/9/2022 931.89 83.53 242.8 49,650 12.1 12 U 720 U 17 U 50 U 1.08 0.003 0.016 0.000 0.001 90.5 7,707.6 660 0.2 1.6 U 94 U 2.2 U 6.5 U 98.7 All systems ON on arrival. Zone 4 active.															1										
July July <th< td=""><td>6/29/2022</td><td>775.72</td><td>56.84</td><td>212.0</td><td>73,100</td><td>J 17.9</td><td>15 U</td><td>J 870 L</td><td>J 20</td><td>60 U</td><td>1.39</td><td>0.0003</td><td>0.017</td><td>0.000</td><td>0.001</td><td>79.2</td><td>7,569.0</td><td>800</td><td>0.2</td><td>1.9 L</td><td>110 U</td><td>2.6 L</td><td>7.8 U</td><td>98.9</td><td></td></th<>	6/29/2022	775.72	56.84	212.0	73,100	J 17.9	15 U	J 870 L	J 20	60 U	1.39	0.0003	0.017	0.000	0.001	79.2	7,569.0	800	0.2	1.9 L	110 U	2.6 L	7.8 U	98.9	
9/14/2022 848.37 72.64 225.9 32,570 J 8.0 6.1 U 30 U 8.3 U 25 U 8.0 0.1 U 300 U 8.3 U 25 U 0.66 0.001 0.07 0.00 0.01 48.1 7,617. 2,070 0.5 2.1 U 12 U 2.8 U 8.4 U 93.6 All systems ON on arrival. Zone 4 active. 12/9/2022 931.89 83.53 242.8 49,650 12.1 12 U 720 U 17 U 50 U 1.08 0.003 0.16 0.00 0.01 90.5 7,707.6 660 0.2 1.6 U 94 U 2.2 U 6.5 U 98.7 All systems ON on arrival. Zone 4 active.								1		1					1			1		1					
12/9/2022 931.89 83.53 242.8 49,650 12.1 12 U 720 U 17 U 50 U 1.06 0.003 0.016 0.000 90.5 7,707.6 660 0.2 1.6 U 94 U 2.2 U 6.5 U 98.7 All systems ON on arrival. Zone 4 active.	9/14/2022	848 37	72.64	225.9	32 570	80	61 1	360 1	83 1	25 11	0.66	0.0001	0.007	0.000	0.001	48.1	7 617 1	2.070	0.5	21 1	120 1	28 1	84 11	93.6	
		0.0.0.																							
	12/3/2022	331.03	03.33	242.0	45,030	12.1	1 12 0	/ /20 L								50.5	1,101.0	000	1 0.2	1 1.0 L	'I 34 U	<u>1</u> 2.2 (0.5 0	30.7	Par systems on on arrival. Zone 4 active.

ear-end Cumulative Mass Removed (lb/vr) ⁹ :	2019	2071	0	4	0	0
	2020	3212	0.4	16.5	0.4	1.3
	2021	2433	0.6	31.5	0.7	2.2
(ID/yI).	2022	374	0.1	4.2	0.1	0.3
CAA Permit Thresho Introl Device Need (I		1,000	6.62		76.9	-

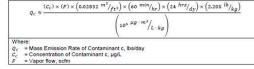
Footnotes:

1. Refer to Table 4 for details and calculations. The PSCAA permit requires the SVE flowrate to be less than or equal to 8. The 375 scfm.

PS(Co

 The TPH concentration is the sum of APH ECS-8 aliphatics, APH EC9-12 aliphatics, and APH EC9-10 aromatics. If one of these was not detected, a consertaive approach of 1x the reporting limit was used in the calculation.

3. Mass emission and removal rates are calculated by variations of:



4. Destruction efficiency is calculated with the Total VOC Oxidizer Outlet Concentration and the Total VOC Oxidizer Inlet Concentration.

5. TPH calculations are based on the Table 4 adjusted field PID readings as the samples may have been diluted.

Unless otherwise indicated, all data from before 9/30/2021 was collected by CRETE and was not reviewed or validated by AECOM.

7. 100 g/mol is used as the average molecular weight of TPH-G used to calculate ppmv. In the equation below, P is atmospheric pressure at sea level, or 101.325 kPa. T is standard temperautre, 298 K.

 $ppmV = \frac{\mu g}{L} \times \frac{1}{Molecular Weight_{contaminant}[g/mole]} \times 8.3144 \left[\frac{L \cdot kPa}{mol \cdot K}\right] \times T_{air}[K] \times \frac{1}{P_{air}[kPa]}$

gual to 8. The PSCAA permit dictates that:

- At all times during operation of the SVE system, the abatement device shall meet the following requirements, as applicable: a) ≥98.5% control efficiency if inlet TPH ≥2,000 ppmv, measured as hexane or its equivalent; or
- b) 297% control efficiency if inlet TPH >200 ppmv and <2,000 ppmv, measured as hexane or its equivalent; or c) 290% control efficiency if inlet TPH <200 ppmv, measured as hexane or its equivalent; or d) 510 ppmv at the outlet of the control device, measured as hexane or its equivalent.
- 9. The PSCAA permit dictates the following. Values in excess of the permit are indicated with bold formatting. The owner or operator may operate the SVE system without the control device when inlet sampling data from two or mor e consecutive months
 - a) Pre-control TPH emission rate is equal to or less than 2.74 lbs/day [eq 1,000 lb/yr]; b) Pre-control benzene emission rate is equal to or less than 0.018 lbs/day [eq 6.62lbs/yr]; c) Pre-control ethylbenzene emission rate is equal to or less than 0.21 lbs/day [eq 76.9lbs/yr]; d) Pre-control toluene emission rate is equal to or less than 657 lbs/day [no annual equivalent]; and e) Pre-control sylene emission rate is equal to or less than 2.0.lbs/day [no annual equivalent].

Abbreviations, Symbols, and Notes:

μg/m³ = micrograms per cubic meter J = Estimated value NA = Not Applicable Ib = pound Ibs/yr = pounds per year NL = Not listed scfm = standard cubic feet per minute SGR = S-mall Quantity Emission Rates TPH = Total Petroleum Hydrocarbons U = Concentration is below the laboratory reporting limit, so the reporting limit is shown

Red values indicate approximated values or averaged values as placeholder for data not recorded in the field.

Blue values indicate data collected by CRETE but input by AECOM, or calculated by AECOM with data previously collected by CRETE.

Bold values = exceeds PSCAA permit limit for removal of control device

		Tidal I	Position		Period	Cumulative	MW-	35 ^{K,M}	MW	-36 ^M	MW-	36A ^M	MW	-39A
		Time of	Time of	Average	Product	Product	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL
	Time of	Nearest	Nearest	DTW	Removed ^L	Removed	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H
Date	Fieldwork	Low Tide ^F	High Tide ^F	(FT)	(Gal)	(Gal)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)
Baseline	NA				NA	NA	NM		0.18		0.04		0.05	
01/09/2020	NM				46.7	46.7	NM	NM	0.14	0.00	<0.01		<0.01	
02/13/2020	NM				21.3	68	NM	NM	0.00		<0.01		<0.01	
03/12/2020	NM				48.4	116.4	NM	NM	0.00		<0.01		<0.01	
05/16/2020	NM				20	136.4	NM	NM	0.04	0.00	0.00		0.35	0.00
06/19/2020	NM				156	292.4	NM	NM	1.00	0.01	0.00		0.16	<0.01
07/28/2020	NM				35	327.4	NM	NM	0.95	<0.01	0.00		0.10	0.01
08/21/2020	NM				32	359.4	NM	NM	0.16	0.00	<0.01		0.04	<0.01
09/10/2020	NM				16.4	375.8	NM	NM	0.00		0.00		TRACE	
10/08/2020	15:30-21:51	20:24	14:24		35.1	410.9	0.52	0.00	0.00		0.00		0.00	
11/11/2020	07:50-14:45	05:48	12:18		99	509.9	0.19	DRY	0.00		0.00		0.00	
12/10/2020 ^C	16:12-17:46	17:24	12:12		NA	509.9	0.02		0.00		0.00		0.00	
01/15/2021	07:53-16:02	07:42	15:06		39	548.9	0.28	0.00	0.00		0.00		0.00	
2/12/2021 ^{C,I}	08:07-10:07	11:49	06:09		NA	548.9	0.06		0.00		0.00		0.00	
03/05/2021	07:15-13:14	11:00	05:54		39 ^D	587.9	0.10	0.00	0.00		0.00		0.00	
4/15/2021 ^C	16:33-18:35	20:42	13:54		NA	587.9	0.42		0.00		0.00		0.00	
05/13/2021	16:01-20:39	19:30	13:00		24	611.9	0.04	0.00	0.00		0.00		0.00	
6/10/2021 ^C	15:05-17:29	18:36	11:48		NA	611.9	0.02		0.00		0.00		0.00	
08/12/2021	16:31-20:26	21:03	14:50		78	689.9	0.02	0.00	0.02	0.00	0.00		TRACE	
11/11/2021 ^G	15:25-21:20	11:18	19:06	8.77	44.3	734.2	0.00		0.00		0.00		0.00	
1/18/2022 ^C	16:37-17:57	19:54	14:30	7.87	NA	734.2	NM	NM	0.00		NM	NM	0.00	
02/17/2022	16:42-19:08	19:48	14:06	8.65	31.48	765.68	0.05	0.00	0.00		0.00		0.00	
4/14/2022 ^c	18:27-19:57	17:48	23:24	8.74	NA	765.68	0.00		0.00		0.00		0.00	
05/12/2022	16:30-21:05	16:24	22:18	9.10	13.3	778.98	0.00		0.00		0.00		0.00	
6/20/2022 ^C	08:31-10:14	05:25	10:07	9.01	NA	778.98	0.00		0.00		0.00		0.00	
07/14/2022	16:29-20:48	11:55	19:33	8.83	10.12	789.1	0.00		0.00		0.00		0.00	
08/11/2022 ^C	16:40-17:23	18:00	11:00	8.98	NA	789.1	0.01		0.00		0.00		0.00	
09/08/2022	16:40-17:49	22:47	17:13	9.53	11.14	800.24	TRACE		0.00		0.00		0.00	
10/13/2022 ^C	17:19-18:12	19:11	14:04	9.44	NA	800.24	0.02		0.00		NA ⁰	NA ^O	NA ^O	NA ^O
11/10/2022 ^C	18:00-18:49	23:54	16:51	8.68	NA	800.24	<0.01		0.00		NA	NA	NA	NA
12/08/2022	16:51-20:30	22:55	15:45	8.79	48.55	848.79	0.03		NA ^O	NA ^O	NA	NA	NA	NA

	MW	-59	MW	-89	MW	-93 ^M	RW	-1 ^M		RW-12		RW-	101
	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL		Initial LNAPL	Final LNAPL
	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	DTW	Thickness	Thickness ^H
Date	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft BTOC)	(Ft)	(Ft)
Baseline	0.90		2.39		1.04		0.55		0.00			0.02	
01/09/2020	2.19	0.00	<0.01 ^A		<0.01		0.03	0.01 ^B	0.71	0.03 ^B		0.02	<0.01
02/13/2020	0.23	0.10 ^B	<0.01		<0.01		0.01	<0.01	0.25	0.03 ^B		<0.01	NM
03/12/2020	0.09	<0.01	<0.01		<0.01		0.05	<0.01	0.78	0.08 ^B		0.03	<0.01
05/16/2020	1.06	0.00	0.00		0.10	0.00	0.56	0.22 ^B	0.78	0.05 ^B		0.08	
06/19/2020	0.93	<0.01	0.00		0.18	<0.01	0.59	0.08 ^B	0.59	0.00		0.07 ^B	0.05 ^B
07/28/2020	0.76	0.01	0.00		0.18	0.00	0.47	0.02 ^B	0.60	0.00		0.09	0.00
08/21/2020	1.12	<0.01	0.00		0.05	<0.01	0.32	0.01 ^B	0.35	0.02 ^B		0.00	
09/10/2020	0.00	NM	0.00		TRACE	TRACE	0.20	<0.01	0.24	0.02 ^B		0.00	
10/08/2020	<0.01	0.00	0.00		0.00		0.11	0.01B	0.45	0.02 ^B		0.05	0.00
11/11/2020	0.00		0.00		0.00		0.28	0.09 ^B	0.43	NM		<0.01	0.00
12/10/2020 ^C	0.00		0.00		0.00		0.04		0.16			0.00	
01/15/2021	0.00		0.00		0.00		0.06	0.01 ^B	0.18	0.01 ^B		0.00	
2/12/2021 ^{C,I}	0.00		0.00		0.00		0.03		0.03			0.00	
03/05/2021	0.09	0.00	0.00		0.00		0.17	0.01 ^B	0.05	0.00		0.00	
4/15/2021 ^C	0.01		0.00		0.00		0.11		0.25			0.00	
05/13/2021	0.62	0.00	0.00		0.00		0.17	0.02 ^B	>0.10	0.00		WI	WI
6/10/2021 ^C	0.86		0.00		0.00		0.26		0.21			0.01	
08/12/2021	WI	WI	0.00		0.00		0.27	0.1 ^B	0.31	0.01 ^B		0.00	
11/11/2021 ^G	0.20	0.00	0.00		0.00		0.15	0.00	0.30	0.00	9.43	0.00	
1/18/2022 ^C	0.39		NM	NM	0.00		NM	NM	0.07		8.28	0.00	
02/17/2022	1.36	0.00	0.00		0.00		0.06	0.01	0.05	0.01	9.16	0.00	
4/14/2022 ^C	0.00		0.00		0.00		0.03		0.06		9.06	0.00	
05/12/2022	0.00		0.00		0.00		0.08	<0.01	0.09	0.00	9.51	0.00	
6/20/2022 ^C	0.12		0.00		0.00		0.08		0.01		9.20	0.00	
07/14/2022	0.00		0.00		0.00		0.09	0.00	0.13	0.00	9.49	0.00	
08/11/2022 ^C	0.00		0.00		0.00		0.06		0.17		9.47	0.00	
09/08/2022	0.19	0.01	0.00		0.00		0.10	0.01	0.32	TRACE	9.64	0.00	
10/13/2022 ^C	0.00		NA ^O	NA ^O	NA ^O	NA ^O	0.06		0.29		9.79	NA ^O	NA ^O
11/10/2022 ^C	0.00		NA	NA	NA	NA	0.07		0.33		9.25	NA	NA
12/08/2022	0.05	0.00	NA	NA	NA	NA	0.04	0.00	0.38	<0.01	9.35	NA	NA

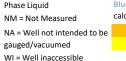
	RW-	102	RW-	103	RW-	104	RW-	105		RW-106			RW-107	
	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL	Initial LNAPL	Final LNAPL		Initial LNAPL	Final LNAPL	
	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	Thickness	Thickness ^H	DTW	Thickness	Thickness ^H	DTW
Date	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft BTOC)	(Ft)	(Ft)	(Ft BTOC)
Baseline	0.00		1.16		0.00		0.00		1.00			0.98		
01/09/2020	0.00	NM	1.16	<0.01	0.00	NM	0.00	NM	1.00	<0.01		0.98	<0.01	
02/13/2020	WI	WI	WI	WI	NM	NM	NM	NM	1.40	<0.01		0.34	0.09 ^B	
03/12/2020	0.00	NM	0.71	0.01 ^B	0.00	NM	0.00	NM	1.05	0.06 ^B		1.37	<0.01	
05/16/2020	0.00		0.45	0.01 ^B	0.00		0.00		1.10	0.00		0.84	0.00	
06/19/2020	0.00		0.29	0.01 ^B	0.00		0.00		1.01	0.00		1.09	0.27 ^B	
07/28/2020	0.00		0.31 ^B		0.00		0.00		0.77	<0.01		1.19	<0.01	
08/21/2020	0.00		0.23	0.01 ^B	0.00		0.00		0.73	0.00		1.41	0.00	
09/10/2020	0.00		1.74	0.00	0.00		0.00		1.55	0.00		2.17	0.00	
10/08/2020	<0.01 ^B		0.86	0.00	0.00		0.00		0.73	0.00		2.49	NM	
11/11/2020	0.00		1.01	0.00	0.00		0.00		0.80	0.00		1.83	0.00	
12/10/2020 ^C	0.00		0.40		0.00		0.00		0.84			1.05		
01/15/2021	0.00		0.75	0.00	0.00		0.00		1.13	0.00		0.78	0.00	
2/12/2021 ^{C,I}	0.00		0.87		0.00		0.00		1.19			1.00		
03/05/2021	0.00		0.49	0.00	0.00		0.00		1.08	0.00		0.96	0.00	
4/15/2021 ^C	0.00		0.31		0.00		0.00		0.78			0.74		
05/13/2021	0.00		0.23	0.00	0.00		0.00		0.71	0.00		0.59	0.00	
6/10/2021 ^C	WI	WI	WI	WI	0.00		0.00		0.58			0.61		
08/12/2021	WI	WI	WI	WI	0.00		0.00		0.59	0.00		0.72	0.02 ^B	
11/11/2021 ^G	0.00		0.61	0.00	0.01	0.00	0.00		1.05	0.00	8.53	0.02	0.00	9.05
1/18/2022 ^C	NM	NM	1.29		0.00		0.00		1.85		7.76	1.45		7.95
02/17/2022	0.00		NM	NM	0.00		0.00		0.92	0.02	8.28	0.65	0.02	8.58
4/14/2022 ^C	0.00		0.60		0.00		0.00		1.12		8.36	0.80		8.58
05/12/2022	0.00		0.29	0.00	0.00		0.00		0.38	0.00	8.72	0.75	0.00	9.02
6/20/2022 ^C	0.00		0.00		0.00		0.00		0.00		8.76	0.00		9.03
07/14/2022	0.00		0.27	0.00	0.00		0.00		0.82	0.00	8.67	0.61	0.00	8.95
08/11/2022 ^C	0.00		0.00		0.00		0.00		0.05		9.04	0.49		9.44
09/08/2022	0.00		0.00		0.00		0.00		0.04	0.01	9.16	0.49	0.37 ^N	9.54
10/13/2022 ^C	NA ^O	NA ⁰	0.00		0.00		NA ^O	NA ⁰	0.01		9.27	0.41		9.66
11/10/2022 ^C	NA	NA	0.28		0.00		NA	NA	2.09		7.68	0.18		8.65
12/08/2022	NA	NA	0.15	0.00	0.00		NA	NA	0.32	0.00	8.59	0.44	0.00	8.86

r					RW-110		
	RW-		RW-			-	
	Initial LNAPL	Final LNAPL Thickness ^H	Initial LNAPL	Final LNAPL Thickness ^H	Initial LNAPL	Final LNAPL Thickness ^H	
Data	Thickness		Thickness		Thickness		
Date	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	
Baseline ^J	0.00		0.00		0.02		
01/09/2020	0.00	NM	0.00	NM	0.02	<0.01	
02/13/2020	0.00	NM	0.00	NM	0.09	<0.01	
03/12/2020	0.00	NM	0.00	NM	0.04	<0.01	
05/16/2020	0.00		0.00		0.10	0.00	
06/19/2020	0.00		0.00		0.34	0.00	
07/28/2020	0.00		0.00		0.46	<0.01	
08/21/2020	0.00		0.00		0.30	0.00	
09/10/2020	0.00		0.00		0.00		
10/08/2020	0.00		0.00		0.01	< 0.01	
11/11/2020	0.00		0.00		0.02	0.00	
12/10/2020 ^C	0.00		0.00		0.00		
01/15/2021	0.00		0.00		0.00		
2/12/2021 ^{C,I}	0.00		0.00		0.19		
03/05/2021	0.00		0.00		0.17	0.00	
4/15/2021 ^C	0.00		0.00		0.10		
05/13/2021	0.00		0.00		0.20	0.00	
6/10/2021 ^C	0.00		0.00		0.25		
08/12/2021	0.00		0.00		0.48	0.00	
11/11/2021 ^G	0.00		0.00		0.01	0.00	
1/18/2022 ^C	0.00		0.00		0.00		
02/17/2022	0.00		0.00		0.02	Trace	
4/14/2022 ^C	0.00		0.00		0.00		
05/12/2022	0.00		0.00		0.00		
6/20/2022 ^C	0.00		0.00		0.00		
07/14/2022	0.00		0.00		0.00		
08/11/2022 ^C	0.00		0.00		0.00		
09/08/2022	0.00		0.00		0.00		
10/13/2022 ^C	NA ⁰	NA ^O	NA ^O	NA ^O	0.00		
11/10/2022 ^C	NA	NA	NA	NA	0.00		
12/08/2022	NA	NA	NA	NA	0.00		

Abbreviations, Symbols, and Formatting:

--- = Data not needed/relevant

Red values = approximated values or averaged values as placeholder LNAPL = Light Non-Aqueous for data not recorded in the field. Blue values = data collected by CRETE but input by AECOM, or calculated by AECOM with data previously collected by CRETE. = Interior Monitoring Well = Performance Monitoring well



Notes:

Ft = Feet

Gal = Gallon

A. Approximately 4 gallons of LNAPL and water were previously removed from this well (MW-89) on November 14, 2019.

B. Vacuum removal was not executed.

C. LNAPL gauging event; no LNAPL removal.

D. Measurement not taken. The total volume extracted was similar to the prior removal event, so the prior product volume was repeated as an estimate.

E. MW-38 was found to be obstructed during during field activities on 09/18/2020. It was not monitored thereafter and was decomissioned on 05/06/2021.

F. Tidal information source: https://tidesandcurrents.noaa.gov/stationhome. html?id=9447130

G. Unless otherwise indicated, all data prior to 10/14/2021 was collected by CRETE and was not reviewed or validated by AECOM.

H. The final LNAPL thickness is the value measured after the final recovery cycle at a well is complete. Recovery is determined complete when the LNAPL thickness is reduced to <0.01 ft or three recovery cycles have been executed within a single event.

I. The data previously entered for the 2/12/21 gauging event did not match the field notes. Values have been updated by AECOM as needed.

J. Baseline LNAPL data was collected during the 10/16/19-10/18/19 gauging and sampling event and during to the first LNAPL recovery event on 1/9/20. AECOM reviewed the historical field notes and revised all wells that had non-detect LNAPL thicknesses to 0.0 ft from the previously reported values of <0.01 ft. Depth to product was not successfully measured/recorded at MW-35 prior to gauging on 10/8/20.

K. MW-35 was initially identified as a biannual gauging well in the CMP. After LNAPL was measured in the well on 10/9/20 it entered into the monthly gauging/removal protocol.

L. Product volume estimated by the vac truck contractor after allowing the water and free product in the truck tank to separate out over night.

M. These monitoring wells temporarily became recovery wells when product was encountered during gauging activities. The CMP dictates that they be monitored at least quarterly after product is encountered, and sample data cannot be used for performance monitoring purposes until 4 consecutive quarters occur with measurements of ≤0.01 ft.

N. RW-107 was extracted by vac truck 3 times for a total of 110 minutes with little impact on LNAPL thickness. The vac truck was confirmed to be working.

O. The prior results marked at least 1 year of measurements < 0.01 ft, resulting in the removal of the well from the product monitoring/recovery protocol.

P. Vacuum recovery performed 3 times for 20, 50, and 60 minutes, per SOP. Cause of LNAPL thickness increase unknown.

PORT OF SEATTLE - TERMINAL 30 Table 7 **LNAPL Gauging Results in Monitoring Wells**

	Tidal Position		Position	MW-35	MW-36	MW-38 ^B	MW-42	MW-45A	MW-46B	MW-54	MW-58A	MW-64	MW-84A
		Time of	Time of	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL
	Time of	Nearest	Nearest High	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness
Date	Fieldwork	Low Tide ^A	Tide ^A	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)
Baseline ^C	NA			NM	0.18	0.0	0.0	0.0	0.0	NM	0.0	NM	0.0
10/8/2020 ^D	NM			0.52 ^E	0.00	NA	NA	NA	NA	NM	NA	NM	NA
6/20/2022 ^F	09:38	05:25	10:07	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA
10/13/2022 ^D	17:33	19:11	14:04	0.02	0.00	NA	NA	NA	NA	0.0	NA	0.0	NA

Abbreviations, Symbols, and Formatting:

Ft = Feet

LNAPL = Light Non-Aqueous Phase Liquid NM = Not Measured NA = Well not intended to be gauged/vacuumed WI = Well inaccessible --- = Data not needed/relevant Blue values = data collected by CRETE

but input by AECOM

Notes:

A. Tidal information sourced from https://tidesandcurrents.noaa.gov/stationhome.html?id=9447130

B. MW-38 was found to be obstructed during during field activities on 09/18/2020. It was not monitored thereafter and was decomissioned on 05/06/2021.

C. Baseline LNAPL data was collected during the gauging and sampling event from 10/16/19-10/18/19. Depth to product was not successfully measured/recorded at MW-54 or MW-64. All wells with thicknesses of 0.0 were corrected from the previously reported values of <0.01 ft after a review of the field notes. Depth to product was not successfully measured/recorded at MW-35 prior to the gauging on 10/8/20.

D. Biannual gauging event for MW-35, MW-36, MW-54, and MW-64.

E. MW-35 was initially identified as a biannual gauging well in the CMP. After LNAPL was measured in the well on 10/9/20 it entered into the product gauging/removal protocol. That data is shown in Table 6.

F. MW-64 was added to the 6/20/22 routine LNAPL gauging event when AECOM discovered that it had not been previously gauged as planned in the CMP schedule.



= Interior Monitoring Well = Performance Monitoring well = CPOC Monitoring Well

PORT OF SEATTLE - TERMINAL 30 Table 7 LNAPL Gauging Results in Monitoring Wells

	MW-85A	MW-86B	MW-87A	MW-92	RW-5A	RW-9	RW-11A
	LNAPL						
	Thickness						
Date	(Ft)						
Baseline ^C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10/8/2020 ^D	NA						
6/20/2022 ^F	NA						
10/13/2022 ^D	NA						

Abbreviations, Symbols, and Formatting:

Ft = Feet LNAPL = Light Non-Aqueous Phase Liquid NM = Not Measured NA = Well not intended to be gauged/vacuumed WI = Well inaccessible ---- = Data not needed/relevant Blue values = data collected by CRETE but

blue values - data collected by Chere t

input by AECOM



Interior Monitoring Well
Performance Monitoring well
CPOC Monitoring Well
Shoreline Monitoring Well

PORT OF SEATTLE - TERMINAL 30 Table 8 Performance and Interior Groundwater Analytical Data

					Diesel							
			Diesel		Range		TPH-Dx	Gasoline				
			Range		Organics	Lube Oil	(Diesel +	Range			Ethyl-	Total
			Organics	Lube Oil	SGC	SGC	Lube Oil) ^a	Organics	Benzene	Toluene	benzene	Xylenes
	Well ID	Sample Date	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Well		GW CULs (µg/L)					500	1,000/800 ^e	23	15,000	2,100	1,000
Туре		GW RELs (μg/L)					2,085	2,085	47	30,000	4,200	2,000
	RW-11A	10/17/19	5,600	1,100 ^b	1,100	250 U	1,100	260	1 U	1 U	1 U	3.0
		4/11/20	3,700 ^b	440 ^b	140	250 U	140	100 U	1 U	1 U	1 U	3 U
		4/11/20 DUP	4,400 ^b	480 ^b	160	250 U	160	100 U	1 U	1 U	1 U	3 U
		9/18/20	2,800	330 ^b	98	250 U	98	100 U	1 U	1 U	1 U	3 U
		4/3/21	NAn	NAn	50 U	250 U	250 U	100 U	1 U	1 U	1 U	3 U
		10/14/21	1,230	163 U	133 ^d	157 U	133	100 U	0.200 U	1.00 U	0.500 U	1.50 U
		4/14/22	1,700 ^b	440 ^b	50 U	250 U	250 U	100 U	1 U	1 U	1 U	3 U
		10/13/22	4,800	410 ^b	50 U	250 U	250 U	100 U	0.35 U	1 U	1 U	3 U
		10/13/22 DUP	4,900	510 ^b	50 U	250 U	250 U	100 U	0.35 U	1 U	1 U	3 U
S	MW-59	10/17/19				Well not s	sampled; free	product enco	untered			
Vell		4/11/20			-	Well not a	sampled; free	product enco	untered	-	-	
Performance Wells		9/29/2020 ^f	1,600	250 U	830	250 U	830	100 U	1 U	1 U	1 U	3 U
anc		4/3/21					sampled; free					
E L		10/14/21					sampled; free					
erfc		4/14/22					e product enco			-		
Å		10/13/22		Well not s	sampled pe		e product enco			eding four o	quarters	
	MW-89	10/18/19	h	h			sampled; free	1				
		4/11/2020 ^f	1,500 ^b	420 ^b	50 U	250 U	250 U	100 U	10	1 U	10	3 U
		9/29/2020 ^f	6,000	540 ^b	550	250 U	550	140 ^b	10	1 U	10	3 U
		4/3/21	NAn	NAn	93	250 U	93	100 U	10	1 U	10	3 U
		4/3/21 DUP	NAn	NAn	88	250 U	88	100 U	10	1 U	10	3 U
		10/14/21	827	334	410 ^d	265	675	100 U	0.200 U	1.00 U	0.500 U	1.50 U
		4/15/22	780 ^b	440 ^b	54	250 U	54	100 U	10	1 UJ	10	3 U
		4/15/22 DUP	910 ^b	480 ^b	50 U	250 U	250 U	170	1 U	6.8 J	1.4	7.7
		10/19/22	550 ^b	250 U	61	250 U	61	100 U	0.35 U	1 U	1 U	3 U

PORT OF SEATTLE - TERMINAL 30 Table 8 Performance and Interior Groundwater Analytical Data

					Diesel							
			Diesel		Range		TPH-Dx	Gasoline				
			Range		Organics	Lube Oil	(Diesel +	Range			Ethyl-	Total
			Organics	Lube Oil	SGC	SGC	Lube Oil) ^a	Organics	Benzene	Toluene	benzene	Xylenes
	Well ID	Sample Date	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Well		GW CULs (µg/L)					500	1,000/800 ^e	23	15,000	2,100	1,000
Туре		GW RELs (µg/L)					2,085	2,085	47	30,000	4,200	2,000
	RW-9	10/17/19	3,100	750 b	1200	250 U	1,200	720	1 U	1 U	1.6	3.9
		9/18/20	3,300	440 b	450	250 U	450	430	1U	1.4	1 U	3 U
		10/14/21	6,360	150 U	1,590	165 U	1,590	227	0.200 U	1.00 U	0.500 U	1.50 U
		10/13/22	9,500 J ^b	2,000 J ^b	200	250 U	200	100 U	0.35 U	1 U	1 U	3 U
nt'd	MW-36A	10/17/19					sampled; free				1	-
Cor		9/19/2020 ^f	3,100	360 ^b	560	250 U	560	120	1 U	1 U	10	3 U
) s		10/14/21	2,610	178 U	404	167 U	404	100 U	0.200 U	1.00 U	0.500 U	1.50 U
Vel		10/13/22	4,900	460 ^b	180	250 U	180	100 U	0.35 U	1 U	1 U	3 U
Se V	MW-39A	10/17/19					sampled; free				1	
anc		9/19/2020 ^f	3,100	1,100	1,500	770	2,270	160	1 U	1 U	10	3 U
E		10/14/21	2,870	1,760	1,980 ^d	1,540	3,520	100 U	0.200 U	1.00 U	0.500 U	1.50 U
Performance Wells (Cont'd)		10/13/22	6,800 ^b	1,200 ^b	110	250 U	110	100 U	0.35 U	1 U	1 U	3 U
<u>م</u>	MW-42	10/17/19	6,600	2,600 ^b	330 ^b	250 U	330 ^b	2,100	37	17	5.1	16
		9/18/20	5,500	1,300 ^b	110 ^b	250 U	110 ^b	620	5.2	3.5	1 U	7.4
		10/14/21	4,780	165 U	315 °	150 U	315 °	248	1.31	1.00 U	0.500 U	1.50 U
		10/13/22	5,600 ^b	1,400 ^b	120	250 U	120	260	0.35	1 U	1 U	3 U
	RW-1	10/17/19				Well not s	sampled; free	product encou	untered		•	
		9/19/20					sampled; free					
ells		10/13/22		Well not s	ampled pe	r CMP; fre	e product enco	ountered withi	n the prece	eding four o	quarters	
Š	RW-5A	10/17/19	1,300	810 ^b	290 ^b	250 U	290 ^b	190	1 U	1 U	10	3 U
Interior Wells		9/18/20	1,700	330 ^b	120 ^b	250 U	120 ^b	230	1 U	1 U	1 U	3 U
nte		10/13/22	1,400 ^b	310 ^b	84	250 U	84	110	0.35 U	1 U	1 U	3 U
	MW-38	10/16/19				Well not s	sampled; wate	r volume insu	fficient.		•	
		9/18/20		Well obse	erved broke	en below gi	rade, not samp	oled. Well dec	omissione	d on May 6	6, 2021.	

PORT OF SEATTLE - TERMINAL 30 Table 8 Performance and Interior Groundwater Analytical Data

Well Type	Well ID	Sample Date GW CULs (μg/L) GW RELs (μg/L)		Lube Oil (µg/L) 	Diesel Range Organics SGC (µg/L) 	Lube Oil SGC (µg/L) 	TPH-Dx (Diesel + Lube Oil) ^a (µg/L) 500 2,085	Gasoline Range Organics (µg/L) 1,000/800 ^e 2,085	Benzene (µg/L) 23 47	Toluene (μg/L) 15,000 30,000	Ethyl- benzene (μg/L) 2,100 4,200	Total Xylenes (μg/L) 1,000 2,000
	MW-93	10/17/19				Well not s	sampled; free	product encou	untered			
		9/19/2020 ^f	8,700	4,100	5,400	3,200	8,600	280	1 U	1 U	1 U	3 U
		10/13/22	2,300 ^b	590 ^b	50 U	250 U	250 U	100 U	0.35 U	1 U	1 U	3 U

Notes:

^a Total TPH D + lube oil is the sum of the Silica Gel Cleanup results.

^b The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

^c Result is estimated due to overlap from Gasoline Range Organics or other VOCs.

^d The sample chromatographic pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component

^e If benzene is present below method detection limits, the TPH-Gx cleanup level is 1000 µg/L. If not, the TPH-Gx cleanup level is 800 µg/L.

^f Data is not to be used for performance monitoring purposes. Free product was present in excess of 0.01 ft during the four quarters prior to the sampling event, rendering the well ineligible per CMP guidance on qualifaction for performance monitoring sampling.

Abbreviations and Formatting:

- **BOLD** = result was detected above the CUL
- **BOLD** = result was detected above the REL
- μ g/L = micrograms per liter
- CUL = cleanup level
- GW = groundwater
- J = estimated value

NR = not reported NAn = not analyzed (analysis was not requested) REL = remediation level SGC = silica gel cleanup U = not detected above the value shown

PORT OF SEATTLE - TERMINAL 30 Table 9 CPOC and Shoreline Groundwater Analytical Data - TPH and BTEX

	Well ID	Sample Date	Diesel Range Organics (µg/L)	Lube Oil (µg/L)	Diesel Range Organics w/ SGC (µg/L)	Lube Oil w/ SGC (µg/L)	TPH-Dx (Diesel + Lube Oil) ^a (µg/L)	Gasoline Range Organics (µg/L)	Benzene (µg/L)	Toluene (μg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)
Well		GW CULs (ug/L)					500	1000/800	23	15,000	2,100	1,000
Туре		GW RELs (ug/L)					2085	2085	47	30,000	4,200	2,000
	MW-45A	10/21/19	610 ^b	250 U	71 ^b	250 U	71 ^b	100 U	1 U	1 U	1 U	3 U
		10/21/19 DUP	600 ^b	250 U	66 ^b	250 U	66 ^b	100 U	1 U	1 U	1 U	3 U
		9/18/20	490	250 U	54 ^b	250 U	54 b	100 U	1 U	1 U	1 U	3 U
		10/13/22	1,100 ^b	300 U	72	300 U	72	100 U	0.35 U	1 U	1 U	3 U
	MW-46B	10/16/19	1,500	380 ^b	150 ^b	250 U	150 ^b	100 U	1 U	1 U	1 U	3 U
		9/18/20	1,300	250 U	81 ^b	250 U	81 b	110	1 U	1 U	1 U	3 U
6		10/13/22	890 ^b	250 U	73	250 U	73	100 U	0.35 U	1 U	1 U	3 U
Wells	MW-58A	10/17/19	1,900	610 ^b	280 ^b	250 U	280 ^b	360	1 U	1 U	1 U	3 U
3		9/24/20	3,000	320 ^b	420	250 U	420	390	1 U	1 U	1 U	4.7
CPOC		10/19/22	6,300 J ^b	900 J ^b	240	250 U	240	130	0.35 U	1 U	1 U	3 U
с С	MW-86B	10/17/19	1,500	610 ^b	1600	250 U	1600	360	1 U	1 U	1 U	3 U
		9/24/20	650	250 U	95	250 U	95	130	1 U	1 U	1 U	3 U
		9/24/20 DUP	890	250 U	94	250 U	94	100	1 U	1 U	1 U	3 U
		10/19/22	1,600 ^b	400 ^b	63	250 U	63	100 U	0.35 U	1 U	1 U	3 U
		10/19/22 DUP	1,600 ^b	420 ^b	89	250 U	89	100 U	0.35 U	1 U	1 U	3 U
	MW-92	10/16/19	5,200	1100 ^b	120 ^b	250 U	120 ^b	250	1 U	1 U	1.2	3 U
		9/18/20	4,800	720 ^b	75 ^b	250 U	75 ^b	200	1 U	1 U	1 U	3 U
		10/19/22	2,400 ^b	410 ^b	81	250 U	81	100 U	0.35 U	1 U	1 U	3 U
e lity	MW-84A	10/17/19	1,100	250 U	410 ^b	250 U	410 ^b	100 U	1 U	1 U	1 U	3 U
Shoreline Water Quality Wells	MW-85A	10/18/19	130 ^b	250 U	50 U	250 U	250 U	100 U	1 U	1 U	1 U	3 U
ter		10/18/19 DUP	130 ^b	250 U	50 U	250 U	250 U	100 U	1 U	1 U	1 U	3 U
Na Na	MW-87A	10/18/19	420 ^b	570 ^b	50 U	250 U	250 U	100 U	1 U	1 U	1 U	3 U

Notes :

^a Total TPH (Diesel + lube oil) is the sum of the Silica Gel Cleanup results.

^b The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Abbreviations/formatting

BOLD = result was detected above the CUL

BOLD = result was detected above the REL

CPOC = Conditional Point of Compliance

GW = groundwater

SGC = silica gel cleanup

U - not detected above the laboratory reporting limit

PORT OF SEATTLE - TERMINAL 30 Table 10 CPOC and Shoreline Groundwater Analytical Data - PAHs

Well Type		Sample Date W CULs (µg/L)	alene (µg/L)	Acenaph thylene (µg/L)	Acenaph thene (µg/L) 643	Fluorene (µg/L) 3,460	Phen- anthrene (µg/L)	Anthracene (µg/L) 25,900	Fluoran- thene (µg/L) 90	Pyrene (μg/L) 2,590	Benzo (g,h,i) perylene (µg/L)	1-Methyl naphthalene (µg/L) 	2-Methyl naphthalene (µg/L) 	Benzo[a] anthracene (µg/L)	Chrysene (µg/L)	Benzo[a] pyrene (µg/L)	Benzo[b] fluoran- thene (µg/L) Total cPAH	Benzo[k] fluoran- thene (µg/L)	Indeno [1,2,3-cd] pyrene (µg/L)	Dibenzo [a,h] anthracene (µg/L)	Total cPAH TEQ ^a (µg/L) 0.018
	MW-45A	10/21/19	0.1 U	0.039	4.0	0.35	0.77	0.01 U	0.032	0.017	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		10/21/19 DUP	Nan	NAn	NAn	Nan	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn
		9/18/20	0.11	NAn	4.3	0.17	0.21	0.022	0.014	0.012	0.02 U	0.11	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		10/13/22	0.2 U	0.02 U	3.7 J	0.039	0.02 U	0.02 U	0.02 U	0.02 U	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
	MW-46B	10/16/19	0.1 U	NAn	3.1	0.036	0.080	0.01 U	0.049	0.035	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		9/18/20	0.1 U	NAn	2.3	0.01 U	0.052 J	0.013	0.017	0.017	0.02 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		10/13/22	0.2 U	0.02 U	0.29	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
s I	MW-58A	10/17/19	0.96	NAn	5.8	1.3	4.2	0.34	1.0	0.51	0.01 U	NR	0.52	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
Wells		9/24/20	0.65	NAn	6.0	2.1	0.054	0.33	0.52	0.26	0.02 U	0.24	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
срос		10/19/22	0.2 U	0.02 U	2.8	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
6	MW-86B	10/17/19	0.1 U	NAn	3.2	0.079	0.17	0.15	0.51	0.26	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		9/24/20	0.1 U	NAn	1.9	0.01 U	0.016	0.041	0.49	0.31	0.02 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		9/24/20 DUP	0.1 U	NAn	2.2	0.01 U	0.012	0.048	0.53	0.38	0.02 U	0.1 U	0.1 U	0.011	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		10/19/22	0.2 U	0.02 U	0.96 J	0.02 U	0.02 U	0.02 U	0.084	0.060	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
		10/19/22 DUP	0.2 U	0.02 U	2.6 J	0.02 U	0.02 U	0.02 U	0.041	0.028	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
	MW-92	10/16/19	0.1 U	NAn	0.071	0.027	0.029	0.01 U	0.01 U	0.01 U	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		9/18/20	0.1 U	NAn	0.087	0.01 U	0.02 J	0.013	0.01 U	0.01 U	0.02 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
		10/13/22	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.04 U	0.2 U	0.2 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015
eline Quality ells	MW-84A	10/17/19	0.1 U	NAn	64	0.74	1.3	0.05	0.031	0.033	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
elin Qua	MW-85A	10/18/19	0.1 U	NAn	49	0.51	0.90	0.034	0.018	0.018	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008
5 L S		10/18/19 DUP	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn	NAn
Sho Wate V	MW-87A	10/18/19	0.1 U	NAn	0.14	0.015	0.019	0.01 U	0.01 U Abbreviatio	0.01 U	0.01 U	NR	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.008

^a cPAH TEQ values are calculated by multiplying the laboratory concentrations by the TEFs provided in MTCA Table 708-2 (WAC 173- 340-900). For ND values, 1/2 of the reporting limit is used as the concentration.

^b Individual cPAH compounds do not have remediation levels

BOLD = result was detected above the CUL

-- = No Value

μg/L = micrograms per liter

cPAH = carcinogenic polyaromatic hydrocarbon CPOC = Conditional Point of Compliance

CUL = cleanup level GW = groundwater J = estimated value

MTCA = Model Toxics Control Act NAn = not analyzed (analysis was not requested)

NR = not reported

PAH = polyaromatic hydrocarbon

TEF = toxicity equivalency factor

TEQ = toxic equivalency lactor TEQ = toxic equivalent concentration U = not detected above the laboratory reporting limit WAC = Washington Administrative Code

PORT OF SEATTLE - TERMINAL 30 Table 11 Monitoring Well Groundwater Sampling Parameters

		Total Well Depth	MP Elevation	MP Elevation	Sample	Depth to LNAPL	Depth to Groundwater	Groundwater Elevation	Groundwater Elevation	LNAPL Thickness	TEMP	TEMP		Conductivity	Specific Conductance	Turbidity	Dissolved Oxygen	ORP
	Well ID	(ft)	(ft NAD 83)	(ft NAVD 88)	Date	(ft BTOC)	(ft BTOC)	(ft NAD 83)	(ft NAVD 88)	(ft)	(°F)	(°C)	рН	(µS/cm)	(µS/cm)	(NTU)	(mg/L)	(mV)
	RW-11A	20	18.02		10/17/19													
					04/11/20													
					09/18/20													
					04/03/21	ND	9.37	8.65		0	64.0	17.8	6.47	1.03		6.6	0.03	-33
					10/14/21	ND	9.7	8.32		0	70.2	21.2	7.42	1.28		7.3	0.97	27
					04/14/22	ND	9.38	8.64		0	60.4	15.79	6.66	1.21		3.6	2.58	49
					10/13/22	ND	9.9	8.12		0	70.2	21.2	6.92		1,390	3.45	0.22	-29.4
	MW-59				10/17/19									ee product enco				
					04/11/20									ee product enco	ountered			1
					9/29/20													
					04/03/21									ee product enco				
					10/14/21	9.31	10.70			1.39			•		encountered wit		-	
					04/14/22	9.24	9.25			0.01					encountered wit			
					10/13/22	ND	9.40			0		not sample	d per CM	p; free product	encountered wit	hin the prec	eding four c	uarters
	MW-89	20	17.91		10/18/19													
					04/11/20													
					09/29/20													
Performance					04/03/21													
Wells					10/14/21	ND	9.87	8.04		0	69.7	20.94	4.37	4.56		38.1	3.6	460
					04/15/22	ND	10.22	7.69		0	64.9	18.29	4.72	1.50		4.8	7.43	150
					10/19/22	ND	10.7	7.21		0	72.3	22.4	3.48		2,947	1.2	5.26	227
	RW-9				10/17/19													
					09/18/20													
					10/14/21	ND	9.33			0	73.9	23.26	7.13	1.10		5.1	0	-107
					10/13/22	ND	9.33			0	73.6	23.1	6.94		1,072.00	0.86	0.13	-127.5
	MW-36A	20.5	NM	NM	10/17/19							1	1	ee product enco				
					09/19/20													
					10/14/21	ND	10.05			0	66.5	19.18	7.73	2.61		12.8	0.54	-318
					10/13/22	ND	11.7			0	66.9	19.4	6.99		1,902.00	73.0	0.19	-139
	MW-39A	20.5	NM	NM	10/17/19							ot sampled		ee product enco				
					09/19/20													
					10/14/21	ND	9.4			0	68.8	20.44	7.25	1.12		3.8	0.13	-142
					10/13/22	ND	9.25			0	69.4	20.8	6.92		1,426.00	9.5	0.1	-141.8
	MW-42				10/17/19													
					09/18/20													
					10/14/21	ND	10.08			0	67.1	19.51	7.55	1.87		1.4	0.3	-168
					10/13/22	ND	10.85			0	66.4	19.1	6.73		1,496.00	51.9	0.23	-115.8
	RW-1				10/17/19									ee product enco				
					09/19/20									ee product enco				
					10/13/22	9.13	9.19			0.06		· · · ·	· ·	p; free product	encountered wit		ceding four o	
	RW-5A	20	18.07		10/17/19													
					09/18/20													
Interior Wells					10/13/22	ND	8.88	9.19		0	61.88	16.6	6.80		878	60	0.20	-138.6
	MW-38				10/16/19									olume insufficie				
					9/18/20		1		/ell observed br	oken below g								
	MW-93	20.5	NM	NM	10/17/19							ot sampled		ee product enco		1	I	1
					09/19/20													
					10/13/22	ND	9.74			0	68.9	20.5	6.44		1,198	103.8	0.68	-71.6
	MW-45A	20.1		16.52	10/21/19													
CPOC Wells					09/18/20													
																		1
					10/13/22	ND	10.51		6.01	0	63.7	17.6	6.73		876	6.45	0.19	-95.1

PORT OF SEATTLE - TERMINAL 30 Table 11 Monitoring Well Groundwater Sampling Parameters

	Well ID	Total Well Depth (ft)		MP Elevation (ft NAVD 88)	Sample Date	Depth to LNAPL (ft BTOC)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft NAD 83)	Groundwater Elevation (ft NAVD 88)	LNAPL Thickness (ft)	TEMP (°F)	TEMP (°C)	pН	Conductivity (μS/cm)	Specific Conductance (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	ORP (mV)
	MW-46B	20.3		16.07	10/16/19													
					09/18/20 10/13/22	 ND	10.64		5.43		63.9	 17.7	 6.71		 1,080	 6.45	1.01	 -63.5
	MW-58A	25	NM	NM	10/17/19 09/24/20													
CPOC Wells Cont'd					10/19/22	ND	11.02			0	66.6	19.2	6.76		1,157	17.5	0.12	-124.2
Contra	MW-86B	20	18.28		10/17/19													
					09/24/20 10/19/22	 ND	12.48	 5.8		 0	 65.5	 18.6	 7.13		 1,917	1.07	 0.15	 -116.8
	MW-92	20	NM	NM	10/16/19													
					09/18/20													
					10/13/22	ND	9.93			0	64.0	17.8	6.60		933	253.1	0.20	-132.6
Shoreline	MW-84A	40	NM	NM	10/17/19													
Water Quality	MW-85A	20	18.09		10/18/19													
Wells	MW-87A	20	17.98		10/18/19													

Notes:

All gw parameter data presented in this table was recorded at the time of sampling after stabilization was achieved in accordance with EPA's low-flow sampling procedures.

This table was created by AECOM in October 2021. Any water quality parameters collected by CRETE prior to AECOM involvement are not included, but are available in the relevant historical field forms.

Abbreviations/Formatting:

PORT OF SEATTLE - TERMINAL 30 Table 12 Well Construction Information

	Well Identification	Date of Installation	Casing Diameter (inch)	Well Screen Interval (ft BGS)	Well Depth (ft BGS)	Northing (ft)	Easting (ft)	MP Elevation (ft NAD83/NAVD88)
	RW-9		6					
	RW-11A	04/24/08	4	5 - 20	20.0	216683.94	1268216.99	18.02 ^a
	MW-36A	10/15/16	2	5 - 20	20.5	NM	NM	NM
Performance Wells	MW-39A	10/15/17	2	5 - 20	20.5	NM	NM	NM
	MW-42		2					
	MW-59		2					
	MW-89	04/22/08	2	5 - 20	20.0	217003.93	1268079.62	17.91 ^a
	RW-1							
Interior Wells	RW-5A	04/25/08	4	5 - 20	20.0	216931.12	1268445.78	18.07 ^a
interior wens	MW-38 ^c							
	MW-93	10/15/17	2	5 - 20	20.5	NM	NM	NM
	MW-45A	11/17/16	2	5.1 - 20.1	20.1	216490.82	1268124.80	16.52 ^b
	MW-46B	11/14/16	2	5.3 - 20.3	20.3	216602.90	1268114.90	16.07 ^b
CPOC Wells	MW-58A	08/29/13	2	5 - 25	25.0	NM	NM	NM
	MW-86B	04/22/08	2	5 - 20	20.0	216946.15	126807.76	18.28 ^a
	MW-92	08/30/13	2	5 - 20	20.0	NM	NM	NM
	MW-84A	04/29/09	2	30-40	40.0	NM	NM	NM
Shoreline Water	MW-85A	04/24/08	2	5 - 20	20.0	216682.46	1268002.20	18.09 ^a
Quality Wells	MW-87A	04/22/08	2	5 - 20	20.0	217186.75	1268010.28	17.98 ^a

Notes:

^a Monitoring Point (MP) and water table elevations in ft (NAD 83)

^b Monitoring Point (MP) and water table elevations in ft (NAVD 88)

^c MW-38 decomission May 6, 2021 due to a subsurface obstruction.

Abbreviations/Formatting:

-- = data not available

BGS = below ground surface

- CPOC = Conditional Point of Compliance
- MP = monitoring ponit

NM - not measured

Figures



SITE LOCATION

PORT OF SEATTLE TERMINAL 30 CLEANUP ACTION SEATTLE, WASHINGTON

FIGURE 1

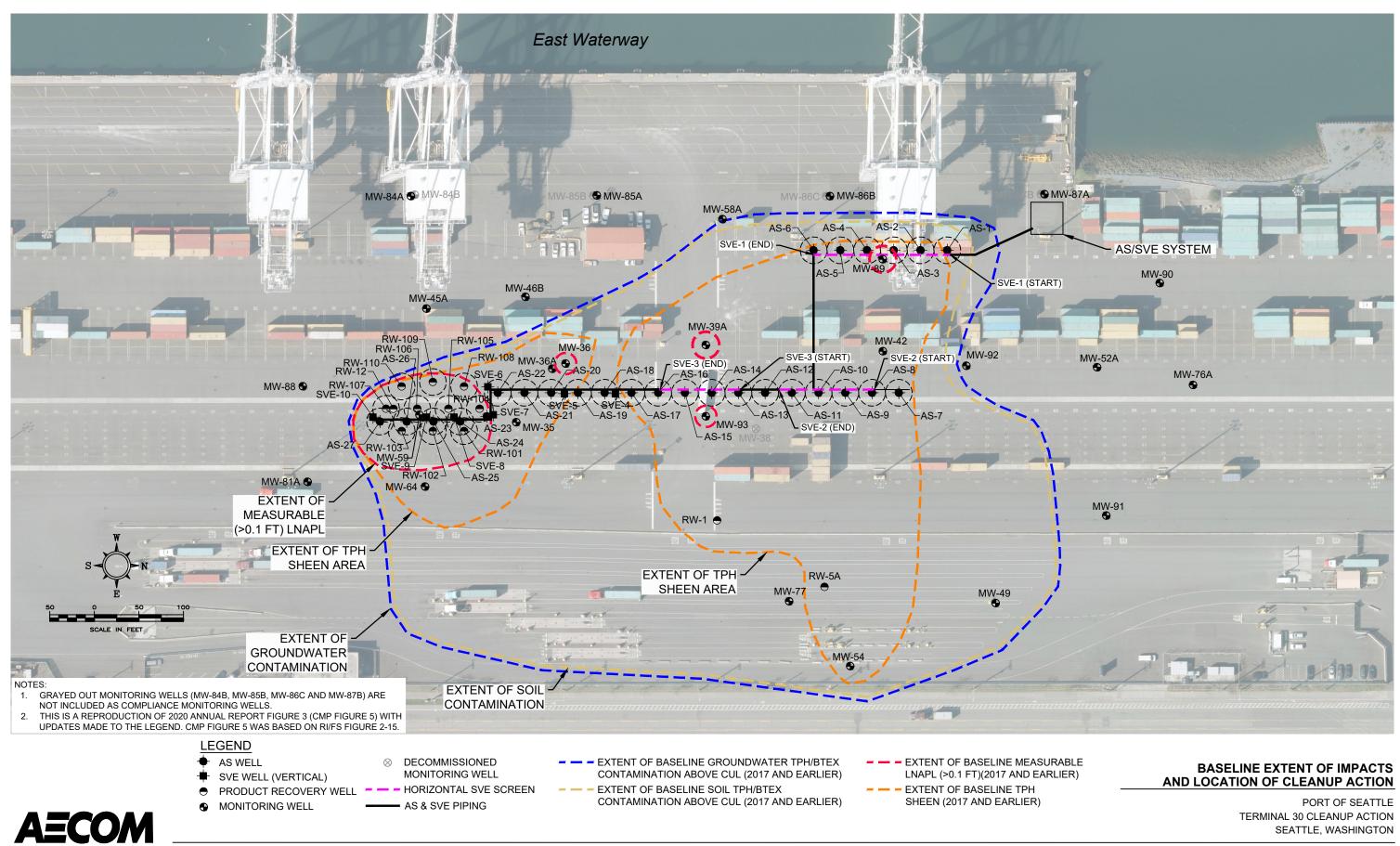
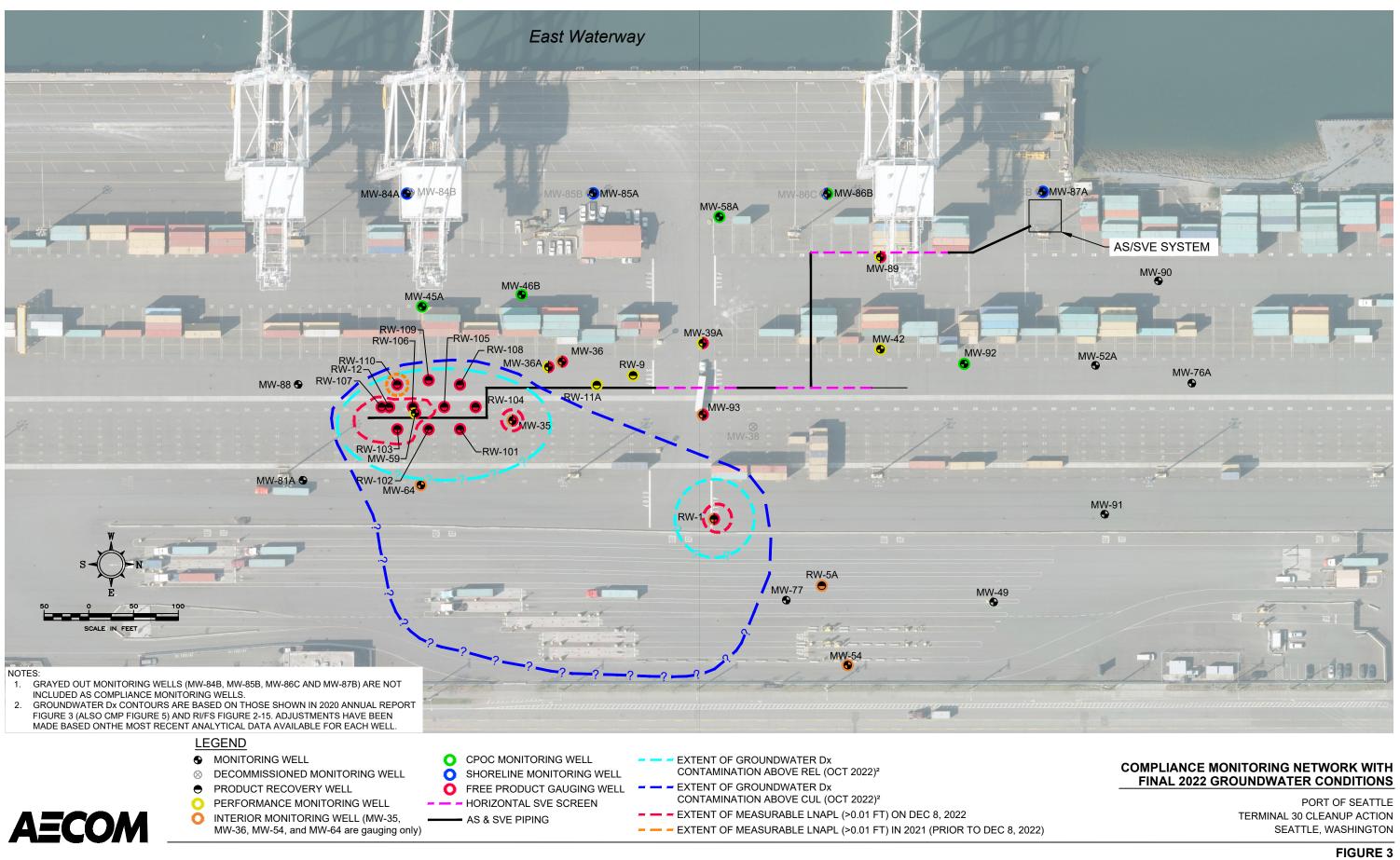
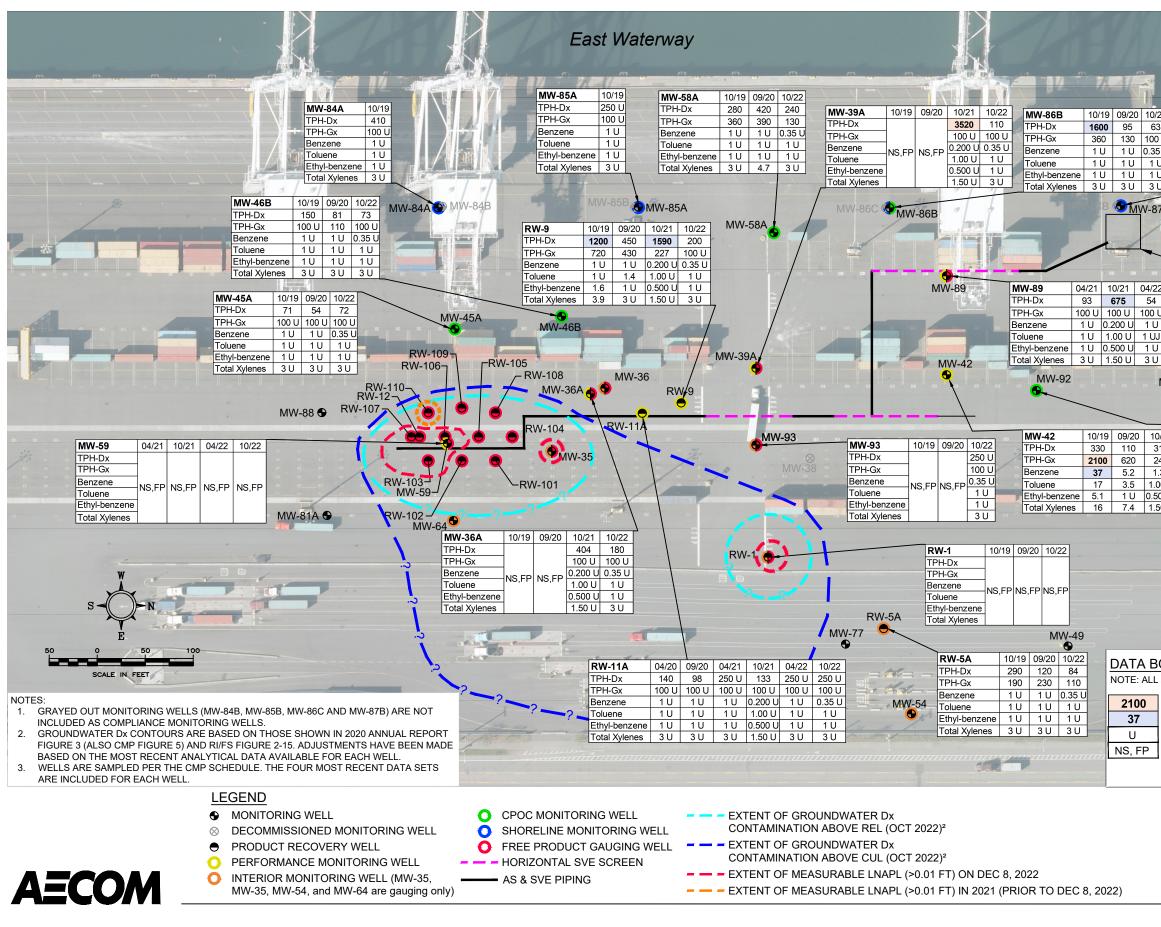


FIGURE 2





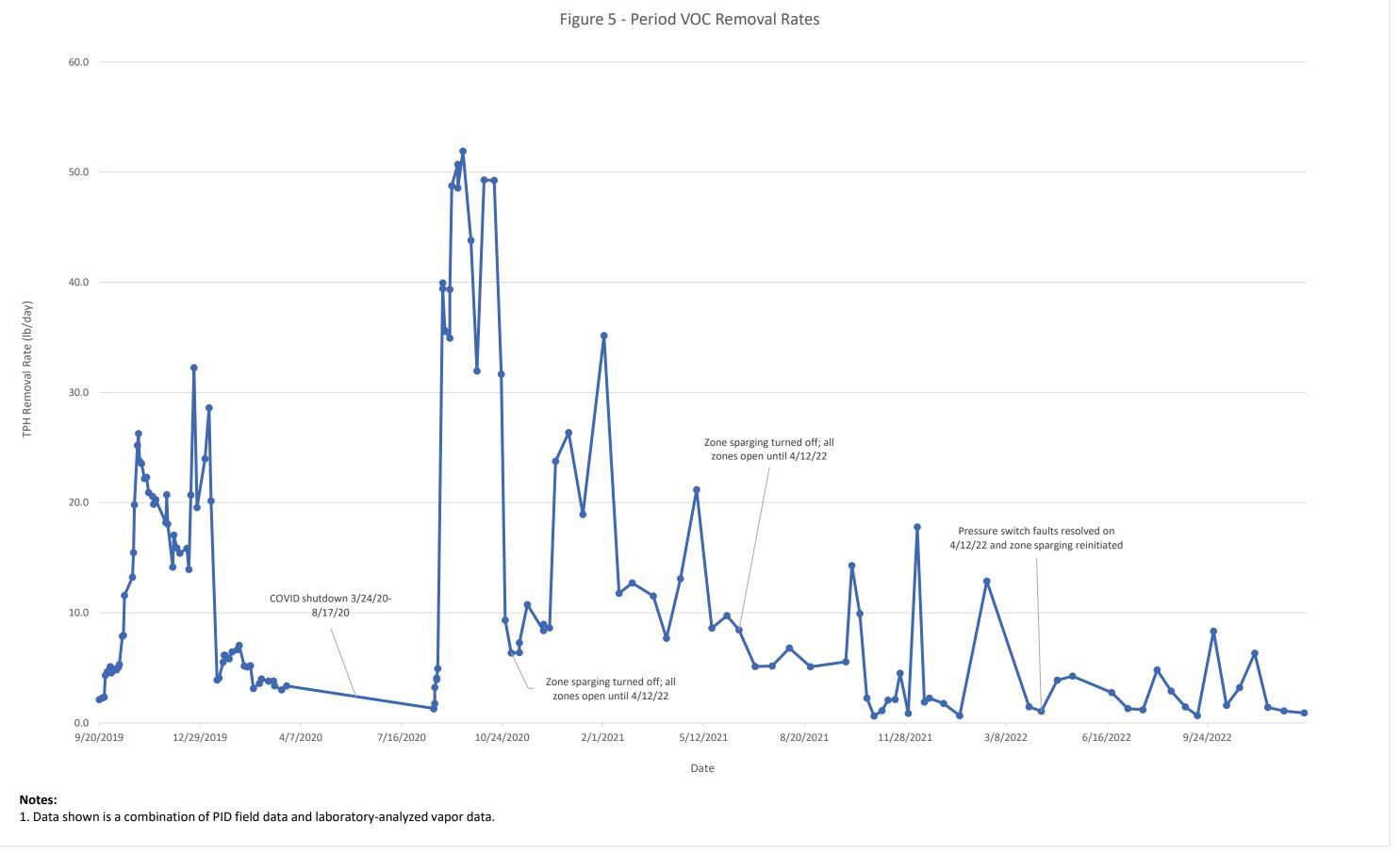
1	1														
7	1					1									
20	10/22		MW-8		10/19 250 U										
5 10	63 100 U		TPH-C		100 U						8	-	1.18	(dele	
U	0.35 U		Benze		10							5.0		1/1	
U U	1U 1U	and a	Toluer Ethvl-l	ne penzene	1U 1U	Martinaria		a parti				1 3.1	1	10	
υ	3 U	1.3.5	Total >	(ylenes	3 U	Caller and	C. LAND				4	1.			
MV	V-87A		-	T			7-			*	-				
	35					1.7.5		1							
1		-								-				-	
	-	-	ACIO	SVE S	VCT				1	-					
1770	1215	1228 12		SVE S				1210, 1215							
0	04/22 54	10/22 61		MW-90)										
1 1	54 100 U	100 U		•											
J	1 U	0.35 U	9722	52 12				-	-	un	972				
1	1 UJ 1 U	1 U 1 U													
J	3 U	30												1	
	NA	M 52/													
	IVI	₩-52A	1 2.6		MW-7	764									
					•••••										
20	10/2	1 10/2	22	MW-92		10/19	09/20	10/22							
0	315	12	0	TPH-Dx TPH-Gx		120 250	75 200	81 100 U	41-						
20 2	248 1.31			Benzene)	1 U	1 U	0.35 U							
2 5	1.00			Toluene		10	10	10	410						
U	0.500	U 1 U		Ethyl-be Total Xyl	enes	1.2 3 U	1 U 3 U	1U 3U							
4	1.50	U 3 l		X		ar an		an _{ar}	(SR						
		N // /	24												
		MW-9	91												
													TR		
									/	1					
									d	2	1				
)	-	1		•	
											-		-		
тл		X LE		Л						A CONTRACT				-	
				DATA AF		PORTI	-D IN 1	ia/L (M	1ICR)GR4	MS	PFR		R)	
100	0 0	CONC	ENTF	RATION	EXC	EEDS	REM	EDIA	TION	I LE\	/EL	(REI	∟)		1

CONCENTRATION EXCEEDS REMEDIATION LEVEL (REL) CONCENTRATION EXCEEDS CLEANUP LEVEL (CUL) CONCENTRATION NOT DETECTED ABOVE THE VALUE SHOWN WELL NOT SAMPLED DUE TO PRESENCE OF >0.01 FT FREE PRODUCT WITHIN THE PREVIOUS FOUR QUARTERS

END OF 2022 COMPLIANCE MONITORING ANALYTICAL RESULTS

PORT OF SEATTLE **TERMINAL 30 CLEANUP ACTION** SEATTLE, WASHINGTON

FIGURE 4



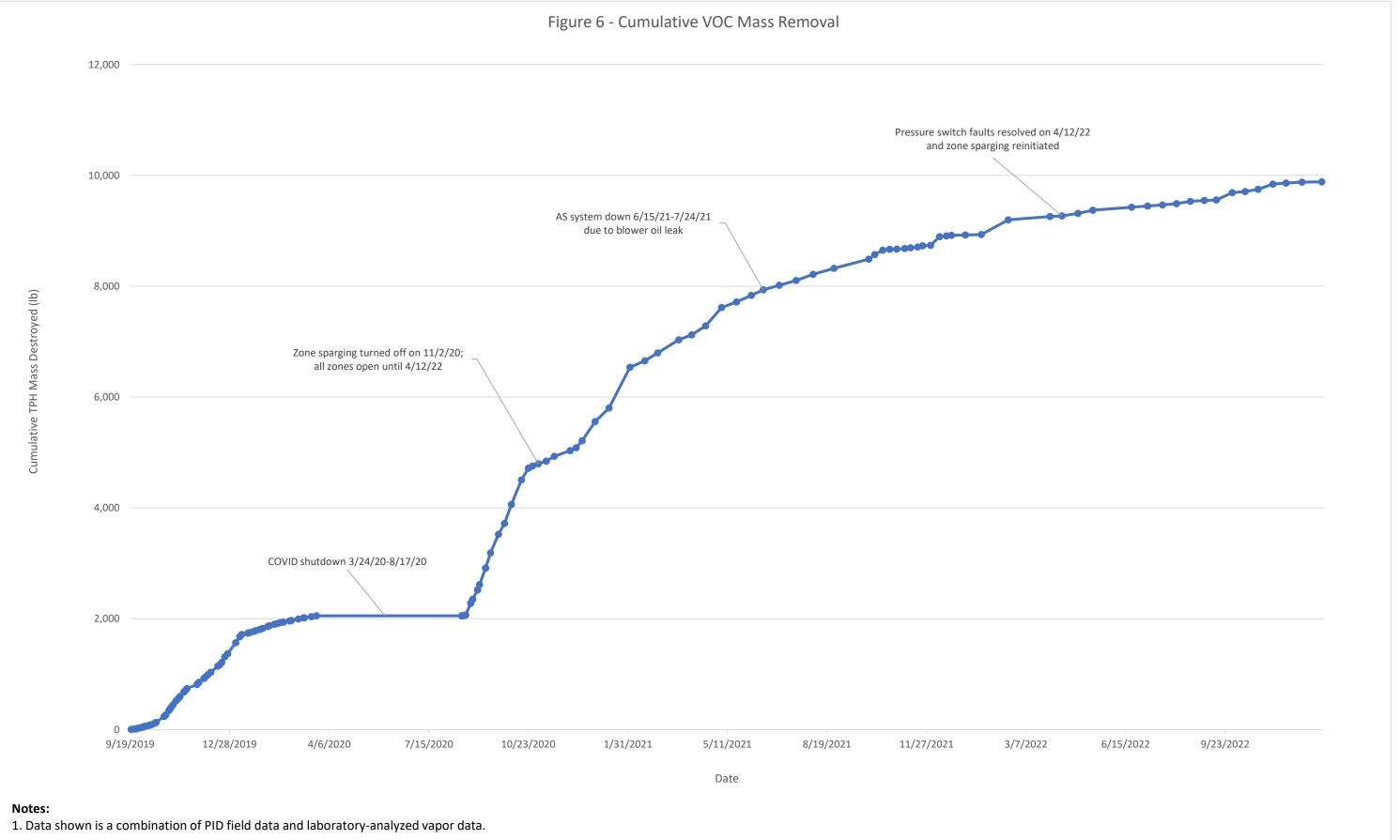
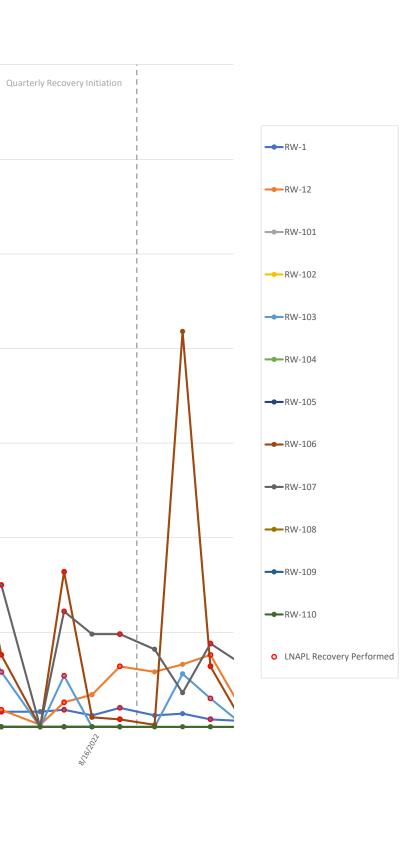
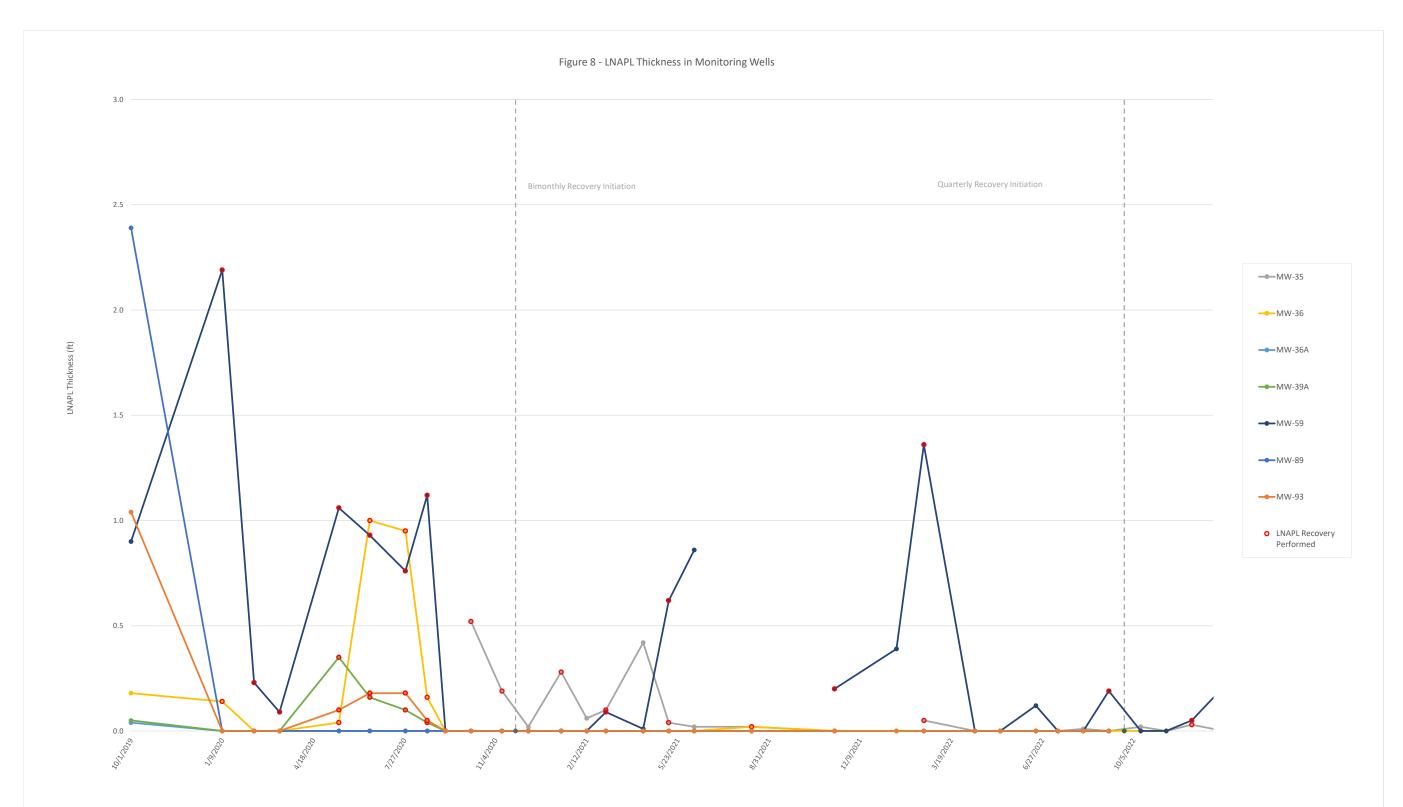


Figure 7 - LNAPL Thickness in Recovery Wells 3.5 Bimonthly Recovery Initiation 3.0 2.5 2.0 1.5 1.0 0.5 0.0 133,400 0/1/2010 Car 2021 Ś ŝ 2

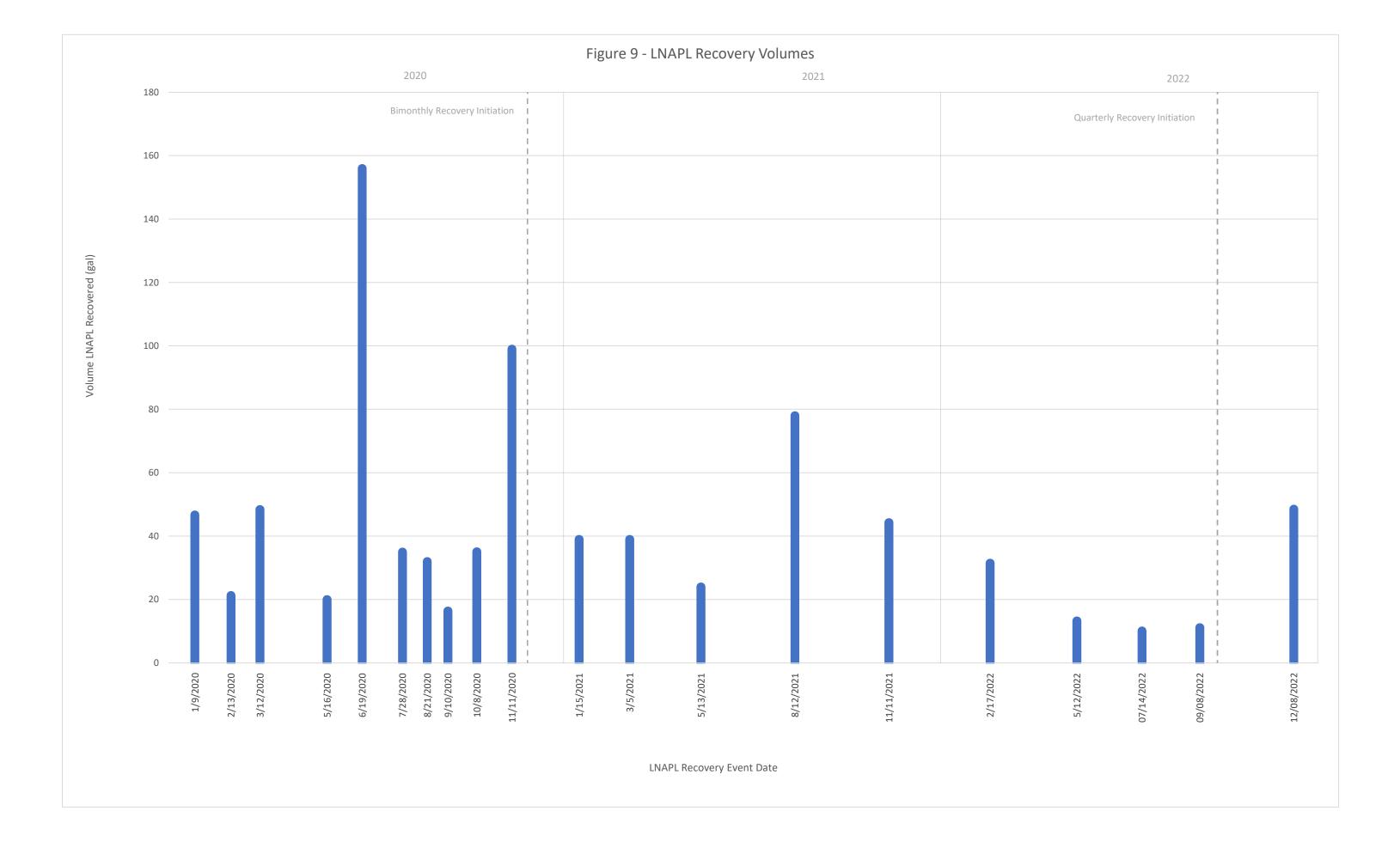
LNAPL Thickness (ft)

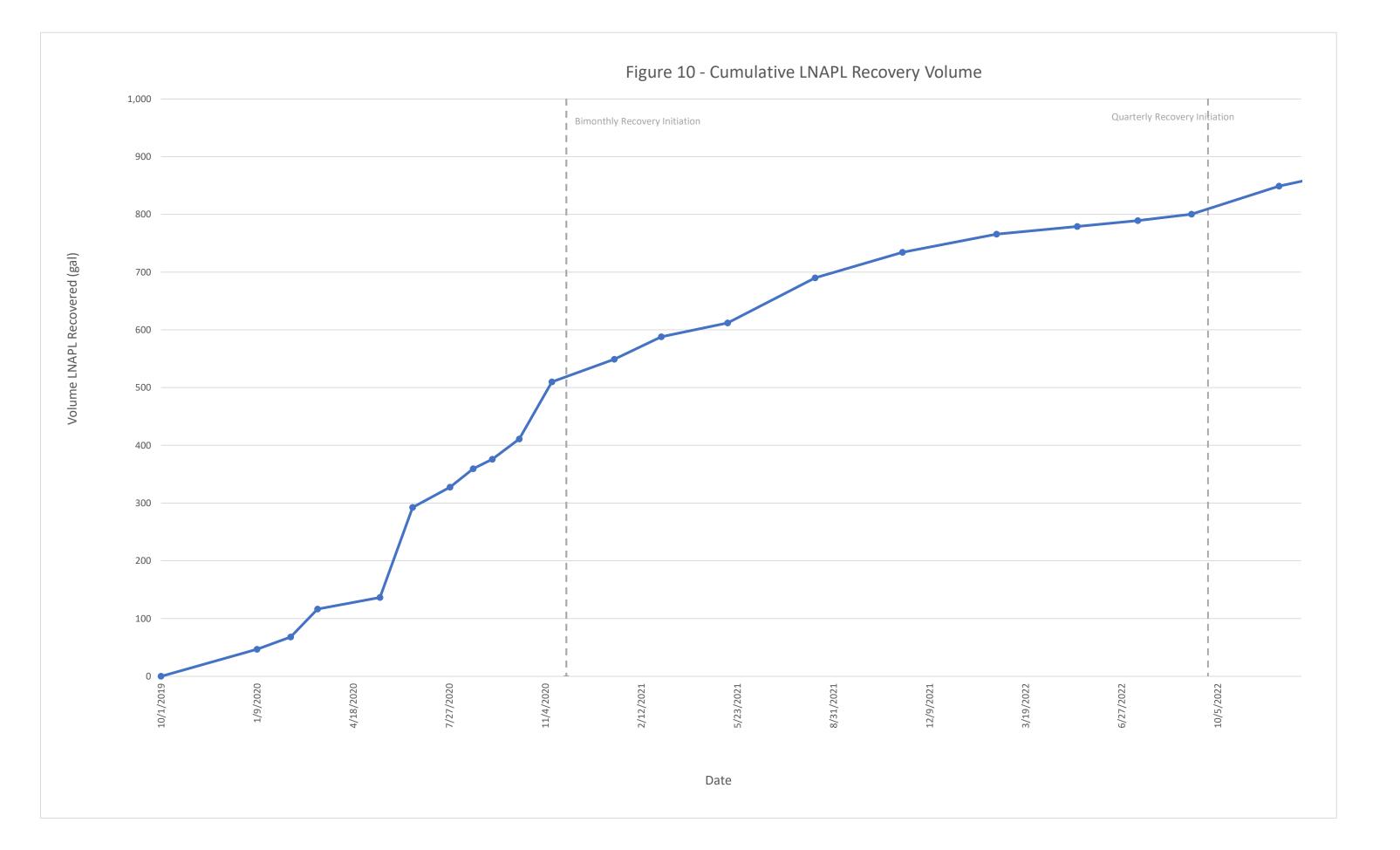
Date

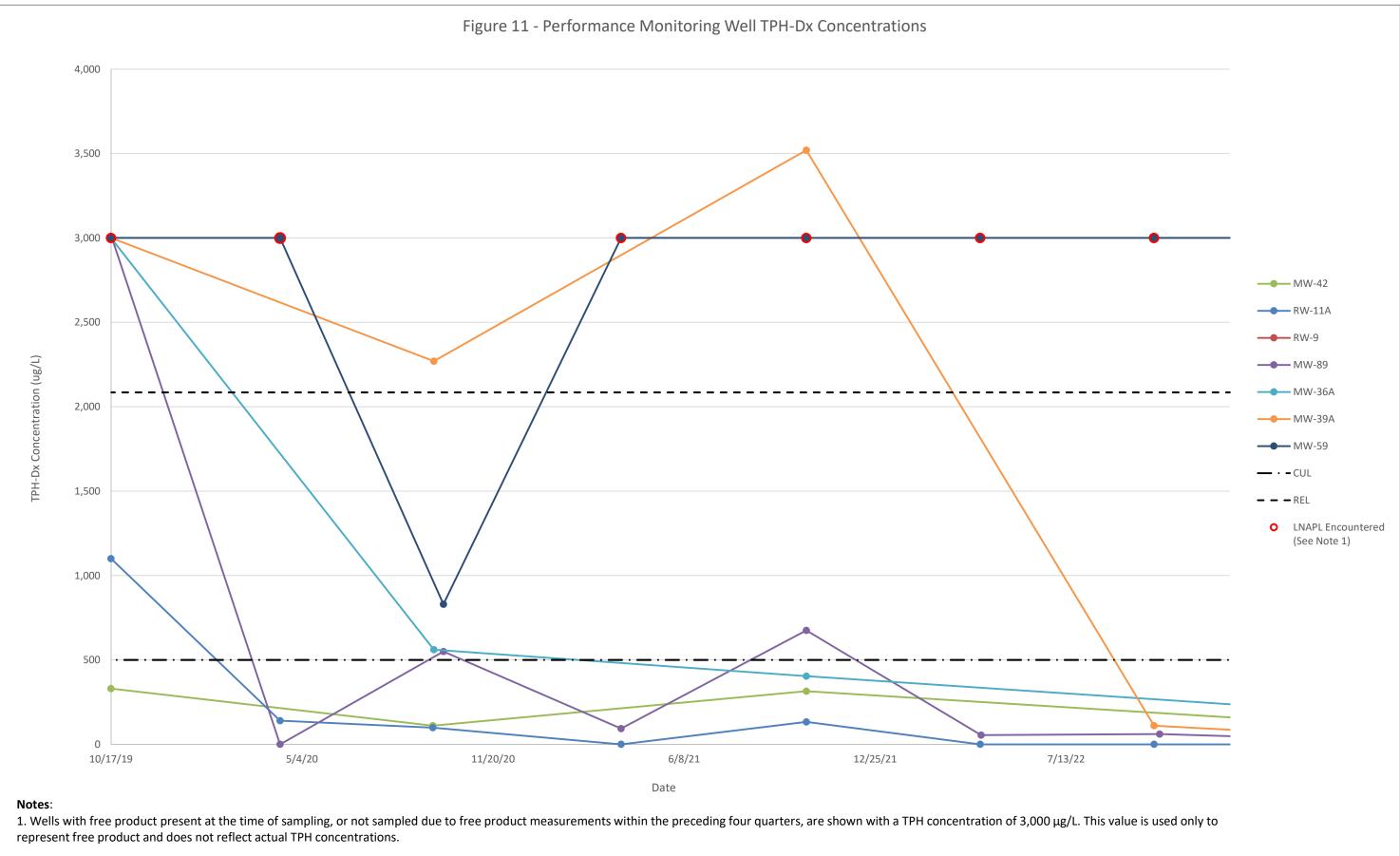




Date







<u>Appendix A</u>

O&M Field Forms

PROJECT <u>T-30</u> JOB NO. DAY & DATE <u>Well 1/5/22</u> SI FIELD ACTIVITY SUBJECT: DESCRIPTION OF DAILY ACTIVITIES AND EVENTS TIME 14:35 <u>Arvive on Site</u> 14:35 <u>Arvive on Site</u> 14:38 <u>Take HIM reacting</u> 14:50 <u>Officier reactings</u> 14:50 <u>Officier reactings</u> 14:50 <u>Officier reactings</u> 14:50 <u>ASE</u> well head r 15:00 <u>ASE</u> well head r 15:15 <u>Pib reactings</u> Eff 15:29 <u>Sent Paul pipotos</u> <u>Burner Chamber ter</u>	Ead ing reachings In P s of field sheets Missed mp and Birner Chamber Inlet on top of gray cylinder). Filled Ime where Inlet Diff pressure Mose there value above
VISITORS ON SITE:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
PERSONNEL ON SITE:	

Field Tech	arge VOC (tefee ff	Date: 1	1160	Equipme	nt I.D. #:	172	27 PI	K
SVF Disch:	arge LEL (%	opm) PID		52.8			<u> </u>		V
Oxygen (%]			Contraction of the second state				
		uum (" H ₂ O)							
	n Inlet ΔP (1					
Oxidizer Di	ischarge V(DC (ppm) Pli	D	1.2	delengen all an opportunit davan davan a		·····		· · · · · · · · · · · · · · · · · · ·
a harron a harron an ann an a	1		-	and the second of the second se	Wells		an a		
Location	Time	Vacuum ("H2O)	Flow (SCFM)	Valve Position (% Open/Closed)	Location	Time	Vacuum ("H2O)	Flow (SCFM)	Valve Position (% Open/Closed
HSVE-2	1456	32	72		HSVE-10	1458	2100	15	(no open/ciosed
HSVE-3		42	72		HSVE-9	1155	93	10	
HSVE-4		82	D	bouncy water	HSVE-8		84	2	
-ISVE-5	Number of States	19	D	dirty	HSVE-6		76	12	
-ISVE-7		90	15	bouncy	HSVE-10		15	78	
	Time	Pressure			Wells		And the second		<u>heart ann an Christian an Angelein Coltanais an Normalais an Angel</u>
ocation	nine	Pressure (PSI)	Flow (SCFM)	Valve Position (% Open/Closed)	Location	Time	Pressure (PSI)	Flow (SCFM)	Valve Position (% Open/Closed)
\S-7	1500	7.5	2.5		AS-17	1504	8.0	1.3	(10 0 per) elosed)
NS-8		7.0	2,4		AS-18		7.0	D	
IS-9		7.0	3.4		AS-19		7.0	5.2	and the second
S-10		7.5	3.2		AS-20		7.0	2,1	an a
S-11		8.0	2.8		AS-21		7.0	0	*****
S-12	1502	7.5	20		AS-22		7.0	1.4	
S-13		7.0	2.8		AS-1	1505	75	3.1	na an a
S-14		6.5	3.3		AS-2		7.0	85	
S-15		7.5	1.3		AS-3		7.0	D	944 / A & BARNES - 2797 / L & B & B & B & B & B & B & B & B & B &
S-16		7.5	1.6		AS-4		7.0	129	
S-23	1503	7.0	0		AS-5		75	4.0	
5-24		6.5	2.4		AS-6		8 4	3.6	
5-25		6.8	1.3		Notes:				n na se
5-26		7.5	-0						
5-27		6.5	3.2						

Abbreviations:

ppm = Parts per Million

% = Percent

deg F - degrees Fahrenheit

" H₂O = Inches of Water

SCFM = Standard Cubic Feet per Minute PSI = Pounds per Square Inch



PORT OF SEATTLE - TERMINAL 30 SVE/AS System Field Data Collection Form

Da	te: 1/5/22	
Screen Tin	ne:	
	Sparge Blower Speed	
54.0		600
1		124.0
81970		in .
- owthat		13TH.6
2.10		27-10.0
1		1-118,8
52	(PSI) PL 200	
165	(PSI) PLADO	0
	SVE Blower Discharge Temperature	
1.0		00
1	March Lange and the second	172
1250		100
1-20	Open Interval(s)	100
94	Open Interval(c)	1
0-1		
nG		
$+ \underline{0.2}$		
110		
1.0		1 (
	Sparge Zone 5 Operating Cycle	1
	Open Interval(s)	L.
6 001		and which the transmission of the second
681	Process Blower Runtime (Hours)	15515
1 cui		10011
684	Combustion Fan Runtime (Hours)	15515
1.00		
015	Burner Runtime (Hours)	ISEDE
170		HUJUJ-
618	Processing Vapors Runtime (Hours)	15497
110		1311-
65	Panel Temperature (oF)	6
0 0 0 10		
open	Flame Signal (Volts)	5.0
ân	Burner Chamber Inlet Differential Pressure	
0.0	("H2O) (\cap
11711		
11.51	System Stats on Mana Manin	
	(Rur cox)	
- A	Propane Tank A Level (%)	75
Empt-1 ett		
today	Propane Tank B Level (%)	80
2=0		Ny sana amin'ny fisian'ny fisian'ny fisian'ny fisian'ny fisian'ny fisian'ny fisian'ny fisian'ny fisian'ny fisia
	Watch Tin Screen Tin 54.0 86979 2.6 52 6.5 1.0 <50 84 0.5 1.0 84 0.5 1.0 (081 684 684 615 678 615 678 615 678 615 678 615	SUG79AS Blower Runtime (Hours) Sparge Blower2. (\wp Sparge Heat Exchanger Runtime (Hours)52Transfer Pump Discharge Pressure (PSI) PI-3006. 5SVE Blower Discharge Pressure (PSI) PI-4005. 5SVE Blower Discharge Pressure (PSI) PI-4003. 5SVE Blower Discharge Temperature (°F) TI-4004. 5Sparge Zone 1 Operating Cycle Open Interval(s)84Open Interval(s)9Sparge Zone 2 Operating Cycle Open Interval(s)9Sparge Zone 3 Operating Cycle Open Interval(s)9Sparge Zone 4 Operating Cycle Open Interval(s)9Sparge Zone 5 Operating Cycle Open Interval(s)9Process Blower Runtime (Hours)9Burner Runtime (Hours)9Burner Runtime (Hours)9Processing Vapors Runtime (Hours)9Panel Temperature (oF)9Peth Flame Signal (Volts)9Burner Chamber Inlet Differential Pressure ("H20)11.37System Stats on Mum Media (Bluc Caps)9Propane Tank A Level (%)

on top of gvay cylinder-Magle.-.

Abbreviations:

1. " H₂O = Inches of Water

2. °F = Degrees Fahrenheit

3. PSI = Pounds per Square Inch

4. % = Percent

5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point



AECOM FIELD	ACTIVITY LOG
project T-30	COMPLETED BY
JOB NO	APPROVED BY
DAY & DATE Friday 1/21/22 SHE	et of
FIELD ACTIVITY SUBJECT: DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
TIME	
12:40 Arrived on site	
13:00 Finally get in gate	. Had trouble with lock.
13:63 HMI Richnes and t	Lenips/pressures, Flows
13.10 UXIAIES 11111 140(1)	de valle
1400 Checked light. I con	Id see from the outside the
IPVPL 6-8 Inches IV	Pal In II
1423 I Paving to take equ	ipment to office
· · · · · · · · · · · · · · · · · · ·	
	CHANGES FROM PLANS OR IMPORTANT DECISIONS:
VISITORS ON SITE:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
Cloudy 450	
PERSONNEL ON SITE:	

	Date:	1/20/22	
	Watch Time:	13:04	
	Screen Time:	13:47	
VE/AS System Location			
VE Blower Speed	- 4 0	Sparge Blower Speed	500
Hertz) VFD	54.0	(Hertz) VFD 57.	52.0
VE Blower Runtime	GODE D	AS Blower Runtime	3994.0
(Hours)	9005.D	(Hours) Sparge Blower Sparge Heat Exchanger Runtime	
Transfer Pump Runtime (Hours) <i>MS Pump</i>	2.6	(Hours)	3993.2
parge Heat Exchanger Discharge Temperature		Transfer Pump Discharge Pressure	5
°F) <i>TI-500</i>	62	(PSI) <i>PI-300</i>	0
AS Blower Pressure		SVE Blower Discharge Pressure	7
(PSI) <i>PI-501</i>	5.0	(PSI) PI-400 SVE Blower Discharge Temperature	0
AS Blower Flow	10	(°F) TI-400	102
(" H2O) DPI-500	1.0		107
SVE Blower Inlet Temperature	54	Sparge Zone 1 Operating Cycle Open Interval(s)	100
(°F) <i>TI-200</i> SVE Blower Inlet Vacuum		Sparge Zone 2 Operating Cycle	
(" H ₂ 0) <i>VI-200</i>	85	Open Interval(s)	1
SVE Blower Filter Differential Pressure		Sparge Zone 3 Operating Cycle	
(" H ₂ 0) <i>DPI-200</i>	0.5	Open Interval(s)	
SVE Blower Inlet Differential Pressure	s r	Sparge Zone 4 Operating Cycle	
(" H ₂ 0) <i>FI-200</i>	1.5	Open Interval(s)	
		Sparge Zone 5 Operating Cycle Open Interval(s)	The Distance
Out discus Structure Location		System STAT on N	PHIA
Oxidizer System Location	0	System Sing One	
Inlet Temperature (°F)	689	Process Blower Runtime (Hours)	15823
			158711
Burner Chamber Temperature (°F)	672	Combustion Fan Runtime (Hours)	19029
(⁰ r)	628	Burner Runtime (Hours)	15813
Outlet Temperature (°F)		Burner Runtime (nours)	1.00.5
Inlet Limit Controller Temperature (°F)	672	Processing Vapors Runtime (Hours)	15800
<u> </u>	(+ 1)		70
Outlet Limit Controller Temperature (°F)	624	Panel Temperature (oF)	10
	1100	Flame Signal (Volts)	5.0
Process Fan Valve Position (Open/Closed)	+	Burner Chamber Inlet Differential Pressure	5.0
Dilution Valve Position (%)	0.0	(" H2O)	0
	1		~~~~~
Combustion Valve Position (%)	11.1		
Moisture Separator Level	SKO		1.m
(% Full)	100	Propane Tank A Level (%)	60
Water Storage Tank Level (DTF, TD from MP; inches)	could see	Bitpang Tank B Level (%)	35
NOTES	POIN IN	DCHERY rain o zere (r)	
P1-2=0			
PI-1=0,5			
Abbreviations:	A Barris Charles Name		ne and a subsection of the second
1. " H ₂ O = Inches of Water			
2. °F = Degrees Fahrenheit			
3. PSI = Pounds per Square Inch		1883 #220000	
4. % = Percent			COM
5. DTF - Depth to Fluid, TD - Total Depth, MP - N	leasuring Point		

	1	- (1-)	tan	Fauipment	.D.#: 4	8808		
wyPa	Helec FP	ate:		and the second se	ALCONTROL OF A CONTROL OF A CON	- Creek Company		
	m) PID		18.1				and the second	
e LEL (%)								
1	("11.0)							
			03				CONTRACTOR OF CONT	And the second
harge VO	(ppm) PID	1	SVE	Wells				
Time	Vacuum	Flow	Valve Position		Time	Vacuum	and the second	Valve Position
Inne			(% Open/Closed)	Location		("H2O)	(SCFM)	(% Open/Closed)
13:41	COLUMN DATE OF CALLER OF CALLE	73		HSVE-10	13:43	7100	10-15	Ft booxing
1		73		HSVE-9		94	0	hieken?
		0	broken/ul	H8VE-8		88	0	FIED WERE DO
	20	Õ	broken?	HSVE-6		78		Flow white pai
	91	0.15		HSVE-10		16	78	A REAL PROPERTY OF THE PARTY OF
		VV	AS	Wells		Contraction of the Contraction o		Lui Desition
Time	Pressure	Flow	Valve Position		Time	and the second se	1	Valve Position (% Open/Closed)
	(PSI)	(SCFM)	(% Open/Closed)	The second se		(PSI)	In MARCHINE ALL DISCOUTE	(// Open/closed/
13:45	65	0		AS-17	1348	5.2	0	
	6.0	16		AS-18		6.0	0	
areas and	55	2.6				\$7.0		
	65	7.4		AS-20		5.1		
1	6.5	2.6		AS-21		5.5		
13:46	6.5	2.0		AS-22	1	5.5	and monthly of the second second	
1	6.2	D		AS-1	1350	6.6		
	5.0	0		AS-2		5.6	8.5	
	6.4	0				5.4	6	
1	65	1				-		
13:47	6.0	0				- left-		
	5.5	2.2				16.0	10	
		0		Notes:				
		U_						
	4.5	12.6				ana ana amin'ny fanana amin'ny fanana amin'ny fanana amin'ny fanana amin'ny fanana amin'ny fanana amin'ny fana		
	e VO£ (pp) e LEL (%) nlet Vacuu nlet ΔP (" harge VOO Time 13:41 13:45 13:45	$\begin{array}{c c} \text{e VOE (ppm) PID} \\ \text{e LEL (%)} \\ \hline \\ \text{nlet Vacuum (" H_2O)} \\ \text{nlet } \Delta P (" H_2O) \\ \text{tharge VOC (ppm) PID} \\ \hline \\ \hline \\ \text{Time} & Vacuum (" H2O) \\ \hline \\ 13:41 & 32 \\ & 38 \\ & 82 \\ & 20 \\ & 72 \\ \hline \\ 13:41 & 32 \\ & 82 \\ & 20 \\ & 72 \\ \hline \\ \hline \\ 13:45 & 42 \\ & 6.5 $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	With the second point of the secon	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Abbreviations:

ppm = Parts per Million

% = Percent

deg F - degrees Fahrenheit

" H₂O = Inches of Water SCFM = Standard Cubic Feet per Minute PSI = Pounds per Square Inch

AECOM

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

	D 48808 m MiniRAE 30 d 1/19/2022 3						
	er Rac Systems er PGM 7320			State Certifi Stat	ied tus Pass		
Serial Number/ Lo Numbe				Тетр	° C 16		
Locatio Departme	on Seattle nt			Humidity	% 53		
-		Calibra	tion Specifications				
Group N	up# 1 [ame VOC	ding		Range Acc % ading Acc % Plus/Minu	6 3.0000		
Stated 7 <u>Nom In Val / In Val</u> 100.0 / 100.0	Accy Pct of Rea <u>In Type</u> PPM	Out Val 100.0		<u>Fnd As</u> 99.9	<u>Lft As</u> 100.0	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments Used	During the Ca	libration			<u>(As (</u>	Of Cal Enti	ry Date)
Test Standard ID Desc	ription	Manufacturer	<u>Model Number</u>	<u>Serial Nur</u> Lot Numb	er Last		e <u>xt Cal Date /</u> opiration Date
SEA ISO 100 Isob PPM PPM	utylene (C4H8) I	100 Airgas	x02ai99cp34206	304-4021	ng som - selected		23/2025
304-402150198- 1		12. 1		-1			

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

Field Tech:			Date:		Equipment	I.D. #:		A Marian	
SVE Dischar	ge VOC (p	pm) PID		383.2 ppm	199.8	ppn			
SVE Dischar									
Oxygen (%)					3.07			E Colore Canal	
SVE System	Inlet Vac	uum (" H ₂ O)		-					
SVE System				-					
Oxidizer Dis	charge V(DC (ppm) Pl	D	*10.1 ppm 7	.9 ppn Wells	in the			and the second se
	-	1			Wells	Time	Vacuum	Flow	Valve Position
Location	Time	Vacuum ("H2O)	Flow (SCFM)	Valve Position (% Open/Closed)	Location	Time	("H2O)	(SCFM)	(% Open/Closed
HSVE-2		26	72		HSVE-10	3 - 3	100	20	
HSVE-3	1000	34	72.		HSVE-9		90	0	a sharan an
HSVE-4		80	10		HSVE-8	1	84	0	
HSVE-5		14	0		HSVE-6		70	10	- and the second
HSVE-7		86	15		HSVE-10	and the	14	76	
		0.		AS	Vells	in the p		1000	
Location	Time	Pressure (PSI)	Flow (SCFM)	Valve Position (% Open/Closed)	Location	Time	Pressure (PSI)	Flow (SCFM)	Valve Position (% Open/Closed
AS-7		6	0		AS-17		6	0	
AS-8		6	σ		AS-18		6	σ	
AS-9	Acres	6	2.2		AS-19		6.5	5.2	- management
AS-10		6	6		AS-20	1	6	0	and some
AS-11		6.5	2.8		AS-21	- and	5.5	0	
AS-12		65	3.4		AS-22		5	2.	
AS-13		6	0		AS-1	1	6.5	0	
AS-14	C	5	C	S	AS-2		5	8.5	
AS-15	SPACE-	6	0		AS-3		5.5	6	
AS-16		6.5	Ò		AS-4		5	13	
AS-23		6	0		AS-5		6.5	0	
AS-24		55	0		AS-6		5.5	1.8	julian je
45-25		5.5	0		Notes:				
45-26		5	0		fail.				
S-27		4.5	64	(n)					

PORT OF SEATTLE - TERMINAL 30

Abbreviations:

ppm = Parts per Million % = Percent

deg F - degrees Fahrenheit

" H₂O = Inches of Water

SCFM = Standard Cubic Feet per Minute

PSI = Pounds per Square Inch

AECOM

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PORT OF SEATTLE - TERMINAL 30 SVE/AS System Field Data Collection Form

Date:	2/17/22		100	
Watch Time:	2130			
Screen Time:				
SVE/AS System Location				
SVE Blower Speed (Hertz) VFD	54.0			
SVE Blower Runtime (Hours)	9499.3			
Transfer Pump Runtime (Hours) MS Pump	2.6			
Sparge Blower Speed (Hertz) VFD	52.0	-		
AS Blower Runtime (Hours) Sparge Blower	4321.4			- 246-25
Sparge Heat Exchanger Runtime (Hours)	4321.1		1.	
Sparge Heat Exchanger Discharge Temperature (°F) TI-500	50.0			
AS Blower Pressure (PSI) PI-501	5.5			
AS Blower Flow (" H ₂ O) DPI-500	1.0			1.8000
SVE Blower Inlet Temperature (°F) <i>TI-200</i>	80	Constant of	10000	a chuidh ann
sys Blower Inlet Vacuum (" H ₂ 0) VI-200	0.5			
nus Plawor Filter Differential Pressure ("H ₂ 0) DPI-200	1.0	180	2017	
The Blower Inlet Differential Pressure (" H ₂ 0) PI-200	0	th prod	126 125 / 1	
Transfer Pump Discharge Pressure (PSI) PI-300	0		1. 1. 200.1	3
Plawer Discharge Pressure (PSI) PI-400	96			
Pitcharge Temperature (*F) 77-400	Open			
1 Operating Cycle - Open inte				
a Operating Cycle - Open inte		1.1		
a Operating Cycle - Open				-
t Operating Cycle - Open				
Sparge Zone 4 Operating Vicle - Open Interval(s)	75 010			
	0"	-		
Moisture Separator Level (MTET) Water Storage Tank Level (DTF, TD from MP; inches)				
Water Storage Tank Level (NOTES:				

Notes:

1. " H_2O = Inches of Water

2. °F = Degrees Fahrenheit 3. PSI = Pounds per Square Inch

5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point





	Open Interval(s)	
675	Process Blower Runtime (Hours)	16319
675	Combustion Fan Runtime (Hours)	16320
608	Burner Runtime (Hours)	16310
675	Processing Vapors Runtime (Hours)	16296
609	Panel Temperature (oF)	64
Open	Flame Signal (Volts)	5.0
0		
17.7		
75%	Propane Tank A Level (%)	85
0.0'	Propane Tank B Level (%)	85
- Measuring Point	A=C	MO
	675 608 675 609 0pen 0 17.7 75% 0.0'	675 Process Blower Runtime (Hours) 675 Combustion Fan Runtime (Hours) 608 Burner Runtime (Hours) 675 Processing Vapors Runtime (Hours) 675 Processing Vapors Runtime (Hours) 609 Panel Temperature (oF) 0pen Flame Signal (Volts) Burner Chamber Inlet Differential Pressure 0 (" H2O) 17.7 75% Propane Tank A Level (%) 0.0' Propane Tank B Level (%)

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Des		17227 MinRae 3000 2/16/2022 12:0	06:32PM					
Model I Serial Numl I L	Number					tus Pass °C 15		
			Calibra	ation Specification	s			
		# 1e Isobutyleney Pct of Reading	ng		Range Acc % eading Acc % Plus/Minus	3.0000 5 0.0	D. 44	Deee/Feill
<u>Nom In Val / In Va</u> 100.0 / 100.0		<u>n Type</u> PPM	<u>Out Val</u> 100.0	<u>Out Type</u> PPM	<u>Fnd As</u> 100.0	<u>Lft As</u> 100.0	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
est Instruments	Used Dur	ing the Calibr	ation		a		Of Cal Entr	<u>y Date)</u> xt Cal Date /
est Standard ID	Descriptio	<u>n</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number	Last Open	Cal Date/ Exj ed Date	oiration Date
	Isobutyler PPM	ne (C4H8) 100	Airgas	x02ai99cp342066	304-402162 -1	466	8/11	1/2025

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Stethan Holmes

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

AECOM

Americas				
Daily Tailgate Mee	ting			S3AM-209-FM5
Instructions: Conduct meeting prior attendance of all AECOM employees	to sending crews to individual tasks. F and subcontractors. Invite personnel	rom	AECOM Supervisor Na Phone Number:	
simultaneous operations for coordination purposes. Review scope of wor briefly discuss required and applicable topics. This meeting is a daily ref not a full orientation. Task-specific discussions associated with Task Ha			AECOM SH&E Rep. Na Phone Number:	ame: Andrew Auguster
Assessment (THA) follow this meeting individual task is started.	g at the task location immediately befo	re	Meeting Leader: Gu	s Frildman
	ect Name/Location: T-ZU	1 1		t Number:
Today's Seens of Work:		1.3.		.1
Binearly O+M, 10	Lupa Samples, pr	644	re suitch trac	1010 Sh 00 1
Muster Point Location:	First Aid Kit Location:	Fire E	xtinguisher Location:	Spill Kit Location:
1. Required Topics		2. Di	scuss if Applicable to T	oday's Work
 SH&E Plan onsite - understo (incl. scope, preplanning haz registers, controls, procedure Task Hazard Assessments (completed for each task imm STOP WORK Right & Respo changes/changed conditions Requirement to report to sup damage, near miss, unsafe a Emergency Response Plan- first aid kit, fire extinguisher, Personal Protective Equipment hazard assessments in good Equipment/machinery inspec and in good condition - operation Work area set up and deman protect workers, site staff, an 	specific) completed and current bod, reviewed, signed by all card assessments / risk es, requirements, etc.) THAs) are to be reviewed and nediately prior to conducting bonsibility- all task a re-assess with THA bervisor any injury, illness, act / condition - including muster point, clinic/hospital location ent (PPE) - Required items per d condition / in use by all cted (documented as required) ators properly trained/certified roation/ barricades in place to ad the public available, understood (describe):		Biological/ Chemical / I Ergonomics - Lifting, B Lock Out/ Tag Out Short Service Employe oversight assignment Simultaneous/ Neighbo Slip/ Trip/ Fall Hazards Specialized PPE Need Traffic Control Waste Management/ D Weather Hazards / Hea Subcontractor Required procedures, reporting, o	ody Position es - visual identifier and mentor/ ouring Operations s econtamination at Stress / Cold Stress ments (e.g., JHAs, THAs, etc.) equired (e.g., Fall Protection, /ork, Critical Lifts, etc.); in place, ach): /attach):
3. Daily Check Out by Site Su	pervisor			in the second
	safe condition and work crew	2 1	d out as fit unless other	
Site Supervisor Name	Signature		Date	3/31/22
Daily Tailgate Meeting (S3AM-20 Revision 9 January 15, 2019	ign In Sign Out sheets applicab		is meeting are on rever	

ACCO26

AECOM

All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand: * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).

* The hazards & control measures associated with each task you are about to perform.

* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).

* That no tasks or work is to be performed without a hazard assessment.

* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning: * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

* You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.

* You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or

impairment/fatigue issue to the AECOM Supervisor.

* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
		In & Fit	Out & Fit
Gus Frildman AECOM Nike Gayn Accon	Gulfin Ma 3 hrs	GF 1000	1645 GE
		In & Fit	Out & Fit
Nike Guyn Accon	the your	NG ions	1345 GF for NG
		In & Fit	Out & Fit
		In & Fit	Out & Fit
			· · · · ·
		In & Fit	Out & Fit
	Α		
		In & Fit	Out & Fit
	<u> </u>		
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

	SITE VISITOR / SITE REPRESENTATIVE					
Name	Company Name	Arrival Time	Departure Time	Signature		
	1 T	<i>a</i> .				
			1,25			

DAILY FIELD LOG

Project Informati	Page 1 of 4
Project Name:	T-30 Location: Seattle
Project/Task No.:	Weather:
Date:	3/3//22 Personnel: GF NG
Observations	
Time	Observation Description
1 1000	GF NG ansite
2	Scope: biweekly O+M, 10 sapar Sunples, pressure
3	suitch transleshout
4	Sattaz tailgate: Traffic hozarda beware crane
5	training next to sixtem
6	Aftempted the trilgak app but it malfinetioned +
7	Worldn't Submit
8 10 30	System tour + train-up for NG
9 1100	
10	Ship prechal dorm active an arrival. Cleared ~ 1050
11	+ Sparge restarted. SUE stayed on.
12 1215	Start collective vapor Sumples
13	GF calls CB to discuss pressure switch tradeshost.
14	System is currently running at 4.5 PSI and few AS vers
15	are registering flows (through many appear strick). The area
16	that show flaws are 15 & forg.
17	. It is our understanding The Switch set Sure wis all The way
18	down & at its highest threshold (-15 psi). GF will confirm.
19	It should be ad revolutions from lavest pressure to
20	highest. Ideally it is set to trip ~ 10 psi, and we leave
21	the system running ~7 psi at end of day. Then increase
22	operational pressue on Subsequent visits as the System
23	allous.
24 1300	to the right changes are Breked off deed value to get
25	to the right consider Broked off deed value to get
Comments / Site A	ctivities / Personnel Tracking

,

DAILY FIELD LOG

Project Information	
roject Name:	Location:
roject/Task No.:	Weather:
Date:	3(3) (22 Personnel: GIF NG.
bservations	
Time	Observation Description
1	a pressure of G psi. at the compressor gauge. Flows
2	indicated on many rotaneters at this setpoint that
3	here previously zoro. Oddly manifold preasures don't
4	Seena Significantly changed
5 315	call PK to discuss.
6	-> system pressure setpoint (design) is le psi
7	> Jesign garge plowrates is 7 cfm to each well
8	Her of Jamaging vells if we pugh Sigter to 10 Bill
9	to set the get given.
10	-> pressure switch should have one part open to atmosple
11	which still had a love factory pluz in it. Gif removed
	it but CB docant think it was affecting things.
12	
13	
	(a, ps:
.5	> recommendation is to leave both switch portes apen
16 1345 17 18 19 19	to otmosplace to tennare switch fine tionality
	Grin NG offsile
8 1400	GF disengages high pressure line from pressure switch.
19	Installs an old gange in its duce to plug up the tee it
10	had connected to.
.1	> System restartled but only ran ~ 30 seconds before
2	dutting down due to a blower pressure glarm. Got to no
3 1415	pestert system again, some thirs happens
4	· Call PK, Says maybe the Switch is wired backwards or broke
25	· Call CB. Sugs same thing. Be commonds replacing

Comments / Site Activities / Personnel Tracking

ROJECT OB NO.	-30 Stellatones	$\frac{GF}{N}$					
DAY & DATE	3/31/22	SHEET 3 OF Y					
FIELD ACTIV DESCRIPTIO	/ITY SUBJECT: N OF DAILY ACTIVITIES AND EVEN	TS:					
TIME							
	high pressure thing	+ settine the set screw all the					
	why but to see if	that makes any difference.					
	JYB.5 revolutions,	n set sinew.					
1445	System restarted. In	sted NO SEC. Shut down at 2 psi					
	Set Swew adjusted to 15 Noolutions down System						
	resterted. Lasted 40 sec. got to 5.5 psi.						
	. Set Grew ad " sted another 10 revolutions (~8 from m						
		usted 37 sec. got to 5.0 psi.					
	warse than previo						
150		I all the way down to max, 8 mare					
		n restorted; did not shut down					
	when held at 5.2	5. Shut down at ~7 ps; when					
122	acjusted with p	e plefé value.					
	. System restarted	, but quickly shot down at 5ps					
	without any adjus						
1500	- Call CB. he isn't S	we. Sustem wor't even stay on					
		photo of the Switch wiring					
1510	Matt from the Part						
	tuking ploto of	ne wiring. Turns sustem back					
	on & it stays on @ no os. Flow not recistering						
	on rota metors as	this pressure.					
1524	System Shors down	again.					
SITORS ON S	ITE:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:					
VEATHER CON	DITIONS:	IMPORTANT TELEPHONE CALLS:					

PERSONNEL ON SITE:

AECOM	FIELD ACTIVITY LOG
PROJECT 7-30 Stella Jones	COMPLETED BY GF
JOB NO.	APPROVED BY
DAY & DATE 3/31/22	SHEET 4 OF 4

TIME								
1530	Call CB again. Remore Switch face date. Wires are							
	set to "Normally Cle	Sed". Sure the bottom load to						
	the "Normally open"	terminal to ma to by Dass.						
		- maybe life it is now or low-						
	pressure Switch + +	le 5, 5tem can't vercome the						
	minial las pressure							
	. Swap lead from "1	Common terminal. This should						
	both on the top	"Common terminal. This should						
	traly by pages the switch.							
1545	Restart a stem Guccessfully. Increase pressure to							
	6 psit successfully. havenent at ~ hast the rotaneters							
	Bump up to 6.5 pSi. Max header well pressure is 1.25							
pri. Max Plow is ~4 cfmg. ~ half are shill at								
1(22	stuck.							
1630	. Reterke PID mensurements to cleck for 190% dostruction							
	17-9 ppp inlet/ 0.4 ppm discharge v							
	· Clean up, lock up.	het he ok.						
1645	·OFFSite	Jet ice ok.						
(0-1-)	CFI-SIAC							
)615							
ISITORS ON S	ITE:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:						
		A						
WEATHER CONDITIONS:		IMPORTANT TELEPHONE CALLS:						

Field Tech			Date: 3	/31/22	Equipment	I.D. #:	21921	4	
	arge VOC (p			18.6 000	GF 17.	9 ppm			
SVE Disch Oxygen (9	arge LEL (%)								
	») m Inlet Vacւ	um (" H ₂ O)		83					
	m Inlet ΔP ('			1.0				1.1.1.	
the second se	Discharge VC		1	2.Lapme	F O.	4 con	^		N
					Wells	. 11			
Location	Time	Vacuum ("H2O)	Flow (SCFM)	Valve Position (% Open/Closed)	Location	Time	Vacuum ("H2O)	Flow (SCFM)	Valve Position (% Open/Close
HSVE-2	1118	28	72	L 100 %	HSVE-10	1120	>100	10	100 %
HSVE-3	1118	39	72	10000	HSVE-9	1121	86	< 5	L 100%
HSVE-4	1119	80	5	100 %	HSVE-8	1121	84	Stuck 10	100 %
HSVE-5	1119	18	20 Stick	100%	HSVE-6	1122	78	10	100 %
HSVE-7	1120	88	15	100%	HSVE-1	1117	14	76	< 100%
x x x x sed on 4.12.2					Vells				
sed on 4.12.2 gh pressure	2)e	Pressure	Flow	Valve Position		Time	Pressure	Flow	Valve Positio
ĞF Ó		(PSI)	(SCFM)	(% Open/Closed)	Location		(PSI)	(SCFM)	(% Open/Close
ىب		6.25	∲0	100 %	AS-17	1103	5.75	540 .0	100%
AS-8		6.0	0		AS-18		6.0	Stuck/o	
AS-9		5.75	5. <mark>0</mark>		AS-19		6.75	Stuck	
AS-10		6.25	<u>مب 0 المت</u>		AS-20		6.0	0	
AS-11		6.5	Stuck	V	AS-21		5.25	Stuck/0	
AS-12	1108	6-25	<u>\$40</u> =	100 %	AS-22		6.25	1.0	
								I . I	100 %
AS-12 AS-13		6.0	<u>St 0</u> 70	1	AS-1	1100	6.5	1.0	100 15
		6.0 5.0	510.70 C+0.70	1	AS-1 AS-2	1100	6.5 5.75	0.0	
AS-13		<u> </u>				1100			
AS-13 AS-14		5.0	C-10,70		AS-2	1100	5.75		
AS-13 AS-14 AS-15	1106	5.0	€ 1 0,70 \$ 1 0,70 \$ 1 0,70 \$ 1 0,70	100 %	AS-2 AS-3	1100	5.75 6.0	Stuck	
AS-13 AS-14 AS-15 AS-16	1106	5.0 6.0 6.5	<u>640</u> 70 54070		AS-2 AS-3 AS-4	1100	5.75 6.0 5.0	2.5	
AS-13 AS-14 AS-15 AS-16 AS-23	1106	5.0 6.0 6.5 6.0	C+0,70 S+0,70 S+0,70 S+0,70		AS-2 AS-3 AS-4 AS-5	1100	5.75 6.0 6.5	2.5].5	
AS-13 AS-14 AS-15 AS-16 AS-23 AS-24	1106	5.0 6.0 6.5 6.0 5.5			AS-2 AS-3 AS-4 AS-5 AS-5	1100	5.75 6.0 6.5	2.5].5	

Abbreviations:

ppm = Parts per Million

% = Percent

deg F - degrees Fahrenheit

" H_2O = Inches of Water

SCFM = Standard Cubic Feet per Minute PSI = Pounds per Square Inch



PORT OF SEATTLE - TERMINAL 30 SVE/AS System Field Data Collection Form

	Date	: 3/3/22	
	Watch Time	1.0.	
	Screen Time		
SVE/AS System Location	Joi cen mie		
SVE Blower Speed	ELL A	Sparge Blower Speed	52.0
(Hertz) VFD	54.0	(Hertz) VFD	52.0
SVE Blower Runtime	10410 0	AS Blower Runtime	110001-
(Hours)	10460.2	(nours) sparge biomen	4851,2
Fransfer Pump Runtime	21	Sparge Heat Exchanger Runtime	4850,3
(Hours) MS Pump	2.6	(Hours)	10,0,5
Sparge Heat Exchanger Discharge Temperature	11	Transfer Pump Discharge Pressure	0
(°F) <i>TI-500</i>	66	(PSI) <i>PI-300</i>	0
AS Blower Pressure	4.75	SVE Blower Discharge Pressure	4.75
(PSI) <i>PI-501</i>	-1.75	(PSI) <i>PI-400</i>	1.75
AS Blower Flow	1.0	SVE Blower Discharge Temperature	108
(" H2O) <i>DPI-500</i>	1.9	(°F) <i>TI-400</i>	100
SVE Blower Inlet Temperature	63	Sparge Zone 1 Operating Cycle	i sh
(°F) <i>TI-200</i>	20	Open Interval(s)	N/A
SVE Blower Inlet Vacuum	711	Sparge Zone 2 Operating Cycle	
(" H ₂ 0) <i>VI-200</i>	78	Open Interval(s)	
SVE Blower Filter Differential Pressure	0.75	Sparge Zone 3 Operating Cycle	
(" H ₂ 0) <i>DPI-200</i>	0.75	Open Interval(s)	
SVE Blower Inlet Differential Pressure	10	Sparge Zone 4 Operating Cycle	
(" H ₂ 0) <i>FI-200</i>	1.0	Open Interval(s)	
		Sparge Zone 5 Operating Cycle	11
		Open Interval(s)	0
Oxidizer System Location			
	670		17285
nlet Temperature (°F)		Process Blower Runtime (Hours)	
Burner Chamber Temperature (°F)	697	Combustion For Dustine (Usua)	17285
		Combustion Fan Runtime (Hours)	
Dutlet Temperature (°F)	615	Burner Runtime (Hours)	17275
nlet Limit Controller Temperature (°F)	678	Processing Vapors Runtime (Hours)	17261
Dutlet Limit Controller Temperature (°F)	620	Panel Temperature (oF)	78
Process Fan Valve Position (Open/Closed)	orm	Flame Signal (Volts)	5
	21	Burner Chamber Inlet Differential Pressure	
Dilution Valve Position (%)	0%	("H2O)	Broken Gurge
	1. 100		0
Combustion Valve Position (%)	14.16		
Moisture Separator Level 7 Need	5 clanged		CCM
(% Full)		Propane Tank A Level (%)	55%
Vater Storage Tank Level	Dry		60%

Abbreviations:

1. " H₂O = Inches of Water

2. °F = Degrees Fahrenheit

3. PSI = Pounds per Square Inch

4. % = Percent

5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point



SAMPLE CHAIN OF CUSTODY

Report To Paul Kaling					SAMPI	LERS (sign	ature)	N.	Gwy.	7							#
Company AECOM				_	PROJECT NAME & ADDRESS , PO #						Standard						
Address 1111 3rd Ave Suite 1600				_		T- 30	Port	of	Sec. 771	2							ges authorized by:
City, State, ZIP Sec HIe, WA 98101 Phone 206 438 2700 Email Paul. Kel:, 4 @ Aecon. Com			~	NOTES	5:					V01 <i>eCo</i>	CE T	0		Def	ault:	IPLE DISPOSAL Clean after 3 days (Fee may apply)	
SAMPLE INFORMATION											ANA	ALYS	IS R	EQU	JEST	TED	
	Lab	Canister	Flow Cont.	Le [.] IA=Ind	orting vel: loor Air oil Gas	Date	Initial Vac.	Field Initial	Final Vac.	Field Final	TO15 Full Scan	TO15 BTEXN	TO15 cVOCs		Helium		
Sample Name	ID	ID	ID	(Circle	e One)	Sampled		Time	("Hg)	Time	Ę.						Notes
Inlet - 033122		8394	18	IA /	SG	3/31/2	2 7-30	1242		1253		X		X			
D: Scherg = - 033122		8538	01	IA /	SG	3/3//22	-24.5	1248	- 5.0	1254	3	X		X			
				IA /	SG												
81. 				IA /	SG												
				IA /	SG					_							
				IA /	SG												
				IA /	SG			-									
				IA /	SG												

Friedman & Bruya, Inc.		PRINT NAME	COMPANY	DATE TIME
3012 16th Avenue West	Relinquished by: When I form	Nate Guys Accom	Aecon	3/31/22 (710
Seattle, WA 98119-2029	Received by:	Yelena Aralleine		
Ph. (206) 285-8282	Relinquished by:	Velena Arableine	MFB	3/31/22 1710
Fax (206) 283-5044	Received by:			
FORMS\COC\COCTO-15.DOC				

AECOM

Americas

Daily Tailgate Mee	ting		S3AM-209-FM5
attendance of all AECOM employees simultaneous operations for coordina briefly discuss required and applicab not a full orientation. Task-specific	to sending crews to individual tasks. F and subcontractors. Invite personnel to ation purposes. Review scope of work le topics. This meeting is a daily refra discussions associated with Task Hazi	and esher, ard Phone Numb	E Rep. Name: Antew Paynter
Assessment (THA) follow this meetin individual task is started.	g at the task location immediately befo	re Meeting Lead	ler: Gas Frildman
Date: 4/12/22 Proje	ect Name/Location: T-30	seattle	Project Number:
Today's Scope of Work: Rivelly O In set of Zone Go Show Maring I	Amy Sporkers a	ound	
Muster Point Location:	First Ald Kit Location.	Fire Extinguisher Lo	ocation: Spill Kit Location:
Front gule	ugex		- No To devide Mercula
1. Required Topics			cable to Today's Work s reviewed or mark 🔳 as not applicable
 SH&E Plan onsite - underst (incl. scope, preplanning ha registers, controls, procedur Task Hazard Assessments completed for each task imm STOP WORK Right & Resp changes/changed condition Requirement to report to su damage, near miss, unsafe Emergency Response Plan first aid kit, fire extinguisher Personal Protective Equipm hezard assessments in goo Equipment/machinery inspe and in good condition - ope Work area set up and dema protect workers, site staff, a Required checklists/records Lessons Learned / SH&E in 	zard assessments / risk res, requirements, etc.) (THAs) are to be reviewed and mediately prior to conducting tonsibility- all task s re-assess with THA pervisor any injury, illness, act / condition – including muster point, , clinic/hospital location nent (PPE) - Required items per d condition / in use by all ected (documented as required) rators properly trained/certified arcation/ barricades in place to nd the public available, understood (describe):	 Ergonomics Lock Out/ Ta Short Service oversight ass Simultaneou Slip/ Trip/ Fa Specialized I Traffic Control Waste Mana Weather Haz Subcontractor procedures, Work Permits: Confined Sp: understood (e Employees - visual identifier and mentor/ signment s/ Neighbouring Operations II Hazards PPE Needs of gement/ Decontamination cards / Heat Stress / Cold Stress or Requirements (e.g., JHAs, THAs, reporting, etc.) s / Plans required (e.g., Fall Protection, ace, Hot Work, Critical Lifts, etc.); in place, identify/attach):
3. Daily Check Out by Site Su			
Describe incidents, near misses interventions from today:	These Operators Time	elite - antica	arned/ Improvement Areas from today:
The site is being left in	a safe condition and work crew	checked out as fit un	less otherwise specified as above.
Site Supervisor Name	Signature	_	Date 4/12/22 Time (at end of day / shift) 1530
Worker Acknowledgement / S Daily Tailgate Meeting (S3AM-2		le to this meeting are	e on reverse and, if applicable, attached.

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AECOM

All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand: * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).

- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning: * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	signature	Initials & Sign In Time	Initials & Sign · Out Time
	1 0:	In & Fit	Out & Fit
Gris Frildman AECOM	ENG	1345 GF	1830 GP
	0	In & Fit	Out & Fit
0		In & Fit	Out & Fit
. •	4	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Name	Company Name	Arrival Time	Departure Time	Signature		
	- II					
55440 M	17.60		26	2		
			See isse	AN THE STATE		

Daily Tailgate Meeting (S3AM-209-FM5) Revision 9 January 15, 2019

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2 of 2

Project Information	Page of
Project Name:	T-30 Location: Seattle
Project/Task No.:	Weather:
Date:	<u>4/12/22</u> Personnel: 67F
Observations	
Time	Observation Description
1 1345	Onsite meeting haring + Amy Sponberg (Port)
2	· Satety tailgate : Practice crave is rearby but not active
3	No ship in port but lots of truck traffic & moving
4	Containers.
5	· Scope: bireldy O+M plus showing having + Any
6	around.
7	- Alap Got of Zone garging?
8	* Amy Gonburg esstmative com
9 1400	neet tharing open up system ascuss responsibilities
10	She pled any alorms that are emergencies they need
11	to respond to?
12	-> Mey de not currently adjusting the system at all. Just
13	monitoring propage Poly tank, restaring after glaring
14	I making sure nothing looks out of place. Uses Rob
15	ding more than that?
16 1415	Amy sponsory joins gets orielated, Git + As leave to see
17	newellfield of Maring Leads offsile
18	- With notice, she will be able to keep LNAPL wells clear for
19	gaughe (vacing in the future, one is corrently blocked
20	That she will don to resolve.
21	- If plere is not a ship in part plere is no work after
22	4:20 pere no matter the day. That also applies to the
23	Se cond Thursday of each minth.
24	- If plece ; wit a your, accessing the cells doser to share
25	should not be an iffue. No containers go there, so should
Comments / Site Acti	vities / Personnel Tracking

Project Informatio	Page 2 of 3
Project Name:	T-30 Location:
Project/Task No.:	Weather:
Date:	4/12/22 Personnel:
Observations	
Time	Observation Description
1	be clear minus through traffic.
2	- Good to have Plashing lights on for roots hight be
3	fort policy.
4	- AS will put together a well map with their container
5	Stalles added / overlaid.
6	- AS side Think the onlive versel Schedule was reliable.
7	Thinks change a lot, best just to contact her. peek-of
8	is best.
9 1545	· Buck at system for OtM readings
10	- higher AS pressure quice is reading 6 per (rear bled) while laver
11	are rends 7 ps.
12	- Its well prechues 5-7.5 psi
13	- SVE retaineters need draining & scrubbing. How do they detach?
14	· pullet of suppy water? by King model
15	cover surp brigh sin cover. Just weed Alcover?
16	- As retoneters seen to have built in unions for removal?
17 1630	· PID readings taken 790% destruction
18 1635	· Sparge zone testine u/ CSB approva 1
19	· zorel : avg Plov ~ 8 cfmg 6-7.75 psi
20 1645	·Zore 2: 310 strole? high pressures 85-10 ps: 3.8 cfmg mex
21	For the patrometers working not a huge change in flow from
22	no-zones,
23 6650	Zore 3: flag readed max 4.9. 7.25-9.5 pc;
24	-> garge place was reading 9.5 neld to lover
25	until me decide attertise. Call CSB. Asree to
Comments / Site Act	ivities / Personnel Tracking

act Name: 7-30 cct/Task No.:	Location: Weather: Personnel:
4/12/22	
	Personnel: GF
rvations	
Time	Observation Description
ain tar 8 phi	at the compression for the zone
with highest ba	
-> hechamica	PRV 3. Laboled to pap at 8.5 psi. IS
it mis-layel	ed? Miz-set? pid not go off.
- Tone 3 page get-	sair to 4/ mellisat & psi on the conpr.
Max Flow N2	
1720 · Zore \$: great 20	il Breakthrough pressures are april or
below at all Su	ells. At spie amor flack re 3.7-
cfmg)
	ack pressue than zone 4. At same bleet
Sekpoint it is a	18.5 pri @ compr.
	The lover pack pressure thing zone S.
G.S ps: equivalent	
	BP to Zone 5 Tied for most conserv.
	? 7 pri equiv Sto
	zore 2 are the compression pressure
set point.	a man of propriet
1745 · Set compresses pre	there to 8 aci on Zore 2 Men took
pleture + Plow re	adjuse for each zones without adjusting it
J Que Z welle L	and no flow
J Car & well & m	ght have been stude or have very high
preakmarch	ord there to
JAna Slow = 54	· most both 1-4-free
· Leaving Sustem at	This set point. Zones set to pon 45.5 hre
14520 - Clean in Plack in	1 staile
nents / Site Activities / Personnel Tracking	
	5
	GF
C \Users\gus friedman\Documents\Field Forms - GENERAL\Field Forms - GF.xls(Daily Field Log. 3/22/2021	3/22

						11.1.1.0	INAL 30			
Date:	-			AS &	SVE Ma	nifold Rea	dings	-		
Date: Field Tech	(c):				-			Time:	1.5.4	and the second
	arge VOC (p	nm) PID		4.5 10.5	- 1	mo .	. a. al	Equipment	t I.D. #:	Co al int
	arge LEL (%			P. 5 10-7		LAID HO	1 Zunco	08 4	solice	from they tube)
Oxygen (%		,		and the second second			1.2			
SVE System	m Inlet Vac	uum (" H ₂ O)		82		ditte F	*G			The Second P
SVE Syster	m Inlet ΔP ((" H ₂ O)		1	100					and the second second
Oxidizer D	ischarge V	OC (ppm) PI	D	0.3	1.0	1123				and a
TALX		15 70		al manager states	SVE	Wells	8			and a start of the start of the
8	Vacuum	Flow	Valve Pos.	1	N/h=1	001.00	Vacuum	Flow	Valve Pos.	The second s
Location	("H2O)	(SCFM-G)	(% Open)	Comments	di katin	Location	("H2O)	(SCFM-G)	(% Open)	Comments
HSVE-2	24	76	L100		<u>a)</u>	SVE-10	710	15	100	
HSVE-3	42	74	100			SVE-9	82	7	100	Juky aprate
SVE-4	81	10 .	100	very sunky	10	SVE-8	-54	0	100	Strik?
SVE-5	11	0	100	gunke str	167	SVE-6	50	10	100	launcing
SVE-7	69	12	100	100/ 5 Stick		HSVE-1	12	72	7100	
	seche					Nells	prosper	e		
Location	Vacoum ("H2O)	Flow (SCFM-G)	Valve Pos. (% Open)	Comments	zore	Location	Vacuum ("H2O)	Flow (SCFM-G)	Valve Pos. (% Open)	Comments
AS-7	70	1.2	100			AS-17	7.0	0	100	
AS-8	7.0	0	100			AS-18	G.75	0		A LING STOLEN
AS-9	7.0	'B	100		-	AS-19	7.5	5.1		Stuck
AS-10	7.0	0	100			AS-20	7.0	1.8		reading without
AS-11	7.25	brokan	100			AS-21	1e-0	0		ti ngan nin marin
AS-12	7.0	1.75	100			AS-22	7.0	0	1	And a straight
AS-13	675	2.2			1	AS-1	7.5	3.5	100	
ÀS-14	65	1.4			1	AS-2	6.5	8.4	31	
AS-15	7.0	1.75			(AS-3	65	0		Juk
AS-16	7.25	1.8		•	1.	AS-4	5.5	6.3		Sector Contest
AS-23	7.0	1.3	100		1	AS-5	1.25	5.4		
AS-24	62<	0			1.	AS-6	6.5	4.4		
AS-25	6.5	0			0.9	A States				
AS-26	7.0	0				1				
	5.5	2-1		STUCK?						

Notes:

Abbreviations:

ppm = Parts per Million % = Percent

deg F - degrees Fahrenheit

" H₂O = Inches of Water SCFM-G = Standard Cubic Feet per Minute - Gauge PSI = Pounds per Square Inch

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PORT OF SEATTLE - TERMINAL 30

curl		TLE - TERIVITIVAL 30	
		stem Data Collection Form	
Date: 4/12/22	Field Tech(s):		
Watch Time: 1545	Screen Time:	1527	
SVE/AS System		Concern Diaman Concern	
SVE Blower Speed (Hertz) - VFD	54	Sparge Blower Speed (Hertz) - <i>VFD</i>	52 100
SVE Blower Runtime		AC DI	
(Hours)	10726.6	AS Blower Runtime (Hours) - Sparge Blower	Side Poul
Transfer Pump Runtime		Sparge Heat Exchanger Runtime	GIAGO
(Hours) - MS Pump	2 0 HMI	(Hours)	2125.84
Sparge Zone 1 Operating Cycle	-	Sparge Zone 4 Operating Cycle Open Interval(s)	- HMI
Open Interval(s) Sparge Zone 2 Operating Cycle	2	Sparge Zone 5 Operating Cycle	FIIVII
Open Interval(s)	HMI	Open Interval(s)	- HMI
Sparge Zone 3 Operating Cycle	_		The second
Open Interval(s)	HMI		
Sparge Heat Exchanger Discharge Temperature	Ø 3	SVE-Blower Filter Differential Pressure	0.25
(°F) - <i>TI-500</i> AS Blower Pressure		(" H20) - <i>DPI-200</i> SVE Blower Inlet Differential Pressure	10.01
AS Blower Pressure (PSI) - <i>PI-501</i>	67	(" H20) - FI-200	
AS Blower Flow)	Transfer Pump Discharge Pressure	6
(" H2O) - <i>DPI-500</i>		(PSI) - <i>PI-300</i>	0
SVE Blower Inlet Temperature	52	SVE Blower Discharge Pressure	07
(°F) - <i>TI-200</i> SVE Blower Inlet Vacuum		(PSI) - <i>PI-400</i>	0 :
(" H ₂ 0) - <i>VI-200</i>	82	SVE Blower Discharge Temperature	94
Oxidizer System	<u> </u>	(°F) - <i>TI-400</i>	
	<u> </u>		1
Inlet Temperature (°F)	692 HMI	Process Blower Runtime (Hours)	17562HMI
Burner Chamber Temperature (°F)	708 HM	Combustion Fan Runtime (Hours)	1756 3HMI
Outlet Temperature (°F)	615 HMI	Burner Runtime (Hours)	175524MI
Inlet Limit Controller Temperature (°F)	0 42 HM	Processing Vapors Runtime (Hours)	17538imi
Outlet Limit Controller Temperature (°F)	609 HM	Panel Temperature (°F)	64 HMI
Process Fan Valve Position (Open/Closed)	Open HM	Flame Signal (Volts)	5 . HMI
Dilution Valve Position (%)	Онм	Burner Chamber Inlet Differential Pressure (" H2O)	broken
Combustion Valve Position (%)	15.4 HM		1. And the
Other Components	T		
Moisture Separator Level	NM		60
(% Full) Water Storage Tank Level		Propane Tank A Level (%)	
(DTF, TD from MP; inches)	empty	Propane Tank B Level (%)	57
NOTES:	ds 6 pai	, gauge at bottom reads 7 pc	
Abbreviations:			
1. " $H_2O =$ Inches of Water	5. DTF - Depth t	o Fluid	
2. °F = Degrees Fahrenheit	6. TD - Total De	pth 🖉	
3. PSI = Pounds per Square Inch	7. MP - Measuri	ng Point AEC	
4. % = Percent			

PORT OF SEATTLE - TERMINAL 30 AS & SVE Manifold Readings Date: 4/12/22 Time: Field Tech(s): ME Equipment I.D. #: SVE Discharge VOC (ppm) PID SVE Discharge LEL (%) Oxygen (%) optimization 5 SVE System Inlet Vacuum (" H₂O) SVE System Inlet ΔP (" H₂O) Oxidizer Discharge VOC (ppm) PID **SVE Wells** Vacuum Vaci NOTE: Location ("H2O) **TAKEAWAY:** ("H on AS-18, -19, and -21 registered flow on With compressor pressure at 8 PSI HSVE-2 5/13 (9.5, 10, and 8 PSI pressures) during zone 2, broken/high HSVE-3 after rotameter cleanings on 4/15 . No backpressure wells are: flow at AS-21 at 8 PSI, but float not SVE-4 AS-3, -11, -18, -19, and -21 stuck. SVE-5 SVE-7 HSVE-1 AS Wells rether here /aeaum Flow Valve Pos. Vacuum Flow Valve Pos. Zoclocation ocation ("H2O) Comments (SCFM-G) (% Open) ("H2O) (SCFM-G) (% Open) Comments AS-7 4.3 2 9 100 AS-17 2.2 4 100 6 7.5 9 C AS-8 0.5 5 2 AS-18 X 7 U 9.25 0 S AS-9 7 5 1.0 ſ 2 AS-19 10.0 Strck.91-AS-10 5,2-0 79 2 AS-20 3.899.5 0 2.7 8 AS-11 7 ろく 0 broken 2 AS-21 8.5 100 AS-12 3.7 26 9.25 78 8.0 AS-22 1.1 2 5.2 AS-13 6 100 8.0 C AS-1 5.1 16 CO 3.7 7,75 7.5129 4.2 AS-14 6 7.0 AS-2 6.75 6.51-8.4 27 85 3 AS-15 3.8 8.0 AS-3 751 6 Suk 7/-1.7 つの 7:5 7.4 AS-16 Stick 3/426 AS-4 ł 6.0 9.5 16 616 9 2 AS-23 9.25 100 3.46 81 L 7 AS-5 75 KAMM17.572.9 5.1 ١ 7.5 AS-24 95 25 Ł AS-6 72 75/16 725 7.0 Ll 513.9 4 AS-25 9.0 0 78 15 9.5 AS-26 1.4 5251 7.5 4.9 AS-27 7.25 L G 4 Notes: Black = Enitial readings w/ bleed value at some sot point it was at with all 5 zones open at Gpzi on the compressor Red = breakthrough pressures, but mused in the compressor gauge. Should probably redo using the manifold gauges, these are ballfork. Blue = breakthrees it flows withdeed set so compressor is @ 8 ps. during zone 2, which had the highest back pressure Abbreviations: ppm = Parts per Million " H₂O = Inches of Water % = Percent SCFM-G = Standard Cubic Feet per Minute - Gauge AECOM deg F - degrees Fahrenheit PSI = Pounds per Square Inch

EPORT

INSTRUMENT CALIBRATION REPORT



3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Instrument ID 48808 **Description** MiniRAE 3000 Calibrated 4/11/2022 12:52:52PM Manufacturer Rae Systems State Certified Status Pass Model Number PGM 7320 Serial Number/ Lot 592-600846 Temp °C 16 Number Location Seattle Humidity % 42 Department **Calibration Specifications** Group # 1 Range Acc % 0.0000 Group Name VOC Reading Acc % 3.0000 Stated Accy Pct of Reading Plus/Minus 0.0 Nom In Val / In Val In Type Out Val Out Type Fnd As Pass/Fail Lft As Dev% 100.0 / 100.0 PPM 100.0 PPM 100.1 100.0 0.00% Pass Test Instruments Used During the Calibration (As Of Cal Entry Date) Serial Number / Next Cal Date / **Test Standard ID Description** Manufacturer **Model Number** Last Cal Date/ Expiration Date Lot Number **Opened Date** SEA ISO 100 Isobutylene (C4H8) 100 Airgas x02ai99cp342066 KBJ-X02AI99 10/14/2023 PPM PPM CP342066-1 KBJX02AI99CP

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Stethan Holmes

Pine Environmental Services, Inc.

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

AECOM

Americas

Daily Tailgate	Meeting	S3AM-209-FM5
attendance of all AECOM emp	ng prior to sending crews to individual tasks ployees and subcontractors. Invite personne coordination purposes. Review scope of wo	Phone Number:
	pplicable topics. This meeting is a daily re pecific discussions associated with Task H	
	meeting at the task location immediately be	
Date: 4/14/22	Project Name/Location: 7.30	Project Number:
Teday's Saana of Works	is: Rw-11A Sampline	g (Day 1 garing '22 sampling)
Muster Point Location:	First Aid Kit Location:	Fire Extinguisher Location: Spill Kit Location:
1. Required Topics		2. Discuss if Applicable to Today's Work
-/	rements, all sign in / sign out	Check 🕼 as reviewed or mark 🔳 as not applicable
-	I. task specific) completed and current	t Biological/ Chemical / Electrical Hazards
\equiv	nderstood, reviewed, signed by all	Ergonomics - Lifting, Body Position
(incl. scope, preplanni	ing hazard assessments / risk	Lock Out/ Tag Out
_/*	ocedures, requirements, etc.)	Short Service Employees - visual identifier and mentor/
	ments (THAs) are to be reviewed and ask immediately prior to conducting	oversight assignment
	Responsibility- all task	Simultaneous/ Neighbouring Operations
	nditions re-assess with THA	Slip/ Trip/ Fall Hazards
Requirement to report damage, near miss, u	t to supervisor any injury, illness, unsafe act / condition	Specialized PPE Needs Traffic Control
first aid kit, fire extingu	e Plan – including muster point, uisher, clinic/hospital location	Weather Hazards / Heat Stress / Cold Stress
hazard assessments i	Equipment (PPE) - Required items per in good condition / in use by all	procedures, reporting, etc.)
and in good condition	 / inspected (documented as required) - operators properly trained/certified I demarcation/ barricades in place to 	Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place,
protect workers, site s	staff, and the public	understood (identify/attach):
	ecords available, understood (describe	e): Other Topics (describe/attach):
Lessons Learned / SH	H&E improvements (describe):	
		Client specific requirements (describe):
3. Daily Check Out by S	àite Supervisor	
	nisses, observations or Stop Work	Describe Lessons Learned/ Improvement Areas from today:
interventions from today:	in and the second of the secon	Land on where constructions and a second s
The site is being l	eft in a safe condition and work cre	w checked out as fit unless otherwise specified as above.
Site Supervisor Name	non Signature	- Date 4/11/t/2.2 Time (at end of day / shift)
Daily Tailgate Meeting (Revision 9 January 15,	S3AM-209-FM5) 2019	cable to this meeting are on reverse and, if applicable, attached.



All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

• Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
 * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning: * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.

* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
Gues Friedman AECOM	Gufi	In & Fit 1645 GF	Out & Fit
Gues Friedman AELOM	his bais	In & Fit 1645 NG	Out & Fit
<i>j i</i>		In & Fit	Out & Fit
· · · · ·		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
E.		In & Fit	Out & Fit
	,	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Name	Company Name	Arrival Time	Departure Time	Signature
	2			
-				9 H

Daily Tailgate Meeting (S3AM-209-FM5) Revision 9 January 15, 2019 PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

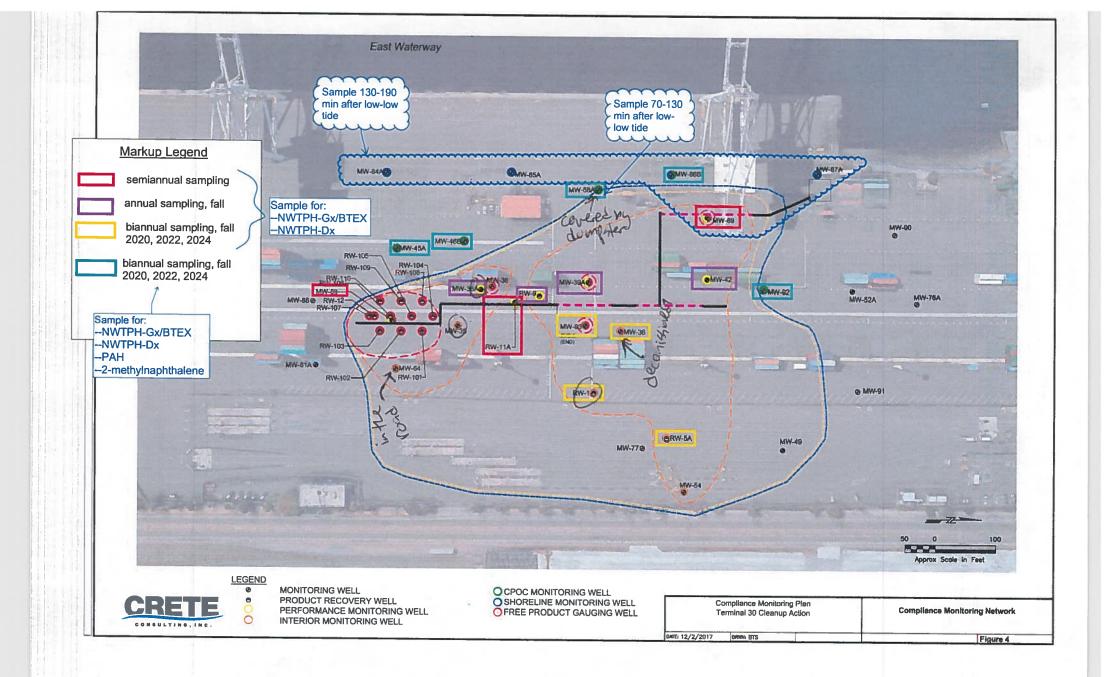
Proj	ect Information	Page of
Proje	ect Name:	P-30 Location: Sentific
Proj	ect/Task No.:	Weather: 45 cloudy
Date	•	4/14/22 Personnel: C1F, NG
Obs	ervations	
	Time	Observation Description
1	Q1645	Onlite J- Thursday no port activity
2		Scope: LNAPL gauging, PW-11A sampling. Will return to
3		Gitt tomorrow for MW-59 sampling.
4		Tailgate: ergonomics. Traffic hozards minima)
5		· Gystem fut OFF. SVE W neter 10785.6
6		AS hr neter 5176.0
7		Last zore or: Zore 4. Pressues 6.5-7.5
8		· Amy successfully uncovered PW-101, Flows 15-4.3
9		
		· NG will sample, GF will gauge.
10		·NG starting on IVA
11		· GF & Labeling monuments
12		-main LNAPL Group is D319-D326
13		- MW-36 both zon Cz04-C310, both the labels of outside
14		Container area.
15		- MW-341A + - 93 are outside of antainer stalls, shouldn't
16		be caread.
17		- MW-SU is at A257 outside container stell
18		* hors MU-36 been decomissioned? Com't find it but there
19		is a patch where it could have been. It is on the
20		2-year Sunding Schedule (would be sumpled this Fall)
21		. We need to Gample MW-sa tomoshow tit is not
22		ant on apron as initially thought. Need to
23		contact Amy to guoid work@ 4257 tomorrow
24		Q 100 12:45
25	1510	Non collected Gamples @ MEN-11/A
Comn	ients / Site Activ	vities / Personnel Tracking

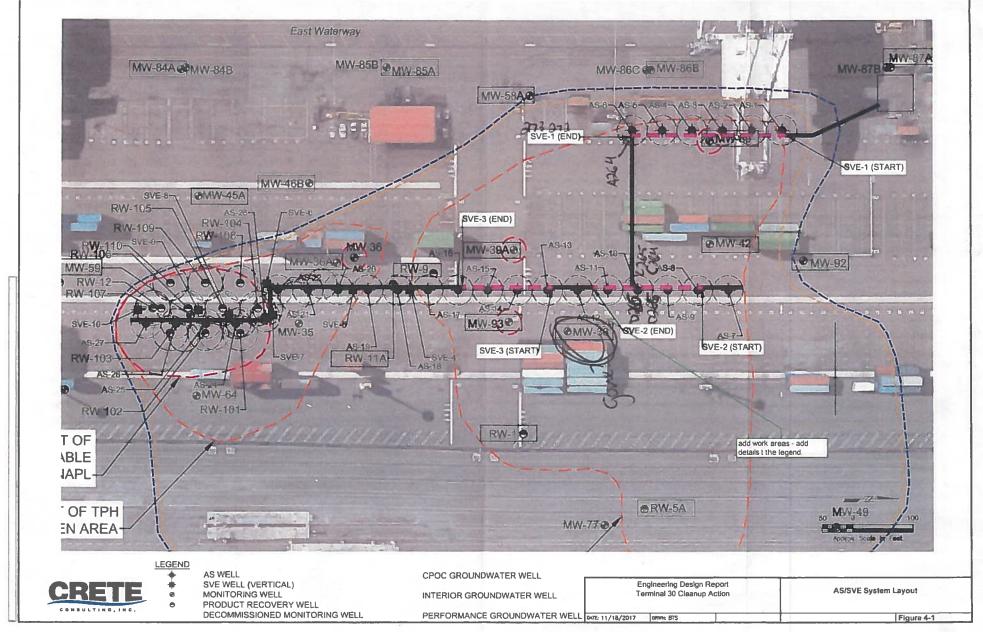
Project Name: 7-20 Location: Project Name: 7-20 Location: Project Task No.: Weather: Date: 44/14/22 Personnel: Observation Description 1 2000 * Finlighted cynucging the LNAPL well's 2 Ket Several an the 1.st where crossed of f dwing last 3 Robert two orbits where crossed of f dwing last 4 Longer predding gauging the - 25, 7241, and - 1. And 5 Row-103. 6 XH Several wills on the list are not not realized as free 7 Product gauging or product we care wills on the 8 Righter what are they included? Mth-35, -764, d RW-1. 9 Same list as above minus RW 100. 10 KH We re-read the comp of X Selemis willer. F gauging 11 Notwell of the formed to see to subte clear the 13 20 cs Returned to system to see to attempt cleaning. 14 removed for cloaning confirmed both of types can. 15 Plan to come back tomorrow to attempt cleaning. 16 X Femail Marina to ensure system does not get 17 restanded. 18 20 40 GF, NG2 of Egite 19 20 21	Project Informatio	Page 2 of 2
Date: 4/14/22 Personnet: Observations Time Observation Description 1 2000 - Finisfield gavging the LNAPL well's 2 KK Several on the 1.st where crossed of f dwing last 3 Rever a longer predding gavging. Mu - 75, -744, and - 1. And 4 Longer predding gavging. Mu - 75, -744, and - 1. And 5 Rev-103. 6 KK Several wells on the list of not indicated as free 7 product gavring or product records wells on the 8 figure while on they included? Mt - 35, -764, d RW-1. 9 Some list as above minus RW 100. 10 KK we re-cool the could a selenis willer. F gavging 11 Wether recover events is required to build cleak 12 Mi.s. 13 2000 Returned to system to see & steward bath Styles can. 14 removed for cleaning confirmed bath Styles can. 15 Plan to come back tomorrow to attempt cleaning. 16 K Email Marina to evenue system does not get 17 restored. 18 2040 GF, NG of Exite 19	Project Name:	772
Observations Time Observation Description 1 2000 "Finished any life LNAPL well's 2 4 Event & be adont side why. Covered by container ? 1/3 4 Longer reading gauging? MW-35, -264, and -1 And 5 6 XKK-Everal wills on the list at not cattle as free 7 product gauging or product recares wells on the 8 figure why call they include? My-35, -264, d RU-1, 9 Some (ist as above minus RW 100) 10 KK We re-read the comp of X Seems unclear. F gauging 11 between recover events is required buttle clear. 12 th.s 13 2005 Returned to system to see & ptaweters can be 14 removed for Upaning Confirmed both Styles can. 15 Plan to come back tomorrow to attempt clearing. 16 K Email Marina to even is stem clear stempt clearing. 18 20th GF, NG officile 19 20 21 22	Project/Task No.:	Weather:
Time Observation Description 1 2000 "Finisfed gauging the LNAFT well's 2 KK Several on the 1.st where crossed of f during last 3 Event to be order to where crossed of f during last 4 Longo yreading gauging TMW-35, -26A, and -1. And 5 Ew-102. 6 XK Several wells on the list are but no catter as free 7 product young or they include? My-35, -26A, d rw-1. 9 The figure when and they include? My-35, -26A, d rw-1. 9 Same list as above minus rew 102. 10 XK we re-read the comp of X seems willer. F gauging 11 Whether recover events is required to catter of they include the clear they are the seems will be and they are they include the they are the seems will be an the figure. They are they are they are they are the seems will be an the the figure. They are the they are they are they are the they are the they are they are the they are they	Date:	(4/1×(22 Personnel:
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2 2 2 2 2 2 2 2 2 2 2 2 2 2	Time	Observation Description
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19 20 21 22	17	restarted.
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22	20	
	21	
23 GF	22	
	23	GF
24	24	
25	25	
Comments / Site Activities / Personnel Tracking	omments / Site Acti	vities / Personnel Tracking

					First Rem	IOAGI			Post R	Remo
Location	Time of Gaging	Initial Depth to LNAPL	Initial Depth to Water	LNAPL	LNAPL	Extraction Start/End Times	Estimated Total Fluid Removal	Time of Gaging	Depth to LNAPL	De
		(Feet TOC)	(Feet TOC)	Thickness	Extraction Duration	(Approx.)	(Gallons)	~	(Feet TOC)	
				(Feet)	(Minutes)					
/W-35	1951	NA	8.64	0	~					T
/W-36	1931	NA	9,17	0						レ
/W-36A	1928	MA	973	0	-				7	1
/W-39A	1037	NA	9.40	0					/	T
/W-59	1857	NA	4,42	0	iv order in	monuma	KWIas	leen.	/	T
1W-89 ³	10ter	NA	9.92	Ø	8×.		<u> </u>			t
4W-93	1940	NA	9.60	0				7		t
W-1	1947	8,42	45,45	0.03	dense l	nyor		K T		t
W-12	1449	9.04	910	0.06		9	/			T
W-101	1835	NA	1.53	0		1.1	/			t
RW-102	1537	NA	5.21	0		14	/			t
W-103	15641	7.96	\$56	0.40			/	1 1		t
W-104	1827	NA	756	0		1				t
W-105	1459	NA	8.45	Ö		/	·		/	t
W-106	1455	804	9.18	1.12		/		1		\checkmark
W-107	Y5 46	5.36	9.16	0.40						t
W-108	1905	NA	8.47	0						F
W-109	1912	NA	5.72	Õ	/			a star	1000	t
W-110	1922	NA	5.70	Ò	/					t
-									2	t
-	v	ACUUM TRUCK M	EASURED AND AP	PROXIMATED TOT	ALS ⁹ :					F
COMBINED	APPROXIMATED T	OTALS IN VACUUM	M TRUCK (INCLUDI	NG HOLDING TAN	K) ¹⁰ :			1.12		F
ter.	COMBINED AP	PROXIMATED TO	TALS A MEASURED	BY DH on 11/12/	2021		8			⊢
otes:										
Feet TOC = Fee	t below top of well	casing.						K		
LNAPL = Light /	Non-Aqueous Phase	e Liquid				re-ga	veget on	4/K dr	ring low.	tic
. Groundwater r	neasurements take	n at throughout th	e evening			DTP	: 9.74	ft bloc	U	
NL = LNAPL not	detected using int	erface probe.				011		ft bloc		
For drum vacu	umed wells, total re	emovals calculated	from drum volume	es from each well	post-recovery at ea	ich well.	: 9,25	ft 610 -		
NA - Not Availa	ble (not able to de	tect or measure)				LA	MOI The	dance:	001 Ft	-
TRACE, MINOR	, VERY TRACE - Indi	cations of LNAPL p	resent, but no accu	urate measuremer	nt or below measu	rable amount.				
	epth tagged at 13.9									
DH Vacuum Tri	ick removal volume	es only (stick meas	ured in vac truck ta	ank).						
			s) in the holding ta		l.					
		ental with vacuum		-eb 17 a						

Guying April 14 Port of Seattle Terminal 30 LNAPL Removal Event (February 17, 2022)

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Americas

Daily Tailgate Meeti	ng				S3AM-209-FM
Instructions: Conduct meeting prior to attendance of all AECOM employees an	nd subcontractors. Invite personnel	from	AECOM Superv Phone Number:		me: Aur Kiling
simultaneous operations for coordination briefly discuss required and applicable to not a full orientation. Task-specific dis	opics. This meeting is a daily refu cussions associated with Task Haz	resher, ard	AECOM SH&E F Phone Number:		me: Anàrch forynter
Assessment (THA) follow this meeting a individual task is started.	it the task location immediately before	ore	Meeting Leader	: Gu	s Friedman
Date: 4/15/22 Project	Name/Location: T30	1.9	see of the state	Project	Number:
Today's Scope of Work:					
"Clean System Pote	mpters				
Sample norsa f	er day 2 of Spri	ng 4	impline		
Muster Point Location: F	irst Aid Kit Location:	Fire E	xtinguisher Loca	tion:	Spill Kit Location:
Front gate	(ovex	Sur	stem anclo	sure	- A
1. Required Topics			cuss if Applicab		
Fitness for Duty requirements,	all sign in / sign out				d or mark as not applicable
Required training (incl. task sp					lectrical Hazards
SH&E Plan onsite - understood		ITT	Ergonomics - Li		
(incl. scope, preplanning hazar	d assessments / risk	리미	Lock Out/ Tag C	-	
registers, controls, procedures,	requirements, etc.)				es - visual identifier and mentor/
Task Hazard Assessments (TH completed for each task immed			oversight assigr	nment	
STOP WORK Right & Response		HAF			uring Operations
changes/changed conditions re	e-assess with THA		Slip/ Trip/ Fall H		
Requirement to report to super damage, near miss, unsafe act		RE	Specialized PPE	= Needs	
Emergency Response Plan – in first aid kit, fire extinguisher, cli			Waste Manager Wéather Hazard		econtamination t Stress / Cold Stress
Personal Protective Equipment hazard assessments in good co	ondition / in use by all		Subcontractor R procedures, rep		nents (e.g., JHAs. THAs, etc.)
Equipment/machinery inspecte			Work Permits / F	Plans re	quired (e.g., Fall Protection ork, Critical Lifts_etc.): in place.
Work area set up and demarca			understood (ider		
Required checklists/records av	ailable, understood (describe):		Other Topics (de	escribe/	attach):
Lessons Learned / SH&E impro	ovements (describe)		/		
	,		Client specific re	auirem	ents (describe):
				- qui o i i	
3. Daily Check Out by Site Supe	rvisor				Michigan and 2 1078
Describe incidents, near misses, ob interventions from today:		Descrit	e Lessons Learne	ed/ Impr	ovement Areas from today:
The site is being left in a sa	afe condition and work crew	checked	l out as fit unles:	s other	vise specified as above.
Site Supervisor Name	Signature			Date 4	4/195/22
Guis Ropdenan	Guffi			Time (a	it end of day / shift)
Worker Acknowledgement / Sigr Daily Tailgate Meeting (S3AM-209-F Revision 9 January 15 2019 PRINTED COPIES ARE UNCO					



È.

All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand: * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).

* The hazards & control measures associated with each task you are about to perform.

* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).

* That no tasks or work is to be performed without a hazard assessment.

* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

* You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.

* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Out Time
		In & Fit	Out & Fit
Nate Guys Accon Guis Frildman AECOM	home 3 Am	NZI agis	
		In & Fit	Out & Fit
Guis Friedman AELOM	Gug	GF 0425	
	0	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
			1

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Name	Company Name	Arrival Time	Departure Time	Signature
Name	Company Name	Arrival Illie	Departure fillio	

Project Information	Page of 3
Project Name:	T-30 Location: Secrette
Project/Task No .:	Weather: 45, overcast
Date:	4/15/22 Personnel: <u>GF</u> , NG
Observations	
Time	Observation Description
1 0925	"Eifonsite NG already onsite prepping materials
2	Supe: Clean Otameters
3	Sumple MW-89 (Spring Gampling Day 2)
4	1911gate Wattic huzards - part activity is live
5	· Called Amy Spunberg to confirm part want need to
6	work around MW-sid miss after noon and she confirmed
7	> Also OK'd re-gauging MW-59 during lunch hour / low
8	tide. PK + RK pert curious if LNAPE might present now
9	even though it didn't at high tide last night.
10	· SVE-10 has a crack in the bottompiece that threads
11	into the rotameter column (king model 0-60 SCFM)
12 125	·GF + NG to gauge MW-59 again (low tide 1105)
13	3 product at 9.24 Ft bloc to product
14	water at 9.25 fd bloc
15	0.01 ft of product
16 11 45	· Frack to cleaning rotaneters
17	· Not all SVE prequire gauges are reading zero
18	SVE-4: 13 H20 7 all polaced w/ Spares
19	SVE-5: 7" HDO From Corex
20	SVE-7: 15 " M20 [
21	SVE -10 27 " H20 /7 total. Can't ugust, need replacing.
22	SVE-9: 10 " HOO (Winters brand 0-100 " HOO
23	SVE-6: 7" HOO bottom mount.
24	SVE-6: 5" H20 Still herds replacing order
25	· All AS gauges are zeroed out. more gauges.

Project Information				Page a of 3
Project Name:	T-30	Location:	5	
Project/Task No.:		Weather:		
Date:	4/15/22	Personnel:	GE NG	

Observations

	ervations	
1	Time	Observation Description
1	1215	· PVC night at paire of GVE- & rotameter Snapped during removal
2		of upper value - fir was too fight
3	·	- Same thing broken an EVE-5 though unilear if break was
4		pre-existing.
5	1315	- Called Marina to see if ve can use the spore plessure gauges in the canex t order replacement nipples. No
6	ļ	gauges in the ranex & order replacement nipples. No
7		argues left message
8	1415	
9		installed the G pares we had on site. SVE-6 still
10		needs a replacement
11	- XX	. On SVE-5 and -9, the lover rotaneter rod sheath and
12		orrive bumber were missive allowing the float to drop all the
13		way to bottom. PK recommends calling King to see if
14		replacement parts are available.
15		> If we have to replace SVE-10 due to the crack in the base
16		Re could steal the speath / Stapper fromit
17	1530	· Place order for 4 her gh 80 i' close nipples with Ferguson
18		Port be ready for pickup contil Monday.
19		· SVE-7 removed for deaning and its nighte brake as well
20		If the value is in there too tight all the strain of remains
21		it tails on the nipple at the base
22		· Call PK the gives the go-alend to restart 5 stem at EOD with those 3 GVE hells closed off. Will return Monday
23		with those 3 GVE hells closed off. Will return Mandey
24		which To trouble shoot the tit
25	(000)	· Diameter of rotaneter rod - "18"

Proje	ct Information	Page $\overline{\zeta}$ of $\overline{\zeta}$
Projec	t Name:	T-30 Location:
Projec	t/Task No.:	Weather:
Date:		4/15/22 Personnel: GFNG
Obser	vations	
	lime	Observation Description
		· Length of top pumper sleath: 3/4" bottom bumper sleath: 1/4"
2		bottom bumper sleath: "b"
3	1610	"Did not clean SVE -1 -2 or -3 as they were not fulled
4		· Valves reinstalled on SVE-5, -7, and -8 in the OFF
5		position.
6		. NG finisled cleaning AS votoneters Several had defarmed
7		0-rings that need replacing order a pack of spares?
8		-7 AS-12 AS-13 AS-27 at least.
9		· ~12 gal of ringewater emphild into polytenk
10	1620	Marms on HMI wait clear for restart. PAH on SVE blower
11		also VAL.
12		· Call PK. CB, no one is sure. will leave system off until
13		return to site Monday to finish repairs.
14	1035	·Clean p, lock op
15	1045	GENG OFFICE
16		
17		
18		
19		
20		
21		
22		
23		
24	-)GF
25		

SAMPLE CHAIN OF CUSTODY

				- UTATILITY		001			•								
Report To Paul Kalin	9		SAMPL	ERS (signo	uture)	2	T.	-	2	0	-			7_			of
Company AECOM Address 1111 3rd Ave, Suite 1600			- T-	SAMPLERS (signature) PROJECT NAME T-30			PO#				0	TURNAROUND TIME Standard turnaround RUSH Rush charges authorized by:					
City, State, ZIP Scattle, WA 98101			REMAR	RKS					11	VVO	ICE	то		_			PLE DISPOSAL
		and the second of the	Project	Project specific RLs? - Yes / No							0	 Archive samples Other Default: Dispose after 30 days 					
				1					- A	NA	LYS	ES R	EQU	ESTE	ED		
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 6021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					Notes
RW-11A-0422		4/14/22	1810	Gw	Ц	$\boldsymbol{\times}$	\times	×									with & without # Silles gel Clanup on DX
RW-11A-0422-MS		4/14/22	1810	Gw	4	×	×	×									
RW-11A-0422-ms0		4/14/22	1810	GW	Ч	×	\times	\times					4	-			
MW-100-0422		4/15/22	1230	Gw,	Ц	×	$\boldsymbol{\star}$	×									
MW-89-0422		4/15/22	1330	Gw	4	×	×	×									
	A	- 0472	Â ⁱ c	1									T				
	· Les		May-	11-24	3.7				a la	14	an		4				
					1171						_			_		_	

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Friedman & Bruya, Inc. Ph. (206) 285-8282	Relinquished by: Gran	Gus Friedman	AECOM	4/15/22	1710
	Received by:	Yelena Araukine	FIFB	1/15/22	1710
1	Relinquished by: Received by:				
	Received by:				

AECOM

Americas

Daily Tailgate N	leeting				S3AM-209-FM5		
Instructions: Conduct meeting attendance of all AECOM emp simultaneous operations for co briefly discuss required and ap	personnel from be of work and	Phone Numb	per:	ne: Paul Kaling ne: Andrew Paynto			
not a full orientation. Task-sp	Task Hazard	zard Phone Number:					
individual task is started.	neeting at the task location immed		Meeting Lead	der: Guc	5 Fritann		
Date: 4/18122	Project Name/Location: 7	-30 Ser	attle	Project	Number:		
Today's Scope of Work:	cole det	1. Securitors		1.1	without the second		
Repair 3 SVI	E Rotaneters n to confirm vo	tambto u	rention	post-	cleaning		
restert systim	h to continue to	1	ALC: NO.	0	0		
repare origer	maggarge						
Muster Point Location:	Fifst Aid Kit Location:		Extinguisher Lo	ocation:	Spill Kit Location:		
Front gate	Conex		stem				
1. Required Topics			scuss if Appli				
	ements, all sign in / sign out				or mark as not applicable		
=/	task specific) completed and		Ergonomics		ectrical Hazards		
	derstood, reviewed, signed by ng hazard assessments / risk		Lock Out/ Ta		ay Position		
registers, controls, pro	cedures, requirements, etc.)				s - visual identifier and mentor/		
	ents (THAs) are to be reviewe sk immediately prior to conduct		oversight as	signment			
STOP WORK Right &				÷	ring Operations		
changes/changed con	ditions re-assess with THA		Slip/ Trip/ Fa				
Requirement to report damage, near miss, un	to supervisor any injury, illness nsafe act / condition	s,	 Specialized PPE Needs Traffic Control Waste Management/ Decontamination Weather Hazards / Heat Stress / Cold Stress Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) Work Permits / Plans required (e.g., Fall Protection, 				
	Plan – including muster point, isher, clinic/hospital location						
	quipment (PPE) - Required iter a good condition / in use by all	ms per					
Equipment/machinery and in good condition	inspected (documented as req - operators properly trained/ce	rtified					
Work area set up and protect workers, site st	demarcation/ barricades in pla aff, and the public	ce to	understood (ork, Critical Lifts, etc.); in place, ch):		
Required checklists/re	cords available, understood (d	escribe):	Other Topics	s (describe/a	ittach): Pinch points		
Lessons Learned / SH	&E improvements (describe):		/				
			Client specifi	ic requireme	ents (describe):		
3. Daily Check Out by Si	te Supervisor		Break Caller	The startes			
Describe incidents, near m	isses, observations or Stop Wo	ork Descr	ibe Lessons Le	arned/ Impro	ovement Areas from today:		
interventions from today:		127 5 2075			LUT DA		
The site is being le	ft in a safe condition and wo	ork crew checke	d out as fit un	less otherw	vise specified as above.		
Site Supervisor Name	Signature	6 1		Date L	H18/22		
GUG Enthe	an Gue	2	-		t end of day / shift)		
Daily Tailgate Meeting (S Revision 9 January 15, 2	3AM-209-FM5)				e and, if applicable, attached. RANET. 1 of 2		



All employees:

- STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
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• Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

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- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
Gus Friedman AElam	Eng	In & Fit	Out & Fit
	0	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
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		In & Fit	Out & Fit
- she -		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Name	Company Name	Arrival Time	Departure Time	Signature
		6		
			2	

Daily Tailgate Meeting (S3AM-209-FM5) Revision 9 January 15, 2019 PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

Project Information Project Information					
Project Name:	7-20	Location:	Seattle		
Project/Task No.:		Weather:	55 sain		
Date:	4/10/22	Personnel:	GIF		

Observations

	Time	Observation Description
1	1250	. Ongite after picking up partice Ferguson
2		· GLODE: Complete repairs of 3 rotaneters w/ proken night
3		Restert system & cleck for rotaneter fonctionality
4		peplace broken non sauge C Oxidizer
5		Perrev gare parts of Marina
6		Tailgate: part paffic horards. Ship is corrently @ part.
7		pinth points working of System piping
8		· Marina on site or arrival. She will order :
9		a × sue voe gouges (0-100" HDO Lottom mount)
10	1	6 × As gauges (0-30 PSIX center back mount)
11		1 x O-2 "Had have genge
12		1× 0-15" Noo meg gonze
13		7? 0-62 ScEn King rot.) SVE
14	·	7.7. 0-83 Sign Wig rot.
15		1.7. 0-13 SLEM Duper rot) AS
16		77. SVE hohing. Seems like there is home in conex
17		leftorer prat is the right size.
18		the Do we want to consider a concept to prevent
19		Sun damage?
20		1 x new Sarah bruch for sight glass!
21	1415	· Broken night pieces Surressfully removed from rotangton
22		Mages perinstall kegun.
23	1445	·GUE-4, -5 and -8 Successfully reinstalled. Loosphile
24		the pipe clamp on the base allowed the durer section to
25		lean out for more lepanan fitting the values back in
omn	nents / Site Activ	vities / Personnel Tracking

Project Informatio	on			Page 2 of 3
Project Name:	7-30	Location:		
Project/Task No.:		Weather:		
Date:	4/18/22	Personnel:	GF	
Observations				

Time	Observation Description
1	A SVE-4 and - & have defermed unishing lower
2	pumpers on the inver rotanetar rod. So the Float
3	goes all sie any too the park. Need replacement
4	ports or provoleshooting
5	* EVE-10 has the angle in the rateineter pase
5	# AG-16:5 study of even after cleaning.
152	
3	une moisture init
15	45 oxidizer stort up
0 160	
1	·SVES might be Stuck. Maybe just reeds new human
2	· SVE-8 + +9 are at 0, and do not appear studk. ~52 in H20
3	at each well.
4 16 K	
5	stmare,
6	· Zare 4 gitive. AG-16 seems to park if you knock it. Might
7	just get stuck up at times
8 162	5. Zone 5 active. (0-3.7 schin).
,	- AS-7 + -11 take most of the flow, closing them off doesn's
)	Significantly increase flow to the other Wei's (maybe oil set
·	- AS-10 has too high a back pressure to get flow at our
<u>!</u>	current setpoint (8 phi @ the compressor in Zne 2).
16	58. Zone 1 active. (0-4.7 4cfm)
-	-AS-5+-le receive most flar, but same as zone 5-reducing them doesn't do much for other vells
5	them doesn't do much for other wells

3/22/2021

Projec	t Information			Page <u>3</u> of <u>3</u>
Project Name: Project/Task No.:		7-30	Location:	
			Weather:	50 rainy
Date:		4/18/22	Personnel:	CTIE J
Observ	vations			
Т	ime		Observation Descrip	ption
1		of getting air.		
2		#AG-3 reeds	new O-ring on	top, or current are adjusted
3	648	·Zone 2 active.	(0-2.6 sch)	
4				move. Unclear if stuck
5				Aresture. S.S and 7.5 psi
6			old respectively.	
7	1702	·Zore 3 active (0-		
8)	psi not receiving flow

flow but the float was Sticky. Taken

er re-install.

n he

Might

hight weed

lin

#45-24

offlire

le new

wing

·Zone

Offsile

rende

replacing

was getting

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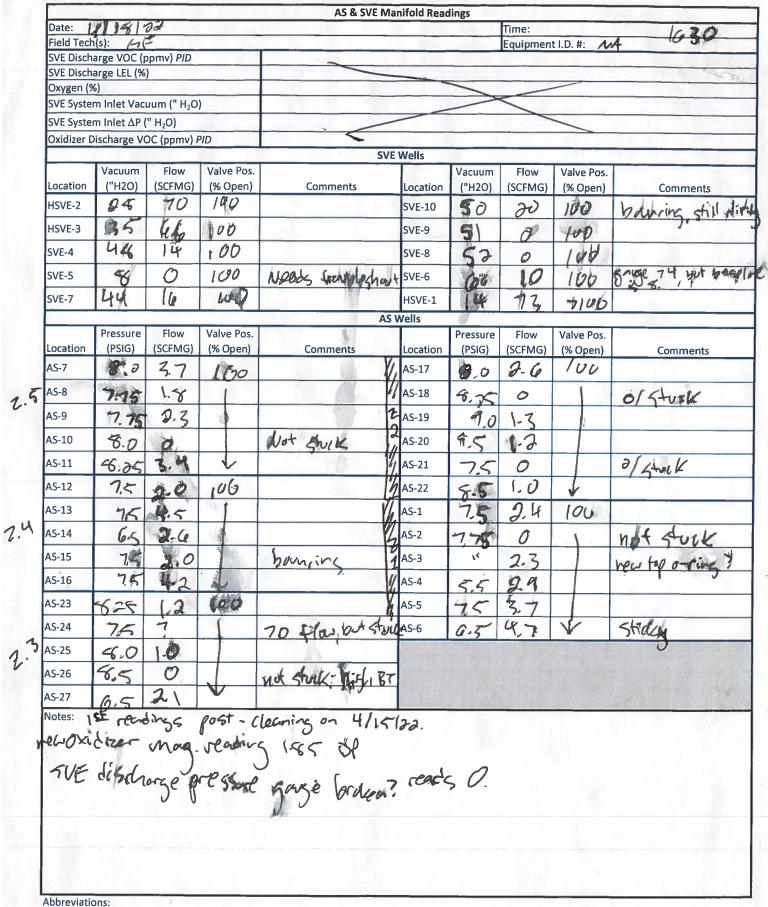
23

24 25 1720

1730

1745

PORT OF SEATTLE - TERMINAL 30



ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



8	FER	GU	SON					**DUPL:		74. ak	Ω.	2			ACCEPT B/C SHOWROOM SOURCE = I	::: [5]	
l.	4100 WES	ST MARG	LE #300 INAL WA' 106-1209	YSW											IB FRT = M OB SHP = M IP GPR 202	1	8. 0. 100.
ORDER	Nd: 206	-757	ed date FSH	<mark>арунк</mark> ан алтан алтан Алтан алтан алта	3090		() N L I N E **		LES		D E	R		TAG PO, NO.	SE	
13406		CUSTOMER AL	PHA ^C CONTRA	<u>.c1N8.7 300</u>	BID NO.	ORDER DATE 04/15/22	ORDERED BY Guo Frizo (Ima)	un Friedma	INSTRU	JCTIONS					VENDOR	10041 0	a 61 6
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UPPL:	an a sa sa sa an na sa sa sa An na sa sa sa	THERET	PRE EXEL	INT UNDER THE EXECUT	WE OPDER	La Vertanise de la sila	the feet the second	t thatta i se		hans i b i bar	and the last have	ando akon		tar tarent taren	
SUBJE	CT TO HANDL	OWED WITHOU ING CHARGES.	JT PROPER A	UTHORIZATION. RETURNED MATERIALS	JOBIOIAL	INBOUND FREIGHT	OUTBOUND Shipping	TAX		LESS DEPOSIT		TOTAL I	DUE		
					_ DATE:			TERMS:							

Pro	ject Information	n Page of
Proj	ect Name:	T-30 Location: Sea HAR
Proj	ect/Task No.:	Weather: 55 Surry
Date	:	4126122 Personnel: GIF, LP, AC
Obs	ervations	
	Time	Observation Description
1	1530	onsite, Versel in part, vehicles active.
2		Scope: Bireekch of M. train up Antonio
3		Safety Tailgate on app
4		Sustein tout
5	1000	Began taking soften readings
6		. HAT does not track indir. States zore runtimes
7		just total.
8		. We shald reprogram the HMI SO the zones on the
9		Sween motch the zores in the field. Wrenth:
10		Screen Field Wells
11		Zorel Zorel AS-1-le
12		5 2 7-11
13		4 3 12-16
14		2892 4 17-22
15		3 7 5 23-27
16		Ething they have is tabeled wante
17	1630	· Troublednoot Oxidizer mayetelic gauge installed las
18		Visit but read O or arrival today
19		» remared MP tibe & water paved out of the part. A
20		Pew draps cane at of the LP part
21		> (58 recommends leaving libes disconnected to
22		prevent moisture from damaging the gauge we
23	XX	reld to install Qit-style values on the pirot
24		the if we do so to prevent contaminated air
25		from blowing out. Left them connected for now
Comr	nents / Site Acti	ivities / Personnel Tracking

Proje	ect Information	Page 2 of 3
Proje	ct Name:	T-30 Location:
Proje	ct/Task No.:	Weather:
Date:	100	U/28/22 Personnel:
Obse	rvations	
	Time	Observation Description
1	laston	> After draining the water out at re-zeroing the gauge
2		it read ~40 in Mgo but fluctuated 30-50, last time
3	1645	. LP + AC the began taking PID readings which 1.85
4		GF inspecting SVE discharge pressure gauge, which
5		has been reading zero. 0-100 in \$20 pressure gauge.
6		The only other space pressure gauge on site the was a 0-30
7		psi gauce . SNapped it in, but it read zero too. Flow
8		out of the part when open was pretty low Maybe are
9		reld a Smaller scale 0-10 m H20?
10		-> Swapped the 0-100 in Hol gauge onto an active
11		sparge well and it registered the pressure too the
12		gauge isn't broken. There is just very low pressure
13		in the SVE discharge pipe.
14	1710	(hanged two zones 40 that vext visit screen zone
15		2 (Field 4) is active of pressure can be adjusted. It
16		will be active 3:00 - 7:30 pm now - Edeally he can
17		actch the end of the prior rane (zone 3) and beginning
18		d mid of The 2 rext time.
19	1735	· Compression pressure read 7 psi. Left it at 8 psi
20		last visit.
21		' Bleed value adjusted to 9 psi
22		= AS-18 not stuck, reading 0 at 9.25 psi
23		> AS-21 breakth ~ 7.75 pri. Took a while for pressure
24		to build up enough to flow. 1.2 scfmg @ \$ psi.
25		→ AS-19: 1.85cfm € 1005i
		ities / Personnel Tracking
h N	1 11-	

A Mognaldic aphimization: CSB recommends adding 1/4" values to the pitot true ports.

Proj	ect Information	Page $\underline{\zeta}$ of $\underline{\zeta}$
Proj	ect Name:	T-20 Location:
Proj	ect/Task No.:	Weather:
Date	:	4/26/22 Personnel:
Obs	ervations	
-	Time	Observation Description
1		-> So after ~ 30-45 min and an increased pressure of
2		9 psi at the compression, 3 of the 5 Zore 2
3		wells were still reading before our 2 sifm
4		Observation Description -> 50 after ~ 20-45 min ¹ and an increased pressure of 9 ps: at the compressor, 3 of the 5 Zore 2 wells were still readine below our 2 sufm minimum spurge flow threshold. · Clean up, lock up · All staff offsite
5	1745	· Clean p, lock cp
6	1750	· All staff offsite
7	<u></u>	
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		GF
23		
24		
25		
Comr	nents / Site Activ	vities / Personnel Tracking

Date: 4/28/22 Watch Time: 15:59 SVE/AS System Motor Control SVE Blower Speed (Hertz) - VFD SVE Blower Runtime (Hours)	Field Tech(s) Screen Time	: LP/GF/AC	
SVE/AS System Motor (ontro) SVE Blower Speed (Hertz) - VFD SVE Blower Runtime	Screen Time		<u></u>
SVE Blower Speed (Hertz) - <i>VFD</i> SVE Blower Runtime		: 15:41	
(Hertz) - <i>VFD</i> SVE Blower Runtime		12 Andrew Contract of the Annual States	and the second
SVE Blower Runtime	54.0	Sparge Blower Speed	.52.0
	HIJH, HM	(Hertz) - VFD	HOHAH
(Hours)		AS Blower Runtime	-1-6
	11026 AM	(Hours) - Sparge Blower	5412,9HN
Transfer Pump Runtime	0,	Sparge Heat Exchanger Runtime	FULAD
(Hours) - MS Pump	2.6 HM	(Hours)	5412.0
Sparge Zone 1 Operating Cycle	10 -	Sparge Zone 4 Operating Cycle	7.
Open Interval(s)	12am Sam	Open Interval(s) (3 Field)	3pm - Hit
Sparge Zone 2 Operating Cycle Screen	F. 12.	Sparge Zone 5 Operating Cycle	7.72 .12.
Open Interval(s) (4 Field)	Sam IVam	Open Interval(s) (2 field)	7:30-120
Sparge Zone 3 Operating Cycle Screen Open Interval(s)	10 311		A LANGER STREET
Open Interval(s) (5 field) Sparge Heat Exchanger Discharge Temperature	10am - 3M	SVE Blower Filter Differential Pressure	
	74	(" H20) - DPI-200	0.5
(°F) - <i>TI-500</i> AS Blower Pressure	11	SVE Blower Inlet Differential Pressure	10.5
AS Blower Pressure (PSI) - PI-501	1 tain	(" H20) - FI-200	1.0
AS Blower Flow	100.0	Transfer Pump Discharge Pressure	1.0
(" H2O) - <i>DPI-500</i>	10	(PSI) - PI-300	D
SVE Blower Inlet Temperature	1.0	SVE Blower Discharge Pressure	
(°F) - <i>TI-200</i>	60	(PSI) - PI-400 Broken gauge	10
SVE Blower Inlet Vacuum		SVE Blower Discharge Temperature	
(" H ₂ 0) - <i>VI-200</i>	1 74	(°F) - <i>TI-400</i>	106
Oxidizer System		<u>N.7. 0.100</u>	1100
	1.01	Process Blower Runtime (Hours)	
Inlet Temperature (°F)	681 HMI	n rocess blower runtime (nours)	17849
Burner Chamber Temperature (°F)	670 HMI	Combustion Fan Runtime (Hours)	17849
Outlet Temperature (°F)	622 HMI	Burner Runtime (Hours)	17839
nlet Limit Controller Temperature (°F)	674 HMI	Processing Vapors Runtime (Hours)	17825m
Outlet Limit Controller Temperature (°F)	617 HMI	Panel Temperature (°F)	780
Process Fan Valve Position (Open/Closed)	Open HMI	Flame Signal (Volts)	5.0
Dilution Value Position (%)		Burner Chamber Inlet Differential Pressure ("H2O) Magnehelic	0.4
Dilution valve Position (%)		3	
	10.1 HMI		
Combustion Valve Position (%) Combustion Valve Position (%) Other Components	10.1 нмі		
Combustion Valve Position (%)	10.1 HMI		
Combustion Valve Position (%) Other Components Moisture Separator Level (% Full)		Propane Tank A Level (%)	60
Combustion Valve Position (%) Other Components Moisture Separator Level	27 Curt		60

AS & SVE Manifold Readings Date: 4/28/22 Time: 15, 40 Field Tech(s): LP/GF/AC Equipment I.D. #: 17227 SVE Discharge VOC (ppmv) PID 38.5 SVE Discharge LEL (%) Oxygen (%) SVE System Inlet Vacuum (" H₂O) SVE System Inlet △P (" H₂O) Oxidizer Discharge VOC (ppmv) PID 0 7 **SVE Wells** Flow Vacuum Valve Pos. Vacuum Flow Valve Pos. Location ("H2O) (SCFMG) (% Open) Comments Location ("H2O) (SCFMG) (% Open) Comments HSVE-2 74 bouncing Fesicive 50 26 SVE-10 water HSVE-3 26.5 SVE-9 70 51 bourging water SVE-4 51 SVE-8 bouncingter SVE-6 8 SVE-5 10 1 DOWLING in)afer SVE-7 HSVE-1 L 2 **AS Wells** Pressure Flow Valve Pos. Pressure Flow Valve Pos. Location (PSIG) (SCFMG) (% Open) Comments Location (PSIG) (SCFMG) (% Open) Comments AS-7 AS-17 ZOMP Insel Zone. PLAS 5 AS-8 AS-18 **45-9** 7) AS-19 R AS-10 AS-20 AS-11 AS-21 AS-12 2.2 5 AS-22 100 4.5 AS-13 AS-1 Zone closed 5 AS-14 2.6 AS-2 AS-15 75 0.8 AS-3 AS-16 7.5 2'7 AS-4 Zone, closed AS-23 AS-5 AS-24 AS-6 ZONP AS-25 AS-26 AS-27 Notes: 17:10 Gus changed Zone times so different zone will be on during nect 3:-7:30pm Zone2 5am-10 am Zone4 Abbreviations: " H₂O = Inches of water ppmv = Parts per million volume % = Percent SCFMG = Standard cubic feet per minute gauge

PORT OF SEATTLE - TERMINAL 30

deg F - degrees Fahrenheit

PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Main gate
Meeting date	4/28/2022
Business Line	Environment
SH&E Manager	Andrew paynter
SH&E Manager Phone #	8053611103
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Meeting Summary

Attendees	Panteleeff, Lucy;Corley, Antonio;
Location	SoDo
Tasks to be performed	Biweekly O&M
Hazards to be considered today	pressure, thermal
Will there be Lone Workers?	No
Hierarchy of controls	рре
Personal Protective Equipment	Task Specific: Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	
Topic of the week	Situational Awareness Can Save Your Life

Other topics discussed	
Hazards	• <u>Pressure</u> • <u>Thermal</u>

AECOM	FIELD	ACTIVITY LOG					
project 7	-20	COMPLETED BY LP /AC					
JOB NO. 60	667994	APPROVED BY					
DAY & DATE	Friday 5/13/22 SHE	j k					
FIELD ACTIVI DESCRIPTION	ITY SUBJECT: OF DAILY ACTIVITIES AND EVENTS:						
TIME							
14 2:50							
142:54	2:54 Took gauge rearling at AS23-AS27 before						
153:07	HMI RECLINCS						
15:70	SNKA Spange wells s	seem to shut down.					
15:24	Called Gus to clisci	SS sparge wells shutting					
	down, Did some	trouble shooting but could not					
	resolve. Did video	Cull w/ Can & Gos. Found					
	VED had fault. Regs	Parchelfault online = the Borch					
	motor temphich. Con	Id not Find temp. Hit					
	reset an lupper left	button). Hit start button them					
	HMI Showed avear au	id vunning. Sparge Blower					
	never showed 'auto	" though Sparge back on 16:08					
16:05	Did veading on al	1 SVERIOWR'GAUGES					
1635	Did DID REALINGS	sat INF SEFFS					
1645	i herli pressures a	nd flows on zone that					
	opened at 2 with	SUSTEM restart.					
1700	leave site and a	Ivop equipment at office					
VISITORS ON SI	ITE:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:					
WEATURD CON	DITIONS.	IMPORTANT TELEPHONE CALLS:					
WEATHER CON		AMI OKIANI TELEI MONE CALLE.					
Sonn	Y 530						
PERSONNEL ON	ISITE:						

/

	and the second	rstem Data Collection Form			
Date: 5/13/22 Field Tech(s): LPSAC					
Watch Time: 3:41 15:11	Screen Time:	14:53			
SVE/AS System					
SVE Blower Speed	r.l.o	Sparge Blower Speed	52.0		
(Hertz) - VFD	54 <u>.</u>) нмі	(Hertz) - VFD	5-BO-IMI		
SVE Blower Runtime	112225	AS Blower Runtime			
(Hours)	11.35/.5HMI	(Hours) - Sparge Blower	5730, AMI		
Transfer Pump Runtime	21	Sparge Heat Exchanger Runtime			
(Hours) - MS Pump		(Hours)	5729.4нмі		
Sparge Zone 1 Operating Cycle Open Interval(s)	-OFF HMI	Sparge Zone 4 Operating Cycle Open Interval(s) 1-18/07 E018 4 1603	STARAL P		
Sparge Zone 2 Operating Cycle	-12	Sparge Zone 5 Operating Cycle	Running		
Open Interval(s)	OFT HMI	Open Interval(s) Field ZOME 5	when our		
Sparge Zone 3 Operating Cycle					
Open Interval(s)	- нмі				
Sparge Heat Exchanger Discharge Temperature	\$070*	SVE Blower Filter Differential Pressure	05		
(°F) - <i>TI-500</i>	2016	("H20) - DPI-200	0.5		
AS Blower Pressure (PSI) - <i>PI-501</i>	9*	SVE Blower Inlet Differential Pressure	IE		
AS Blower Flow	1 2	("H20) - FI-200	1.7		
(" H2O) - <i>DPI-500</i>	*	Transfer Pump Discharge Pressure (PSI) - <i>PI-300</i>	0		
SVE Blower Inlet Temperature	1 1	SVE Blower Discharge Pressure			
°F) - <i>TI-200</i>	60 *	(PSI) - <i>PI-400</i>	\$17		
SVE Blower Inlet Vacuum	70 .	SVE Blower Discharge Temperature	\$0		
" H ₂ 0) - <i>VI-200</i>	18 *	(°F) - <i>TI-400</i>	108		
Oxidizer System					
nlet Temperature (°F)	100	Process Blower Runtime (Hours)			
	680 HMI		18167нмі		
Burner Chamber Temperature (°F)	6266	Combustion Fan Runtime (Hours)	18168HMI		
Dutlet Temperature (°F)	626 HMI	Burner Runtime (Hours)	18157нмі		
nlet Limit Controller Temperature (°F)	671 нмі	Processing Vapors Runtime (Hours)	18/4Знмі		
Outlet Limit Controller Temperature (°F)	619 нмі	Panel Temperature (°F)	84 нмі		
Process Fan Valve Position (Open/Closed)	Орей ны	Flame Signal (Volts)	5.0 нмі		
Dilution Valve Position (%)	5.5	Burner Chamber Inlet Differential Pressure (" H2O)	0.35		
Combustion Valve Position (%)	10.6 нмі	(neo)	0.00		
Other Components					
Moisture Separator Level	Cant 1	11			
(% Full)	reac di	Prøpane Tank A Level (%)	55		
Water Storage Tank Level	Visual		110		
(DTF, TD from MP; inches)	LOOKS AM	Fropane Tank B Level (%)	48		
P1 Z=0 P1 1 = 0					
Abbreviations:					
" $H_2O = Inches of Water$	5. DTF - Depth to	o Fluid			
2. °F = Degrees Fahrenheit	6. TD - Total Dep				
	7. MP - Measurin				

				AS & SVE	Manifold Read	lings			
Date: 🖻	1-1-11	22					Time: 10	0:35	
Field Tech(s): 1 P 7 AC							Equipmen	t I.D. #:	45235
	arge VOC (_I			34.7					
	arge LEL (%	5)							
Oxygen (%		uum (" H ₂ O	<u>،</u>						
	m Inlet ∆P	_)	A					
		(H ₂ O) ОС (ppmv) <i>I</i>	חוכ	074					
Oxidizer	ischarge v	OC (ppinv) r	-10	0,4	SVE Wells				
	Vacuum	Flow	Valve Pos.	l		Vacuum	Flow	Valve Pos.	
Location	("H2O)	(SCFMG)	(% Open)	Comments	Location	("H2O)	(SCFMG)	(% Open)	Comments
HSVE-2	30	72			SVE-10	58	15		Vac bounding flow
HSVE-3	36	71			SVE-9	100	\square		(Flow broken?
SVE-4	58	10		bouncy vac	SVE-8	66	Ď		flow broken?
SVE-5	8	U			SVE-6	78-50	10		Flow bounding
SVE-7	50	9		bouncy vac	HSVE-1	14	76		1
	-				AS Wells				
Location	Pressure (PSIG)	Flow	Valve Pos.	C		Pressure	Flow	Valve Pos.	
AS-7	(P310)	(SCFMG)	(% Open)	Comments	Location AS-17	(PSIG)	(SCFMG)	(% Open)	Comments
		Alne	0/		AS-17	8	6.0		16:49
AS-8		C103	YU.		AS-18	9.5	1.2		
AS-9					AS-19	10	1.4		
AS-10					AS-20	9	3.0		
AS-11					AS-21	8	0		turned offen to set
AS-12					AS-22	9	2.2		Flow jump
AS-13		ALEC	ne		AS-1				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
AS-14		(10)) JC		AS-2				ſ
AS-15					AS-3		ſ	Inst	2/
AS-16				Del.	AS-4			10-3	
AS-23	40	3.2	100	14:56 pm	AS-5				
AS-24	8.5	38	1	p - u	AS-6				
AS-25	8.5	32			dan ye				
AS-26	9.5	1.8			1 de contras				
AS-27	60	3.2	,						
Notes						14.4 C 12.5 C			

Notes:

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



Project Information	n Page (of
Project Name:	T-30 Location: Colentill
Project/Task No.:	Weather: 10 honny
Date:	Weather: <u>10 Gung</u> <u>6/21/22</u> Personnel: <u>GrFAC</u>
Observations	
Time	Observation Description
1 1755	GIF+ AC ansite
2	System ON
3	Supe: Gineekky and M
4	Gatety tailgate
5	Green Zare 2 (field zae 4) is active
6	· Sprige VED has an odd screen instification, Togelos
7	br 52.0 Hz and "A20 10"
8 1900	· Gir updated zones so that they each overlap by
9	half on now. Kopeful, it prevents the VED faults
10	ne ve vitregged a fait times deving changeover
11	Ine : 0000-0580 (5.5 hrs) (45 hrs dedicated)
12	2000 2 : 1500 - 2000 (5.0 hrs) (40hrsdedicated
13	Zore 3: 1000 - 1530 (5.5 his) (45 his dedicated
Ne	Zone 4: 0500-1020 (5.5 his) 145 hig dedicated)
15	2010 5: 1930 - 0030 (5 hrs) (40 hrs dedicated)
16	2010 is the motor temp high glasm case. Not sure what
17	Ne "A" in front signifies.
18	· Spare canlock caps for the stingers in RW-103 + - 107
19	are in the covere potentially! Here to say if they are the
20	Same Gize. They are a different brand from what AC
21	prev. photographed in a different well.
22 1920	· Clean up, lack up, ofter; te.
23	
24	TAE GIALOZ

Project Name:	T36	Location:	Seattle.
Project/Task No.:		Weather:	Suppi 70°
Date:	6/21/22	Personnel:	Seattle Sunny 70° AC, GF
Observations			
Time		Observation Descripti	ion
1 1750	Arrived et T30		
2	Scope - Syster	n Oand M	
3 1800	Began System C	Dand M/GF upd	ated Zones to have a + VFd Faults
4	30 min overlap	to hopefull prevent	ved Faults
5 19-1920	Left site	<u>- , , , , , , , , , , , , , , , , , , ,</u>	
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			AC
18			6/21/22
19			
20			
21			
22			
23		/	
24			
25			
omments / Site Act	tivities / Personnel Tracking		

	SVE/AS & Oxidizer	System Data Collection Form	
Date: 6/2/22	Field Tech(s): 14C,	GF	
Actual Time: 1755	AS/SVE HMI Time:	124	
SVE/AS System	Noyove minine.		
SVE Blower Speed	F/1 -	Sparge Blower Speed	
(Hertz) - VFD	54.0 HM	(Hertz) - VFD	52 нит
SVE Blower Runtime	ilead il	AS Blower Runtime	
(Hours)	11824.4 HM	II (Hours) - Sparge Blower	6047.3 HMI
Transfer Pump Runtime (Hours) - <i>MS Pump</i>	2,6 HM	Sparge Heat Exchanger Runtime	6046,4 HMI
Sparge Zone 1 Time	1200-0500	(Hours) Sparge Zone 4 Time	
Span(s) Operational:		Span(s) Operational:	0500-1000
Sparge Zone 2 Time	1500-1930	Sparge Zone 5 Time	1930-1200 N
Span(s) Operational:	HM	Span(s) Operational:	0000 HMI
Sparge Zone 3 Time Span(s) Operational:	1000-1500	Sparge Zone Active:	Zone Z
Sparge Heat Exchanger Discharge	CooR	SVE Blower Filter Differential Pressure	
Temperature (°F) - TI-500	92°F	(" H20) - <i>DPI-200</i>	0,5
AS Blower Pressure	8:	SVE Blower Inlet Differential Pressure	12
(PSI) - <i>PI-501</i> AS Blower Differential Pressure	8 psi	(" H20) - FI-200	1,3
" H2O) - <i>DPI-500</i>	0.8	Transfer Pump Discharge Pressure (PSI) - PI-300	6
SVE Blower Inlet Temperature		SVE Blower Discharge Pressure	
°F) - <i>TI-200</i>	72°6	(" H ₂ O) - PI-400	
SVE Blower Inlet Vacuum		SVE Blower Discharge Temperature	
" H ₂ 0) - <i>VI-200</i>	74	(°F) - TI-400	115°F
Dxidizer System			1101
nlet Temperature (°F)	696 HM	Process Blower Runtime (Hours)	18655 W HMI
Burner Chamber Temperature (°F)	672°f HM	Combustion Fan Runtime (Hours)	idici
Dutlet Temperature (°F)	632 HM	Burner Runtime (Hours)	istur
nlet Limit Controller Temperature			10075 HM
°F)	698 HM	Processing Vapors Runtime (Hours)	18630 HMB
Outlet Limit Controller Temperature	1.00		
°F)	628 HM	Panel Temperature (°F)	103°F HMI
Process Fan Valve Position	000	Flame Signal (Volts)	
Open/Closed)	Open HMI		SOV HMI
Dilution Valve Position (%)	000 HMI	Oxidizer Inlet Differential Pressure (" H2O) - FI-1	. 40 not reading
ombustion Valve Position (%)			Correctiv
ther Components	10.3 0 HMI		
Noisture Separator Level	-11		
% Full)	040	Propane Tank A Level (%)	356/6
Vater Storage Tank Level			2011
DTF, TD from MP; inches)	Zinches TD	Propane Tank B Level (%)	LOÝO
GF-pdated zones	nt EOD so th	hat they Cach overlap	by 30 mins.
bbreviations:			
." $H_2O = Inches of Water$	5. DTF - Depth to Fluid		
°F = Degrees Fahrenheit	6. TD - Total Depth		
. PSI = Pounds per Square Inch	7. MP - Measuring Point	A 4	ECOM
% = Percent	in the second second		

				AS & SVE Ma	nifold Read	lings			
Date:	6/21/1				Land Salar		Time:		1750
Field Tech		AC, GF		- <u>11 </u>	1.41		Equipment	:1.D. #: 📍	J.D R11309
	arge VOC (p arge LEL (%			24.3					
Oxygen (%		1							
		uum (" H ₂ O))	-55-					
	m Inlet ΔP (
Oxidizer D	ischarge V	OC (ppmv) A	PID	1,6					
	Vacuum	Flow	Valve Pos.	SVE	Wells	14	Cl	Valve Pos.	
Location	("H2O)	(SCFMG)	(% Open)	Comments	Location	Vacuum ("H2O)	Flow (SCFMG)	(% Open)	Comments
HSVE-2	30	70	10000		SVE-10	52	14	100 \$	Flow maker bouncing
HSVE-3	34	70	100.90		SVE-9	50	2	100%	
SVE-4	62	12	100%		SVE-8	62	4	10006	
SVE-5	10	015		Braken Rotarocter Floot gus stuck	SVE-6	70	12	10000	Both Flaw and vacum
SVE-7	46	10	100%	riar goo stor	HSVE-1	14	74	3090	Particly opened
	•	-	40	AS	Wells	•		3040	reading opened
	Pressure	Flow	Valve Pos.			Pressure	Flow	Valve Pos.	
Location AS-7	(PSIG)	(SCFMG)	(% Open)	Comments	Location AS-17	(PSIG)	(SCFMG)	(% Open)	Comments
AS-8				1	AS-17	6.0	7.2	10000	
AS-9		$\vdash \leftarrow$	lose	<u>d</u>	AS-18 AS-19	8.0	1,5	10076	
AS-5 AS-10					AS-19 AS-20	9,0	1.8	0000	
AS-10					AS-20 AS-21	8,0	3,2	10000	Stuck?
AS-11 AS-12						6.0	0	100%0	-
					AS-22	7,5	2,45	10090	FIOGH DOWNCING)
AS-13			osec	0	AS-1				
AS-14			0.50	4	AS-2				
AS-15					AS-3		CI	osed	
AS-16'			•		AS-4		•		*
AS-23					AS-5				
AS-24			locat		AS-6				(A)
AS-25		C	10260					1. 1.	
AS-26									
AS-27					1979				
Notes:	Zone	e 2 a	ictile.	All of her zones	off	untri zi	one cha	nge	

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water

SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Main gate
Meeting date	6/21/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SoDo
Attendees (Workers)	Friedman, Gus;Corley, Antonio;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M
Hazards to be considered today	pressure, noise
Will there be Lone Workers?	No
Hierarchy of controls	рре
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Plywood Floor Openings - Stay Aware
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	
Hazards	• <u>Noise</u> • <u>Pressure</u>

A=COM DATE 6/29/22 DAY w, BRIGHT OVERCAST PROJECT MANAGER Poul Kirn. WEATHER CLEAR RAIN SNOW SUN 50-70 TEMP To 32 32-50 70-85 T-30 85 up PROJECT Report No WIND SER Moder High 60681370 JOB NO : Moder AECOM FIELD REP: NG wy 1 S. Brand HUMIDITY Drv Humid SUB-CONTRACTORS ON SITE: NA EQUIPMENT ON SITE: Pid, Sunny constas, Hand pols WORK PERFORMED: 1020 Arrive on Sile Sign in get Silven Brelif han and Satur tailgate erectly 1035 take Pid Records of 13th inlet and discharm Dischar 0.5 Inlet 0.0 1040 give gus a call about low pid Readings and walk tom alorns on contro parme Thy Both parts again Bath Read 0.0 this time (The Alum, hus SV off But, Sve Still on) 1110 Work orand alampand AIK with gus & cary Somple inlet and Discon again inlet 18.4 Pischan 0.7 Stens good man to Suma Sampe Collecting 1123 Start Collecting Inter Velve Supple initial Vacuum or 28.5 128 finis collection inlat Value suggest find vector of 5.0 133 Shut collem dish volue Sama in vac of 30.0 1138 Fiaish collecte d'sche Volu Some final voc of 5.0 1140 fill out Col and labe Cankars 1200 Pick up and low Sike for day Sign out of 弘 THA Abra 6/25/22 XX; XX wis Thiped The sive was on when we arrived But As was down due to alor This was any distanced NZg 6/25/22 when initial Readings were twin Discharge 0.0 Clearing alum AS Sherked Beck up Afler Zone 5 Active Simped Pid again Both into Ke & discusse were O.O. Chicked other garigos to make since soon similar le pier tires and then Check Pid Rentros ago.n Festeral AS. utur abut TITLE & Goding is 1 BY NZ9 SHEET___ OF

Vapor Sampling Field Form

Site Address: 1901 East Marginal Way South, Seattle, WA

Project No.: 60681370 Project: 7-30

Date: 6/24/22 Field Personnel: N. Gwyn, S. Brand

Surface Conditions: Overcost Breezy Dry 60's

				Sa	mple Sta	nrt	S			
Sample ID	Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ¹	Time	Date	Final Canister Reading (in-Hg) ¹	Time	Date	PID Field Reading
Inlet - 062922	4183	305	1 L: HM	28.5)123	6/29	5.0	1128	6/29	18.4
Discharge -062922	9562	62	1 1. ver	30.0	1133	6/29	5.0	1138	6/29	0.7

¹ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Initial	Piul Field Readings were low inter - 0.0 Discharge - 0.5	
sve on	But As off due to The Alera 6/25/22	
	K on after alarm cland and resample pid realings after ≈ 30 min Discharge - 0,7	
These the	realizes soon to Be none inline with previous enes so proceed to Sample collections	
Sample	Collecting west well with no issues	

SAMPLE CHAIN OF CUSTODY

								1	ev.			500		_			3
				S.	AMPL	E CHAI	N OF	CUS1	rody	ζ	7		m.,				
Report To	Kalina	7			SAMP	LERS (sign	nature)	N. 6	um		1	<u></u>		٦.		Page	e#of
Company Acco	N				PROJI	ECT NAMI	E & AL			<u> </u>	PC)#		-	Z Sta	andaı	RNAROUND TIME
Address 111 3rd	Am	Ŝu:K	1600	_		T- 3~	Pors	ef	Sat						∃ RU Rush		rges authorized by:
City, State, ZIPSeaty 4	, h	1A 98	101	_	NOTE						VOI	CEI	07	- -		SAN	MPLE DISPOSAL
Phone 206 438 2700 En	mail	Paul. Kalin	- @ Acca	1.007							ka				≥ Dei E Arc	fault: chive	Clean after 3 days (Fee may apply)
AMPLE INFORMATION											AN		SIS B		UES		
			TPI	Le	orting vel:						r015 Full Scan			APH			
Sample Name	Lab ID	Canister ID	Flow Cont. ID	SG=S	loor Air oil Gas e One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. (''Hg)	Field Final Time	T015	T015	TOIE	¥	He		
111-062922		4183	305	IA /	6G	6/29/22			5.0	1128		Х		X			Notes
Schenge - 062922		9562	62	IA /	63	6/29/22	30.0	1133	5.0	1138		X		X			
	*			IA /	SG												
				IA /	SG												
				IA /	SG	_											
				IA /	SG		-										
				IA /	SG												
				IA /	SG								-+				

Friedman & B <u>ru</u> ya, Inc.	SIGNATURE	DDINGNANCE			_
3012 16th Avenue West		PRINT NAME	COMPANY	DATE	TIME
	Received by: When y lin Received by: Modelin	Nak Guy Acom	Acam	6/29/22	1225
Ph. (206) 285-8282	Relinquished by:	Windy Madden	FHBI	6/29/22	12:25
Fax (206) 283-5044	Received by:				
FORMS\COC\COCTO-15.DOC					

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Tractore	nent ID	29725						
		MIniRae 3000						
Cal	ibrated	6/28/2022 5:10	0:39PM					
Manuf	acturer	Rae Systems			State Certified			
Model N	Number	MiniRAE 3000)		Status	Pass		
Serial Numb	per/ Lot	592-919182			Temp °C	21		
ľ	Number							
L	ocation	Seattle			Humidity %	39		
Depa	artment							
			Calibra	tion Specification	ns			
1	Group	# 1			Range Acc %	0000		
Gr	-	isobutylene			Reading Acc %			- 19
	-	ey Pct of Readi			Plus/Minus (10.5
			-					
<u>Nom In Val / In V</u>	al	In Type	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00		PPM	100.00	PPM	99.70	100.00	0.00%	Pass
Test Instruments	Used Du	iring the Calib	ration			<u>(As C</u>)f Cal Entr	y Date)
					Serial Numbe			xt Cal Date /
Test Standard ID	Descript	non	<u>Manufacturer</u>	Model Number	Lot Number			piration Date
SEA ISO 100	SFA IS	O 100 PPM	Gasco	SEA ISO 100 B	PDM	Upen	ed Date	/2023
PPM	TJBJ-24		Gasco	SEA 150 100 I	TJBJ-248-10	0	915	12023
TJBJ-248-100-1	1303-2-	10-100-1			1	0-		
1101-2-0-100-1	-				1			

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

AECOM

Daily Tailgate Me						S3AM-209-FN		
nstructions: Conduct meeting price attendance of all AECOM employee								
simultaneous operations for coordir priefly discuss required and applica	nation purposes. Review	scope of work and	A FOOTA O	H&E Rep. N		<u>Tiul 14</u>		
ot a full orientation. Task-specific	c discussions associated	with Task Hazard	Phone Nur		Nure C	ely		
ssessment (THA) follow this meet individual task is started.	ing at the task location in	mediately before	Meeting Le	eader:	Non Gu	the second se		
Date: 6/29/22 Pro	ject Name/Location:	Vapon S	Sampling	Projec	ct Number:	60681370		
Today's Scope of Work:	Ispor Sampli							
Muster Point Location: Veh:21e 1. Required Topics Fitness for Duty requireme Required training (incl. task SH&E Plan onsite - unders (incl. scope, preplanning har registers, controls, procedu Task Hazard Assessments completed for each task im STOP WORK Right & Respondent of the second to the second	k specific) completed a tood, reviewed, signe azard assessments / r ures, requirements, etc (THAs) are to be revi imediately prior to com ponsibility- all task ns re-assess with THA upervisor any injury, ill	2. ut and current d by all isk c.) iewed and ducting	Biological/ Ergonomic Lock Out/ Short Serv oversight a Simultaned Slip/ Trip/ Specialize	Dicable to 1 as reviewe Chemical / cs - Lifting, E Tag Out rice Employe assignment bus/ Neighb Fall Hazards d PPE Need	ed or mark Electrical Haz Body Position Bees - visual ide ouring Operat	as not applicable ards entifier and mentor/		
 damage, near miss, unsafe Emergency Response Plar first aid kit, fire extinguished Personal Protective Equipre hazard assessments in good Equipment/machinery insperand in good condition - ope Work area set up and dema protect workers, site staff, a Required checklists/records 	n – including muster p r, clinic/hospital location nent (PPE) - Required od condition / in use b ected (documented as erators properly trained arcation/ barricades in and the public	on [] I items per y all s required) d/certified [] u place to	Weather H Subcontrac procedures Work Perm Confined S understood	nagement/ E lazards / He ctor Require s, reporting, nits / Plans r	required (e.g., Vork. Critical I tach):	ld Stress		
Lessons Learned / SH&E in	mprovements (describ	e):	Client spec	cific requiren	nents (describ	e):		
B. Daily Check Out by Site Se	upervisor			<u></u>				
Describe incidents, near misses nterventions from today:	s, observations or Stop	o Work De	scribe Lessons L	.eamed/ Imp	provement Are	eas from today:		
The site is being left in	a safe condition and	I work crew che	cked out as fit u	inless othe	rwise specifi	ed as above.		
Site Supervisor Name	Signature			Date	6/291	22		

1

Americas



松

All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

* The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).

* The hazards & control measures associated with each task you are about to perform.

* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).

* That no tasks or work is to be performed without a hazard assessment.

* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning: * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
		In & Fit	Out & Fit
North Gan Accon	ktu 3 m	NRY 1025	1200 NG
		In & Fit	Out & Fit
Nithen Can Accon STEVE BOAND AELONG	1 hom	S.B. 10:25	12-0 SB
	0	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		1	

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

VISITOR / SITE R	EPRESENTATIVE			
Name	Company Name	Arrival Time	Departure Time	Signature

Project	t Information						Pa	ge_l_of3_
Project	Name:	7-30		Locatio	n:	Seattle		
Project	Task No.:			Weathe	r:	70,50	nny	
Date:		7/7/22		Personn	el:	GF, A	CV .	
Observ	ations			100				
Ti	ime			Observatio	on Description	n		
1	1700	GEACO	nsite					
2		Safetz tail	sak. F	hectrica	1 ha	rands to	aining C	save
3		averere	4				0	
4		Sige: Bi	reevely	otm	20e	rewiring	Angle 5	is
5		ds	newsiling	s for 6	AC	1500060	repla	ement
6		De	ct orde	es eser	ruh	1		
7		Gustern C	.1	errival				
8	710	AE LaKing	nease					· · · · ·
9		· AS calore	t gava	2.0	linuie	1-filled.		
10		· As mag 7	auge 10) does		ave a PT.	Oue
11		U = V	nected ;u		anite	1 15 1	+ the o	
12	×*	tube in a	1)	fmos de-			ook?	
13		. Clicht Lanna		ctable e		Vor C Gaug	1	16
14)	ibration	but	- 0 0		mac
15		· 2 man c	INVER -	(2-15" F	1.0	= JUSS	C	P
16		33	g	(2-15"	H n	WU DT	conchiel	flow
17		·Vibration	mare h	Darback (ing inc	1-110-0	Convoiter	1100
8		· Tare 2 (rea		8		Breakt	1 5	a([
19		rotameter	Δ .		tive.	(Bleet va		L'Sure(
20		AS -17	Dhitial fla		Break	prough psI	Final Pla 2.2	n open
		-15	1.25	9		946		esty ou
21	·	-19	1.0	9.75		<u>7.0</u> .0	1-4	
22		-20					1.2	100 %
23			3.75	45.5	6.	and the second se	2.2	cracked
24		-21	61	6.5	Ч		1.0	100 4-
25		-22	2.7	8.5	6.5		2.2	(rolle

Comments / Site Activities / Personnel Tracking

Project Informa	Page 2 of 3
Project Name:	T-30 Location:
Project/Task No.	Weather:
Date:	7/7/22 Personnel: GFAC
Observations	
Time	Observation Description
1	- sand AG-17 -20 & -22 table flow most lasily.
2	Even al tem barely cracked open & set isst
3	above 2 sching, be can't get more than 1.5 sching
4	to the after 3 hells (sparge-level whole ~ 2 5 forge)
5	> All solenekrs seen in working order Though AS.17
6	is a bit hard to read due to UP.
7 1800	
8	rewering.
9	Adjust plan to move the wives convecting the PLC with
10	to the motor values. At the PLC unit Each wire labeled
11	white associated MV: MMV control wing Previous
12	MU-A PULLIE 017 60 A/B 017
13	MU-B 018 64A1B 0/H
14	MV-C OLA 63ALB elio
15	MUD 0/10 61 A/B 0/8
16	$mv \in O _1 (a2A 3 O _9$
17 187	
18	
19	Loves on the fll now match the zones in the
20	field. "Zore 2" had been on w/ MV-B and Zore 2 is now on w/ MV-E + the accurate wells AS-7-11_
21	· All other MUS tested & work as desired.
22	
23	. At taking down new set of manifold readings . GF newsulg out dimensions for the GAC
24	design Gebruh Rail
25 Comments / Site	Activities / Personnel Tracking
comments / Sile	Activities / reisonnei i racking

Project Name:	7-30	Location:				<u>3_of_3</u>
roject/Task No.:		Weather:				
Date:	7/7/22	Personnel:		GIF, AC		
bservations					1.1	
Time		Observation	Description			G/
1	Potaneter	Zmit flow a	freshe	Brith	Final Ka	is coa
2	A5-7	9.0	9.6	6.5	5	(100
3	-8	U.2	55	6.5	5	100
4	-9	4.4	8.0	6.0	5	50
5	-10	0	8.5	70	6	100
6	-1(8.6	9.0	6.5	4.6	(ach
7				1		
8	-reven w/ a	Aler wells comb	ed dor	n to 2 5	1 Fmc	4
9	nell press	re C 9 161	A5-10	won't tab	le a.C.	
0	· KO signitalass	looks to be 2	n			
1	· Clema of 10					
2 1915	Offite		1.4.4			1.1
3			/		1.1.5	
4						
5						
6						
7						
8					1	
9						
0						
1		IG	E			1
2		(5)	T			
3						
4						
5		-				
	ivities / Personnel Tracking					
			1	C		
			-	and the second sec		1.4

							MEASUREMENT AND LOCATION	MEASUREMENT	UNITS	NOTES
				DOUBLE SWING GATE		1	PROPANE TANK A	FUEL LEVEL	%	
		(13)		(12' GATE OPENING)		2	PROPANE TANK B	FUEL LEVEL	%	
	SWING GATE (4' CATE	OPENING)				3	BURNER CHAMBER INLET DIFFERENTIAL PRESSURE	PRESSURE	INCHES OF WATER	
				-27 Ft 1		4	OXIDIZER DISCHARGE VOC	VOC CONCENTRATIO	DN PPM	COLLECT PSCAA DISCHARGE COMPLIANCE SAMPLE HERE
				1		5	SVE DISCHARGE VDC	VOC CONCENTRATIO	N PPM	COLLECT PSCAA INLET COMPLIANCE SAMPLI HERE
				-xxx		5	SVE BLOWER DISCHARGE PRESSURE	PRESSURE	INCHES OF WATER	
		ELECTRICAL				5	SVE BLOWER DISCHARGE TEMPERATURE	TEMPERATURE	DEGREES F	
		* PANELBOARD	´ (II)	TAHK A		5	D'UDIZER IHLET TEMPERATURE	TEMPERATURE	DEGREES F	
1		TRANCE MARK	1000 GALLON PROPANE TANKS		= 19.5 fi	6	SVE BLOWER INLET DIFFERENTIAL PRESSURE	DIFFERENTIAL PRESSURE	INCHES OF WATER	
ž	ECOBLOCK PRE-CAST CONE					6	SVE BLOWER FILTER DIFFERENTIAL PRESSURE	DIFFERENTIAL	INCHES OF WATER	AT OF ABOVE 15 INCHES OF WATER - CHAN FILTER
2	BARRER PLACED ALONG ALL SIDES OF THE EQUIPMENT	9	CONDENSATION STORAGE TANK	TANK B	1	7	TRANSFER PUMP DISCHARGE PRESSURE	PRESSURE	PSI	
<u>p</u>	AREA AS SHOWH		STORAGE TANK			8	SVE BLOWER IN LET TEMPERATURE	TEMPERATURE	DEGREES F	
1	(10)	3 0 H	10.1.			8	SVE BLOWER IN LET VACUUM	VACUUM	INCHES OF	
T.	SVE AND AS PIPE HEADER	SA EN SA	(1			9	HSVE AND SVE WELL VACUUMS	VACUUM	WATER INCHES OF WATER	
1	DAYLIGHT AREA	1	(12)	Une C	i i	9	HSVE AND SVE WELL FLOWS	FLOW	SCEM	
9		9 8	G	15.75 8		10	AS WELL PRESSURES	PRESSURE	PS)	
2	0	WED NO.			d - verente	10	AS WELL FLOWS	FLOW	SCEM	
	(9)	1 1 1 K				11	HEAT EXCHANGER DISCHARGE TEMPERATURE	TEMPERATURE	DEGREES F	INSIDE AS BLOWER SOUND ENGLOSURE
12 (A A A A		90t+		12	OVIDIZER BURN (R CHAMBER TEMPERATURE	TEMPERATURE	DEGREES F	SHOWN ON OXIDIZER PLC/MMI SCREEN
5	(8)	L R R	THERMAL OXIDIZER	EQUIPMENT		12	OVIDIZER DISCHARGE TEMPERATURE	TEMPERATURE	DEGREES F	SHOWN DV OXIDIZER PLE/MMI SCREEV
11/2	0	G		ENCLOSURE AREA		12	OXIDIZER INLET LIMIT CONTROLLER TEMPERAT JRE	TEMPERATURE	DEGREES F	SHOWN ON OXIDIZER PANEL
2			56	2		12	OXIDIZER OUTLET LIMIT CONTROLLER TEMPERAT JRE	TEMPERATURE	DEGREES F	SHOWN ON CHIDIZER PANEL
ting:					Ī	12	OXIDIZER PROCESS FAN VALVE POSITION	VALVE POSITION	OPEN/CLOSED	SHOWN ON OXIDIZER PLC/MMI SCREEN
3	MOISTURE SEP ARA TOR					12	OXIDIZER DILUTION VALVE POSITION	VALVE POSITION	%	SHOWN O'Y DUDDIZER PLC/MMI SCREEN
1		a		CHAIN LINK FENCE		12	OXIDIZER COMBUSTION VALVE POSITION	VALVE POSITION	×	SHOWN ON DADIZER PLC/MMI SCREEN
200		0	(4)	D GRANT GIRK FENCE		12	OXIDZER RUNTIMES	TAME	HOURS	SHOWN ON OXIDIZER PLC/MMI SCREEN
20		6	EDOSTING LIGHT			12	ONDIZER PANEL TEMPERATURE	TEMPERATURE	DEGREES F	SHOWN ON OXIDIZER PLC/MMI SCREEN
ALC: NO		U	5 TOWER TOUNDATION			12	OXIDIZER FLAME SIGNAL	FLAME STRENGTH	VOLTS	SHOWN ON OXIDIZER PANEL
- 1a						13	SVE AND AS BLOWER SPEED	BLOWER SPEED	HERTZ	SHOWN DY SVE/AS PANEL
100		PLAN	(h)	a ¹ 6 at		13	SVE/AS RUNTIMES	TIME	HOURS	SHOWN ON SVE/AS PLC/MMI SCREEN
1		EQUIPMENT ENCLOSUIS AREA (AVOUT N	SCALE: 1"=5" 0 5'	10	13	SPARGE ZONE OPERATING CYCLES	TIME	HOURS	SHOWN ON SVE/AS PLC/MMI SCREEN

CALL 2 DAYS BEFORE YOU DIG 1-800-424-5555 HOLES BARA No really break Port of Seattle THE NEW PRACT HARD billion p-st 00309702dP78 80 2995 COLUMN TWO -NO MOUTH LADIES 1000 CRETE Aur 1255- 1453215-SALAR MARTINE No.2 Fed and fait PROJECT HE HAL WSE P Har Ander T Tayanest adapt Interest & nistol Plat And HET HEL EQUIPMENT ENGLOSURE AREA LAYOUT -----Re DELETARDE PA

0

Field Tech(s):		
	GF	
AS/SVE HMI Time:	650	
54.0	Sparge Blower Speed	52.0
54.0 HM	(Hertz) - VFD	SL.O HI
1220(1	AS Blower Runtime	6340.7
2,6	1 4	6339.8
	Sparge Zone 4 Time	0500-1030
MAN MAN	Span(s) Operational:	H
1500 2000	Sparge Zone 5 Time	1930-0030
HMI	Span(s) Operational:	1130-0030 H
1000-1520	Sparge Zone Active:	7.02
1000 1330 HM		Zone 2
Gyop		0,5
8.5 osi		1,0
	-	
0.5	(PSI) - PI-300	0
11.00	SVE Blower Discharge Pressure	~
64°F	(" H ₂ O) - <i>PI-400</i>	0
12	SVE Blower Discharge Temperature	
76	(°F) - <i>TI-400</i>	11607
6810F	Process Blower Runtime (Hours)	19038
625°f HM	Combustion Fan Runtime (Hours)	19039
623°f	Burner Runtime (Hours)	19028
668° F	Processing Vapors Runtime (Hours)	19014
63009	Panel Temperature (°F)	93
Mar	Flame Signal (Volts)	50
Open		5.0
0 +44		0.30
€ 9. Sŏ/o		
0	Dranana Tank A Level (9/)	85al
	Propane Tank A Level (%)	1
Clinch of water	Propane Tank B Level (%) 5 Swapped	17796
	2, 6 2, 6 6, 7 6, 7 7, 6 6, 7 7, 6 7, 7 6, 7 7, 7	12206.1(Hours) - Sparge Blower2.6Sparge Heat Exchanger Runtime (Hours)0000 - 0530Sparge Zone 4 Time Span(s) Operational:1500 - 2000Sparge Zone 5 Time Span(s) Operational:1000 - 1530Sparge Zone Active:94° FSVE Blower Filter Differential Pressure ("H20) - DPI-2008.5 ps;SVE Blower Inlet Differential Pressure ("H20) - FI-2000.5Transfer Pump Discharge Pressure (PSI) - PI-3000.5SVE Blower Discharge Pressure (PSI) - PI-40064° F"H20) - PI-4005VE Blower Discharge Temperature ("F) - TI-400681° FProcess Blower Runtime (Hours)623° FBurner Runtime (Hours)623° FBurner Runtime (Hours)630° FPanel Temperature (°F)0Flame Signal (Volts)0Oxidizer Inlet Differential Pressure ("H20) - FI-10Flame Signal (Volts)

	7//	A-7		AS & SVE Ma	anifold Read	ings			
Date:	17]	22					Time:	10 11 0	an overne
Field Tech	(s): arge VOC (p	AC, GF		13.0			Equipment	1.D. #: 17 ,	I.D 045235
	arge VOC (p arge LEL (%			13.0					
Oxygen (%			1			1			
SVE Syster	n Inlet Vac	uum (" H ₂ O)		76					
	m inlet ΔP (0.5					
Oxidizer D	ischarge V	DC (ppmv) P	D	1.0					
	Lu			SV	E Wells	L.			22-1-2-1
Location	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Comments	Location	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Comments
HSVE-2	30	72	100		SVE-10	55	14	100	gauge banking
HSVE-3	36	68	100		SVE-9	60	6	100	Sase bancing
SVE-4	52	10	100	Gause/Floch barneing Flo Gause barneing	SVE-8	50	4	100	Sase banung
SVE-5	40	Placet holizon		Ao Gause bancing	SVE-6	78	12	100	gase bouncing
SVE-7	50	12	100		HSVE-1	14.0	78	2000	
	6	-		AS	Wells	1			1
Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments	Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments
AS-7					AS-17	6.5	7.0	100	
AS-8				R.,	AS-18	9.0	1.2	100	
AS-9					AS-19	9.5	1.2	100	
AS-10					AS-20	9.0	3,6	100	
AS-11					AS-21	6.5	1.0	100	L 7. 1
AS-12					AS-22	8.5	2.4	100	Floch Bouncity
AS-13					AS-1				
AS-14		e			AS-2				
AS-15	-				AS-3				
AS-16					AS-4			1.1	
AS-23					AS-5				5.54.1
AS-24					AS-6				
AS-25									
AS-26					2				
AS-27	4.				at the				
Natas				the second se					

Notes:

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



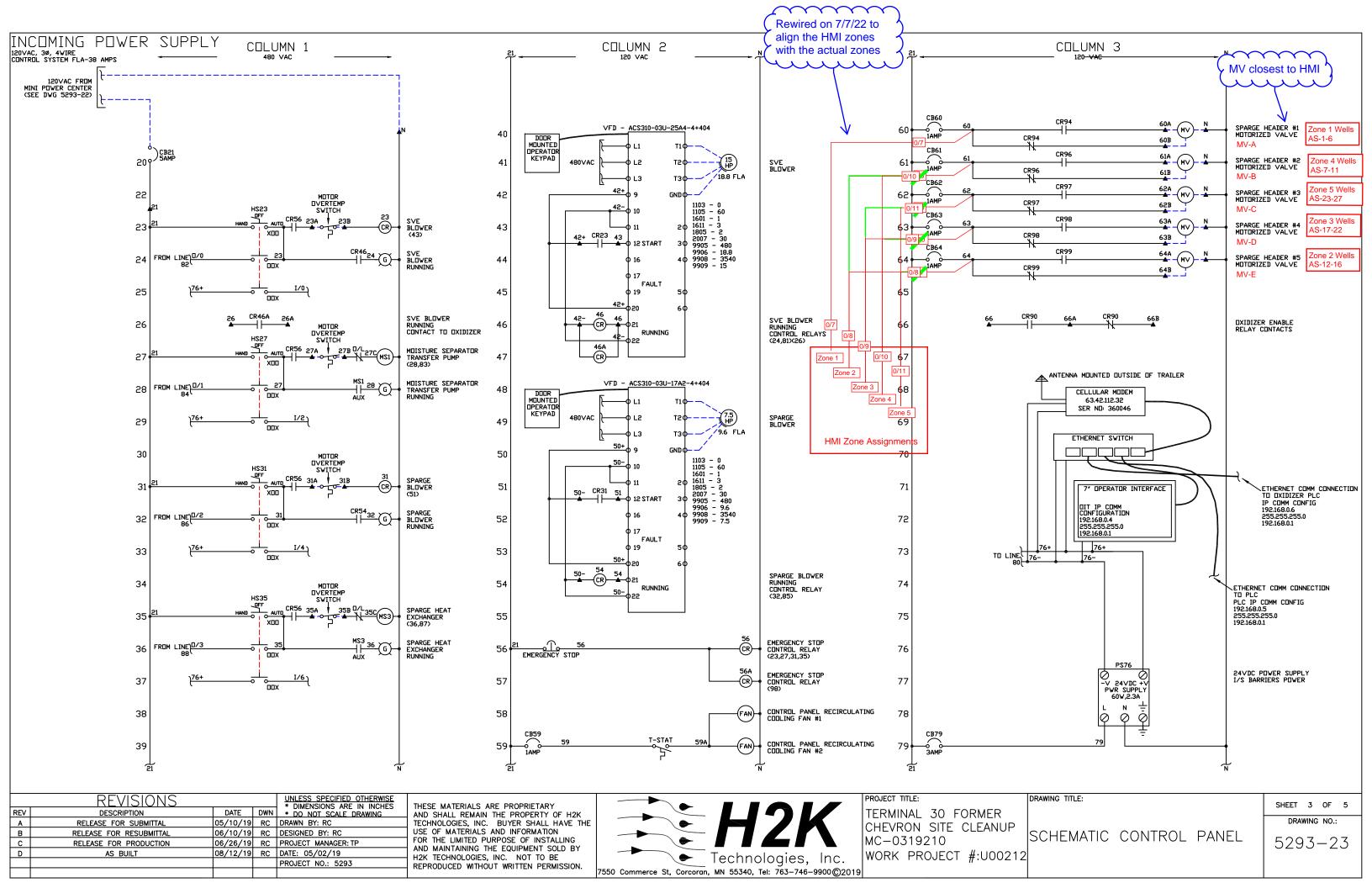
Date:		7772	2	SVE Manifold Readings - N			Time:	843	
Field Tech	(s):	1 - 1 -					Equipment	:1.D.#: C	245235
				re (°F) - <i>TI-500</i> :					
		PSI) - PI-501.				-01			
			" H ₂ O) - DPI-	500:					
	n inlet ΔP (uum (" H ₂ O)	:						
		perature (°I	-) . TI. 200-	- (in					
542 010442	a milet fem	peracute ()	<i>] - 11-2.00.</i>	S	VE Wells				
	Vacuum	Flow	Valve Pos.			Vacuum	Flow	Valve Pos.	
Location	("H2O)	(SCFMG)	(% Орел)	Comments	Location	("H2O)	(SCFMG)	(% Open)	Comments
HSVE-2					SVE-10				
HSVE-3					SVE-9				
SVE-4				-	SVE-8				
SVE-5					SVE-6				
SVE-7					HSVE-1				
				L	AS Wells		l		
Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments	Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments
AS-7 .	9.0	G	100		AS-17				
AS-8	8.5	4.2	100		AS-18				
AS-9	8.0	4,4	100		AS-19				
AS-10	85	0	100	Floct broken	AS-20				
AS-11	9,0	8.6	100		AS-21				
AS-12					AS-22				
AS-13					AS-1				
AS-14					AS-2				
AS-15					AS-3				
AS-16					AS-4				
AS-23					AS-5				
AS-24					AS-6				
AS-25									
AS-26									
AS-27									

Notes:

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge





<u>Clear Creek – Terminal 30 Cleanup – Seattle, Va/#5293</u> STANDARD CONTROL PANEL SYMBOLS AND NOTES

•	TERMINAL IN PANEL		WIRING COLORING & NOTES: 1) 120VAC CONTROL - RED (16AWG OR 18AWG) 2) 120NEUTRAL - WHITE (16AWG OR 18AWG) 3) 24VDC POSITIVE - BLUE (16AWG)
СК	MOTOR CONTACTOR		4) 24VDC COMMON - WHITE W/ BLUE STRIPE (16AWC 5) GROUND - GREEN (16AWG) 6) ALL OTHER WIRING AS INDICATED
\bigcirc	GREEN PILDT LIGHT	MS	7)
R	RED PILOT LIGHT	OLI ULIO OLI ULIO SINGLE PHASE MUTUR STARTER	<u>IDRQUE SPECIFICATIONS</u> 1) FIELD WIRING TERMINALS - 7LB-IN
$\mathbf{\tilde{w}}$	WHITE PILOT LIGHT		2) 25 AMP CONTACTORS - 16LB-IN 3) DVERLOADS - 16LB-IN 4) DISTRIBUTION BLOCK PRIMARY - 120LB-IN
	AMBER PILOT LIGHT		5) ALL OTHER DEVICES PER MANUFACTURER SPECIFIC
TDR	CONTROL TIMER	O O PUSHBUTTON	
CR	CONTROL RELAY		
RTM	ELAPSED RUN TIMER METER	<u></u>	CONTROL PANEL FULL LOAD PE
Ŷ	FLOAT SWITCH CLOSES ON RISING LEVEL	O CHREE POSITION H.O.A. SELECTOR SWITCH	***NDT DVERALL SYSTEM PDWER REQUIRED PER NEC 480VAC, 3¢ CONTROL PANEL LOAD PER
Ť	FLOAT SWITCH OPENS ON RISING LEVEL		480VAC, 30, 3WIRE SVE BLOWER 15 MOISTURE SEPARATOR TRANSFER PUMP 3/
Ŷ	PRESSURE SWITCH CLOSES ON RISING PRESSURE	SELECTOR SWITCH O O ADDITIONAL CONTACTS MAY BE ADDED	MUISTURE SEPARATUR TRANSFER PUMP 3/- SPARGE BLUWER 7.5 SPARGE BLUWER HEAT EXCHANGER 1/2
Å	PRESSURE SWITCH OPENS ON RISING PRESSURE	0 1 POLE CIRCUIT BREAKER	
مح مح	TEMPERATURE SWITCH OPENS ON RISING TEMPERATURE	2 POLE CIRCUIT BREAKER	CONTROL PANEL SYSTEM FLA @ 480VAC CONTROL PANEL FULL LOAD PEI ****NOT OVERALL SYSTEM POWER REQUIRED PER NEC 120VAC, 10 CONTROL PANEL LOAD PER
<u>م</u> رار	TEMPERATURE SWITCH CLOSES ON RISING TEMPERATURE	3 POLE CIRCUIT BREAKER	120VAC, 1¢, 3WIRE CONTROL PANEL
$\overset{\circ}{\succ}$	TIMER CONTACT CLOSES AFTER TIME SET		
Ţ	TIMER CONTACT OPENS AFTER TIME SET	VIRE CONTINUATION	CONTROL PANEL SYSTEM FLA @ 120VAC
41-	NORMALLY OPEN CONTACT		
₩	NORMALLY CLOSED CONTACT	(TYPE & SIZE INDICATED)	
	FIELD WIRING	OF DISCONNECT SWITCH	
<u></u>	GROUNDING BLOCK		

		REVISIONS			UNLESS SPECIFIED OTHERWISE * DIMENSIONS ARE IN INCHES	THESE MATERIALS ARE PROPRIETARY		PROJECT TITLE:
F	REV	DESCRIPTION	DATE	DWN	* DIMENSIONS ARE IN INCHES * DO NOT SCALE DRAWING	AND SHALL REMAIN THE PROPERTY OF H2K		TERMINAL 30 FORMER
	Α	RELEASE FOR SUBMITTAL	05/10/19	RC	DRAWN BY: RC	TECHNOLOGIES, INC. BUYER SHALL HAVE THE		CHEVRON SITE CLEANUP
	в	RELEASE FOR RESUBMITTAL	06/10/19	RC	DESIGNED BY: RC	USE OF MATERIALS AND INFORMATION		
	С	RELEASE FOR PRODUCTION	06/26/19	RC	PROJECT MANAGER: TP	FOR THE LIMITED PURPOSE OF INSTALLING		MC-0319210
	D	AS BUILT	08/12/19	RC	DATE: 05/02/19	AND MAINTAINING THE EQUIPMENT SOLD BY H2K TECHNOLOGIES, INC. NOT TO BE	Technologies, Inc.	WORK PROJECT #:U0021
					PROJECT NO.: 5293	REPRODUCED WITHOUT WRITTEN PERMISSION.	Technologies, Inc.	π .00021
							7550 Commerce St, Corcoran, MN 55340, Tel: 763-746-9900(C)2019	9

(16AWG)

PECIFICATIONS

DAD PER UL508A/698A R NEC DR LDCAL INSPECTING AUTHORITY*** AD PER UL508A PROCEDURES

	L1	L2	L3	
15HP	18.8A	18.8A	18.8A	
3/4HP	1.35A	1.35A	1.35A	
7.5HP	9.6A	9.6A	9.6A	
1/2HP	.9A	.9A	.9A	
	30.7A	30.7A	30.7A	

DAD PER UL508A/698A ER NEC DR LDCAL INSPECTING AUTHORITY*** AD PER UL508A PROCEDURES

L1	N 3A	
L1 3A	3A	
ЗА	ЗА	

	DRAWING TITLE:			SHEET	1	OF	5
IP				DRAV	NING	NO.:	
	SCHEMATIC	CONTROL	PANEL	529	3.	-2	1
212					-		

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30			
Project Number	60681370			
Project Manager	Paul Kalina			
Project Manager Phone #	2063105097			
Muster Point location	Main gate			
Meeting date	7/7/2022			
Business Line	Environment			
SH&E Manager	Tim Gilles			
SH&E Manager Phone #	3128335991			
First Aid Kit Location	Conex			
Prepared by	Friedman, Gus			

Shift Summary

Location	SoDo
Attendees (Workers)	Corley, Antonio;Friedman, Gus;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M Zone rewiring analysis GAC dimension measurements Replacement equipment analysis
Hazards to be considered today	noise, mechanical, electrical
Will there be Lone Workers?	No
Hierarchy of controls	elimination, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

<u> </u>	ĮI
Topic of the week	Hand Tools
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	
Hazards	 <u>Mechanical</u> <u>Noise</u> <u>Electrical</u>

Project Informatio				Page of
Project Name:	<u>t-30</u>	Location:		of Scattle
Project/Task No.:		Weather:		76°F
Date:	7/22/22	Personnel:	AC, (5F
Observations				
Time		Observation D	escription	
1 1608	Arrived onsite, S	ystem "ON" on a	irrivel. Did so	Rety tailgate
2	meeting			
3 1620	Began taking Sys	tem readings		
4 1649	All readings taker	n, began taking	PID readings	
5 1702	PID readings Co	,		
6 1711		ing all Magnehelic	galges Using	Manometer from
7		ove readings - St		
8		10 100 1100 000		
9				
10	Mag Location	Current Reading	Manometer QC	Lucles
11	AS Intoke	1.0	1, 1	Notes 0-2,0-5 vange VS 0-15 vange gauge
	SUE Influent	1,0	1.4	03 0-13 101320
12	SUE Filter	0.25	0,65	1-1-
13	Quidizer Inlet	0.30	0.7	Not perfect size tubing
14	Caddine 4mici		0.7	
15 16 1727	All gauges checked	GE Succest we	change agings	Co Ho
		ranse to a more	~	
17	0		respirable 0-5	or 0-2 range
18	for more all	urate readings	12 11	
19	CC	11 1	0,1,5	
20 1740	GF checks break		or the spruge 1	10tameters
21	AS-1 throug			
22		See chart on	next page	
23				
24		- 27		
25		-		

Proj	ect Informatio	n						Page 2 of 2		
Proje	ect Name: ect/Task No.:		<u>†-30</u> 7/22/22	2	Wea	ition: ther:		17 of Seattle		
Date			1/26/20		Perso	onnel:	140			
Obse	ervations	1								
-	Time				Observ	ation Description	n			
_1										
2	1740	Well	Init.	Init	Breakthash	Final	1%	Comments		
4		ID	Flow	Pressue	Pressue	Flow	open			
5		AS-1	7.4	9.5	8.0	8.8	100			
6		A5-2	1.0	8.5	7,75	1.2	100	Sticky votameter		
7		A5-3	6.4	8.5	7,50	8.4	100			
8		A5-4	4.2	2,5	<1.5	8,2	100	Sticky istameter/Floet Stuck		
9		A5-5	11.6	9,0	5.25	11.6	100			
10		A5-6	11.8	8.5	5.25	4.3	crack			
11			a							
12			Su	vitched	Lones 10	and 3 7	to check	for lone		
13			-	next.						
14	1755	Done	-		the day.	, Leaving	size			
15		$\left \begin{array}{c} \end{array} \right $				0				
16			\backslash				_			
17			$\overline{\}$							
18										
19			AC							
20							7/	22/22		
21							\searrow '			
22										
23										
24										
25										
Com	ments / Site Ac	tivities / Person	nel Tracking							

	SVE/AS & Oxidizer S	ystem Data Collection Form			
Date: 7/22/22	Field Tech(s):	GF			
Actual Time: 1608	AS/SVE HMI Time:	1549 07/22/22			
SVE/AS System					
SVE Blower Speed	Cu	Sparge Blower Speed	52 MM		
(Hertz) - VFD	54 нм	(Hertz) - VFD	JC MM		
SVE Blower Runtime	12556.2 HM	AS Blower Runtime	6692,5 HAN		
(Hours)	12556. L HM	(Hours) - Sparge Blower	6692,5 HM		
Transfer Pump Runtime	2.6 HM	Sparge Heat Exchanger Runtime (Hours)	6691.4 HM		
(Hours) - <i>MS Pump</i> Sparge Zone 1 Time		Sparge Zone 4 Time	00111		
Span(s) Operational:	1500-2000		0500-1030		
Sparge Zone 2 Time		Sparge Zone 5 Time			
Span(s) Operational:	0000 - 0530 HM	Span(s) Operational:	1930 ~ 0030 HM		
Sparge Zone 3 Time		Energe Zene Active	71		
Span(s) Operational:	1000-1530 HM	Sparge Zone Active:	Zonet		
Sparge Heat Exchanger Discharge	88°f	SVE Blower Filter Differential Pressure	DE		
Temperature (°F) - <i>TI-500</i>	1-00	(" H20) - <i>DPI-200</i>	0.5		
AS Blower Pressure	9.0	SVE Blower Inlet Differential Pressure	1.0		
(PSI) - <i>PI-501</i>	1.0	(" H20) - FI-200 Transfer Pump Discharge Pressure	00		
AS Blower Offerencer Pressure (" H2O) - DPI-500	1.0	(PSI) - <i>PI-300</i>	$ $ \bigcirc		
SVE Blower Inlet Temperature		SVE Blower Discharge Pressure			
(°F) - <i>TI-200</i>	78°f	("H ₂ O) - PI-400			
SVE Blower Inlet Vacuum (" H ₂ 0) - <i>VI-200</i>	74	SVE Blower Discharge Temperature (°F) - TI-400	11607		
Oxidizer System					
Inlet Temperature (°F)	663 BM	Process Blower Runtime (Hours)	19390 HM		
Burner Chamber Temperature (°F)	681 HM	Combustion Fan Runtime (Hours)	19391		
Outlet Temperature (°F)	631 HAM	Burner Runtime (Hours)	19380 HM		
Inlet Limit Controller Temperature (°F)	698	Processing Vapors Runtime (Hours)	19365		
Outlet Limit Controller Temperature (°F)	622 HM	Panel Temperature (°F)	90°£ 1		
Process Fan Valve Position (Open/Closed)	Open H	Flame Signal (Volts)	5.0		
Dilution Valve Position (%)	0 691	Oxidizer Inlet Differential Pressure (" H2O) - <i>FI-1</i>	0.30		
Combustion Valve Position (%)	14.2				
Other Components					
Moisture Separator Level	Soto before pump kicks		((
(% Full)	30% before pump non	Propane Tank A Level (%)	65		
Water Storage Tank Level (DTF, TD from MP; inches)	Clinch	Propane Tank B Level (%)	60		

Abbreviations:

1. " H₂O = Inches of Water

2. °F = Degrees Fahrenheit

3. PSI = Pounds per Square Inch

4. % = Percent

5. DTF - Depth to Fluid

6. TD - Total Depth

7. MP - Measuring Point



Date:	11	2 22			Manifold Read		Time:		1610	
Field Tech(s): AL, GF							Equipment	: I.D. #:	1610	35
SVE Discharge VOC (ppmv) PID			12.1							
	arge LEL (%)									
Oxygen (%										
		uum (" H ₂ O)								
	m Inlet ΔP (_								
Oxidizer D	ischarge VO	DC (ppmv) A	PID	0,9	SVE Wells					
	Vacuum	Flow	Valve Pos.			Vacuum	Flow	Valve Pos.	1	
Location	("H2O)	(SCFMG)	(% Open)	Comments	Location	("H2O)	(SCFMG)	(% Open)		Comments
HSVE-2	26	72	100		SVE-10	52	12	100	Flogt b	
HSVE-3	32	70	100		SVE-9	50	2	1 30	Flout	
SVE-4	50	15	100	Geise and Floct bouncing	SVE-8	60	2.0	100		broken
SVE-5	10	Ø12	100	Floct broken	SVE-6	70	10	100	Garge k	puncing
SVE-7	52	16	100	1.1.17	HSVE-1	12	74	15%		
				1	AS Wells		-			
Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments	Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)		Comments
AS-7	(F310)	(SCI MO)	(nopen)	Commenta	AS-17	(15/0)				comments
AS-8					AS-18					
AS-9					AS-19					
AS-10					AS-20					
AS-11			_		AS-21					
AS-12					AS-22					
AS-13					AS-1	9.5	\$7.4	100		
AS-14					AS-2	8.5	1.0	100		
AS-15					AS-3	8.5	6.4	3090		
AS-16		-			AS-4	2.5	4.2	100		
AS-23					AS-5	9.0	11.6	100		
AS-24					AS-6	8.5	11.8	100		
AS-25										
AS-26										
AS-27										
Notes:										

Notes:

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit

" H₂O = Inches of water SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Main gate
Meeting date	7/22/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Corley, Antonio

Shift Summary

	The second s
Location	SoDo
Attendees (Workers)	Friedman, Gus;
Attendees (Visitors)	
Tasks to be performed	Biweekly system O&M
Hazards to be considered today	pressure, noise, mechanical, electrical
Will there be Lone Workers?	Νο
Hierarchy of controls	elimination, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	 Uncontrolled release of electricity Contact with moving parts of machinery Impact by vehicle or mobile equipment

Topic of the week	<u>Heat Stress - Darker urine color, drink water, use</u> shadows and breaks, Heat Stress Index
Other topics discussed	
Mid day reviews	
End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	
Hazards	<u>Mechanical</u> <u>Noise</u> <u>Pressure</u> <u>Electrical</u>



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID 45235 Description Mine Rae 3000 Calibrated 7/21/2022 5:54:01PM Manufacturer Rae Systems Model Number PGM7320 Serial Number/ Lot 592-927137w2 Number

Location Seattle Department Humidity % 42

State Certified

Status Pass

Temp °C 27

		Calibra	tion Specificatio	ns			
	Group # 1 oup Name Isobutylene tated Accy Pct of Reading	ng		Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In V</u> 100.00 / 100.00	<mark>al <u>In Type</u> PPM</mark>	<u>Out Val</u> 100.00	<u>Out Type</u> PPM	<u>Fnd As</u> 99.60	<u>Lft As</u> 100.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments	Used During the Calib	ration			<u>(A</u>	s Of Cal Entr	y Date)
Test Standard ID	Description	Manufacturer	<u>Model Number</u>	<u>Serial Number</u> Lot Number	: <u>La</u>	<u>Ne</u> ast Cal Date/ Ex pened Date	<u>xt Cal Date /</u> piration Date
SEA ISO 10	Isobutylene (C4H8) 10	Gasco	31716	TJBJ-248-1			6/2024

Notes about this calibration

PPM

PPM

TJBJ-248-10-7

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

INSTRUMENT QC/ PACKING LIST

Description	RAE Systems MiniRAE 3000	
Instrument ID	45235	O PINE
Lamp Voltage	10.6 eV □ 11.7 eV □ 9.8 eV	www.pine-environmental.com
Date Calibrated	07-21-22	www.pine-environmental.com

Standard Items	Prepared	QC check	Received by customer	Returned to Pine
MiniRAE 3000 with carry case	4	1		
Rechargeable battery (installed)	14	_		
Protective rubber boot	4			
Manual	4			
Quick reference card	4			
Probe tip	4			
Charger/ adapter, or charger and cradle	4			
(2) Hydrophobic filters	4			
Alkaline adapter with (4) AA alkaline batteries installed	4			<u></u>
ProCal calibration sheet			· · ·	
Supporting Items				
100 ppm isobutylene calibration gas	<u> </u>			
Gas regulator				
Tedlar bag				
Datalogging software				
Communications cable				
*100 ppm Isobutylene SDS				
✓ Must match cylinder with setup		<u> </u>		
*SDS provided upon request				
Spare alkaline battery pack	_			
Alkaline AA batteries	_			
		<u> </u>		

Prepared by: QC checked by:

21-22 Date: 07=

This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

		Page of
9-30	Location:	Port of Seattle
	Weather:	
<u> </u>	Personnel:	AC
	Observation Description	
Arrive on-site, Syst	en is on, Perform	n sately fail gate
Tailacte complete, l	pesin taking HML A	leadings
All readings taken,	Zone change from	Long 1 to Long
3 happens an	+ 1521 real time,	will wait for
system to 1	very up and then	falce love Charge
readings		
Besch taking 20ne	change readings	
All readings takes	n, locking yp a	ind leaving site
	/ /	
	/	
	/	AC 8/5/22
		/
		/
		\
	Arrive on-site, Syst Tailgote complete, All readings taken, 3 happens a- System to readings Besan taking 20ne	<u>T-30</u> <u>Weather:</u> <u>B/S/2022</u> <u>Personnel:</u> <u>Observation Description</u> <u>Arrive on-site, System is on, Perfors</u> <u>Tailgate complete, besin Jaking Hirt I</u> <u>All readings Jeken, Zone change From</u> <u>3 happens Gt IS21 real fime</u> <u>System to very y and then</u>

	SVE/AS & Oxidizer Sy	stem Data Collection Form	
Date: 8 8 22	Field Tech(s): AC		
Actual Time: 1435	AS/SVE HMI Time: 14	14	
SVE/AS System			
SVE Blower Speed	54,0	Sparge Blower Speed	(20
(Hertz) - VFD SVE Blower Runtime	51,0	/ (Hertz) - VFD	52.0
(Hours)	12679.6	AS Blower Runtime (Hours) - Sparge Blower	6812,5
Transfer Pump Runtime		Sparge Heat Exchanger Runtime	001215
(Hours) - MS Pump	2,7	(Hours)	6811.4
Sparge Zone 1 Time		Sparge Zone 4 Time	e one
Span(s) Operational:	1000-1530	Span(s) Operational:	0500-1030
Sparge Zone 2 Time		Sparge Zone 5 Time	and a state of the state of the state
Span(s) Operational:	0000-0530	Span(s) Operational:	1930-0030
Sparge Zone 3 Time	1000 2000	Sparge Zone Active:	1
Span(s) Operational:	1500-2000		
AS Blower Intake Pressure (" H2O) - <i>DPI-500</i>	0.60	SVE Blower Filter Differential	000
AS Blower Discharge Pressure		Pressure (" H20) - DPI-200	0.50
(PSI) - PI-501	8.5	SVE Blower Inlet Differential Pressure (" H20) - <i>FI-200</i>	1.0
Sparge Heat Exchanger Discharge	and the second sec	Transfer Pump Discharge Pressure	10
Temp (°F) - <i>TI-500</i>	86°F	(PSI) - PI-300	0
SVE Blower Inlet Temperature	A STATE OF A	SVE Blower Discharge Pressure	
°F) - <i>TI-200</i>	80°F	(" H ₂ O) - <i>PI-400</i>	\mathcal{O}
SVE Blower Inlet Vacuum	85	SVE Blower Discharge Temperature	
" H ₂ 0) - <i>VI-200</i>	28	(°F) - <i>TI-400</i>	118°f
Oxidizer System			
Dxidizer Inlet Differential Pressure " H2O) - FI-1	0.46	Combustion Valve Position (%)	14.7 00
Burner Chamber Temperature (°F)	677°f	Process Blower Runtime (Hours)	19514
Dutlet Temperature (°F)	GIIOF	Combustion Fan Runtime (Hours)	19515
nlet Limit Controller Temperature	661°F	Burner Runtime (Hours)	
^o F) Dutlet Limit Controller Temperature	661 F HA		19504
F)	613°F	Processing Vapors Runtime (Hours)	19489
rocess Fan Valve Position			
Open/Closed)	Open	Panel Temperature (°F)	90°f
Vilution Valve Position (%)	0	Flame Signal (Volts)	5.0
ombustion Valve Position (%)	14.7 86		
ther Components			
nockout Tank Level	C 1. all		7011
Fightglass % Full) ¹	Empty 0%	Propane Tank A Level (%)	1200
Vater Depth in Storage Tank	linch		721
DTF from MP/TD (calc); inches) ²		Propane Tank B Level (%)	10 20

PORT OF SEATTLE - TERMINAL 30

Abbreviations:

" H₂O = Inches of Water

^oF = Degrees Fahrenheit

PSI = Pounds per Square Inch % = Percent

DTF - Depth to Fluid DTB - Depth to Bottom

MP - Measuring Point TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. DTB of water tank from the MP is XX. Calculate the water depth

by subtracting DTF from DTB.



			and the second second			PORT OF SEA	ATTLE - TERI	VINAL 30				
Data			edelas	and the		AS & SVE	Manifold Re	adings				
Date: Field Te	ch(s):	AC	8/5/22		17227-0-1	-			Time:	1445	17227	
Teld re	cii(s).	AC		-	******	Vapor	Concentrati	ons	Equipmer	nt I.D. #:	ILLI	
	Inlet VOC		- 49	,6					1			
Oxidizer	Discharge	VOC (ppm)	1) PID: 2	.,5								
Well	Vacuum	Flow	Valve Pos.	Dewater		3	VE Wells Well	Vacuum	Flow	Valve Pos.	Dewater	
ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Co	omments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2	28	68	10000				SVE-10	52	20	100		
HSVE-3	34	64	100%				SVE-9	44	10	100%		Floct bouncing
SVE-4	48	16	100%				SVE-8	SO	4.0	100%		Fleat broken
SVE-5	28	13	100%		Floc-	bisken	SVE-6	68	15	100%		Gaise enel Floct
SVE-7	48	18	100%				HSVE-1	12	74	2500		Contrainy
lotes:										23-0		
Well	Pressure	Flow	Valve Pos.			β	S Wells Well	0	Firm	V-1-0		
ID	(PSIG)	(SCFMG)	(% Open)		Comme	nts	ID	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)		Comments
			Zone 2					1 (10.07	(Serind)	Zone 4		comments
\S-7					11		AS-17					
\ \$-8							AS-18					
\S-9							AS-19			10		
S-10							AS-20					
S-11							A5-21					
							AS-22					
			Zone 3							Zone 1		
S-12							AS-1	9.0	6.9	00		
S-13							AS-2	8.5	1.0	109		
S-14							AS-3	8.0	7.4	100		
S-15							AS-4	5.0	12.2	100		
S-16			1				AS-5	8.0	11.8	40		
			Zone 5				AS-6	6,5	4.0	50		
S-23									1224			
s-24												
S-25												
5-26												
5-27							1255					
otes:												
otes												

Abbreviations:

% = Percent

" H₂O = Inches of water deg F - degrees Fahrenheit N/A = Not applicable SC ppmv = Parts per million volume PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



Page 2 of 3

ate:	\$	51	S177 AS	& SVE Mar	ifold Readings - **N	iew Zone Fr	om Initial R			a hard	
ield Te			5/22					Time: Equipme	540		
	10.00				Vapor	Concentrati	ons	Indubute	ic i.D. #:		
	r Inlet VOC										ere a
Oxidizer	r Discharge	VOC (ppm	v) PID:								
Well	Vacuum	Flow	Valve Pos.	Dewater		SVE Wells Well	Vacuum	Flow	Valve Pos.	Dewater	
ID	("H2O)	(SCFMG)		(Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2	30	66	100			SVE-10	52	20	100		
HSVE-3	34	64	100			SVE-9	44	10	100		
SVE-4	48	16	130	3		SVE-8	50	4.0	100		
SVE-5	28	13	100			SVE-6	68	15	100		
SVE-7	48	18	100			HSVE-1	12	74	25		
lotes:									23		
Well ID	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)		Comments	AS Wells Well ID	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)		Comments
			Zone 2					1,(Zone 4		comments
S-7						AS-17					
S-8						AS-18					
S-9						AS-19					
S-10						AS-20					
S-11						AS-21					
						AS-22					
	5		Zone 3						Zone 1		
S-12	8.0	1.2	190			AS-1	8.S	3.6	100		
5-13		5.6	100			AS-2	80	1,0	100		
S-14	6,5	3.8	100			AS-3	7,5	4,4 .	100		
5-15	8.0	2.8	100			AS-4	4,0	10.4	100		
5-16	8.0	5.2	100			AS-5	7.5	9,2	100		
			Zone 5			AS-6	6.0	3.8	50		3
		1.1									
5-23											
5-23											
						1.1.1					
5-24		_		_		I Shares a					
5-24											

Abbreviations:

% = Percent

" H₂O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable SCI ppmv = Parts per million volume PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrum	nent ID	17227						
Desc	ription	MinRae 3000						
	-	8/4/2022 11:37:	01AM					
		Rae Systems			State Cert	ified		
		PGM-7320				tatus Pa		
Serial Numb N	er/ Lot : umber	592-000396			Tem	р°С 24		
	ocation a	Seattle			Humidit	t y % 43		
			Calibra	ation Specifications				
	Group	# 1			Range Acc	% 0.00	00	
Gro	up Nam	e Isobutylene		R	eading Acc	% 3.00	00	
Sta	ated Acc	y Pct of Readir	ng		Plus/Min	us 0.0		
<u>Nom In Val / In Va</u>	<u>ul 1</u>	in Type	<u>Out Val</u>	Out Type	Fnd As	Lft A	<u>Dev%</u>	Pass/Fail
100.0 / 100.0	ł	PPM	100.0	PPM	106.3	100.	0 0.00%	Pass
Test Instruments	Used Du	ring the Calibr	ation	<u> </u>			(As Of Cal En	try Date)
toot moti amonto	oseu pu		ution		Serial Nu			Next Cal Date
fest Standard ID	<u>Descripti</u>	on	<u>Manufacturer</u>	Model Number	Lot Num	ber	Last Cal Date/ H Opened Date	
SEA ISO 100	Isobutyle	ene (C4H8) 100	Airgas	x02ai99cp34206	6 MBJ-X0			2/5/2023
	PPM				CP34200	56-1		
4BJ-X02A199C								

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

INSTRUMENT QC/ PACKING LIST

Description	RAE Systems MiniRAE 3000
Instrument ID	17227
Lamp Voltage	⊠ 10.6 eV 🛛 11.7 eV 🗔 9.8 eV
Date Calibrated	08-04-22

OPINE www.pine-environmental.com

Prepared QC check **Received by** Returned to Standard Items customer Pine MiniRAE 3000 with carry case / Rechargeable battery (installed) / Protective rubber boot / Quick reference card Charger/ adapter, or charger and cradle (2) Hydrophobic filters Alkaline adapter with (4) AA alkaline batteries installed ProCal calibration sheet Supporting Items 100 ppm isobutylene calibration gas Datalogging software **Communications cable**

*100 ppm Isobutylene SDS ✓ Must match cylinder with setup

Manual

Probe tip

Gas regulator

Tedlar bag

*SDS provided upon request

Spare alkaline battery pack

Alkaline AA batteries

Prepared by: QC checked by:

Date:

This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Main gate
Meeting date	8/5/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Corley, Antonio

Shift Summary

Location	Terminal 30				
Attendees (Workers)	Antonio Corley;				
Attendees (Visitors)					
Tasks to be performed	Bi weekly system O&M				
Hazards to be considered today	pressure, noise, mechanical				
Will there be Lone Workers?	Yes				
Hierarchy of controls	administrativecontrols, ppe				
Personal Protective Equipment	Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots				
High Risk Events	 Impact by vehicle or mobile equipment Contact with moving parts of machinery Uncontrolled release of electricity 				

Topic of the week	Lock Out Tag Out Basics - 10 basic steps
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	
Hazards	Mechanical Noise Pressure

oject Name:	T-30			Location:	Seat	tle	
roject/Task No.:				Weather:			
ate:	8/19/8	12		Personnel:	AC,	53	
bservations							
Time				Observation Des	cription		
1 1505	Arrind	on-site	, Systen	is on [)o Scherty	tailgat	
2	wit	h Steve	ß				
3 1513	Tailgo	le com	rkk, S	cope of m	ak is 1	E-weekly	system
4		Dand	M			,	
5 1515	Besil	nº takin	S HAI	Readings			
6 1521				Began tak	ing burner	readings	1
7 1528				Began taki			
8 1539				ing hell rea			
9 1558				began taki		recolins	s
10 1611		readings					-
1 1615	1-1-		/ 4/ 4/				
2	well 1	twit]	Init	Brekthus	Fithol	õb	1
3	ID	Flow	Pressure	Preside	fbn	open	
4 AS-1	72		1.10001	76.5	7.0	100	1
5 AS-2				6.6	3.6	100	
6 AS-3				6,5	6, 9	100	
7 AJ-4				6	10,2	100	
8 AS-5				5,0	8.18	30	
9 As 6	1	ľ		5.51	6,0	10	
						, ,	
20		Asu	had fla	w with b	and water	Cube	20-10
21			THU VIO	w wigh D	NCTO VEIVE	TNIY B	par
22 23 1625	logsad	ell la	2 mar hall and	Pressues	C. 7	1 n//	Zavaes
u					Tar Conc	1 1-11	
25 1636			al timef	TOMIS			
25 1000	learns	Site Tracking	/			·	

PORT OF SEATTLE - TERMINAL 30

	SVE/AS & Oxidizer Syst	tem Data Collection Form	
Date: 8/19/27	Field Tech(s): AC	·B	
Actual Time: 55	AS/SVE HMI Time:	55	
SVE/AS System			
SVE Blower Speed	The al	Sparge Blower Speed	51
(Hertz) - VFD	Toothe Ster	(Hertz) - VFD	<u> </u>
SVE Blower Runtime (Hours)	13014.8 HM	AS Blower Runtime	744 71116 3
Transfer Pump Runtime	I JOITO HM	(Hours) - Sparge Blower	747 7149.3
(Hours) - MS Pump	2.7 HM	Sparge Heat Exchanger Runtime	7148,0 H
Sparge Zone 1 Time		Sparge Zone 4 Time	1.1010
Span(s) Operational:	1000-1530 HM	Span(s) Operational:	0500-1030 HI
Sparge Zone 2 Time		Sparge Zone 5 Time	
Span(s) Operational:	0000-0530 HM	Span(s) Operational:	1930 1900-0030 H
Sparge Zone 3 Time	1000 0000	Sparge Zone Active:	-
Span(s) Operational:	1500 -2000 HM		ZONEI
AS Blower Intake Pressure	1.0	SVE Blower Filter Differential	.5
(" H2O) - DPI-500 AS Blower Discharge Pressure	110	Pressure (" H20) - DPI-200	
(PSI) - PI-501	7,1	SVE Blower Inlet Differential Pressure (" H20) - <i>FI-200</i>	10
Sparge Heat Exchanger Discharge	Deel	Transfer Pump Discharge Pressure	6
Temp (°F) - <i>TI-500</i>	98°f	(PSI) - PI-300	
SVE Blower Inlet Temperature		SVE Blower Discharge Pressure	6
(°F) - <i>TI-200</i>	82°f	(" H ₂ O) - <i>PI-400</i>	O
SVE Blower Inlet Vacuum		SVE Blower Discharge Temperature	TOP
" H ₂ 0) - <i>VI-200</i>	74	(°F) - <i>TI-400</i>	Soof
Oxidizer System			
Dxidizer Inlet Differential Pressure " H2O) - <i>FI-1</i>	.40	Combustion Valve Position (%)	HA
Burner Chamber Temperature (°F)	695 HM	Process Blower Runtime (Hours)	19851 HM
Dutlet Temperature (°F)	630 M	Combustion Fan Runtime (Hours)	19851 HA
nlet Limit Controller Temperature °F)	701	Burner Runtime (Hours)	19840 HA
Outlet Limit Controller Temperature °F)	627 HM	Processing Vapors Runtime (Hours)	19825 HA
Process Fan Valve Position Open/Closed)	Open HMI	Panel Temperature (°F)	104 HM
Dilution Valve Position (%)	О	Flame Signal (Volts)	5.0
Combustion Valve Position (%)	14.5 HM		
Other Components			
nockout Tank Level	ting		674
Sightglass % Full) ¹ Vater Depth in Storage Tank		Propane Tank A Level (%)	0390
Vater Depth in Storage Tank DTF from MP/TD (calc); inches) ²	less than linch		1-1

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit

PSI = Pounds per Square Inch

% = Percent

DTF - Depth to Fluid

DTB - Depth to Bottom MP - Measuring Point TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. DTB of water tank from the MP is XX. Calculate the water depth

by subtracting DTF from DTB.



PORT OF SEATTLE - TERMINAL 30

					PC	ORT OF SEA	TTLE - TERM	VINAL 30					
0111						AS & SVE N	lanifold Re	adings					
Date:			•						Time:	1515			
Field Te	ch(s):	-							Equipmer	nt I.D. #:			
Ovidizor	Inlet VOC (nomu) RID	: 29,	3		Vapor C	oncentratio	ons					
	Discharge		·) PID: 2,	<u>,</u>									
		ree (ppini				S۱	/E Wells				· · · ·		
Well	Vacuum	Flow	Valve Pos.	Dewater			Well	Vacuun	Flow	Valve Pos.	Dewater		
ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Com	ments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)		nments
HSVE-2	28	69	100				SVE-10	52	20	100		Flort	bountry
HSVE-3	34	68)00	•			SVE-9	50	10	100			barnens
SVE-4	52	17	100				SVE-8	50	4	100		Floch	Stuk
SVE-5	42	1-20	100		Floet	stuck	SVE-6	70	10	100			Bornein
SVE-7	50	17	100				HSVE-1	14	74	2000			-
						A	S Wells						
						A							
Well ID	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)		Comment	e	Well ID	Pressure (PSIG)	E Flow (SCFMG)	Valve Pos.			_
	(, , , , , , , , , , , , , , , , , , ,	(00111107)	Zone 2		connicht	5	ID (PSIG) (SCFMG) (% Open) Comments Zone 4						
4S-7							AS-17						
AS-8							AS-18						
4S-9							AS-19	1					-
AS-10							AS-20					A	
AS-11							AS-21						
							AS-22						
			Zone 3							Zone 1			
AS-12					1997		AS-1	8.0	8.2	100			
\S-13							AS-2	7.0	1.4	100			
S-1 4							AS-3	7.0	8.2	100			
AS-15							AS-4	2.0	12,8	100			
S-16							AS-5	7.0	10.0	100 100 ³⁰			
-			Zone 5				AS-6	6.0	5,4	10			
S-23													
S-24													
10-24							Sec. 1						
S-25													
NS-25 NS-26 NS-27													

Abbreviations:

% = Percent

" H₂O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable ppmv = Parts per million volume SCFMG = Standard cubic feet per minute gauge

PSIG = Pounds per square inch gauge



INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

	nent ID 38726						
Des	cription MiniRA	E 3000					
Cal	ibrated 8/18/202	22 12:33:37PM					
	acturer Rae Sys			State Cert	ified		
	Number PGM73			St	tatus Pass		
	per/Lot 592-920	494		Tem	р°С 26		
	Number						
	ocation Seattle			Humidi	ty % 49		
Depa	artment						
		Calibra	tion Specifications				
	Group # 1		I	Range Acc	% 0.0000		
	oup Name VOC		Re	ading Acc	% 3.0000		
St	ated Accy Pct of	f Reading		Plus/Min	us 0.0		
<u>Nom In Val / In V</u>	al In Type	<u>Out Val</u>	Out Type	<u>Fnd As</u>	Lft As	Dev%	Pass/Fail
100.0 / 100.0	PPM	100.0	PPM	106.5	100.0	0.00%	Pass
	······		8 E 174	100.5			
lest instruments	Used During the	Calibration			<u>(As (</u>	Of Cal Ent	ry Date)
Test Standard ID	Description	Manufacturer	Model Number	<u>Serial Num</u> Lot Num			ext Cal Date
	Laboration (O4)	10) 100 41				ed Date	
SEA ISO 100 PPM	Isobutylene (C4I	H8) 100 Airgas	x02ai99cp342066		467314	6/	13/2026
	I" I" IVI			-1			
304-402467314-							

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

Project Nam		730	Leastic	Page _ of Port of Sect+/c
Project/Task	_		Location:	SUNNY 7806
Date:		09/02/2022	Personnel:	AC
Observation	-		-	
Time			Observation Descript	ion
1 145	55	Arme on-site, SUE IS	On upon	criel spase system
2		off spage to	clorm Rec	ads
3	1	" Sparge Blowe	V TAH" G	t 1448 on 08/31/22
4	18. M	Oscidizer is on	A 19/6/11/2/11	, ,
5 150	x	Reset sporge alorm,	Spage is b	ack online
6 150	s	Reset sporge alorm, Began taking readings	to allow .	Sparge System to
7		ham up		
8 13	32	All readings taken, besi	in taking	PID readings
9 13	346	PID readings take	1	V
10 /5	51	locking up and leav		
11		\backslash	0	
12				
13				
14				
15				
16				
17			4	C 09/2/22
18				, ,
19			<u> </u>	
20				
21				
22				
23	- 4.			
24				
25				
Comments /	Site Activ	ties / Personnel Tracking		

Date: 09/02/22	Field Tech(s): AC	ystem Data Collection Form	
Actual Time: 1455		2	
SVE/AS System	AS/SVE HMI Time: 143	2	
SVE Blower Speed			
(Hertz) - VFD	54	Sparge Blower Speed (Hertz) - VFD	52
SVE Blower Runtime (Hours)	13294.7	AS Blower Runtime (Hours) - Sparge Blower	7382.6
Transfer Pump Runtime (Hours) - MS Pump	2.7	Sparge Heat Exchanger Runtime (Hours)	7381.3
Sparge Zone 1 Time Span(s) Operational:	1500-2000	Sparge Zone 4 Time Span(s) Operational:	0500-1030
Sparge Zone 2 Time Span(s) Operational:	0007-0530	Sparge Zone 5 Time Span(s) Operational:	1930-0020
Sparge Zone 3 Time Span(s) Operational:	1000-1530	Sparge Zone Active:	3
AS Blower Intake Pressure (" H2O) - DPI-500	1,0	SVE Blower Filter Differential Pressure (" H20) - DPI-200	1,0
AS Blower Discharge Pressure (PSI) - PI-501	7,5	SVE Blower Inlet Differential Pressure ("H20) - <i>FI-200</i>	1.5
Sparge Heat Exchanger Discharge Temp (°F) - <i>TI-500</i>	76°f	Transfer Pump Discharge Pressure (PSI) - PI-300	\bigcirc
SVE Blower Inlet Temperature (°F) - <i>TI-200</i>	82°F	SVE Blower Discharge Pressure (" H ₂ O) - <i>PI-400</i>	0
SVE Blower Inlet Vacuum (" H ₂ 0) - <i>VI-200</i>	72	SVE Blower Discharge Temperature (°F) - TI-400	116°F
Oxidizer System			1161
Dxidizer Inlet Differential Pressure " H2O) - FI-1	.40	Combustion Valve Position (%)	
Burner Chamber Temperature (°F)	661	Process Blower Runtime (Hours)	20132
Dutlet Temperature (°F)	631	Combustion Fan Runtime (Hours)	20132
nlet Limit Controller Temperature °F)	669	Burner Runtime (Hours)	20121
Dutlet Limit Controller Temperature F)	634	Processing Vapors Runtime (Hours)	20106
rocess Fan Valve Position Open/Closed)	Open	Panel Temperature (°F)	97°£
Vilution Valve Position (%)	0	Flame Signal (Volts)	5.0
ombustion Valve Position (%)	11.3		
ther Components			
nockout Tank Level ightglass % Full) ¹	Empty	Propane Tank A Level (%)	55
/ater Depth in Storage Tank DTF from MP/TD (calc); inches) ²			55 50
OTES:	1235 4690 11K	Propane Tank B Level (%)	50

PORT OF SEATTLE - TERMINAL 30

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit

DTF - Depth to Fluid

- PSI = Pounds per Square Inch % = Percent
- DTB Depth to Bottom MP - Measuring Point
- TD Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. DTB of water tank from the MP is XX. Calculate the water depth

by subtracting DTF from DTB.

AECOM

Page 1 of 3

Date:	0	9/02/	22			Manifold Re		Time:	1455		
Field To	ech(s):	<u>/4C</u>			Vanor	Concentrati		Equipme	nt I.D. #:	24193	
	r Inlet VOC		: 12.0	2	vapor	concentrati	ons				
Oxidize	r Discharge	VOC (ppm	v) PID: 2	.8							
Well	Vacuum	Flow	Valve Pos	Dewater	S	VE Wells Well	Vacuum	Flow	Valve Pos	Dente	1000
ID	("H2O)	(SCFMG)		(Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	Dewater (Gal)	Comments
HSVE-2	30	10	100			SVE-10	48	18	100		
HSVE-3	36	68	106			SVE-9	44	8	100		
SVE-4	SO	16	100			SVE-8	50	10	100		
SVE-5	42	14	100		Float bislan	SVE-6	64	12	100		
SVE-7	46	18	100			HSVE-1	12	72	15		
Well ID	Pressure (PSIG)	Flow (SCFMG)	Valve Pos (% Open)			Well	Pressure (PSIG)		Valve Pos.		C
Well	Pressure	Flow	Valve Pos		A	S Wells Well	Pressure	Flow	Valve Poc		
ID	(PSIG)	(SCFMG)	(% Open) Zone 2		Comments	ID	(PSIG)	(SCFMG)	(% Open)		Comments
45-7			Lone 2			AS-17			Zone 4		
\S-8						AS-17					
5-9											
S-10						AS-19					
5-11						AS-20				·	· · · · · · · · · · · · · · · · · · ·
		1.47				AS-21					
			Zone 3			AS-22			Zone 1		
S-12	7.5	1.4	100			AS-1			201101		
5-13	7,5	4.8	100			AS-2					
S-14		3.6	100			AS-3					
S-15	7.0	2.4	100			AS-4					
S-16		3.8				AS-5					
			Zone 5			AS-6					
					·	3	118618				
5-23											
5-23 5-24 5-25											
5-24											
5-24 5-25					-						

Abbreviations:

% = Percent

" H₂O = Inches of water

ppmv = Parts per million volume PSIG = Pounds per square inch gauge

N/A = Not applicable

SCFMG = Standard cubic feet per minute gauge



deg F - degrees Fahrenheit

Page 2 of 3

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

11669 Lilburn Park Rd. St. Louis, MO 63146 Office: 314.344.1079

Pine Environmental Services, Inc.

Desc	-	24193 MiniRAE 3000 8/30/2022 8:18						
Model N Serial Numb	umber	Rae Systems MiniRAE 3000 592-910774				rtified Status Pass mp °C 27		
L		St. Louis			Humic	lity % 41		
	ated Aco <u>al</u>	# 1 ne Isobutylene cy Pct of Readin <u>In Type</u> PPM		tion Specification R <u>Out Type</u> PPM	Range Ac Reading Ac	cc % 0.0000 cc % 3.0000 inus 0.0 Lft As 100.1	<u>Dev%</u> 0.10%	Pass/Fail
Test Instruments		aring the Calibr		Model Number		(As O Number / Imber Last C	<u>f Cal Ent</u> <u>N</u> Cal Date/ E	Pass ry Date) ext Cal Date / xpiration Date
SEA ISO 100PPM 304-402206886- 1	Isobutyl PPM	ene (C4H8) 100	Airgas	x02ai99cp34200	56 304-4(-1	<u>Opene</u>)2206886	<u>d Date</u> 9/	16/2025

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

INSTRUMENT QC/ PACKING LIST

Description	RAE Systems MiniRAE 3000				
Instrument ID	24193				
Lamp Voltage	☐ 10.6 eV □ 11.7 eV □ 9.8 eV				
Date Calibrated	8130				



www.pine-environmental.com

Standard Items	Prepared	QC check	Received by customer	Returned to Pine
MiniRAE 3000 with carry case	<u> </u>			
Rechargeable battery (installed)				
Protective rubber boot			2 <u></u>	
Manual			N	
Quick reference card	6			
Probe tip	/			
Charger/ adapter, or charger and cradle	/		8	
(2) Hydrophobic filters				
Alkaline adapter with (4) AA alkaline batteries installed				
ProCal calibration sheet				
Supporting Items				
100 ppm isobutylene calibration gas				
Gas regulator				
Fedlar bag				
Datalogging software				
Communications cable				
100 ppm Isobutylene SDS				
✓ Must match cylinder with setup				
SDS provided upon request				
Spare alkaline battery pack				
Alkaline AA batteries				

Prepared by: QC checked by: Date:



This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

Proj	ect Informatio	Page 1 of 7
Proje	ect Name:	T-20 Location: Seattle
Proje	ct/Task No.:	Weather: 65 clores
Date		<u>9/14/22</u> Personnel: <u>GF, AC, CB</u>
Obse	ervations	
	Time	Observation Description
	2900	Ongite, melt in parking lot. Drik 2 cers in
2		Safety failgate nelting
3		Scope: winteld, otm
4		3a vapor Sumples
5		System aptimizations: Sui dewater pilot: gauge replacements
6		As per test holding tank M measurement, 23
7		bregkthrs testing
8	1000	AC takes down wireldly highlim readings
9		· 24 active. Low AS Flows, 1-2 Schma per well. This
10		is consistent of past date
11		· Low influent PID - 4 ppm
12		·GF+ CB discuss As aptimization. >2 Schme ideal, but
13		happy if a well is getting an air. 24 was previously
14		happy if a ciell is getting an air. 24 was previously adjusted to allieve this of will be left as-is.
15	1100	Set up Summas to take vapor Samples (7015 & MAN)
16		Julet-09(472 @ 11:25
17		Discharge-09/422 @ 11:25
18		All cood u/ initial of final pressues (30/5)
19	1130	Inspect 74 pressure ganges for pressure frap after
20		Inspect 74 pressure gauges for pressure frap after Inse Anut-down (23 now active). +1-1 psi
21		- No clock values too all wells in the zone should accepted
22		equilibra H to the same pressure. AS-17 and AS-19
23		were not matching the others and were replaced.
24		- 22 still had pressure from before 24. AS-9 pressure gauge did not match the others and was replaced.
25		gauge did not match the others and was replaced.
Comn	nents / Site Acti	vities / Personnel Tracking

roject Name:	Page <u>7 of 7</u> T-36 Location:
oject/Task No.:	Location: Weather:
ate:	9/14/22 Personnel: CHF. AC CB
bservations	
Time	Observation Description
1 1220	23 break thru pressures
2	hell Frit Init Bother Final to Comments f
3	ID Place Pressure Flow open
4	AS-12 1.7 7.5 7.0 2.2 100 didn't want to take ai
5	-13 5.2 7.5 6.5 2.5 10 quol
6	-14 3.2 6.0 525 3.0 10 God
7	-15 2.0 8.0 7.0 2.9 10 god
8	-16 4.2 7.5 6.75 3.3 10 good
9	
1245	·Clecked pressure gauges in the other zones KIH AC-14
11	- Tore 3: All gauges reading NBPSI high, tore reptices 200 M
2	- Zarel: AS-4 reading low & replaced
3	- Zore 5: AG-27 replaced
4	· SVE-6 voc gauge replaced
5	· Remaining gauge Stock:
6	- 5 = d-100 in the vac gauges
7	- O ver 0-30 PGI preshive gauges
8	32 used, one reads 1/2 psi high the other I psi high
, x *	order more of nege! But make hern 0-15.
0	· Investigated the AS pressure relief raive. It has been
1	working pe Whole time, but different than what we're see
2	to Doesn't pop + gut anything down, it ist blelds off
3	air at increasing flows as pressure increases. It was
	have to tell at what point it started venting but somewhere
4	DALSES and Unileder is dealer the
5	in the 8-9 psi range. However, it does not vent

Project Information	n			Page <u>3</u> of <u>7</u>
Project Name:	7-20	Location:		-
Project/Task No.:	1	Weather:		
Date:	9/14/22	Personnel:	GFAC CB	

Observations

Time	Observation Description
1	enough to keep the compressor pressure at 8-9 psi.
2	We tard Switched to Zare 4, which has the highest
3	back pressure of the zores (Note this used to be
4	called zore 2 on the HMI) In 24 and with the
5	
	bled value shut to zero pe PRU vept the compressor
6	pressure to my 11.5 psi. This is in excess of the man
7	design pressure, but the 24 manifold pressures were
8	all at or below 10 psi, which was previously
9	determined to be acceptable. Conclusion: we can keep
0	the theed value closed and the privil heep us
1	within and design parameters
2	- Then we switched zones buck to 23 under these
3	conditions, total 23 flows doubled (155 sching to
4	Ulosofma) (4.6-10.2 Some mage). We should
5	Sel much better Mowrates across the board like
6	this as the privill only vent as needed
7	· Child -> Total Plow in Zael in trese conditions: 47.7 5
8	Baseline not recorded. Last zone I data in the
9	
1530	Spreadsleet equaller Note sching total. SVE inspection 46
1	> observed that the dilution value was apen. (B remembered
2	O d a set a set la construction of
	We closed it down and were able to maintain the
3	
; * *	prior flows by reducing the UFD from 504 to 42 Hz.
5 **	>CB recommends calcing the every snungs via HP reduction.

Project Information		a de la companya de l	Page <u>U</u> of <u></u>
Project Name:	7-30	Location:	
Project/Task No.:		Weather:	
Date:	9/14/22	Personnel:	GF, AC, CB

Observations

Time	Observation Description
1	· Zore transition on AS occurred up zonel joining Zane 3
2	for the 30-min overlap before zone 3 shuts down. The
3	AS blacks Shut down due to a VED fault shorth
4	hereafter, which it did parlier in the day when zone 1
5	was activated too. Neither time did it regult in an
6	MMZ alarm. The fault was a motor high temp
7	both times, and was resolved by clearing it on the
8	VED at toggling the blower to OFF and back to
9	AUTO. No clear indication of why this happened.
10	with multiple zores open total bulk pressure Should fre
11	decreased & reduced Strain on the motor.
12	I while inspective the VFDs in the cabinet we noticed
13	Mere are two standalore ventilation fans, one of which
14	(the bottom are) was not connected to power when
15	the reconnected the power card hanging rest to it, it
16	immediately kicked on. This is how we left it.
17	rodd note: No vents to atmosphere in the cabinet.
18	No circulation of outside air - just the warm that
19	air inside the cabinet.
20	· SVE dematering:
21	-we tried a lot of things & results where a bit inconclusive.
22	SVE-6, ~ and -5 all had significant water in
23	the rotaneters. We draited them via the dead less with
24	a peripump and then stuck tobay down the stob-y
25	and drained those as well. About 4 gallons total

Project Information				Page <u>5</u> of
Project Name:	7-30	Location:		
Project/Task No.:		Weather:		
Date:	9/14/22	Personnel:	GF, AC, CB	

Observations

Time	Observation Description
1	were recovered in this way, which was less than antizing
2	- The rotaneter floats seen to trop water in the
3	rotaneters, retaining it even after everything else
4	Los pumped, even it the system on our
5	Solution was to block the end of the air tubing to
6	increase vacuum and enable the System to such
7	the water up out the top of the rotaneter. ance
8	this was done at all 3, water did not return
9	for the rest of the gite visit.
0	- CB installed a 1/4 - in hose barb for 3/8" babing at
1	the base of SVE -8. It worked well for draining the
2	deadley and was more accessible than the preexisting
3	tubing behind the manifold
4	- Disconnective the air base compacts to clear out the
5	rotometer water is a pain. Recommend a pilot
6	test to after the manifold assembly Replace the 4-in
7	Sch 80 PVE cap at the top of the deadler with a
8	4×2" bushing, a close nipple and a 2" bell value.
9	This pawould be a much more accessible way to
0	increase the vacuum, and could also act as an
1	access point for dematering (Shick tubing down into
2	the dendley
3	- The more gave air hose in the coner matches what
4	- The anti-spare air hose in the conex matches what is in use. Two rolls of 15? ft each with a male d
5	female cambook fitting attacked. The ones in use
omments / Site Ad	ctivities / Personnel Tracking

Sch 80 prc: Hra" bushing a" close night a" ball value

Project Information	1			Page <u>6</u> of <u>7</u>
Project Name:	7-30	Location:		
Project/Task No.:		Weather:		
Date:	9/14/22	Personnel:	GF, AC, CB	

Observations

Time	Observation Description
1	have fimale fittings on both ends, so the new ones
2	pould reld retrofitting. CB said in his experience
3	hot water works best to soften the hose. The
4	cambook fitting in use could be reused.
5	ARecommendation is to replace one of the hoses
6	on the wells affected by water as a pilot test.
7	Drape it over a barrier (Sawhorge? Cincor block?)
8	to ovoid low point. See if this is effective at
9	preventing water accumulation in the manifold.
10	alleck if we can do this or MM has to.
11	- For vapor sampling can we buy a vacuum pump like
12	he ait are to keep onsite? If the rotemeters are
13	deccrity try lext visit we can try monitoring upper
14	levels at the manifold for each well.
15	- We really need replacement internal parts for the
16	SVE rotaneters Bropably for 7 of them GIF
17	to follow up with marina.
18	· VOT Sightglass scrubbed out. Full of very dirty Water
19	that we drained where pump menually into the holding
20	fon K. Tested the flogt to make Swe it shut the
21	System down, which it did.
22	· Holding tank depth measured from the inner "pot
23	the in to the bottom as: 6.92 ft
24	J both flogts triggered successfully to test alorn
25	functionality. All looked good
Comments / Site A	Activities / Personnel Tracking

Comments / Site Activities / Personnel Tracking

Proj	ect Information	Page 7 of	2
Proje	et Name;	1-30 Location;	
Proje	ct/Task No.:	Weather:	
Date		9/14/22 Personnel: GFAC, CB	
Obse	rvations		
	Time	Observation Description	
1	1745	All tapks complete for the day. Clean up site. Lock	_
2	×	Cabirets conex & Gustern gate. All 3 Sustems	
3		white smoothly on departure.	
4	1815	All tables complete for the day. Clean up site. Lock Cabirets, conex, & Gystem gate. All 3 Systems running smoothly on deporture. All steff offsite	_
5			_
6			_
7			-
			-
8			-
9			-
10			
11			-
12			
13		/	_
_14		/	
15		/	_
16		/	_
17			_
18		GE	_
19		9/14/02	~
20			
_21			
22			
23			_
24			_
25			-1
رے			

Comments / Site Activities / Personnel Tracking

Project Name: T-30 Location: Port of Seattic Project/Task No: O9/14/22 Personnet: AC, GF, CB Observations Time O9/14/22 Personnet: AC, GF, CB Observations Time Observation Description 1 0935 Arrive on site Scope of work is Normel System O and M 2 plus additional maint, items to optimize system 3 0942 Performal safety tailsote 4 0955 Tarlsote Complete 5 D955 Tarlsote Complete 6 1025 All readings system veadings 6 1025 All readings taken, began taking PJ, D readings 7 1039 Readings taken, began taking to PL, D readings 8 1050 Switching stape to performing additionel maintenance 9 On system with CF, CB and myself 10 1100 Bogan schling up for voper Sampling of Intel and 11 Sei discharge Vac sampling paints 12 1143 All Sampling complete very sampling taken at infield 14 Infield Vaccum of Cennistas, 15 Intel - 30 in Hz 16 Discharze - 29 in Hz 17 Finel receding 18 I tritet - 5 in Hz 19 120 Began adving additional Maintenance to As/SUE Systems 21 /805 All maintenance complete, learny site	Project Informatio	n Page of
Projectitask Na: <u>09/14/22</u> Veather: <u>AC, GF, CB</u> Differentiations <u>Otherrations</u> <u>Otherration Description</u> <u>1</u> 0935 Arrive on Site Scope of work is Normel System Oard M <u>2</u> plus additional maint, items to optimize system <u>3</u> 0942 Preformed Safety trailgate <u>4</u> 07550 Trailsafe Complete <u>5</u> 0757 Besch taking System veadings <u>6</u> 1025 All readings taken, besch taking PILD readings <u>7</u> 1039 Readings taken, besch taking PILD readings <u>7</u> 1039 Readings taken, besch taking taken <u>8</u> 1050 Switching Scope to performing additional maintenance <u>9</u> Orn System with CF, CB and myself <u>10</u> Bogan schling up for upper Sampling of Inled and <u>11</u> Serialized complete, vepu somples taken at infled <u>12</u> 1143 All sampling complete vepu somples taken <u>13</u> frine Of 1125 and finished at 1131 <u>14</u> Inflip Vaccum of Committees, <u>15</u> Inlet - 30 in Hz <u>16</u> Discharge 5 in Hz <u>17</u> Final reading <u>18</u> I filet - 5 in Hz <u>19</u> 1266 Besan dains additional Maintenance for As/SUG Systems <u>21</u> /806 All maintenance complete, learing site <u>21</u> /806 All maintenance complete, learing site	Project Name:	T-36 Location: Port of Seattle
Observation Description Imme Observation Description 1 0935 Arrive on site Scope of work is Normal System O and M 2 plus additional maint, items to aptimize system 3 0942 Pubarned safety tailgate 4 0935 Tarlsate Complete 5 0954 Bescin taking system vectings 6 1025 All readings taken, bescin taking PID readings 7 1039 Readings taken, bescin taking PID readings 8 1030 Switchings scope to performing additional maintenance 9 On System with EF, CB and myself 10 100 Began setting up to vopor Sampling of Inlet and 11 Sindiching complete veps sampling taken 12 1143 Sampling complete veps sampling taken 13 Jaime Of Ills and finished at IISI 14 Initial Sampling 15 Inlet - 30 in Hg 16 Discharge S in Hg 17 Finel receling 18 Inlet - S in Hg 19 Discharge S in Hg 20 1206 Began doing additionel Maintenance to As/Sub	Project/Task No.:	
Time Observation Description 1 0935 Arrive on Site Scope of work is Normal System O and M 2 plus additional maint, itens to optimize System 3 0942 Pedformed Safety tailgate 4 0950 Tartgate Complete 5 0950 Tartgate Complete 6 1025 All readings System vecdings 6 1025 All readings taken, began taking P-I.D readings 7 1038 Readings taken, began taking P-I.D readings 8 1025 All readings taken, began taking P-I.D readings 9 On System with GF, CB and myset 10 Bagan setting up for vapor sampling of Intel and 11 Strington of Connitaes, 12 1143 1100 Bagan setting complete vapor sampling of Intel and 11 Strington of Connitaes, 12 1143 118 Intribut Vaccum of Connitaes, 12 Intel - 30 in Hg 13 Intel - 5 in Hg 14 Intel - 5 in Hg 15 Intel - 5 in Hg 16 Discharge S in Hg	Date:	<u>09/14/22</u> Personnel: <u>AC, GF, CB</u>
1 0935 Arrive on site Scope of work is Normal system O and M 2 plus additional maint, items to optimize system 3 0942 Pedournal safety tailgate 4 0550 Tarlsate Complete 5 0954 Bescin taking system veadings 6 1025 All readings taken, beson taking P-I.D readings 7 1039 Readings taken, beson taking to readings 8 1050 Suntachings complete, All system readings taken 9 On system with EF, CB and myself 10 100 Bosan sething up for vapor sampling of taken and 11 Stridisching up for vapor sampling of taken at influe 12 1143 All sampling complete vapor sampling of taken at influe 13 time of 112s and finished at 1131 14 Influe Vaccum of Connitaes, 15 Inlet - 30 in Hg 16 Discharge 5 in Hg 20 106 Besan dains additional Maintenance to As/sub Systems 21 106 22 106 23 All maintenance complete, learing site	Observations	
2 plus additional maint, items to optimize system 3 0942 Putomikel safety tailgate 4 0950 Tatisate complete 5 0954 Bessen taking system veadings 6 1025 All readings taken, beson takins PI.D readings 7 1039 Readings taken, beson takins PI.D readings 8 1020 Switching scape to performing additional maintenance 9 On system with EF, CB and myself 10 Bogan setting up for vapor sampting of Inlet and 11 See dischage var sampling paints 12 1143 118 Sampling complete vapor sampling of Inlet and 119 Fine of 1125 and finished at 1131 12 Indicting a finished at 1131 14 Inscharge - 29 in Hg 15 Inlet - 30 in Hg 16 Discharge - 5 in Hg 17 Finel reading additionel Maintenance to As/sus Systems 20 1206 21/806 All maintenance complete, learing site 22 All 23 All		Observation Description
3 0942 Public new safety tailacte 4 0950 Tarlsate Complete 5 0954 Bessen taking system veadings 6 1025 All readings taken, besan taking P.J.D readings 7 1039 Readings taken, besan taking P.J.D readings 7 1039 Readings complete, All system readings taken 8 1050 Switching scope to performing additional mointenance 9 On system with GF, CB and myself 10 Began setting up for vapor sampling of Inlet and 11 Switchage vac sampling points 12 1143 All sampling complete vapor sampling to Inlet and 11 Switchage vac sampling points 12 1143 All sampling complete vapor sampling to Inlet and 11 Sampling complete vapor sampling to Inlet and 12 III43 All sampling complete vapor sampling to Inlet and 13 fine of II25 and finished at II31 14 Inritic Vaccum of connitras, 15 Inlet - 30 in H5 16 Discharge 5 in H5 17 Finel reading additionel Maintenance to As/sub Systems 18 Inlet -	1 0935	
3 0942 Public new safety tailacte 4 0950 Tarlsate Complete 5 0954 Bessen taking system veadings 6 1025 All readings taken, besan taking P.J.D readings 7 1039 Readings taken, besan taking P.J.D readings 7 1039 Readings complete, All system readings taken 8 1050 Switching scope to performing additional mointenance 9 On system with GF, CB and myself 10 Began setting up for vapor sampling of Inlet and 11 Switchage vac sampling points 12 1143 All sampling complete vapor sampling to Inlet and 11 Switchage vac sampling points 12 1143 All sampling complete vapor sampling to Inlet and 11 Sampling complete vapor sampling to Inlet and 12 III43 All sampling complete vapor sampling to Inlet and 13 fine of II25 and finished at II31 14 Inritic Vaccum of connitras, 15 Inlet - 30 in H5 16 Discharge 5 in H5 17 Finel reading additionel Maintenance to As/sub Systems 18 Inlet -	2	plus additional maint. items to optimize system
s Disy Bescin taking system vectings 6 1025 All readings taken, began taking PID readings 7 1039 Readings taken, began taking PID readings 8 1050 Switching scope to performing additional maintenance 9 On system with CF, CB and myself 10 1100 Began setting up for very sampling of Inlet and 11 Set dischage Vac sampling points 12 1143 All sampling complete very samples taken at initial 13 fime of 1125 and finished at 1131 14 Initial Vaccum of Cannitas, 15 Inlet - 30 in Hg 16 Discharge 5 in Hg 19 Discharge 5 in Hg 20 1206 Began doing additional Maintenance to As/sup Systems 21 18076 All maintenance complete, leaving site 22 All	3 0942	
s Disy Bescin taking system vectings 6 1025 All readings taken, began taking PID readings 7 1039 Readings taken, began taking PID readings 8 1050 Switching scope to performing additional maintenance 9 On system with CF, CB and myself 10 1100 Began setting up for very sampling of Inlet and 11 Set dischage Vac sampling points 12 1143 All sampling complete very samples taken at initial 13 fime of 1125 and finished at 1131 14 Initial Vaccum of Cannitas, 15 Inlet - 30 in Hg 16 Discharge 5 in Hg 19 Discharge 5 in Hg 20 1206 Began doing additional Maintenance to As/sup Systems 21 18076 All maintenance complete, leaving site 22 All	4 0950	Tarlsate Complete
6 1025 All readings taken, besan takins P.J.D readings 7 1039 Readings complete, All system readings taken 8 1050 Switching scape to performing additional maintenance 9 On system with CF, CB and myself 10 1100 Bogan setting up for vapor sampling of Inlet and 11 Stricting complete verse sampling points 12 1143 All sampling complete verse samples taken at influe 13 fine of 1125 and finished at 1131 14 Influe Influe 15 Inlet - 30 in Hg 16 Discharge - 29 in Hg 17 Finel reading 18 Inlet - 5 in Hg 20 1206 8 Inlet - 5 in Hg 20 1206 8 Inlet - 5 in Hg 21 18 22 All maintenance complete, learing site 23 All	5 D954	
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15 Inlet - 30 in Hg 16 Discharge - 29 in Hg 17 Finel reading 18 Inlet - 5 in Hg 19 Discharge 5 in Hg 20 1206 Began doing additional Maintenance to As/sup Systems 21 1806 22 AC	14	
16 Discharge - 29 in Hg 17 Finel reading 18 Inlet - 5 in Hg 19 Discharge 5 in Hg 20 1206 Besan abing additional Maintenance to As/SUE Systems 21 1806 22 All maintenance complete, learing site	15	
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18 Initet - 5 in Hg 19 Discharge 5 in Hg 20 1206 21 1806 21 1806 22 All maintenance complete, learing site	17	
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20 1206 Besan doins additional Maintenance to As/SUE Systems 21 1806 All maintenance complete, learing site 22 23 All Maintenance Complete, learing site	19	
21 1806 All maintenance complete, learing site 22 23 AC	20 / 206	Began doing additional Maintenance to AS/SUE Systems
22 23 AC	21 1806	All maintenance complete, learing site
	22	
24	23	AC
	24	
25	25	

Comments / Site Activities / Personnel Tracking



T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: 9/14/2	Field Personnel: GFACCR
Weather: 65 doud	
Weather: 65 doub Sample ID: $I_n e + -0914$	72 (INLET/DISCHARGE-mmddyy)
Sample Port Description: De.	signed oridizer inlet upper part
	0 8

Conditions at Sample Port:

•••••••	The second secon		
Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)
0	112°f	4,5	13567.8

Before Sampling:

	Yes or No (Y/N)
Install clean tubing on the sample port	Y
Purge the tubing (30-60 seconds)	Y

Summa Can Leak Test¹:

Initial Canister	Duration of	Final Canister
Reading	Test (2 min	Reading
(in-Hg)	recommended)	(in-Hg)
30	2 mip	30

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

All good

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³
3230	204	1L	30	Samp	le Start 9/14 /22	5
6				Sampl	e End	
Analyses Requested:		l		/131	9/14/22	

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

AECOM

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: <u>9/14/22</u>	Field Personnel: AC, GF, CB
Weather: 65 cloudy	Weather Barometric Pressure (in Hg): <u>30</u>
Sample ID: Discharge 09	1422 (INLET/DISCHARGE-mmddyy)
Sample Port Description:	licated Oxidizer discharge vapor port

Conditions at Sample Port:

Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)
0	NIA	0.5	13567.8

Before Sampling:

	Yes or No (Y/N)
Install clean tubing on the	V
sample port	
Purge the tubing (30-60	V
seconds)	1

Summa Can Leak Test¹:

Initial Canister	Duration of	Final Canister
Reading	Test (2 min	Reading
(in-Hg)	recommended)	(in-Hg)
29,25	2 min	29.25

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

All good

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³
		-		Samp	ole Start	
3540	206	11	29,25	1125	9/14/22	2
				Samp	le End	
Analyses Requested: TO-	15 BTEX	N, AI	0H	1131	9/14/22	

² The flow controller should be for a 4-5 minute integrated sample

³Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

				SAMPL	SAMPLE CHAIN OF CUSTODY	N OF	CUST	DY							
Report To Raul Kalina	ואס			SAMPI	SAMPLEBS (signature)	ature)							Page # TURN	AROIIND	of /
Company AECOM				PROJE	Er NAME	& ADD	RESS			P0 #			Standard	q	
Address 1111 3vd Ave Suite 1600	Sur	e 1600		7-30		OF S	Port of South					n an	b char	u RUSh charges authorized by:	ted by:
City, State, ZIP Scattle, WA 98/01	W/M	68/01		NOTES:					NI	INVOICE TO	TO	8	SAN efault:(SAMPLE DISPOSAI	DSAL ing
Phone 206-438-2700 Email Poul. Kolina (C) accor, Con	mail Po	ul.Kglinalo) מננסאי כ	×.						-		9 H	inal rep old (Fe	final report delivery [Hold (Fee may apply):	
SAMPLE INFORMATION							-			ANALYSIS REQUESTED	VSIS R	EQUE	STED		
				.(-	XE		
•• *:				Reporting Laval								Hd	uny		
19 1	Lab	Canister	Flow Cont.	IA=Indoor Air SG=Soil Gas	Date	Initial Vac.	Field Initial	Final Vac.	Field Final	E GIOI	TOI5		SIQ PH		M
Sample Name	8	Ð	Ð	(Circle One)	Sampled	("Hg)		("Hg)	Time	<u>ل</u>			-		Notes
Inlet - 09/4 22	'	3230	204	IA / SG	22/11/5	Я	1125	S	1131	191	3.5	×	×		
Discharge - 091422		3540	206	IA /(SG)	51/4/25	29,25	1125	S	1131		à	\times	X		-
		-		IA / SG				•							
		1		IA / SG	r										
				IA / SG							-				
				IA / SG	-					-			-1		
				IA / SG											
				IA / SG					16					1	
-									. . .						
Friedman & Bruya, Inc.		SIC	SIGNATURE	G		PRIN	PRINT NAME		Ì		COMPANY	ANY		DATE	TIME
3012 16th Avenue West	hunay	by:	Dr.C	•	Gue		Friedman	5		41	AECON	5	-	9/19122	13-21
Seattle, WA 98119-2029	Received by:		hud		AN	Ť	PHAN	ζ		Ц	F3 8			12/14/10	12:21
Ph. (206) 285-8282	Reling	Relinquished by:													
Fax (206) 283-5044	Received by:	ed by:							-				+		

SAMPLE CHAIN OF CUSTODY

Fax (206) 283-5044 FORMSVCOCVCOCTO-15.DOC

T-30 Optimization Task List

- Pilot test of SVE dewatering
 - Tap new hole in front of deadleg & move/build a new valve assembly there
 - Pump out deadleg and hose/pipe & observe recharge time
 - Determine potential to alleviate water issue by elevating SVE hoses
- Determine if anything new is needed to begin SVE header vapor monitoring
- Mechanical pressure relief valve test
- Measure from holding tank MP to bottom of tank for incorporation into field form
- Conduct breakthrough pressure testing on active zone (should be Zone 3 (10:00-3:30))
 - Maybe adjust Zone 3 to come on earlier in the day to ensure that it's at equilibrium when we arrive?
- Install whatever valves/gauges we can from what Marina has ordered
 - SVE-6 pressure gauge is the faulty one still
 - o Replace SVE influent magnehelic with a lower scale gauge?
 - Don't change the other two. The changeout threshold for Solberg filters is 15 " H2O. MM is supposed to take care of this.
 - OMM Manual Table 13 (pg 71)

	Moistu	ire Separator
As Needed. Recommended to check monthly during blower oil changes.	Clean/Replace demister.	When differential pressure across the filter exceeds 15" of water.
	Clean sump, site glass, pump down switch.	As needed, depending on water quality. Recommend initial inspection after 6 months.

- •
- Solberg section of O&M manual (Appendix D pg 61)

Section D

MAINTENANCE RECOMMENDATIONS

- Pressure drop readings are recommended to have an effective air filter. Always document initial pressure drop during start-up when element is clean. Replacement cartridge is needed when system experiences 10" to 15" / 250-380mm H₂O higher pressure drop above the initial reading. Refer to page 4 for instructions.
- Remove "zone cheat sheet" list from the cabinet door
- •

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

-	 15961 MiniRae 3000 9/13/2022 12:0 	93:33PM					
	Rae Systems	Aless .	 	State Certifi		100	
Model Number Serial Number/ Lo			us Pass				
Serial Number/ Lo				Temp	U 24		
Location				Humidity	% 46		
Department	t			•			
		Calibra	tion Specifications				
Group # 1				Range Acc %			
Group Na	R	eading Acc %					
	ccy Pct of Readi	ng		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	<u>Pass/Fail</u>
100.00 / 100.00	PPM	100.00	PPM	100.20	100.00	0.00%	Pass
Test Instruments Used E	Ouring the Calib	ration	· · · · · · · · · · · · · · · · · · ·		<u>(As</u>	Of Cal Ent	ry Date)
Test Standard ID Descrip	ption	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Num</u> Lot Numbe	r Las		<u>ext Cal Date /</u> xpiration Date
PPM PPM	ylene (C4H8) 10) Airgas	x02ai99cp34206	6 302-40244 -1			28/2026
302-402445936- 1							

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com PORT OF SEATTLE - TERMINAL 30

Date: 09/14/22		System Data Collection Form	
	1	EF, CB	
Actual Time: 0954	AS/SVE HMI Time: 09	32'	
SVE/AS System	·		
SVE Blower Speed Hertz) - <i>VFD</i>	54.0	Sparge Blower Speed	500
SVE Blower Runtime	51.0	(Hertz) - VFD AS Blower Runtime	52.0
Hours)	13567.8	(Hours) - Sparge Blower	7657.0
ransfer Pump Runtime		Sparge Heat Exchanger Runtime	
Hours) - MS Pump	2.7	(Hours)	7655.5
parge Zone 1 Time pan(s) Operational:	1500-2000	Sparge Zone 4 Time Span(s) Operational:	0500-1020
parge Zone 2 Time	1000 2000	Sparge Zone 5 Time	0500-1030
pan(s) Operational:	0000-0530	Span(s) Operational:	1930-0030
Sparge Zone 3 Time Span(s) Operational:	1000-1530	Sparge Zone Active:	Zone 4
AS Blower Intake Pressure " H2O) - <i>DPI-500</i>	1.0	SVE Blower Filter Differential	25
AS Blower Discharge Pressure		Pressure (" H20) - DPI-200 SVE Blower Inlet Differential	0, 3
PSI) - PI-501	8.5	Pressure (" H20) - FI-200	1.5
parge Heat Exchanger Discharge		Transfer Pump Discharge Pressure	6
emp (°F) - 71-500	90°f	(PSI) - <i>PI-300</i>	
VE Blower Inlet Temperature ² F) - <i>TI-200</i>	84°f	SVE Blower Discharge Pressure ("H ₂ O) - PI-400	0
VE Blower Inlet Vacuum " H ₂ 0) - <i>VI-200</i>	72	SVE Blower Discharge Temperature (°F) - TI-400	114°f
Oxidizer System			1 1 1 1
Dxidizer Inlet Differential Pressure ' H2O) - FI-1	. 40	Combustion Valve Position (%)	9.2%
urner Chamber Temperature (°F)	6640 f	Process Blower Runtime (Hours)	-
utlet Temperature (°F)	635°f	Combustion Fan Runtime (Hours)	20406
let Limit Controller Temperature			20407
F)	702°f	Burner Runtime (Hours)	20396
utlet Limit Controller Temperature F) .	625° f	Processing Vapors Runtime (Hours)	20381
rocess Fan Valve Position Open/Closed)	Open	Panel Temperature (°F)	88°F
ilution Valve Position (%)	0%	Flame Signal (Volts)	5.0
ombustion Valve Position (%)	9.20%		
her Components			
ockout Tank Level ghtglass % Full) ¹	00%	Propane Tank A Level (%)	6000
ater Depth in Storage Tank	24 6,68	Construction (10)	Sc 1/
TF from MP/TD (calc); inches) ²	,24	Propane Tank B Level (%)	5506

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit

PSI = Pounds per Square Inch % = Percent DTF - Depth to Fluid DTB - Depth to Bottom MP Measuring Point

TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. DTB of water tank from the MP is XX. Calculate the water depth

by subtracting DTF from DTB.



Date:	9/	14/22				Manifold R	a a a a a a a a a a a a a a a a a a a	Time:	0	<u> </u>		
Field Te	ield Tech(s):						Time: 0454 Equipment I.D. #: P. S. D 15961					01010
Ovidiza	r Inlet VOC	(ppmv) PID			Vapor	Concentrat	ons					
		VOC (ppmv		0.5								
	-				5	VE Wells						
Well ID	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Dewater		Well	Vacuum		Valve Pos.	Dewater		
HSVE-2	29	68		(Gal)	Comments	ID SVE-10	("H2O)	(SCFMG)	(% Open)	(Gal)		mments
HSVE-3	141		00			_	52	20	100		+ 100+	bouncing
	31	70	100			SVE-9	48	6	100		flog+	bouncing
SVE-4	50	17	100		floct broken	SVE-8	50	2	100		floct	broken
SVE-5	42	14	100		flout broken	SVE-6	74	18	100			
SVE-7 Notes:	44	19	100			HSVE-1	13	72	15			
Well	Pressure	Flow	Valve Pos.			S Wells Well	Pressure	1 1	Valve Pos.			
	1	Flow	Valve Pos.				Pressure	Flow	Valve Pos.	os.		
ID	(PSIG)	(SCFMG)	(% Open) Zone 2		Comments	ID	(PSIG)	(SCFMG)	(% Open) Zone 4		Commer	its
\S -7						AS-17	5.0	14		a.E.I		1104
45-8						AS-18		1.4	10	actually	avound	1 1000 op
45-9							9.0	1.0	100			
\S-10						AS-19	9.5	2.0	00			
						AS-20	7.5	1.3		10%	>	
AS-11						A5-21	6.0	1.5	100			
						AS-22	8.5	2.4	100	108/	2	
S-12			Zone 3				T		Zone 1			
						AS-1						
S-13						AS-2						
S-14						AS-3						
S-15						AS-4						
S- <u>1</u> 6						AS-5						
			Zone 5			AS-6						
						161.0					19. 19. 2	
S-23												
S-23 S-24					· · ·							
S-24												
S-24 S-25												

Abbreviations:

% = Percent

N/A = Not applicable SCFMG = Standard cubic feet per minute gauge

" H₂O = Inches of water deg F - degrees Fahrenheit

ppmv = Parts per million volume PSIG = Pounds per square inch gauge AECOM

			Δ5	& SVE Mani	fold Readings - **	Vew Zone En	om Initial D.	aund of P-	adinge**		
Date:	09/	14/22	-	A STE ITICIII	ion readings(vew zone Pr		Time:	adings	12.5	
Field Te	ech(s):							Equipmer	nt I.D. #:		
					Vapor	Concentrati	ons				
	r Inlet VOC r Discharge										
OXIGIZE	i Discharge	voc (ppin	v) FID:	<u>.</u>		SVE Wells					
Well	Vacuum	Flow	Valve Pos.	Dewater		Well	Vacuum	Flow	Valve Pos.	Dewater	
ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2						SVE-10					
HSVE-3						SVE-9					
SVE-4						SVE-8					
SVE-5					·	SVE-6	1				
SVE-7						HSVE-1	1				······
Notes:		L		L			1				
<u> </u>						AS Wells					
Well	Pressure	Flow	Valve Pos.		,	Well	Pressure	Flow	Valve Pos.		
ID	(PSIG)	(SCFMG)	(% Open)	C	omments	ID	(PSIG)	(SCFMG)	(% Open)		Comments
	<u> </u>		Zone 2				1	T	Zone 4		
AS-7						AS-17					
\S-8						AS-18					
S-9						AS-19					
\$-10						AS-20					
S-11						AS-21					
						_					
						AS-22					
			Zone 3			AS-22			Zone 1		
S-12	8.0	1,4	7			AS-22 AS-1			Zone 1		· · · · · · · · · · · · · · · · · · ·
	8.0 7,5	1.4	100						Zone 1		
S-13	7,5	5.2	100 100			AS-1			Zone 1		
S-12 S-13 S-14 S-15	7,5 6,5	5.2 3.0	100 100 100			AS-1 AS-2 AS-3			Zone 1		
5-13 5-14	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100			A5-1 AS-2 AS-3 AS-4			Zone 1		
S-13 S-14 S-15	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100			A5-1 A5-2 A5-3 A5-4 A5-5			Zone 1		
S-13 S-14 S-15 S-16	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100 100			A5-1 AS-2 AS-3 AS-4			Zone 1		· ·
S-13 S-14 S-15 S-16 S-23	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100 100			A5-1 A5-2 A5-3 A5-4 A5-5			Zone 1		
S-13 S-14 S-15 S-16 S-23 S-24	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100 100			A5-1 A5-2 A5-3 A5-4 A5-5			Zone 1		
S-13 S-14 S-15 S-16 S-23 S-23 S-24 S-25	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100 100			A5-1 A5-2 A5-3 A5-4 A5-5			Zone 1		
S-13 S-14 S-15 S-16	7,5 6,5 8.0	5.2 3.0 2.0	100 100 100 100 100			A5-1 A5-2 A5-3 A5-4 A5-5			Zone 1		

Abbreviations:

% = Percent " H_2O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable SCFMG = Standard cubic feet per minute gauge

ppmv = Parts per million volume PSIG = Pounds per square inch gauge AECOM

T-30 alarm reset

9/15/22

- High temp alarm activated at 21:00 on 9/14/22. This followed a day of O&M and optimization work that concluded around 18:00.
- Marina cleared the alarm ~16:30 on 9/15/22 and the system started itself back up
- Analysis:
 - 0 21:00 is in the middle of a zone, so this was not associated with a zone switch
 - This was a blower issue, not a VFD issue
 - A possible cause is that during our optimization work we closed down the AS bleed value in favor of letting the air vent through the PRV as needed. A possible downside is that while the bleed value is downstream of the heat exchanger, the PRV is upstream. The AS cabinet is enclosed without ventilation so it could be that the hotter air vented by the PRV is getting recirculated and caused the system air temperatures to exceed the programmed threshold. We will monitor future alarms and adjust set points accordingly.

T-30 Sparge Alarm Reset

9/20/22

Action 1

• Sparge high temp alarm activated at 22:48 on Thursday 9/15/22. This was just 6 hours after Marina restarted the system due to the same alarm, seemingly triggered by the closure of the AS bleed valve and venting through the PRV.

• Marina cleared the alarm ~12:30 on 9/20/22 (~4.5 days downtime) and the system started itself back up.

- Analysis:
 - This was a blower issue, not a VFD issue
 - A possible cause is that during our optimization work we closed down the AS bleed value in favor of letting the air vent through the PRV as needed. A possible downside is that while the bleed value is downstream of the heat exchanger, the PRV is upstream. The AS cabinet is enclosed without ventilation so it could be that the hotter air vented by the PRV is getting recirculated and caused the system air temperatures to exceed the programmed threshold. We will monitor future alarms and adjust set points accordingly.

Action 2

- Another sparge high temp alarm (TAH) activated at 13:36 on 9/20/22, just 1 hour after Marina restarted the system due to the same alarm.
- MM cleared the alarm at 16:30 (4 hrs downtime) and the system started itself back up. With AECOM recommendation they opened up the bleed valve ~1/2 turn.
- After re-opening the bleed valve, there was not another TAH alarm and the system stayed operational through the next O&M visit on 9/30/22.

Project Information			Page of
Project Name:	T-30	Location:	Port of Seattle
Project/Task No.:		Weather:	Sunny 70°f
Date:		Personnel:	A'c

Observations

Time	Observation Description
1 1257	Arrive on-site, open fonce and immediately hear
2	a grinding noise coming from one O of the
3	blace motors for the thermal Oxidizer. I take
4	a video recording and send to Gus F.
5 130S	Perform Safety failgate. Today's scope of work
6	is Bi-neckly system Dand M
7 1306	Tailgate complete. Began taking HMI and Oxidice readings
8 1403	All system readings taken, Visible water in hose lines
9	for SVE-6, SVE-8 and SVE-9. KO tank sight glass
10	was empty
11 1425	Taking pictues of system and looking for more potential
12	Optimication areas for Entire System
13 1500	Timed system off to get Motor Sheare readings
14	for both SVE Blower and Air Spage Blower
15	
16	Air Sparge Sheaves SVE Sheaves
17	Motor - Sinches Motor - Tinches
18	Blower - Jinches Blower - 6.5 inches
19	5.5
20 /549	Sheare readings taken, carers put back on at Stating
21	System back up
22 1603	System fully turned on, Locking up and leaving site
23	
24	A 9/30/22
25	
omments / Site Acti	vities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

0010-100	A 4	em Data Collection Form		
Date: 09/30/22	Field Tech(s):			
Actual Time: 1310	AS/SVE HMI Time: 124	1		
SVE/AS System				
SVE Blower Speed	42 13953.2	Sparge Blower Speed	67	
(Hertz) - VFD		(Hertz) - VFD	52	
SVE Blower Runtime	12582 24	AS Blower Runtime	76160	
(Hours)	ISSIC HM		79/6.0	H
Transfer Pump Runtime	28	Sparge Heat Exchanger Runtime	7911.3	
(Hours) - MS Pump	L , O HM	<u> </u>	111.2	H
Sparge Zone 1 Time	1500-2000 HM	Sparge Zone 4 Time	0500-1030	
Span(s) Operational:	1500-2000 Rid	Span(s) Operational:	0300 - 1030	НH
Sparge Zone 2 Time Span(s) Operational:	0000-0530 HM	Sparge Zone 5 Time Span(s) Operational:	1930-0030	
Sparies Zone 3 Time	0000 0330		1150-0050	::10
Span(s) Operational:	1000-1530 HM	Sparge Zone Active:	3	
AS Blower Intake Pressure		SVE Blower Filter Differential		
(" H2O) - <i>DPI-500</i>	1.0	Pressure (" H20) - DPI-200	0,5	
AS Blower Discharge Pressure		SVE Blower Inlet Differential		
(PSI) - <i>PI-501</i>	8.5	Pressure (" H20) - <i>FI-200</i>	1.5	
Sparge Heat Exchanger Discharge		Transfer Pump Discharge Pressure	0	
Temp (°F) - <i>TI-500</i>	84°F	(PSI) - <i>PI-300</i>		
SVE Blower Inlet Temperature		SVE Blower Discharge Pressure	6	
(°F) - <i>TI-200</i>	72°F	(" H ₂ O) - <i>PI-400</i>	\circ	
SVE Blower Inlet Vacuum	50	SVE Blower Discharge Temperature		
(" H ₂ 0) - <i>VI-200</i>	8	(°F) - <i>TI-400</i>	112°F	
Oxidizer System				
Oxidizer Inlet Differential Pressure	0.20			
(" H2O) - <i>FI-1</i>	0.30	Combustion Valve Position (%)	9.0	
	100			
Burner Chamber Temperature (°F)	694 HM	Process Blower Runtime (Hours)	20793	ΗN
	120		0.0001	
Outlet Temperature (°F)	632 ни	Combustion Fan Runtime (Hours)	20794	ΗA
Inlet Limit Controller Temperature	(62	Burner Runtime (Hours)	20702	
(°F)	693 AM	burner Kuntime (nours)	20783	114
Outlet Limit Controller Temperature	(112	Processing Vapors Runtime (Hours)	20719	
(°F)	642 HM		20768	HA
Process Fan Valve Position	000	Panel Temperature (°F)	aı	
(Open/Closed)	Open HM			FOV
Dilution Valve Position (%)	O IM	Flame Signal (Volts)	5.0	
			5.0	EU.
Combustion Valve Position (%)	9.0 EM			
Other Components				
Knockout Tank Level	\land		110	
(Sightglass % Full) ¹		Propane Tank A Level (%)	45	
Water Depth in Storage Tank ²	.25 in		~ ~	
	6.67 in	Propane Tank B Level (%)	35	
(DTF/WD (calc in ft))				

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit PSI = Pounds per Square Inch % = Percent

- DTF Depth to Fluid
- DTB Depth to Bottom
- MP Measuring Point
- WD Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



					PORT O	F SEATT	LE - TERN	IINAL 30				
	. Secolar			K. I	AS &	SVE Ma	nifold Rea	adings				
Date:	29/	<u>/30/2</u> 9C	2							1310		
ield Teo	ch(s):	4				anor Co	ncentratio		Equipmen	t I.D. #: 🛛 🕇	6590	
Oxidizer	Inlet VOC (ppmv) PID	: 56,	S			ncentratic	/15				
		VOC (ppmv) PID: S	.7								
		1	1			SVE	Wells					
Well ID	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Dewater (Gal)	Commen	ts	Well ID	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Dewater (Gal)	Comments
ISVE-2	30	76	100	(001)	connici		SVE-10	54	28	100	(00.)	connicitty
ISVE-3	34	73	100				SVE-9	50	10	100		
SVE-4	52	15	100				SVE-8	66	2	100		
SVE-5	52	13	100				SVE-6	52	10	100		
SVE-7	50	18	100				HSVE-1	14	77	15		
Notes:	30	10	100					11		15	1	10.2
		. /				AS	Wells					_
Well	Pressure	Flow	Valve Pos.				Well	Pressure	Flow	Valve Pos.		
ID	(PSIG)	(SCFMG)	(% Open)		Comments		ID	(PSIG)	(SCFMG)	(% Open)		Comments
		1	Zone 2		_			1		Zone 4		
4S-7							AS-17					
45-8							AS-18					
AS-9	-						AS-19					
AS-10							AS-20			- P	1	
45-11	1,000,000			1			AS-21					
			Zone 3				AS-22			7000 1		
AS-12	6 6	u c					AS-1			Zone 1		
AS-12	9.0	4,5	100				AS-1 AS-2					
45-14	9.0	9.4	100				AS-2 AS-3					
AS-14	8.5	7.8	100				AS-3 AS-4					
	9,0		100									
13-10	9.0	9.2	100 Zone 5				AS-5 AS-6					
AS-23			20112 3				-C-C-M	2				
AS-23												
AS-25												
							1					
92-26												
AS-26												

Abbreviations: % = Percent

" $H_2O = Inches of water$

deg F - degrees Fahrenheit

N/A = Not applicable SCF ppmv = Parts per million volume PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge

AECOM



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Descrip	nt ID 36590 ntion MiniRAE 3000 ated 9/29/2022 1:38						
	urer Rae Systems nber PGM7320			State Certifie			
Serial Number	Lot 592-918212			Temp °	us Pass C 22		
	nber ntion Seattle			Humidity 9	∕₀ 52		
Departu		Calibra	tion Specifications				
Group	Froup # 1 Name Isobutylene Ind Accy Pct of Range		·	' Range Acc % eading Acc % Plus/Minus	0.0000		
<u>Nom In Val / In Val</u> 100.00 / 100.00	In Type PPM	<u>Out Val</u> 100.00	<u>Out Type</u> PPM	<u>Fnd As</u> 101.00	<u>Lft As</u> 100.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments Us	ed During the Calibr	ation	. <u></u>		<u>(As</u>	Of Cal Ent	ry Date)
Test Standard ID Do	escription	Manufacturer	<u>Model Number</u>	<u>Serial Numl</u> Lot Number	<u>Last</u>		ext Cal Date / xpiration Date
	obutylene (C4H8) 100 PM	Airgas	x02ai99cp34206	6 304-402200 -1			16/2025

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	9/30/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Corley, Antonio

Meeting Summary

Attendees	Antonio Corley
Location	SODO
Tasks to be performed	Bi-weekly system O&M
Hazards to be considered today	noise, mechanical, electrical
Will there be Lone Workers?	Yes
Hierarchy of controls	administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	 Impact by vehicle or mobile equipment Contact with moving parts of machinery Uncontrolled release of electricity
Topic of the week	Severe Weather(Flooding)- Water on roads, watch-warning-emergency

Other topics discussed	
Hazards	Mechanical Noise Electrical

AECOM		FIELD ACTIVITY LOG
PROJECT	730	$\underline{\qquad} COMPLETED BY \underline{\qquad} A \underline{\leftarrow}$
OB NO		APPROVED BY
DAY & DATE	10/13/22	SHEET OF
FIELD ACTIVI DESCRIPTION	TY SUBJECT: OF DAILY ACTIVITIES AND E	VENTS:
TIME		
1453	Arrive onsite, spon	ge system is off but oxidizer is toilgate
1501	the second s	, Sparge bloner VFD Read.
		. I do not restert an spase due
		hoppening after Oand M
1506	Besin taking other	system readities as normal
1527	All veodings taken	, nouns to grabbins PIO readings
1543	PID readines ta	ken. All system Oand M
	Complete	
1556	Shutting System	down for well gaugins and
	GW Samplins	to be done I after Port Shutdown
	and the second second	
		A
VISITORS ON SIT	ГЕ:	CHANGES FROM PLANS OR IMPORTANT DECISIONS:
WEATHER CONE	DITIONS:	IMPORTANT TELEPHONE CALLS:

Į

PORT OF SEATTLE - TERMINAL 30

10/17/04		System Data Collection Form	<u> </u>	
1210	ricia realizir	1112		
	AS/SVE HMI Time:	149		
SVE/AS System				10
VE Blower Speed Hertz) - VFD	42	Sparge Blower Speed	Serie C	n in Incw
VE Blower Runtime		AS Blower Runtime	001724	
Hours)	14261,6	Hours) - Sparge Blower	8019.2	
ransfer Pump Runtime		Sparge Heat Exchanger Runtime		1077
Hours) - MS Pump	2.8	(Hours)	8017.5	
parge Zone 1 Time	1700-2230	Sparge Zone 4 Time	100	
pan(s) Operational:	1100-2250	Span(s) Operational:	1930-0030	
parge Zone 2 Time	1000 1530	Sparge Zone 5 Time	1200-1730	
pan(s) Operational: parge Zone 3 Time	1000-1530	Span(s) Operational:	1200-7750	H
ipan(s) Operational:	1500-2000	Sparge Zone Active:	S	
AS Blower Intake Pressure	6	SVE Blower Filter Differential		
" H2O) - <i>DPI-500</i>	\mathcal{O}	Pressure (" H20) - <i>DPI-200</i>	0,5	
AS Blower Discharge Pressure	6	SVE Blower Inlet Differential	_	
PSI) - <i>PI-501</i>		Pressure (" H20) - <i>FI-200</i>	2.0	
parge Heat Exchanger Discharge	200	Transfer Pump Discharge Pressure	\cap	
emp (°F) - <i>TI-500</i>	70°f	(PSI) - <i>PI-300</i>		
VE Blower Inlet Temperature °F) - <i>TI-200</i>	68° f	SVE Blower Discharge Pressure (" H ₂ O) - PI-400	0	
VE Blower Inlet Vacuum		SVE Blower Discharge Temperature		
" H ₂ 0) - <i>VI-200</i>	78	(°F) - <i>TI-400</i>	106°f	
Dxidizer System	· V			
Dxidizer Inlet Differential Pressure	20	Combustion Valve Position (%)	141	
" H2O) - <i>FI-1</i>	.20	Combustion valve Position (%)	14,6	- 8
Burner Chamber Temperature (°F)	667°F	HM Process Blower Runtime (Hours)	21103	Н
Dutlet Temperature (°F)	624° f	Combustion Fan Runtime (Hours)	21104	
nlet Limit Controller Temperature °F)	663°f	Burner Runtime (Hours)	21093	ні
Outlet Limit Controller Temperature °F)	642° F	Processing Vapors Runtime (Hours)	21077	d
Process Fan Valve Position Open/Closed)	Open	HN1 Panel Temperature (°F)	106	н
Dilution Valve Position (%)	0	Flame Signal (Volts)	5.0	H
Combustion Valve Position (%)	14.6	HEI		
Other Components			,	
(nockout Tank Level Sightglass % Full) ¹	60° ful	Propane Tank A Level (%)	60	
Vater Depth in Storage Tank ²			40	

Abbreviations:

" H₂O = Inches of Water

^oF = Degrees Fahrenheit PSI = Pounds per Square Inch % = Percent DTF - Depth to Fluid

DTB - Depth to Bottom MP - Measuring Point

WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring DTF from the MP and

then subtracting that from 6.92 ft (DTB).



					PORT OF SEAT	TLE - TERN	IINAL 30		1.0		
4		10 X 10 2			AS & SVE M	anifold Rea	adings				
Date:	10/13	127C						Time:	1330		
Field Teo	ch(s): '	AC	/		N			Equipmen	t I.D. #: 🥑	<u>45235</u>	
Ovidizor	Inlet VOC (ppmv) PID		5 2	vapor Co	oncentratio	ons				
		VOC (ppmv) PID:	5.3 0.7							
			,		SV	E Wells				<u> </u>	
Well	Vacuum	Flow	Valve Pos.	Dewater		Well	Vacuum	Flow	Valve Pos.	Dewater	
ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2	30	72	100			SVE-10	SO	37	100		
HSVE-3	34	70	100			SVE-9	44	10	100		
SVE-4	52	18	100			SVE-8	62	6	100		
SVE-5	40	26	100			SVE-6	54	16	100		
SVE-7	50	22	100			HSVE-1	14	74	10		
Notes:											
					AS	Wells	-				
Well	Pressure	Flow	Valve Pos.			Well	Pressure	Flow	Valve Pos.		
ID	(PSIG)	(SCFMG)	(% Open)		Comments	ID	(PSIG)	(SCFMG)	(% Open)		Comments
			Zone 2						Zone 4		
AS-7					6	AS-17					
AS-8						AS-18					
AS-9						AS-19					
AS-10						AS-20					
AS-11						AS-21			·········		
				1		AS-22					
			Zone 3						Zone 1		
AS-12						AS-1					
AS-13						AS-2					
AS-14						AS-3					
AS-15						AS-4					
AS-16						AS-5					
			Zone 5			AS-6					
AS-23				As I	's off on cruck		1			1	
AS-24											
AS-25											
AS-26											1 2 2 1
AS-27					-						
Notes:	·										

Abbreviations: % = Percent " H_2O = Inches of water deg F - degrees Fahrenheit

N/A = Not applicable

ppmv = Parts per million volume PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



Page 2 of 3



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrumen	t ID 45235										
Descrip	otion Mine Rae 3000)									
	ated 10/12/2022 5:										
Manufact	urer Rae Systems			State Certifi	ed						
Model Nun	nber PGM7320			Stat	us Pass						
Serial Number/	Lot 592-927137w2		Temp °C 24								
Nun	nber										
Loca	ation Seattle			Humidity	% 40						
Departr	nent										
	Group # 1			Range Acc %							
	Froup # 1 Name Isobutylene			Range Acc % eading Acc %							
	d Accy Pct of Readi	ng		Plus/Minus							
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail				
100.00 / 100.00	PPM	100.00	PPM	99.90	100.00	0.00%	Pass				
Fest Instruments Us	ed During the Calib	<u>ration</u>			<u>(As (</u>	of Cal Entr	ry Date)				
Test Standard ID De	escription	<u>Manufacturer</u>	Model Number	<u>Serial Num</u> Lot Numbe	r Last (Cal Date/ Ex	ext Cal Date opiration Date				
	obutylene (C4H8) 100 PM) Airgas	x02ai99cp34206	5 302-40244 -1		ed Date 7/	28/2026				
02-402445936-											

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Proje	ect Information	3		Page of
Proje	et Name:	T.30	Location:	Sentile
Proje	ct/Task No.:		Weather:	55, Smoky Kunny
Date:		10/19/22	Personnel:	GFCB
Obse	rvations			
	Time		Observation Descript	ion
1	0710	· Arrive ansite CB	already here	•
2		· Scape: Gin sumple	The 3 ren	naining tidal wells
3		Traudeshort	the As vi	FD U
4				are the most significant
5		astre	Port is ap	reventional taday.
6		SVE Sistem ON on	erriver! bu	+ AS System uns down
7		due to another VF	D hich tem	a fault. As meter
8		at 8030.	J. Y	
9		SVE System left	- ON for 5	anding
10	0730			A. Target Sample 70-130 min
11		Total ow low tide	, Todris	low-low tide was UGKO,
12		60 Sample vindow	was one	0-0850.
13		> MW-58A-1022		
14		· Some Small a	st-colored	flecks were observed
15				nat were not previously
16		anseneding	ne awaren	rater.
17	04050			2 CB on MW-89.
18		Both have target a		
19		after low-low tide		274.01 224.00000000000000000000000000000000000
20		-> MW=86B-1022 50		0940 20
21		2.00	Sampled a	+ "1200"
22		-> MW-89-1022	sandled	at 0949. PH and
23		lever than at	- other we	15 on site (3.75 v5 ~7)
24		and temp way	s hisler	(22.5°C V5 ~19°C)
25	1030	· VFD traildeshootine	v	
Com	ments / Site Act	ivities / Personnel Tracking)	

Projec	t Information			P	$2 \operatorname{age} 2 \operatorname{of} 4$
Project	t Name:	T-20	Location:	Senttle	
Project	/Task No.:		Weather:	60	
Date:		10/19/22	Personnel:	GF, CB	
Obser	vations				
Т	ìme		Observation Descriptio	n	
		·VED Frond not	restart when we we	legted it on arrive	al but
2		inned; steh did	when it pressed	the "Stort" but	tan
3		at 1050. Not			
4		· with heat exchange	meer OFF, temp	Switch is shuth	n the
5	<u></u>	agten davn	in the 100-00.	France, TAH.	foult.
6		. The aremand the			
7		of the beat en	-changer bet	20n -150 - 650	fpm
8				it is beld. Lo	
9				highest is the	
10		night (surt	17 S S S S S S S S S S S S S S S S S S S	0	
11			2.3 F1 × 0.83 Ft	= 1.94 sf	
12			nge = 290-1150		
13		-> Sporge cabi	et is ns'x 6'x	4.25' = 76.5 0	f. That
14		preans pe's	e getting 3.75 -	15 air exchange	s per
15		minute.	0		
16		NOTE: ven	der said the hea	+ exchange should	1 20
17				it has the me	
18		he	thought it wou	W. Knumit confir	med.
19	1155	· with the As a	abilet fully open	pe heat excha	meer
20		was keeping ten	nps ~ 62 F. Am	bient temptis no	5895
21	1157	· Cabinet Jours C	losed to see of	fect on temps	
22	1224	=> 72° on the ther	maneter. An AZ	old all appea	ed_
23		on the AS VE	D, which is to	e legger high te	mp
24		alarm. UFD St	mys on al it au	tive. There does "	t appear
25		to be any scal	sin to doubt the	Mermoneter's au	curacy.
Comm	ents / Site Acti	vities / Personnel Tracking			5

Project Informatio	Page <u>3</u> of <u>4</u>
Project Name:	1-20 Location:
Project/Task No.:	Weather:
Date:	10/19/22 Personnel: GF, CB
Observations	
Time	Observation Description
1	The AS motor is warm but not not to he touch. The
2	SUE motor is significantly hotter. It's discharge air
3	55 MOGF.
4	> ADO10 code Grantaneously Stapped Plashing, despile
5	no marked share in apartion ~12:50.
6 12:25	GF installed simblers on all vertical SVE Lell Leaders
7	(SUE-4-10). They work great stabilizing previously very
8	unstable readings. Prior to install one gauge was
9	OSTIMATE to be at 48 in 420, with a range of 42-54.
10	with the psouldber installed, it was stable at 47 in Hop
11	I the horizontal SVE wells do not have the game value
12	fluctuation and shubbers are not related.
13	· GF installed a sputcher & the new O-15 in the gauge
14	at the GUE discharge part in place of the 0-100 mt
15	gauge that always read O. The new gauge reads
16	astendy 10.9 in H.D.
17	-> When the gauge was grand in its readle rotated
18	counter clockware to 10.9 passing the bottom of
19	the gauge seemed and but was reproducible with
20	and without the snupper.
21	> place are 4 Snubbers left as gares.
22 13:00	
23	ore 1/4" NPT and reed to be 18".
24	· CB is troubleshooting the VFD. Eventually calls ABB
25	(the mometacturer) & determines that the motor is house
Comments / Site Ac	ctivities / Personnel Tracking

Project Inf	formation		Page 4 of 4
Project Nar	nc: <u>7.30</u>	Location:	
Project/Tas		Weather:	
Date:	10/19/22	Personnel:	GFCB
Observatio	DNS		
Time		Observation Descri	The Constant of the Constant o
1	to work too he	rd with the b	eld value at its corrent
2	position. Ful-	load Amps or	9.6 but it was princing
3	at 10.5 and his	Ler. ABB recon	mends using a corrent
4	Joup to determine	Weller it is a	actually sending that
5	more mills to	ne motor. I	fit is the motor has an
6			is an ichel. I can
7	typhis during	Oth on nex	t weds.
8			I the bleed value more
9		A Contract Contract of Contrac	10 ar so, Mapefully
10	this avoids		1
11	> we also a	nfimed there	is no actual temp services
12	in the mote	N it is Comm	miratily with
13	-7 Cary has de	failed notes a	an all of this
14 14	120 . The temp sense	c has an adju	istable dig (that has
15	been set to 12	DOF. Halver,	he asserved TAH Shutdow
16			PS were 100-100F. We
17	increased the d	iat to 130°F	to compensate.
18 15	15 . CB trok a cal	I for another pr	oject, but will stick around
19	to cleck on the	System when I	reisdone. It was in Levid, and everything
20	1e Zare 2/201	es gerlap	served and everything
21	was running	smoothly.	. 0.5
22	GFOFEGIR)	
23	1 2		
24			
25)4	F
Comments	/ Site Activities / Personnel Tracking	5	

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name		T-30				Well ID:	MW-58A				
Project Numb		60681370				Sample ID:	MW-58A- 4	222	[WellID-MMYY]	1	
Date:		10/191	27		-	Well Condition:	Far		Traditin-tanari 1	1	
Weather:			(lordy		7.1 	Sampled by:	GF, C	5	-		
PRE-PURGE		DN	J								
	to Water* (ft b		10.9	3 0.	7:36	Purge/Sample Me	thod:	Low-Flow		Pire Equi	Owent
	duct* (ft btoc)			- 6-		Purge/Sample Equ		Peristaltic Pi	ump		
Product Thick			0		-	Total Well Depth*	•	25		755:51 Robe:41	292
Water Colum	n (ft):		~12	5.77	-	Screened Interval	* (ft bgs):	5-25		Rober 4	1202
Water Volum	e in Well (gal):		~2:	26		Tubing Inlet Dept	Tubing Inlet Depth* (ft):			Noge - It	
Inner Casing	Diameter (Inch	ı):	2		_	Sampling Tube Ma	iterial:	LPDE			
Inner Casing	Material:		PVC		_						
PURGING IN										06:40	
Start Purge T	ime: 7 :	42	-			****Tidal w	vell, sample 70	-130 min afte	r the low-low tic	ie E	
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments	
0752	200	10.98		19.2	1173	0.29	676	-16.1	55.7		
6802	ч	10.99		19.2	1164	0.20	6.77	-122	14.7		
0807	~	- 11		19.2	1161	0.17	6.77	-123.3	16.1		
081 Dk		11.00		19.2	1159	6.14	6.77	-123.9	18.7		
0817	U.	11.02	-	19.1	1157	0.13	6-77	-124.0	17.7		
0621	щ			19.2	1157	6.12	6.76	-124.2	17.5		
	SAM	PLED	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	23 -							
					\square						
						6-					
						CIP					
		L			/		1	1			

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	COC	Method	Container	No. of bottles	Preservative
Mar 1 5511 442.2		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
MW-584-1022	Ma	Dx	NWTPH-Dx	500 mL Amber	1	
	0003	PAHs & 2-	SVOCs	1 L Ambler	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% USEFUL INFORMATION * = Measured from top of inner casing

Gras also present rust-colored flecks visible in VOAs that were not asserved at and of purzing.

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

									LD		
Project Name	e:	T-30			→	Well ID:	MW-86B		T U	up2	
Project Num	ber:	60681370			=	Sample ID:	MW-868-		[Well ID-MMY	Y]	
Date:		10/10	9/22			Well Condition:	fair		_		
Weather:		21 21	۴F		- 2	Sampled by:	GF	,	-		
PRE-PURGE		ON								D. Er	0. 1. 6
Initial Depth	to Water* (ft b	otoc):	12.	63	-	Purge/Sample Me	thod:	Low-Flow		Pine Equip YGI : 512 Ridge: 402	11-011
Depth to Pro	duct* (ft btoc)	:		-	-	Purge/Sample Equ	ipment	Peristaltic P	ump	V67 :512	92
Product Thick	kness (ft):		C	>	_	Total Well Depth*	(ft bgs):	20		(92 · JIV	
Water Colum	in (ft):		٨٦.		_	Screened Interval	* (ft bgs):	5-20		Ridge: 402	06
Water Volum	ie in Well (gal)	:	1.10	1	40	Tubing Inlet Depth	1* (ft):	16	bas		
Inner Casing	Diameter (Incl	ו):	2		_	Sampling Tube Material: LPDE		V			
Inner Casing	Material:		PVC		_						
PURGING IN	FORMATION									,0640	
Start Purge T	ime: 09	07	_			****Tidal w	ell, sample 13	0-190 min afte	er the low-low	tide	
[Purge	Depth to	Volume			Dissolved		T			
Time	Rate (mL/min)	Water (ft)	Purged (gal)	Temp (°C)	Conductivity (mS/m)	Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments	
0917	200	12.02		18.8	2022	0.29	7.16	-90.4	527		
0927	41	12,54		18.8	1946	0.20	7.14	-109.1	3.34		
0932	h	12.51		198.8	1931	0.17	714	-114-0	2.41		
0935	n	12.49		18.4	1921	0.16	7,14	-114,9	1.44		
0938	6	12.48		146	1917	015	7.13	-116.8	1.07		
	- <	Ann	EC	940							
						-					
					$\left \right\rangle$		+				
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r					$\vdash \leq$	6-		<u> </u>	├ ──┼		
						Gr					

SAMPLING INFORMATION	AMPLING INFORMATION									
Sample ID(s)	Sample time(s)	сос	Method	Container	No. o bottle	- IV	Preservative			
1012 50 7 1122		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	3	HCL			
MW -563-1072	ogue	Dx	NWTPH-Dx	500 mL Amber	1	1				
Dup 2-1022	1200	PAHs & 2- methylnaphthalene	SVOCs	1 L Ambler	1	1	87			

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

NA

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: Project Number:

Date:

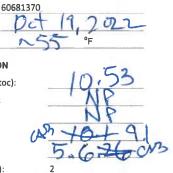
Weather:

PRE-PURGE INFORMATION

T-30

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:

PURGING INFORMATION



PVC

Well ID: Sample ID: Well Condition:

Sampled by:

MW-89- 1022 [Well ID-MMYY] GOOD Broan

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft bgs): Sampling Tube Material:

MW-89

Low-Flow **Peristaltic Pump** 7.0 20 (filming won it go deepe 5-20 LPDE

Start Purge Ti	me: <u>70</u>	1				****Tidal wel	l, sample 130-	190 min afte	r the low-low	tide
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (˘C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
914	280	10,91		23.2	2201	3,99	3.95	226	8.5	
925	230	10.83		22,3	2757	4.64	3.Ho	292	8.6	
933	250	031		22.5	2719	496	3.76	311	7,1	
936	200	1020)	22.1	2700	5,07	3.74	319	8.8	
940	200	1070		22.2	-2692	5.11	3.76	324	7.4	
943	200	10.20		22.1	2688	5.14	3.76	327-	4.5	
Su	itch.	e 2	nd Y	51 -	to ce	ntim	enp	\$ pt	(Re	advers
948	200	10.3		22.4	29417	- 5.26	348	227	1.2	

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
Mw-89-1022	219	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
	-41	Dx	NWTPH-Dx	500 mL Amber	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10%

Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

NB

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

las remared from Well MW-89

Pire Equipment VGI: 46376 Prose: 7481

SAMPLE CHAIN OF CUSTODY

Report To Paul Val	inc	Report To Paul Valina							2			_]_			AROUND		-
Company AE(ON				PROJEC	CT NAME			0			Р	0#					ndard	l turnaroun		
Address 1111 3rd A	ve			T-3	0													es authoriz	ed by:	
City, State, ZIP Seg ++	le	LIA ag	101	REMAR	REMARKS INV Project specific RLs? - Yes / (No)					INVOICE TO							PLE DISPO samples	OSAL	-	
Phone 206 - 310 - 5097E	nail_	Paul. Kalin	allotion	. (an Project s	specific RL	s? - Ye	es //	ND.	and the she							Other Default: Dispose after 30 day				
		gus.trile	manear	(0th. (0h	2					ŀ	ANAI	LYSI	ES RI	EQU					o uays	
Sample ID		Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars		NW/TPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	RTEX EPA 820				N	otes	
MW-89-1022	W-89-1022 10/19/22						×	×						×						
MW-588A-1022 10/14/22			0-623	gw	5	×	×				×		×				1PAHS	include	2	
MW-563-102	2		10/14/22	0940	gw	5	×	×				×		×				2-m	include ethytma leve	ph
Dup2-1022			10/19/22	1200	gw	5	×	×				X		×) the	Jere-	
1 Salar																				1
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																				1
References																				
																			2	
Signature Inc. Belingwished by					PRIN	TN	AMI	C				C	OMI	PAN	Y		DATE	TIME		
	Priedman & Bruya, Inc. Ph. (206) 285-8282 Received by: Wesley Eaud				Gus	Frie	dr	na	n			A	FEC	(0)	n	à		10/19/22	1640	
	Relin	iquished by:	by Eau		Wes	cy l	ef			TB1					10/17/11	1646				
		ived by:																		



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID	51292						
Description	Pro DSS Displa	ay					
Calibrated	10/10/2022 4:	54:48PM					
Manufacturer	YSI	<u></u>		State Certified			
Model Number	Pro DSS			Status	Pass		
Serial Number/ Lot	21D221618			Temp °C	25		
Number							
	Colorado			Humidity %	16		
Department							
		Calibra	tion Specification	<u>IS</u>			
Group	#			Range Acc %			
Group Nar	ne		F	Reading Acc %			
Stated Ac	cy			Plus/Minus			
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	<u>Fnd As</u>	ft As 1	Dev%	Pass/Fail
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>	_	<u>ration</u> <u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number		<u>Ne</u> Date/ Ex	y Date) xt Cal Date / piration Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Des	ment ID 51293 cription YSI Pro DSS S librated 10/10/2022 4:5			under an		0 namp atar 20	
	Group # 5 roup Name Dissolved O tated Accy Pct of Reading			Range Acc % Reading Acc % Plus/Minus	3.0000	rationa principalitation maintationalitation maintationalitatio altationali	la def Nered
<u>Nom In Val / In V</u> 100.00 / 100.00	/al <u>In Type</u> %	<u>Out Val</u> 100.00	<u>Out Type</u> %	<u>Fnd As</u> 102.30	<u>Lft As</u> 100.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments	Used During the Calib	ration			(As	Of Cal Enti	ry Date)
<u>Test Standard ID</u>	Description	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number	Last		ext Cal Date / opiration Date
CO 126/124 NTU	CO 126/124 YSI NTU 21L21440187	YSI	607300	22A214601			30/2023
(22A214) CO AUTO CAL 0NTU/PH4 18262406	CO AUTO CAL 0NTU/PH4 18262406	AMCOCLEAR		18262406			
CO COND 1.413(2GG653)	1413 COND STND LOT	AquaPhoenix Scientific	31986	2GG653		7/:	30/2023
CO ORP 240MV(2GI207)	ORP SOLUTION 240 mV	Pine Environmental Services, Inc.	32001	2GI207		6/	1/2023
CO PH 4 1GF009	CO PH 7	AquaPhoenix Scientific		1GF009		6/	1/2023
CO PH10 1GD492	CO PH10	AquaPhoenix Scientific		1GD492		4/	1/2023
CO PH7 1GF460	CO PH 7	AquaPhoenix Scientific	BU5007-T			6/	1/2023
CO ZERO DO	CO Zero Dissolved Oxygen Solution	Hanna	HI7040L	S0021/18		3/	1/2023

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

•	ID 51293 on YSI Pro DS ed 10/10/2022						
Manufactur Model Numb Serial Number/ L Numb	er Pro DSS ot 21E100011			State Certifie Statu Temp %	s Pass		
Locatio Departme	on Colorado nt			Humidity %	6 16		
		<u>Calib</u>	ration Specific:	ations			
Group N	oup#1 Name PH Accy Pct of Re	ading		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 7.00 / 7.00 4.00 / 4.00 10.00 / 10.00	<mark>In Type</mark> PH PH PH PH	<u>Out Val</u> 7.00 4.00 10.00	<u>Out Type</u> PH PH PH	Fnd As 6.94 4.23 9.83	<u>Lft As</u> 7.00 4.00 10.00	<u>Dev%</u> 0.00% 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass Pass
Group N	oup # 2 Name Turbidity Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 0.00 / 0.00 124.00 / 124.00	<u>In Type</u> NTU NTU	<u>Out Val</u> 0.00 124.00	<u>Out Type</u> NTU NTU	<u>Fnd As</u> 0.00 126.00	<u>Lft As</u> 0.00 124.00	<u>Dev%</u> 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass
Group N	oup # 3 Name Conducti Accy Pct of Re	•		Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 1.413 / 1.413	<u>In Түре</u> ms/cm	<u>Out Val</u> 1.413	Out Type ms/cm	<u>Fnd As</u> 1.430	<u>Lft As</u> 1.413	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Group N	oup#4 Name Redox (C Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 240.00 / 240.00	<u>In Түре</u> mv	<u>Out Val</u> 240.00	<u>Out Түре</u> mv	<u>Fnd As</u> 243.50	<u>Lft As</u> 240.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Group N	Group # 5 Group Name Dissolved Oxygen Span Stated Accy Pct of Reading				0.0000 3.0000 0.00		
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Instrument ID 40206 Description Solinst IP (200 ft) Calibrated 10/11/2022 5:41:18PM Manufacturer Solinst **State Certified** Model Number N/A Status Pass Serial Number/ Lot 312227 Temp °C 23 Number Humidity % 43 Location Seattle Department **Calibration Specifications** Group # Range Acc % **Group Name Reading Acc % Stated Accy Plus/Minus** Nom In Val / In Val In Type Out Val Out Type Fnd As Lft As Dev% Pass/Fail **Test Instruments Used During the Calibration** (As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Serial Number / Test Standard ID Description Manufacturer **Model Number** Lot Number **Opened Date**

Pine Environmental Services, Inc.

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	51630			
Description	Pine Environmental Peristaltic Pu	mp		
Calibrated	10/11/2022 1:03:56PM			
Manufacturer	Pine Environmental Services, Inc	•	State Certified	
Model Number			Status H	Pass
Serial Number/ Lot	n/a		Temp °C 2	23
Number				
Location	Seattle		Humidity % 4	16
Department				
Group Group Nar Test Performed: Yes)# 1	on Specification	s As Left Result: P	ass
Test Instruments Used D Test Standard ID Descrip		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	<u>(As Of Cal Entry Date)</u> <u>Next Cal Date /</u> <u>Last Cal Date/ Expiration Date</u> <u>Opened Date</u>

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	46801			
Description	Geotech Peristaltic Pump			
Calibrated	10/11/2022 1:06:32PM			
Manufacturer	Pine Environmental Services, Inc	. S	tate Certified	
Model Number	Geopump		Status P	ass
Serial Number/ Lot	n/a		Temp °C 2	3
Number				
Location	544004		Humidity % 4	6
Department				
	Calibrati	on Specifications		
Group) # 1			
Group Nar	ne PERISTALSIS AND			
	FUNCTIONAL TEST			
Test Performed: Yes	As Found Result: Pass	Α	s Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Real and the second	and the second se			
Instrument ID	7481			
Description	Solinst Interface			
Calibrated	10/11/2022 5:40:10PM			
Manufacturer	Solinst		State Certified	
Model Number	IP 200'		Status P	ass
Serial Number/ Lot	286714		Temp °C 24	4
Number				
Location	Seattle		Humidity % 4	3
Department				
	Calibrat	ion Specifications	\$	
Group	y # 1			
Group Nar	ne			
Test Performed: Yes	As Found Result: Pass		As Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

	46376 Pro DSS Displa 10/6/2022 12:4					
Manufacturer Model Number Serial Number/ Lot Number Location Department	YSI Pro DSS 19D104639	7:34PM		State Certified Status Temp °C Humidity %	21	
Group Group Nar Stated Ac	ne	Calibra	tion Specification F	IS Range Acc % Reading Acc % Plus/Minus		
<u>Nom In Val / In Val</u> <u>Test Instruments Used Du Test Standard ID</u> <u>Descrip</u>		<u>Out Val</u> ration <u>Manufacturer</u>	Out Type Model Number	<u>Fnd As</u> <u>L1</u> <u>Serial Number</u> <u>Lot Number</u>		

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

(As Of Cal Entry Date)

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873 Description YSI Pro DSS Calibrated 10/6/2022 12:43:56PM

Group	oup # 5 Name Disolved Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	105.10	100.00	0.00%	Pass

Test Instruments Used During the Calibration

Test Standard ID	<u>Description</u>	Manufacturer	Model Number	<u>Serial Number /</u> Lot Number	Last Cal Date Opened Date	<u>Next Cal Date /</u> Expiration Date
SEA AUTOCAL 22140172	SEA AUTOCAL AMCO Clear	GFS	8483	22140172	<u>Opened Dute</u>	4/30/2023
SEA COND 1.413 µS/CM 2GE259	Conductivity solution 1.413 µS/cm	AquaPhoenix Scientific	Conductivity 1.413 mS/cm	2GE259		5/31/2023
SEA NTU 126 22C2205179	SEA 126 NTU turbidity for YSI	YSI	607300	22C2205179		3/31/2023
SEA ORP 240 2GB110	240 mV ORP Solution	AquaPhoenix Scientific	32001	2GB110		11/30/2022
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018		7/24/2024
SEA PH 7 2GB314	pH 7 Buffer Solution	AquaPhoenix Scientific	32025	2GB314		2/29/2024
SEA PH4 2GG184	pH 4 Buffer Solution	AquaPhoenix Scientific	32017	2GG184		7/31/2024

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance





Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

•	ID 46873 on YSI Pro DS red 10/6/2022 1						
Manufactur Model Numb Serial Number/ L Numb	d is Pass C 21						
	on Seattle			Humidity %	6 56		
		Calib	ration Specific	ations			
Group N	oup#1 NamePH AccyPctofRe	ading		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.12	7.02	0.29%	Pass
4.00 / 4.00	PH	4.00	PH	3.89	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.37	10.05	0.50%	Pass
Gro	oup#2			Range Acc %	0.0000		
Group I	Name Turbidity	/		Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	NTU	0.00	NTU	1.20	0.00	0.00%	Pass
124.00 / 124.00	NTU	124.00	NTU	127.51	124.02	0.02%	Pass
Gro	oup#3			Range Acc %	0.0000		
	Name Conduct	ivity		Reading Acc %			
Stated	Accy Pct of Re	eading		Plus/Minus	0.000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.174	1.413	0.00%	Pass
	oup # 4 Name Redox (0)RP)		Range Acc % Reading Acc %			
•	Accy Pct of Re	-		Plus/Minus			
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	238.90	240.00	0.00%	Pass
	oup # 5			Range Acc %	0.0000		
	Name Disolved	Oxygen Span		Reading Acc %			
	Accy Pct of Re			Plus/Minus			

AECOM Daily Tailgate Meeting Summary

Project information

r oject information				
Project Name	T-30			
Project Number	60681370			
Project Manager	Paul Kalina			
Project Manager Phone #	2063105097			
Muster Point location	Clubhouse			
Meeting date	10/19/2022			
Business Line	Environment			
SH&E Manager	Tim Gilles			
SH&E Manager Phone #	3128335991			
First Aid Kit Location	Conex			
Prepared by	Friedman, Gus			

Shift Summary

Location	SODO
Attendees (Workers)	Brown, Cary;Friedman, Gus;
Attendees (Visitors)	
Tasks to be performed	Tidal well gw sampling AS VFD troubleshooting
Hazards to be considered today	noise, motion, mechanical, electrical
Will there be Lone Workers?	No
Hierarchy of controls	engineering, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Hearing Conservation
Other topics discussed	Traffic hazards Crane operation awareness
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All wells sampled within the required time periods. Progress made troubleshooting VFD
Hazards	Mechanical Motion Noise Electrical

AECOM

DATE 10/26/22

	DAY	S M T		H F	S
PROJECT MANAGER: Paul Kaling	WEATHER	BRIGHT SUN CLEAR	OVERCAST	RAIN	SNOW
PROJECT: T- 30	TEMP	To 32 32-50	50-70	70-85	85 up
JOB NO.:	WIND	Still Moder	High	Repo	ort No.
AECOM FIELD REP: GF	HUMIDITY	Dry Moder	Humid		- 78
SUB-CONTRACTORS ON SITE: NA	10 8 CT 10	2.5	45-23		
EQUIPMENT ON SITE: PTD ID: 39957	0.7 0.7	812	Me-24		
L'A (PC CANSASAMEN	許清してき	12	15-26		
13 100	10.0 9.01	S-1-	Ac - sig		
WORK PERFORMED: Biweekly OAM VFS (bur	rent loop ne	orginemen	K		
IECT OWNER					
· Gafeb trilacte - Ship in -	+ Maffic	is artive	2.		
·Gafety trilgate - Ship in par -System ON on arrival. Zon period.	- 2 + 2+5	the dias	N C	verla	P
Jacied an allow of the con	is a <u>sou</u>	1.0 4040	5		Y
Ar ite entry	62 M- G	AGEL	\$2.40	19.75	
SAS VED ugga registed	10/10- 6-	G INDA A	the	and a	
· Marina has installed yess	leives for 2	n oppint	in lu	can	*
- Kng SVE rotaneter guide	Frank nove	arnice	1		4
- 4ch 80 pvc clock ripples	for 115 1013.	have or	Privec	· mi	
- spare union firtings w/ 0-r	135 ter 12	yes AS TO	15 162	- WII	ord
> still missing king svE st	pros + 1/06:	5 LIT GAPIN	cade :)	ina S.	
> 2" ball value attembly	for Svie Leo	nders .	3 63	0.00	e state
> busings for pitot tubes.	1 series a	144 C.	20-04	192 ())	0.1
1600. Below taking Sugar readings	multiple lightered	11 5-5 1	Ceranes		
Reset zores 2 2 + 4 Rutines	5. They also	accidental	5 ente	red	
with AMIPM switched. The r	egult was h	at only	Zore S	5 ~52	5
active,	when Rup	and the second	Ladard	24	-1
-> AS-7, -9, et 11 rotaneter Fluo	ts where Stra	k -ftor z	are swill	64 (zore
\$ 5000 For AK-12 15 + 16	in zore 3	a at Little		30	1
of All dropped with a smalk ex	cept AS-11 wh	ich staged	1 Stuck	とう	15-
10045. SVE-5, 8 +9 have Sighific	cont water		12 217	4	area
· SUE-5 to Plante art stu	k at batta	-	ويتداو بالروج		
· SVE-5+8 floats get stud · SVE-9 is dirty	- 0.1 -0110	Ni Proto		0020	1
1645 Collected PID readings alle	mlet/0,7 d	scheree	1		
BY GI					
BY CIT		TITLE		1 01	-

AECOM

DAILY QUALITY CONTROL REPORT

PROJECT: T-30	REPORT NO.
JOB NO.:	DATE 10/26/22

							k	
1655	Zure 5	break	through	pressi	res:		51i-	
	mal ID	Initial	Ignit	Rthru	Final	Fini		
		flow	Prestal	fress	flow	Valve du	commer	<i>s</i> +5
	A5-23	2.2	9.75	8.25	2.1	100	goul	
	AG-24	3.8	9.0	8.0	36	100	Sticky	
	A5-25	1.9	9.5	8.75	2.2	100	Conden	
	AS-26	1.2	10.0	9.0	1.3	100	P.1	
	15-27	2.3	8,75	7.75	2.4	(00	9000	
					R 21		•	
	(locion	46-24	al la	Prething	NISCE	in a bur	no. Not ne	rthit.
715 1	VED DOM	cent 10	in ine	2 days	nte. 20	15 al	thre NED	reads 10
	Sunal. C	ide	pres	Surce	Moter	Side		VED
	- this	,w/		1/2		12	Not ne tive. Vi-D W2	
1 6	lock bolack	10/01/4	(Bow.	n 1 or	meel	Yellow	
	.25 9.80			11.33		73	Yellow 11.32	10.5
5+19	59 9.3	5 9 1	٢	11.08	10	87	11.57	9.5
· · · · · ·	511 "0	01 /	· · · · · · · · · · · · · · · · · · ·					
CP	lles (D	(m) to	diside	5. Hew	ill talk	to AB	B about it	•
17/10 0	interest	lood to	we me	her 1/4	-twn	Itis	now 1 full	twingten
	1 ed -0.1	7-5+	1	days	from G	5 to C	7.1 Bisser	- Con (on
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	up for s	in les	t few	weller	Jul to	anth	hàn chizt e Snafu.	0
1.18	101/101			Ender	hin ru	nnine -	marth	
POBLEMSE	Looked u	K SSST	CTION TAKEI	N)		
1760	Autor	K1 L	all 1-	- alite t	o dis.	102 d	-107 allie	to well work
1170	4010	Thing 1			ALALOI	(0) -1 (0,0) -1	-107, White . There are 1 e 1 "? 1.	lel alla la
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	EXPECTATIONS		os no type K					
2500	1 U.15 C	TTSIT	4	\leq	-6	P.C.		
			1417 X			GF col	74(72	
				<u> </u>	ų			
			В	y Gif		TITL		0 -
							SH	

PORT OF SEATTLE - TERMINAL 30

	SVE/AS & Ovidizer Sud	tem Data Collection Form	141	-
Date: 10/26/22	Field Tech(s): C7 F			
Actual Time: 600	AS/SVE HMI Time:	38		00.0
SVE/AS System			D.SA,	926
SVE Blower Speed (Hertz) - <i>VFD</i>	42 Hz 14.2 ASC	Sparge Blower Speed (Hertz) - VFD	52 Hz, 9.5A,	521
SVE Blower Runtime		AS Blower Runtime		HIVI
(Hours)	14564.8 HM	(Hours) - Sparge Blower	8136.5	НM
Transfer Pump Runtime		Sparge Heat Exchanger Runtime		1.216.4
(Hours) - MS Pump	2-9 HM	(Hours)	8134.	НM
Sparge Zone 1 Time	0.0270	Sparge Zone 4 Time	10 2	107
Span(s)_Operational:	1700-2230	Span(s) Operational:	1930 - 0030	НМ
Sparge Zone 2 Time		Sparge Zone 5 Time		
Span(s) Operational:	1000 - 1530 PM	Span(s) Operational:	1200-1730	HM
Sparge Zone 3 Time	15011-20 000719	Sparge Zone Active: 2,3,45	5, after up	detec
Span(s) Operational:	1000 - 1530 PM		0,0110000	3
AS Blower Intake Pressure " H2O) - <i>DPI-500</i>	1.0	SVE Blower Filter Differential Pressure (" H20) - DPI-200	0.5	
AS Blower Discharge Pressure	0.17	SVE Blower Inlet Differential		
PSI) - PI-501	9.0	Pressure (" H20) - FI-200	1.5	
Sparge Heat Exchanger Discharge	-74	Transfer Pump Discharge Pressure		
Гетр (°F) - <i>TI-500</i>	70	(PSI) - <i>PI-300</i>	0	
SVE Blower Inlet Temperature	C a	SVE Blower Discharge Pressure	10.11	
°F) - <i>TI-200</i>	58	(" H ₂ O) - <i>PI-400</i>	10.4	
SVE Blower Inlet Vacuum	83	SVE Blower Discharge Temperature		
" H ₂ 0) - <i>VI-200</i>	0)	(°F) - <i>TI-400</i>	102	
Oxidizer System				
Dxidizer Inlet Differential Pressure " H2O) - <i>FI-1</i>	0.75	Combustion Valve Position (%)		HMI
Burner Chamber Temperature (°F)	6-6 2 HM	Process Blower Runtime (Hours)	21408	HMI
Dutlet Temperature (°F)	644 HM	Combustion Fan Buntime (Hours)	21409	HMI
nlet Limit Controller Temperature °F)	672 HM	Burner Runtime (Hours)	12397	НМІ
Dutlet Limit Controller Temperature °F)	G43 HM	Processing Vapors Runtime (Hours)	213-62	нмі
Process Fan Valve Position Open/Closed)	open	Panel Temperature (°F)	76	HMI
Dilution Valve Position (%)	Онм	Flame Signal (Volts)	5.0	HM
Combustion Valve Position (%)	Ю нм			
Other Components				
Knockout Tank Level	33%		l.c	
		Propane Tank A Level (%)	60	
Vater Depth in Storage Tank ² DTF/WD (calc in ft))	507 1.25	Propane Tank B Level (%)	55	
DTF/WD (calc in ft))	507 1.25			22

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit PSI = Pounds per Square Inch % = Percent DTF - Depth to Fluid DTB - Depth to Bottom

MP - Measuring Point

WD - Water Depth

1.1

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



PORT OF SEATTLE - TERMINAL 30

					PORT OF SEAT		1.53				
					AS & SVE Ma	anifold Re	adings				
Date:	012612	2						Time: 1	630 t I.D. #: Z		
Field Tee	ch(s): 🖌	۶ ۲			Votor			Equipmen	t I.D. #: 🏅	993	7
Oxidizer	Inlet VOC	(ppmy) PID	21	10	vapor co	ncentratio	ons				
	Discharge		i) PID: G .	7							
					SVE	Wells					
Well	Vacuum	Flow	Valve Pos.	Dewater		Well	Vacuum	Flow	Valve Pos.	Dewater	
ID	("H2O)	(SCFMG)	1	(Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2	32	75	100	-	Gove	SVE-10	55	29	100	-	Good
HSVE-3	39	72	100	-	good	SVE-9	53	8?	100	-	lots of water
SVE-4	56	17	100	-	banning float	SVE-8	59	5!	100	-	stuk; lots of a
SVE-5	53	20	[00]	-	prencine 1 strak	SVE-6	57	11	100	-	good, water
SVE-7	52	20	100	-	Good	HSVE-1	142194	78	20	-	5002
Notes:					10th of	r					
					AS	Wells					
Well	Pressure	Flow	Valve Pos.			Well	Pressure	Flow	Valve Pos.		
ID	(PSIG)	(SCFMG)	(% Open) Zone 2		Comments	ID	(PSIG)	(SCFMG)	(% Open) Zone 4		Comments
AS-7						AS-17	Ι		20110 1		
AS-8				-		AS-18					
AS-9						AS-19					
AS-10						AS-20					
AS-11						AS-21					
3.2.2			R. Star			AS-22					1.102
			Zone 3			-			Zone 1		
AS-12		-				AS-1					
AS-13						AS-2		t			
AS-14						AS-3					
AS-15						AS-4					
AS-16						AS-5					
			Zone 5			AS-6					
AS-23	9.75	2-2	100	2.300							
AS-24	9.0	3.5	1								
AS-25	9.5	1.9									
AS-26	10.0										and the states
AS-27	8,75	2.3									
Notes:							24				
						**					

Abbreviations:

% = Percent " H₂O = Inches of water deg F - degrees Fahrenheit N/A = Not applicable ppmv = Parts per million volume

PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge

AECOM

Page 2 of 3

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrum	ent ID 39957						
Desci	ription MiniRAE 300	0					
Cali	brated 10/25/2022 12	:33:46PM					
	cturer Rae Systems			State Certifi	ed		
Model N	umber PGM 7320				us Pass		
	er/ Lot 592-920838 umber			Temp	PC 18		
	cation Seattle			Humidity	% 48		
	rtment						
		Calibra	tion Specification	8			
	Group # 1			Range Acc %	0.0000		
Gro	up Name ISOBUTYI	LENE	R	eading Acc %	3.0000		
Sta	ted Accy Pct of Read	ing		Plus/Minus	0.00		
Nom In Val / In Va	I In Type	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	РРМ	100.00	PPM	94.20	99.90	-0.10%	Pass
lest Instruments	Jsed During the Calib	oration				Of Cal Entr	
Fest Standard ID	Description	Manufacturer	Model Number	<u>Serial Num</u> Lot Numbe	r Last		<u>xt Cal Date</u> piration Dat
SEA ISO 100	Isobutylene (C4H8) 10	0 Airgas	x02ai99cp34206	6 304-40239			23/2026
	PPM]			

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jessica Brandgard

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	10/26/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SODO
Attendees (Workers)	Gus Friedman;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M AS VFD troubleshooting
Hazards to be considered today	pressure, noise, mechanical, electrical
Will there be Lone Workers?	Yes
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Hazardous Materials Communication
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All work completed safely
Hazards	 <u>Mechanical</u> <u>Noise</u> <u>Pressure</u> <u>Electrical</u>

Project Information	on			Page of 2
Project Name:	7-30	Location:	Seattle	
Project/Task No.:		Weather:	45 cloud	
Date:	11/10/22	Personnel:	ENE	

Observations

	Time	Observation Description
	1445	Observation Description
1	10/-(5	Onlige
2		Scope: binecky oth
3		replacement parts/ 5, stem up grades
4		replacement parts/system up goodes WARL Gauging
5		Safety toilyate
6		Sistem ON an anjual, GVF. AG+ Ox
7		Rysten readings collected. All operating per usual
8		426 pmv coming in 0.56 ppmv going out.
9		-voitor in Sprend rotoneters (SNE)
10		· Still don't have all the necks (site + the line
		· Still don't have all the parts for pitot tupe/may gauge
		ball valves. Need 1/8 close nipples of 1/4 female connectors or
12		A 1/8 Finist x must pall values & grap what we have.
3		· Still don't have all the pieces Rr Site you repairs. They
4	· · · · ·	only sent quide rads + the puc end fittings. Do they
5		have spore sumpers? I guess we don't reed replacence.
6		floats.
7		· Dilot SVE pipe upgrade completed - 4" Stub up to 2" ball
8		value. Unferenally the peri pump was malfunctioning
9		GO I couldn't try to dewater. Seems like it should
0		wark well though as intended.
1		· Ferrell and shared of to refill prove to 1/2 The
2		· Ferrell gues should up to refill propane tanks. They got filled to 88 to (A) & 82 % (B) full.
3	1700	·Becom LNAPL gauging of ID'ing well locations w/stall #5.
4		Found complete cape in anex of added them to the Reverses
5		to be crus in concer i read pum porter towards
_		vities / Personnel Tracking

Proj	ect Information	Page 2 of 2
Proje	et Name:	<u> </u>
Proje	ct/Task No.:	Weather:
Date	:	Weather: 11/10/20- Personnel: OrF
Obse	ervations	
	Time	Observation Description
1	1910	· LNAPL gaveing completed. Swells had product your A.
2		· LNAPL gauging completed. Swells had product 70.01 Fr. · System a.N. Gates looked.
3	1915	·Gif offsite
4		
5		
6		
7		
8		
9		
10		CK
11		
12		11/10/22
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
23		/
24		·
22		

PORT OF SEATTLE - TERMINAL 30

				AS & SVE Ma	anifold Read	lings			
Date: 1/16/22				1.1		Time:		1605	
Field Tech		3F	-				Equipmen	t I.D. #:	
	arge VOC (42.6					
SVE Discharge LEL (%)									
Oxygen (%) SVE System Inlet Vacuum (" H ₂ O)									
<u> </u>	m Inlet ΔP								
		0С (ppmv) <i>F</i>		0.8				-	
Oxidizer L	ischarge vi	OC (ppmv) /	10		E Wells				
	Vacuum	Flow	Valve Pos.			Vacuum	Flow	Valve Pos.	
Location	("H2O)	(SCFMG)	(% Open)	Comments	Location	("H2O)	(SCFMG)	(% Open)	Comments
HSVE-2	31	80	(00	5002	SVE-10	55	30	100	boncing float
HSVE-3	38	78	100	5002	SVE-9	58	7	100	bts of right, dirty
SVE-4	56	17	100	dirty rotaneter	SVE-8	64	0	100	float such? lots of
SVE-5	54	r 20	100	dirty rotaneter plant gots stuck at pattom; water	SVE-6	64	12	100	bts of ingter, dirty float shule? lots of shirks float 5002
SVE-7	58	15	100	borning Float	HSVE-1	14	SU	25	5002
	Pressure	Flow	Valve Pos.	AS AS	Wells	Deserves	Flaur	Malue Dec	1
Location	(PSIG)	(SCFMG)	(% Open)	Comments	Location	Pressure (PSIG)	Flow (SCFMG)	Valve Pos. (% Open)	Comments
AS-7					AS-17				
AS-8					AS-18				
AS-9					AS-19				
AS-10					AS-20				
AS-11					AS-21				
AS-12					AS-22				
AS-13					AS-1				
AS-14					AS-2				
AS-15					AS-3	1			
AS-16				•	AS-4				6
AS-23	9.5	1.4	100	90 0 d	AS-5				
AS-24	9.0	2.5			AS-6				
AS-25	9.0	1.2							
AS-26	9.5	1.0							
AS-27	8.5	1.9	1			12.2			

Notes:

Abbreviations:

ppmv = Parts per million volume % = Percent deg F - degrees Fahrenheit " H₂O = Inches of water

SCFMG = Standard cubic feet per minute gauge PSIG = Pounds per square inch gauge



PORT OF SEATTLE - TERMINAL 30

Date: 11/10/22		r System Data Collection Form	
	Field Tech(s): GT		
Actual Time: 1505	AS/SVE HMI Time:	5:41	
SVE/AS System			
SVE Blower Speed (Hertz) - VFD Hz/A/+T	42/14.7/63.8	Sparge Blower Speed MI (Hertz) - VFD H 2/A / % T	52/10.2 /89.3H
SVE Blower Runtime (Hours)	14923.3	AS Blower Runtime	5495.3 HI
Transfer Pump Runtime (Hours) - <i>MS Pump</i>	29	Sparge Heat Exchanger Runtime	8492.8 H
Sparge Zone 1 Time Span(s) Operational:		Sparge Zone 4 Time VII Span(s) Operational:	0730-1230 HA
Sparge Zone 2 Time Span(s) Operational:	2012-00-0	Sparge Zone 5 Time VII Span(s) Operational:	1200-1730H
Sparge Zone 3 Time Span(s) Operational:	0300 - 0800 H		5
Sparge Heat Exchanger Discharge Temperature (°F) - <i>TI-500</i>	69	SVE Blower Filter Differential Pressure (" H20) - DPI-200	0.5
AS Blower Pressure (b:3 durye)	8.5	SVE Blower Inlet Differential Pressure (" H20) - <i>FI-200</i>	1.5
AS Blower Differential Pressure (" H2O) - DPI-500	1.0	Transfer Pump Discharge Pressure (PSI) - PI-300	0
SVE Blower Inlet Temperature (°F) - <i>TI-200</i>	53	SVE Blower Discharge Pressure (" H ₂ O) - <i>PI-400</i>	10-2
5VE Blower Inlet Vacuum " H ₂ 0) - <i>VI-200</i>	85	SVE Blower Discharge Temperature (°F) - TI-400	97
Oxidizer System			
nlet Temperature (°F)	681 HP	Process Blower Runtime (Hours)	21768 HA
Burner Chamber Temperature (°F)	641 HP	Combustion Fan Runtime (Hours)	21768 HA
Dutlet Temperature (°F)	636 HA	Burner Runtime (Hours)	21757 HR
nlet Limit Controller Temperature [®] F)	660 HI	Processing Vapors Runtime (Hours)	21741 HA
Outlet Limit Controller Temperature [©] F)	636 HM	Panel Temperature (°F)	71 ни
Process Fan Valve Position Open/Closed)	apen HA		5 ни
Dilution Valve Position (%)	Онл	Oxidizer Inlet Differential Pressure	6.6
Combustion Valve Position (%)	9.2 HN	Л	in the second
Other Components			
Automotive Providence in the state	12 10 50	Propane Tank A Level (%)	47
Aoisture Separator Level (% Full) Vater Storage Tank Level	10 70 561		40

Dilution value o turns open

Bleed Unive I tour I tour

1. " H_2O = Inches of Water

2. °F = Degrees Fahrenheit

3. PSI = Pounds per Square Inch

4. % = Percent

6. TD - Total Depth

7. MP - Measuring Point

5. DTF - Depth to Fluid



	Port of Seattle Terminal 30 LNAPL Gauging Event								
Field Tec	hnician(s):	GIF		Client:	Port of Seattle				
Date: N/	10 /92			Location:	Terminal 30, Seattle				
Project Nu	mber:	60681370		Weather:	45 cloudy				
Closest Hig	gh Tide:	16:51		Closest Low	v Tide: 23:54				
Location	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Comments				
MW-35	1800	60.01	9.07	-					
MW-36	1841	NID	9.27	-	water in monument				
MW-59	1817	ND	8.59	-	1 m				
RW-1	196 49	8.99	9.06	0.07					
RW-12	1830	9.16	7.49	0.33	monument Gilled in				
RW-103	1621	8.13	8.41	0.26	and the second s				
RW-104	1804	ND	8.3	-	9.20 is the average				
RW-106	1807	7.11	9.05/9.35	2.09	starting 9.05 + Sous bell at 9.35				
RW-107	1824	44	8.38	8.18					
RW-110	1833	ND	\$.40	-					

Notes:

1. Feet BTOC = Feet below top of well casing.

2. LNAPL = Light Non-Aqueous Phase Liquid

3. ND = LNAPL not detected using interface probe.

4. NA - Not Available (not able to detect or measure)

5. TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.

6. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. This pertained to MW-36A, -39A, -89, -93, and RW-101, -102, -105, -108, and -109.

T-30 Well Locations

Sampling	Stall #/	Product	Stall #/	AS/SVE	Stall #/	AS/SVE	Stall #/
Well ID	Location	Well ID	Location	Well ID	Location	Well ID	Location
MW-59	D324#	MW-35	D 314	HSVE-1	A254.5	AS-10	40 265
MW-89	Ad57	MW-36	C 309.5	HSVE-2	0260	AS-11	40268
RW-9	(४०२	MW-36A	CSTIS	HSVE-3		AS-12	7 27
MW-36A	C311.5	MW-39A	m	SVE-4	40 304	AS-13	40 273
MW-39A	6273	MW-59	A257	SVE-5	90 309	AS-14	90 275
MW-42	(258 *	MW-89	\sum	SVE-6	0/0317	AS-15	40 interestor
RW-1	Entry lares, entr 20375 (Wof	MW-93	0275	SVE-7	7316×	AS-16	90 301
RW-5A	entry lanes by	RW-	40 206	SVE-8	D 320.5 K	AS-17	40 ZO2
MW-38	\sim	RW-12	0327	SVE-9	D323#	AS-18	40 305
MW-93	\sim	RW-101	D 319.5	SVE-10	D 329 #	AS-19	C/J 705
MW-45A	3324	RW-102	0322.5*	AS-1	A 250	AS-20	90311
MW-46B	13 313.5	RW-103	D 326	AS-2	Aass	AS-21	0/0 313
MW-58A	A273	RW-104	17 314	AS-3	A256	AS-22	90316
MW-86B	Apron	RW-105	D 321	AS-4	A259*	AS-23	D 317#
MW-92	(250	RW-106	1324	AS-5	A261	AS-24	0320*
MW-84A	Apren	RW-107	0 327	AS-6	A264	AS-25	17325
MW-85A	Agran	RW-108	c/0 320	AS-7	40257	AS-26	D 325#
MW-87A	Apron	RW-109	0/17 323	AS-8	40 259	AS-27	0328
		RW-110	90326	AS-9	40 262		

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	21852		
Description	Geopump - Peristaltic Pump		
Calibrated	11/8/2022 3:08:06PM		
Manufacturer	Geotech	State Certified	
Model Number	Geo pump	Status	Pass
Serial Number/ Lot	21852	Temp °C	17
Number			
Location	Seattle	Humidity %	41
Department			
	Calibratio	n Specifications	
Group	# 1		
Group Nan	ne Functional Test		
-Test Performed: Yes	As Found Result: Pass	As Left Result:	Pass
Test Instruments Used Du Test Standard ID Descrip		<u>Serial Number</u> Model Number Lot Number	(As Of Cal Entry Date) / <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

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	Calibratio	n Specifications	
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AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	11/10/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SODO
Attendees (Workers)	Gus Friedman;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M System part upgrades LNAPL gauging
Hazards to be considered today	pressure, noise, motion, mechanical
Will there be Lone Workers?	Yes
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Fall Season - Daylight Saving Time Hazards
Other topics discussed	
Mid day reviews	
End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	Completed safely and successfully
Hazards	 <u>Mechanical</u> <u>Motion</u> <u>Noise</u> <u>Pressure</u>

Project Information			Page of 3			
Project Name:	T-30 Location		the			
Project/Task No.:	Weath	r: <u>50</u>	dan			
Date:	1(23/22 Person	iel: Gif	<u>B</u>			
Observations						
Time		on Description				
1 1515	GIF + AB onsite					
2	Sope: bimelkly OtM	; part upc	indes			
3	Safety tailagte. Practice	crave open	stars are a chile.			
4	Safetz tailigte. Practice System ON an arrival.	GF Show	ed to around gen			
5	an artentation		· ()			
6	Tuck down regular otm	readings				
7 [609	Took PID readings. In let < Get up SVE manifold very	5,8 ppm, a	estlet 11 ppmu			
8 1615	Get up GVE manifold ver	cr moniteri	rg. Silicon on hose			
9	DUG. New mini KO. Fr	isting sample	parts work great.			
10	KSVE-1: 1.0 Mmu	5				
11	HSNE-2: 13.5"					
12	HSVE - 2: 4.6					
13	SUE-4:1.0 .		54 C			
14	-5: NM					
15	-6 · 0.6					
16	-7: 6.5 .		S. 1997			
17)			
18	-9:2.5					
19	-(0:0.9)					
20 1640	SVE-8 demotoring w/mani	fold upgrad	e			
21	- closed glape value + ap					
22	- dewatered doubles up per					
23	- terres opered glase valu	e or cleared,	rotaneter in coverise			
24	& uncovering the open to	value	0 0			
25	- water successfully deved f	on stanet	s d float read 15-20			
	Comments / Site Activities / Personnel Tracking					
Should tr	y bigger tubing. Took a while	(15 min?) to	dewater Igal w/pe			
hormal pu	in pump sized tubing.					
•						

 \mathbb{C} l
Usersigus friedmant Documents Field Forms - GENERAL Field Forms - GF
 xls(Daily Field Log) 3/22 2021

Project Informatio	Π		Page of	3
Project Name:	7-36	Location:	Seattle	_
Project/Task No.:	A CONTRACTOR OF A CONTRACTOR OFTA CONTRACTOR O	Weather:		_
Date:	11/23/22	Personnel:	GIF AB	_
Observations				
Time		Observation Descript	ion	
1	Schn- c nonent	arily before dro	ping down to O. The	_
2			but the well is not	_
3 2	getting on	flow?	•	
100 Kg	Swlen the ?	ive-5 float ce	ts Stuck at O the vac	
5 094			will blocking the pipe.	_
6			is different. It does	_
7	have an in	tact bottom	Kamper which SVE-	5
8			it might really be O	
9			noving & not sticky.	
			all value setup for bit loss	+
11	4 of the wells (WE-4,5,6, 29)		_
12	> herizontal w	115 don't seen to	accumulate	
13	> SVE-7 210	don't accumulate	?	_
14 1715	Upgroded ordizer	may gauge al 1	s-in ball makes to protect	4
15	from condensation			_
16	· SVE pitot/may g	auge already he	d mini ball values but TL	<u>e</u>
17	tubing has alm	mis been kept	attached Eagy to keep	_
18	Jetached excep	+ when taking	a reading maning forces	d.
19 18 20	Poly tonk measure	enerts	0 0	_
20	- 2.17 Ft water i	n tank		_
21	> low Ploat is	at 3.26 Pt w/	~ 5 in until it hits its float	<u>F</u>
22	Stopper, so m	mbe 3.75 ft bef	are it trigger </td <td>_ </td>	_
23	-> high Float is	at 4.84 Ft, ak	so w/ ~5 IN until it hits	_
24	its float Stap	20. Mybe 5.25	ft before it toispers ?	_
25	31.09-1.5 Ft F	lmaing before 1st	Float 2.67 - 3.08 f+ befor	e
Comments / Site Ac	tivities / Personnel Tracking	0		

Proj	ect Information				Page <u>3</u> of <u>3</u>
Proje	ect Name:	1.30	Location:	Seathe	
Proje	ect/Task No.:		Weather:		
Date	•	11/23/22	Personnel:	GF, AB	
Obs	ervations				
	Time		Observation Description		
1		2nd Plant thi	georg 2 welks	whil LNAPL r	ecovery
2		W/ DH.	00		0
3	19635	Clean up lock	sp.		
4		·Follow-ups:			
5			ker pumper replace	ments	
6		- bigger per:	punp tubing		
7		- more sve m	mifold pall value	affemblies	
8			is to keep on sit		
9	1855	OFFSIK (GF)	· · · · · ·		
10			/		
11					-
12					
13					
14					
15				10000	
16			GF	25,51,21	
17			11/28/22		
18					
19					
20				2.11	
21					
22					
23					
24					
25					

Equipment I.D. #: Vapor Concentrations Weil Vacuum Flow Valve Pos. Dewater 00112 3.5 5.5 5.5 5.5 5.5 Weil Vacuum Flow Valve Pos. Dewater 5.6 Weil Vacuum Flow Valve Pos. Dewater 6.1 7.6 0.00 0	£2			AS	& SVE Ma	nifold Readings - **Nev	v Zone Fro	m Initial Ro				
Vagor Concentrations Variable Voc (ppmv) PID: Set Wells Well Vacuum Flow Valve Pos. Dewater 10 (1/20) (SCFMG) (% Open) (Ga) Comments 10 (1/20) (SCFMG) (% Open) (Ga)	Date:	11/23/2	22									
Statistic VOC (ppmv) PD: SVE Wells Well Vacuum Flow Valve Pos. Dewater 10 (*120) (SCFMG) (% Open) Gail Comments 5VE-2 33 79 (00 50% SVE Wells Vacuum Flow Valve Pos. Dewater 10 (*120) (SCFMG) (% Open) Gail Comments SVE-2 33 79 (00 50% SVE *** Gail 7 (*00 go ol SVE-2 35 79 (00 50% SVE *** Gail 7 (*00 go ol SVE-3 61 7 (00 50% SVE *** Gail 7 (*00 go ol VE-5 58 16 100 go ol SVE *** Gail Gail<	feld le	cn(s): 0	<u>n-, /16</u>			Vapor Co	ncentratio	ons	Equipmen	t I.D. #:		
SVE Wells Well Vacuum Flow Value Pos. Dewater 10 (*1/20) (\$CFMG) (% Open) (Ga) Comments 10 (*1/20) (\$CFMG) (% Open) Ga) Comments 5VE-2 35 79 (UO $50eA$ SVE-10 600 3.7 (UO go of 5VE-3 41 74 (UO go of SVE-9 61 7 (UO go of 5VE-5 56 (G 17 (UO go of svE-8 64 8 (UO (under, dirf, dir	Dxidizer	Inlet VOC (ppmv) PID	: 8	8							
Well Flow Value Pros. Dewater Comments Well Value Flow Value Pros. Dewater Comments ID ("H2D) (\$CFMG) (\$CPMG)	Dxidizer	Discharge	VOC (ppmv) PID:								
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Well	Vacuum	Flow	Valve Pos	Dewater	SVI		Vacuum	Flow	Valve Pos	Dewater	
SVE2 33 79 100 4 and good SVE10 60 277 100 good SVE3 41 74 100 90°d SVE9 61 3 100		1				Comments		1				Comments
SVE3 41 74 100 jord sve3 61 8 100 water dirt VE5 55 1(0 100 Girty sve8 68 6 100 water dirt VE5 55 1(0 100 Girty sve8 68 6 100 water VE5 55 1(0 100 Good 15% 100 water water VE5 55 1(0 100 Good 15% 100 water water VE5 55 10 100 Good 15% 100 water good 15% 10 10	ISVE-2	33	79	100		5002	SVE-10	60	27	100		
VE4 GO IT LOU Sirty SVE8 GB LOU Leader VE5 SS I.G I.UU Maximized with Sve6 G.M. IO I.UU minor with with Sve6 VE7 GS VT IDD good HSVE1 I.G BO 20 god VE7 GS VT IDD good HSVE1 I.G BO 2D god VE7 GS VT IDD good HSVE1 I.G BO 2D god VE8 Flow Valve Pos. good TS Summers Togets Summers Togets God G	ISVE-3	41	74	100			SVE-9	1 1	8	100		water dirt
otes: AS Wells AS Wells Well Pressure Flow (SCFMG) (% Open) Comments ID Comments Zone 2 Comments Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments AS-19 Comments Solutions of the colspan="2">Comments Zone 3 Zone 1 Zone 3 Zone 1 Zone 3 Zone 1 Solution of the colspan="2">Cons 5 AS-6 Cone 5 Solution of the colspan="2">Cone 5 Solution of the colspan="2">Cone	VE-4		17	100		dirty	SVE-8	68	Ø	100		
otes: AS Wells AS Wells Well Pressure Flow (SCFMG) (% Open) Comments ID Comments Zone 2 Comments Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments AS-19 Comments Solutions of the colspan="2">Comments Zone 3 Zone 1 Zone 3 Zone 1 Zone 3 Zone 1 Solution of the colspan="2">Cons 5 AS-6 Cone 5 Solution of the colspan="2">Cone 5 Solution of the colspan="2">Cone	VE-5	58	16	100		bunging/stuck.	SVE-6	64	10	100		minal water
otes: AS Wells AS Wells Well Pressure Flow (SCFMG) (% Open) Comments ID Comments Zone 2 Comments Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments Zone 2 Zone 4 Solutions of the colspan="2">Comments AS-19 Comments Solutions of the colspan="2">Comments Zone 3 Zone 1 Zone 3 Zone 1 Zone 3 Zone 1 Solution of the colspan="2">Cons 5 AS-6 Cone 5 Solution of the colspan="2">Cone 5 Solution of the colspan="2">Cone	VE-7	55	17	(0D			HSVE-1	16	80	20		good
ID (PSIG) (SCFMG) (% Open) Comments ID (PSIG) (% Open) Comments 5.7	Well	Pressure	Flow	Valve Pos		AS	1	Pressure	Flow	Valve Por		
Zone 2 Zone 4 5-7 A AS-17 AS-17 AS-17 5-8 A AS-18 AS-18 AS-19 AS-19 5-9 A AS-19 AS-10 AS-10 AS-10 5-10 A AS-19 AS-20 AS-20 AS-20 AS-20 5-11 A AS-20 AS-20 AS-20 AS-20 AS-20 AS-20 5-11 A AS-20 AS-20 <td< td=""><td>Well</td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Well					_						
5.7 1 <t< td=""><td></td><td>(PSIG)</td><td>(SCFMG)</td><td></td><td></td><td>Comments</td><td>ID</td><td>(PSIG)</td><td>(SCFMG)</td><td></td><td></td><td>Comments</td></t<>		(PSIG)	(SCFMG)			Comments	ID	(PSIG)	(SCFMG)			Comments
5.9 1 <t< td=""><td>S-7</td><td></td><td></td><td></td><td></td><td></td><td>AS-17</td><td></td><td></td><td></td><td></td><td></td></t<>	S-7						AS-17					
3-10 1 <	S-8						AS-18					
5-11 Image: Constraint of the second se	S-9						AS-19					
Zone 3 AS-22 Zone 1 5-12 AS-1 AS-1 AS-1 5-13 AS-1 AS-2 AS-1 5-14 AS-2 AS-3 AS-3 5-15 AS-1 AS-3 AS-3 5-16 AS-3 AS-4 AS-3 $Zone 5$ AS-5 AS-1 AS-3 $S-16$ AS-5 AS-1 AS-1 $S-23$ 9.0 2.0 WO $S-23$ 9.0 2.0 WO $S-24$ 5.5 2.2 $AS-6$ $AS-6$ $S-25$ 5.5 1.2 $AS-6$ $AS-6$ $S-27$ 5.5 1.2 $AS-6$ $AS-6$ $S-23$ 9.0 2.0 WO WO $S-24$ 5.5 2.2 $AS-6$ $AS-6$ $AS-6$ $S-25$ 5.5 1.2 $AS-6$ $AS-6$ $AS-6$ $S-27$ 5.5 1.5 $AS-6$ $AS-6$ $AS-6$ $AS-6$ $S-27$ 5.5 1.5	S-10						AS-20					
Zone 3 Zone 1 5-12 AS-1 AS-1 5-13 AS-2 AS-3 5-14 AS-3 AS-3 5-15 AS-4 AS-4 5-16 AS-5 AS-6 70ne 5 AS-6 AS-6	S-11						AS-21					38 to
5-12							AS-22					
5-13 AS-2 AS-2 AS-3 5-14 AS-3 AS-3 AS-3 5-15 AS-4 AS-4 AS-3 5-16 AS-4 AS-5 AS-6 5-16 AS-5 AS-6 AS-6 5-23 9.0 3.0 WO 5-24 5.5 3.2 3.0 $5-25$ 6.5 1.7 3.6 $5-25$ 6.5 1.7 3.6 $5-26$ 9.5 1.6 3.6 $5-27$ 76.5 1.4 1.2				Zone 3	1					Zone 1		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	S-12						AS-1					14
5-15 A5-4 A5-4 5-16 A5-5 5-16 A5-5 5-16 A5-5 5-16 A5-5 5-23 9.0 3.0 WO 5-24 45.5 2.2 5-25 45.5 3.2 5-25 45.5 3.7 5-26 9.5 1.4 $5-27$ 45.5 1.4	S-13						AS-2					
5-16 Image: Second	S-14						AS-3					
Zone 5 AS-6 5-23 9.0 3.0 WO 5-24 6.5 3.2	S-15						AS-4					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	S-16	ļ					AS-5					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				Zone 5			AS-6					-
5-25 46.75 1.7 5-26 9.25 1.2 5-27 8.5 1.4	S-23	9.0		wO								
5-26 9.25 1.2 5-27 58.5 1.4	S-24	5.5	2.2									
5-27 ~ 6.5 1.5	\$-25											
	5 25	9.25										
otes:	S-26											
	S-26 S-27	5.5	1.5	- 1						-	and the second second	

Abbreviations:

% = Percent

" H₂O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable

ppmv = Parts per million volume PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge

AECOM

PORT OF SEATTLE - TERMINAL 30

		em Data Collection Form	
Date: 11/23/22	Field Tech(s): GFAS		
Actual Time: 1535	AS/SVE HMI Time:		
SVE/AS System			
SVE Blower VFD Setpoints	112 Lu alalla	AS Blower VFD Setpoints	and Alace
Hertz/Amps/Torque %) - VFD	42/14.8A/544.	(Hertz/Amps/Torque %) - VFD	52 H2/0.2A/89
VE Blower Runtime		AS Blower Runtime	2000 1
Hours)	15229,3 HM	(Hours) - Sparge Blower	5800.3 HM
ransfer Pump Runtime	2.9 HMI	AS Heat Exchanger Runtime	5797.7 HM
Hours) - MS Pump	d. HMI	(Hours)	HM
iparge Zone 1 Time	1700 - 2230 HMI	Sparge Zone 4 Time	0730-1230 HM
ipan(s) Operational:	I. 00-70 HMI	Span(s) Operational:	HM
parge Zone 2 Time span(s) Operational:	2200-330 HM	Sparge Zone 5 Time	1200-1730 HM
Sparge Zone 3 Time		Span(s) Operational:	
ipan(s) Operational:	0300-0600 HM	Sparge Zone Active:	5
AS Blower Intake Pressure	The Prive	SVE Blower Filter Differential	
" H2O) - <i>DPI-500</i>	1.0	Pressure (" H20) - DPI-200	0.5
AS Blower Discharge Pressure	0.0.5	SVE Blower Inlet Differential	
PSI) - <i>PI-501</i>	8.25	Pressure (" H20) - FI-200	1.75
AS Bleed Valve		Transfer Pump Discharge Pressure	•
# turns open) -		(PSI) - <i>PI-300</i>	
AS Heat Exchanger Discharge Temp		SVE Blower Discharge Pressure	10. 2
°F) - <i>TI-500</i>	-15	(" H ₂ O) - <i>PI-400</i>	10.2
VE Blower Inlet Temperature	53	SVE Blower Discharge Temperature	0.0
°F) - <i>TI-200</i>	לכ	(°F) - <i>TI-400</i>	97
SVE Blower Inlet Vacuum	\$1	SVE Blower Dilution Valve	4
H ₂ 0) - <i>VI-200</i>		(# turns open) -	0
Dxidizer System			
Dxidizer Inlet Differential Pressure ("	0.2	Combustion Valve Position (%)	11.1
120) - <i>FI-1</i>	÷		HM.
nlet Temperature (°F)	GTO HMI	Process Blower Runtime (Hours)	22074 HM
Burner Chamber Temperature (°F)	669 HMI	Combustion Fan Runtime (Hours)	22075 HM
Dutlet Temperature (°F)		Burner Runtime (Hours)	
outlet remperature (F)		Burner Kuntime (nours)	77/1/26
	626 HM		JOUS HM
nlet Limit Controller Temperature °F)	<u> </u>	Processing Vapors Runtime (Hours)	27065 HM
°F)	668 HMI		22048 HM
°F) Dutlet Limit Controller Temperature	668 HMI	Processing Vapors Runtime (Hours) Panel Temperature (°F)	22048 HM
PF) Dutlet Limit Controller Temperature PF)	668 HMI	Panel Temperature (°F)	22048 HM
^o F) Dutlet Limit Controller Temperature ^o F) rocess Fan Valve Position	668 HMI		22043 нм 76 нм
² F) Jutlet Limit Controller Temperature ² F) Irocess Fan Valve Position Open/Closed)	668 нмі 626 нмі	Panel Temperature (°F)	22043 нм 76 нм
PF) Dutlet Limit Controller Temperature PF) rocess Fan Valve Position Dpen/Closed) Dilution Valve Position (%)	668 нме 626 нмі ореч нмі	Panel Temperature (°F)	22043 нм 76 нм
^o F) Dutlet Limit Controller Temperature ^o F) rocess Fan Valve Position Open/Closed) Dilution Valve Position (%) Dilution Valve Position (%) Dilution Components inockout Tank Level	668 нме 626 нмі ореч нмі о нмі	Panel Temperature (°F)	2-2044 нм 76 нм 5 нм
°F) Dutlet Limit Controller Temperature °F) Process Fan Valve Position Open/Closed) Dilution Valve Position (%) Other Components Cinockout Tank Leve! Sightglass % Full) ¹	668 нме 626 нмі ореч нмі	Panel Temperature (°F)	2-2044 нм 76 нм 5 нм
nlet Limit Controller Temperature °F) Outlet Limit Controller Temperature °F) Process Fan Valve Position Open/Closed) Dilution Valve Position (%) Other Components Knockout Tank Level Sightglass % Full) ¹ Vater Depth in Storage Tank ² DTF/WD (calc in ft))	668 нме 626 нмі ореч нмі о нмі	Panel Temperature (°F) Flame Signal (Volts)	22043 нм 76 нм

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit

PSI = Pounds per Square Inch

% = Percent

DTB - Depth to Bottom MP - Measuring Point

DTF - Depth to Fluid

WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring DTF from the MP and

then subtracting that from 6.92 ft (DTB).



AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	11/23/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SODO
Attendees (Workers)	Friedman, Gus;Bragg, Austin;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M System part upgrades
Hazards to be considered today	pressure, noise, motion, mechanical
Will there be Lone Workers?	No
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	ThanksgivingSafety
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All tasks completed safely and successfully
Hazards	 <u>Mechanical</u> <u>Motion</u> <u>Noise</u> <u>Pressure</u>

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Descr	ent ID 38726 iption MiniRAE 300 prated 11/18/2022 6:						
	cturer Rac Systems			State Certifi			
Serial Numbe	mber PGM7320 r/ Lot 592-920494 mber				tus Pass °C 19		
	cation Seattle			Humidity	% 27		
		Calibra					
	Cuerra # 1	Canbra	tion Specifications		0.0000		
	Group # 1 1p Name VOC			Range Acc %			
	ted Accy Pct of Read	ing		Plus/Minu			
<u>Nom In Val / In Val</u> 100.0 / 100.0	In Type PPM	<u>Out Val</u> 100.0	Out Type PPM	<u>Fnd As</u> 102.1	<u>Lft As</u> 100.0	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments U	sed During the Calib	oration			<u>(As</u>	Of Cal Ent	ry Date)
3	Description	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Num</u> Lot Numbe	er Last		ext Cal Date / xpiration Date
	sobutylene (C4H8) 10 PPM	0 Airgas	x02ai99cp34206	6 302-40248 -1			18/2026

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

Proj	ect Information	Page of
Proje	ct Name:	T-30 Location: Sentille
Proje	ct/Task No.:	Weather:
Date		12/8/22 Personnel: GF AB
Obse	rvations	
	Time	Observation Description
1	11:45	G.F. AB on site
2		Scape: 46 of up to suppor suppling. 40 LNAPL recover
3		· Safety tailegte
4	12:00	·Gustin OFF on anival.
5		- LAH alarm 12/3/02 @ 12:29
6		-LAMH full 12/12 @ 08:19 Shut sugten down
7		1 + triggered other foults, montpe not though?
8		- KOT LAH Trisceld 12/11/2 @ 14:22 and seems
9		to have about the suctem down then.
10		Is maybe se LANH just shuts down the transfer pump?
11		. Maring on site printing for perrell pag. Tanks are at
12		30 Yo (A) and 20 to (B)
13	1300	· marger test completed. power disconcected in advance
14		- The Nothing Significanthy stood out from the readings
15		· TOOK are of coveral maintenance to-dos:
16		- Guanding a new votioneter for AS-7 Very hard
17		to get the top black have off of the borb. The
18		new rotonetest union campo is taller than the
19		old ones but instead of cutting down the
20		plack have we just left it pumped up higher
21		man the other dres. Figured we can alway cut
22		it down to size later if need be. All SF ne
23		pipe picked & fittings below the votaneter were
24		impossible to get don't, which he tried to de
25		to swap in a smaller pipe nipple there.
Com	mants / Sita Acti	ivities / Personnel Tracking

 ${\cal U}^{\prime}$

Project Informatio	$P_{age} \simeq \frac{2}{of} \frac{3}{3}$
Project Name:	T-20 Location:
Project/Task No.:	Weather:
Date:	12/51/22 Personnel:
Observations	
Time	Observation Description
1	· replaced the hose on SVE . removed the female
2	cambook fittings from the old hose using bot
3	water to goften it. And to but the make fitting
4	off the year hose as it had staps crimped an.
5	put one of the old formale fittings over the new
6	hold + hooked it if left it lone for me
7	time being + propped of the cails of 5-5-51
8	buckets It an write reasonable well
9	· replaced the crackle pottom piece of the SUE-10
10	using enal part maring ordered. Had to retain
11	the drive from the old pipele.
12	· Scrubled sut the KOT sight black
13	· Trile usive the lorger-sized solinst peri pump to
14	dewater the gut wells, but it wouldn't tern on.
15	Didn't work with the battery of off of my car.
16	Called Larry (PINE) + Le'll take a look & have
17	Rectional and and and in during
18	· Loured at suppling out the SVE mag gauge 10-15 "
19	but we only had 0-2 or 0-0.25 in the range.
20 1 1	Weld to order a O-5 rance for it.
21	· Couldn't bid out further dewarkning setups wet
22	ble parts are still in transit.
23	· SVE manufer internal parts and still bein ordered
	opened & closed rarely-used values @ KOT & SVE manifold.
²⁴ 25 \630	·DH onsite (AI) for LNAPL gauging
	tivities / Personnel Tracking

	DAILY FIELD LOG
Project Information	Page \underline{S} of \underline{S}
Project Name:	7-20 Location;
Project/Task No.:	Weather:
Date:	2/6/72 Personnel:
Observations	
Time	Observation Description
1	Sofety failagte. Sape is 9 wells expecting product
2	171 500 THE GEG OVER ALOUR SMICH.
3	· Began gauging & vercing on fw 59.
4	GIF for ked Ais through the process, showed him the wells,
5 6 17 <i>0</i> 0	AB 2Ffik for the night.
7	·Git gauged all oper wells. Product present in 7 wells:
8	MW-35, RW-1, -12 -104, -106 -107 & MW-59
, 2100	Dore Vacing vehicid. Mared to sugten tank
10	> Holding fank has ~0.25 Ft of scun/product at the
11	Surface. Tank is 28t dia, 50 ng5 gal.
12 2120	went to re-songe RW-107+-12 for end-of-day neasurements
13 2140	· Returned to system. Al done vacing of got the entire
14	holding tank of secondary containment: 2328 gal tot EOD.
15	· Cleared system alorms & restarted axid: 205
16	- cleaked HOT + it had already pumped itself out. Maybe
17	once the holding tonk floats drapped doing the vac? · SVE + AS standed up fire once Ox heated -p
18	· SVE & AS stands up fine once Ox Leasted -p
19	-> Zae 2 happened to be active, including AS-7. New
20	rotaneter louks good. No lanks audible Easy to read (~2)
21	-> Geens live lots of water in the SNE lines
22	KNOTE: Trips the POS interface probe but it wouldn't some water or product. Also it is netric, (m d m.
23	> New here on SVE-9 had water uside in it.
25 2210	REGHE. Systemall locked p
	No his inclusion Walton k

Gí

C /Users gus triedman\Documents Field Forms - GENERAL Field Forms - GF xls(Daily Field Log) 3/22/2021

Field Tech(s): Date:

Equipment ID:

		Baseline Rea	dings (See Note 2)		
	Motor	AS Com	pressor	SVE B	lower
		Winding	Insulation	Insulation	
Motor		Resistance	Resistance	Resistance	Resistance
Wires	Date	(Ohms)	(Megaohms)	(Ohms)	(Megaohms)
G & B	N/A	N/A (>100.0)	NM	N/A (>100.0)	NM
G&O	N/A	N/A (>100.0)	NM	N/A (>100.0)	NM
G & Y	N/A	N/A (>100.0)	NM	N/A (>100.0)	NM
B&O	N/A	NM	N/A (0.00)	NM	N/A (0.00)
0&Y	N/A	NM	N/A (0.00)	NM	N/A (0.00)
B&Y	N/A	NM	N/A (0.00)	NM	N/A (0.00)

Legend: G= Ground Wire B= Brown Wire O= Orange Wire Y= Yellow Wire N/A= Not applicable

Notes:

1 These tests check for a breakdown of insulation within the internal motor windings over time. Use a Megger Model MIT 220.

2 Baseline data is unavailable. Testing was not conducted by CRETE and readings were only initiated once issues with the AS motor were identified.

3 Insulation resistance testing was completed between winding phase at 500 volts over approximately 30 seconds

4 >1,000 Mohm readings generally means you have an open curcuit

5 0.00 Mohm readings mean that the phase being tested is shorted to Ground

6 Ideally the phase-to-phase winding resistance readings between each phase should be the same or at least very close

7 Phase-to-phase winding resistance readings should not be 0 ohms (i.e. short) or OL (overload) or infinity

8 Generally high resistance readings (greater than 10 Mohms) indicate the motor insulation is good

Motor			Comments						
Test		Winding Resistanc	e		nsulation Resistan	B&Y jumped from	1.4-1-8 Olin		
Motor Wires	B & O	0 & Y	B&Y	G & B	G & O	G&Y	or i Jorkel (orti		
Date/Time	(Ohms)	(Ohms)	(Ohms)	(Megaohms)	(Megaohms)	(Megaohms)			
Baseline	N/A	N/A	N/A	N/A	N/A	N/A			
	1.41	1.42	1.40	0.14	0.13	0-12			

Motor			Comments						
Test		Winding Resistance	2	I	nsulation Resistanc	e	CEB	initially	0.12, but 0.14
Motor Wires	B & O	0&Y	B & Y	G & B	G & O	G & Y		3	
Date/Time	(Ohms)	(Ohms)	(Ohms)	(Megaohms)	(Megaohms)	(Megaohms)	after	others	were tested
Baseline	N/A	N/A	N/A	N/A	N/A	N/A			
	0.73	0.13	0.74	0.12	0.13	0.14			

Port of Seattle Terminal 30 LNAPL Removal Event

Field Techni	cian(s):	GF	AB				Client: Port of Seattle				Closest Low Tide:					
Project Num	nber:	1	60681370				Project:	T-30			Closest High 1					
Date:	12/4	122					Location:	Seattle, WA			Weather:	40,2	i.zzl	L		
			Initial G	Sauging	-		First R	emoval			Post-Re	moval		Further		
			Initial Depth	Initial Depth	LNAPL	Approx Vac	Extraction	Extraction	Est Total		Depth to	Depth to	LNAPL	Removals		
Well ID	Well Location	Time of Gauging	to LNAPL (Ft BTOC)	to Water (Ft BTOC)	Thickness (Feet)	Duration (Minutes)	Start Time (Approx.)	End Time (Approx.)	Removal (Gallons)	Time of Gauging	LNAPL (Ft BTOC)	Water (Feet TOC)	Thickness (Feet)	Required? (Yes/No)	Comments	
MW-35	D 314 **	1750	9.04	9.07	0.03	20	1955	2015	-	2032	-	10.52	1	No	15 ft depression even 15 min 10st - Vac	
MW-36	C 309.5			itoring protocol												
MW-36A	C 311.5			itoring protocol												
MW-39A	C 237	Removed fro	om LNAPL mon	itoring protocol	following 0	9/08/22 event	· · · · ·									
MW-59	D 324 **	1651	9.10		0:05	20	1765	1725		1813	_	9.14		No		
MW-89	A 257			itoring protocol												
MW-93	D 275 Entry lanes W of	Removed jro		itoring protocol			,	· · · · ·								
RW-1	wall, even w/ D 275	1753	7.64	8.68	Osk		2040	2100	-	265	_	10.14	-	No	@26:35 DT 9.65	
RW-12	D 327	1732	9.25		0.2~{	75045	1845	1930	1	1951	a. 40	9,55	0.15	415		
RW-101	D 319.5			itoring protocol												
RW-102	D 322.5 **	Removed fro	om LNAPL moni	itoring protocol	following 09	9/08/22 event										
RW-103	D 326	1710	\$.40	8.55	0.15	20	1755	1815	-	F641	-	5.42	-	No		
RW-104	D 318	1743	1	6.12				-	-	-					4	
RW-105	D 321			itoring protocol				1.								
RW-106	D 324	Removed fr	INAPL moni	toring protocol	following 05	198/22 even	see to	low								
RW-107	D 327	1291	8.74	9.18	0.44	902	1815	1845	1	1925	8.75	<i>₹.4</i> 4	0.14	Yes		
RW-108				toring protocol												
RW-109	C/D 323	Removed fro	om LNAPL moni	toring protocol	following 09	/08/22 event		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -								
RW-110	C/D 326	1726	/	8.97	-				1							
VACUUM TR	UCK MEASUR	ED AND APP	ROXIMATED T	OTALS				(nol	tink.	Abbreviatio	ns:	0.1-1-1-170				
Estimated vo	olume in vac tr	uck, post-LN/	APL recovery bu	ut pre-poły tank	(gal):	NM .	0 132.	8 (15	tink wood	BTOC = B	elow top of we	I casing.				
Estimated vo	olume in vac tre	uck at end of	day (including	poly tank) (gał):	2	328'			LNAPL = L	ight Non-Aque	ous Phase Lig	uid				
Estimated co	mbined volum	e, measured	by DH the folk	owing day (gal):						ND = LNAPL not detected using interface probe.						
> Estimated	d product port	ion (gał):								NA - Not Available (not able to detect or measure)						
> Estimated	d water portion	n (gal):								TRACE - LNAPL present, but no accurate measurement.						
Guidelines:	idelines:										D 314 ** = Well located in a container stall					

- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

- If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min - If product thickness is greater than 0.51 ft, vac for approx 60 min

Notes: During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. RW-106/1653 8.50 8.82 0.32 36 M0 1725 1755 1915/-865/- No

Port of Seattle Terminal 30 LNAPL Removal Event -- Further Removals

Field Techni	cian(s): C	11- 14	5					Client:	Port of Seattle			Closest Low	Tide:		20		19-13
Project Num			60681370					Project:	T-30			Closest High		-78			10
Date:	Vala	122						Location:	Seattle, WA			Weather:	HO	122	4		
	1														to book good		
		Post- Removal	Approx		Seco	nd Remova	1		<u> </u>	Approx		1	Third Ren	Post-Removal			
		LNAPL	Vacuum	Extraction	Extraction		Post-Removal	Post-Removal	LNAPL	Vacuum	Extraction	Extraction		Depth to	Post-Removal	LNAPL	
		Thickness	Duration	Start Time	End Time	Time of	Depth to LNAPL	Depth to Water	Thickness	Duration	Start Time	End Time	Time of	LNAPL	Depth to Water	Thickness	
Well ID	Well Location	(Ft BTOC)	(Minutes)	(Approx.)	(Approx.)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(Minutes)	(Approx.)	(Approx.)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	Comments
MW-35	D 314 **																
	0.000.5	0	10/401	· · · · · · · · · · · · · · · · · · ·	15-11	(10/22					<u> </u>			l			
MW-36	C 309.5				of following 11												
MW-36A	C 311.5				ol following 09				e1								
MW-39A	C 237	removea jro	m LINAPL mon	toring protoci	ol following 09	/08/22 even			1	-			r	r			
MW-59	D 324 **	1															
14144-33	0.324																
MW-89	A 257	Removed fro	m LNAPL mon	l itoring protoco	l of following 09	1 /08/22 even	l				I				1		
MW-93	D 275				ol following 09									· ·			
	+			1			l	1			1	<u> </u>					
RW-1	Entry lanes W of walt, even w/				ļ			[
	D 275																
RW-12	D 327	0.15	661	2015	2000	DOZE	W.40	10.46	20.01	·							
RW-101	D 319.5				of following 09	· ·											
RW-102	D 322.5 **	Removed fro	n LNAPL moni	toring protoco r	ol following 09	/08/22 even	t						,				
		_															
RW-103	D 326								-								
	+							ł			<u> </u>			·			0.4.4.4.4.1.
RW-104	D 318	-															
RW-105	D 321	Removed from	n LNAPL moni	toring protoco	ol following 09	/08/22 even	t	.			L	1					<u></u>
RW-106	D 324	-															
			1														
		- 11					_										
RW-107	D 327	0.14	20	1930	1956	2011	-	8.80	-	-	<u> </u>						
		,						0.00									
RW-108	C/D 320				of following 09												
RW-109	C/D 323	kemoved fro	n LNAPL moni	toring protoco	ol following 09,	/U8/22 even	τ 							<u> </u>			
RW-110	C/D 326	-															
N44-110	C/D 320										<u> </u>					~	
				1	1	1		1			1	1	L				

Guidelines:

- If product thickness is 0.01 - 0.25 ft, vac for approx 20 min

⁼ If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min

If product thickness is greater than 0.51 ft, vac for approx 60 min

² Repeat vac events until product thickness is <0.01 ft or three vac events have been completed

- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

LNAPL = Light Non-Aqueous Phase Liquid

BTOC = Below top of well casing.

Abbreviations:

ND = LNAPL not detected using interface probe.

NA - Not Available (not able to detect or measure)

TRACE - LNAPL present, but no accurate measurement.

Notes:

During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

Port of Seattle Terminal 30 LNAPL Removal Event -- EOD Gauge

Field Technic	cian(s):	GF.	+5			Client:	Port of Seattl	e	Closest Low Tide:		
Project Num	ber:		60681370			Project:	T-30		Closest High Tide:		
Date:	\	216122				Location:	Seattle, WA	_		drizzle	
						End of Day					
Well ID	Weli Location	Initial LNAPL Thickness (Feet)	End Time of Last Extraction	Time of Gauging	Depth to LNAPL (Ft BTOC)	Depth to Water (Ft BTOC)	LNAPL Thickness (Feet)	Time Lapse Since Extraction (Minutes)		Comment	ts
MW-35	D 314 **	_									
MW-36				protocol following 1.				11 July 11 July 11			
MW-36A				protocol following 0							
MW-39A	C 237	Removed from i	LNAPL monitoring p	protocol following 0	9/08/22 event				1		
MW-59	D 324 **										
MW-89	A 257	Removed from L	NAPL monitoring p	rotocol following 0	9/08/22 event			15-			
MW-93	D 275	Removed from L	NAPL monitoring p	rotocol following 0	9/08/22 event			North Contraction			
RW-1	Entry lanes W of wałł, even w/ D 275										
RW-12	D 327	0.245	205-0	2135	709	G.72	0.03	65			
RW-101				protocol following 0							A
RW-102	D 322.5 **	Removed from L	NAPL monitoring p	rotocol following 0	9/08/22 event			31			
RW-103	D 326										a t.
RW-104	D 318	· _									-
RW-105	D 321	Removed from L	NAPL monitoring p	rotocol following 0	9/08/22 event		·				
RW-106	D 324										
RW-107	D 327	0.44	1950	2130			0.12	100			2
RW-108				rotocol following 0							
RW-109	C/D 323	Removed from L	NAPL monitoring p	rotocol following 0	9/08/22 event						
RW-110	C/D 326	-									
Guidalinas											and the second

Guidelines:

- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Abbreviations:

BTOC = Below top of well casing. LNAPL = Light Non-Aqueous Phase Liquid ND = LNAPL not detected using interface probe. NA - Not Available (not able to detect or measure) TRACE - LNAPL present, but no accurate measurement.

3

Notes:

During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

	NON-HAZARDOUS	1. Generator ID Number	:	2. Page 1 of 3.	Emergency Respons	e Phone	4. Waste Tr			~~~		
	WASTE MANIFEST	NoneRegulred		1.15	(900) 337		and the second sec		30-12	822	-01	
	5. Generator's Name and Mailin	g Address Port of Seattle	Terminal 30	G	enerator's Site Addres	ss (if different	than mailing addre	ess)				
	V	1731 Anal a Way S										
		Septile, WA 90154		1								
	Generator's Phone: 6. Transporter 1 Company Nam	6	Altra 1				U.S. EPA ID	Number				
	OH Environme	ental, Inc.		WAH000047217								
	7. Transporter 2 Company Nam	e		U.S. EPA ID Number								
	8. Designated Facility Name and						U.S. EPA ID	Number				
		Baham St VA 99109					WAD9	80974	4521			
	10.000	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -					1					
	Facility's Phone:				10. Cont	ainers		12. Unit				
	9. Waste Shipping Name	and Description			No.	Type	11. Total Quantity	Wt./Vol.			4	
	1. Nor-RCRA.	non DOT (Oily Ground	Mhtow)		-					1912		
TOI		umu mari frank minana	waves y		DI	TT	2328	Gi				
GENERATOR		11F 11				11	a ser p	\square				
GEN	2.											
											2	
2	3.									15.7/		
	4.											
	13. Special Handling Instructions	and Additional Information				L			- he have not	-		
		file# FOS-30-IDW Viste	r-021320									
	10 C - 10 C - 10 C										_	
	14. GENERATOR'S/OFFEROR'	S CERTIFICATION: I hereby declare tha	t the contents of this co	onsignment are fi	illy and accurately des	scribed above	by the proper shi	pping name	, and are classifi	ed, packa	ged,	
	marked and labeled/placarde	ed, and are in all respects in proper condi	tion for transport accord	ding to applicable	international and nat	ional governm	nental regulations.					
	Generator's/Offeror's Printed/Typ			Signati					Month	Day	Year	
-	15. International Shipments				i seje				7*	0	0 ~	
INT'L	Transporter Signature (for expor	Import to U.S.	Ĺ] I	Export from U.S.	Port of er Date leav				4			
	16. Transporter Acknowledgmen				Date iday	ang 0.0.						
TRANSPORTER	Transporter 1 Printed/Typed Nar			Signatu	re		5		Month	Bay	Year	
SPC	and the second second	16ton		-	- PI	· ······	and and the		12		de him	
RAN	Transporter 2 Printed/Typed Nar	ne		Signatu	re				Month	Day	Year	
F	17 Diserenance											
	17. Discrepancy 17a. Discrepancy Indication Spa	CA										
		Quantity	Туре		Residue		Partial Rej	ection		Full Rejec	tion	
					Manifest Reference I	Number						
≿	17b. Alternate Facility (or Genera	ator)					U.S. EPA ID !	Number				
CILI							<i>v</i>					
0 FA	Facility's Phone:											
ATE	17c. Signature of Alternate Facili	ty (or Generator)		T					Month	Day	Year	
GN										Č.		
DESIGNATED FACILITY												
ī												
	18. Designated Facility Owner or	Operator: Certification of receipt of mate	rials covered by the ma	anifest except as	noted in Item 17a	1						
	Printed/Typed Name			Signatu					Month	Day	Year	
Y					12							

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	38679		
Description	Solinst 410 Reristaltic Pump		
	12/6/2022 5:04:26PM		
Manufacturer	Solinst	State Certified	
Model Number	410	Status P	ass
Serial Number/ Lot Number	1591	Temp °C	6
Location	Seattle	Humidity % 4	1
Department			
Group		on Specifications	
Group Nan	ne		
Test Performed: Yes	As Found Result: Pass	As Left Result: Pa	155
Test Instruments Used D	uring the Calibration		(As Of Cal Entry Date)
Test Standard ID Descrip	tion <u>Manufacturer</u>	<u>Model Number /</u> <u>Lot Number</u>	<u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	12/8/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SODO
Attendees (Workers)	Friedman, Gus;Al Leiataua;Bragg, Austin;
Attendees (Visitors)	
Tasks to be performed	4Q system O&M w/vapor sampling
Hazards to be considered today	pressure, noise, motion, mechanical
Will there be Lone Workers?	No
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Winter Driving
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All work completed safely and successfully
Hazards	 <u>Mechanical</u> <u>Motion</u> <u>Noise</u> <u>Pressure</u>

Project Information	Page _ of _2			
Project Name:	7-30	Location:	Seattle	
Project/Task No.:		Weather:		
Date:	12/9/22	Personnel:	GF AB	

Observations

0030	Time	Observation Description
		Observation Description
1	0830	Ongite. Some confusion at entrance guards don't think
2		while had access, but then they let us through.
3		Scope: Completion of 48 Oth isit + uper sampling
4		Safety Tailyate. Port Shut down today so external
5		particides are for femer.
6		· System ON on arrival. Began falling down Oth
7		readings. Zore 4 active.
8		· shall be block the wanters
9		· checked may gaves I a hundled manonetor.
10		- SUE inlet is accurate but we about seplace will a 0-5
11		in the gauge for impraced precision. Hard to tell 1.5
12		vs 1.78 on this at
13		- particulate Filter DP was only 0,25 vs 0.43. Weed
14		to be able to nearsire to B" on that one for
15		changert indication.
16		· Walked AB thru tube blow-our procedure for the may gauge
17		reaches.
18	10:00	· TOUK PIDS. 4.8 ppmu at SVE and 1.0 ppmu at Ox
19		O'Geberge.
20	10:20	. Tour Vaper Gamples
21		- Discharze-120922 @ 10:32
22		- mlet- 120922 (10:32
23	10:45	· Took down manifold readings + attered PID readings on
24		SVE Side. 1/20ne 4 active, zore 2 vers still extracting the most most. In 24, GVE-6 had Oppmv and the GVE-5
25		the most mass. In 24, GVE-le had Oppmer and the GVE-5
Com	manta / Sita A ati	ivities / Personnel Tracking

Project Informatio	Page <u>2</u> of <u>2</u>
Project Name:	7-36 Location:
Project/Task No.:	Weather:
Date:	12/9/22 Personnel: GF, AB
Observations	
Time	Observation Description
1	rotaneter part is stuck on the bottom. Nelds a new limper.
2	of dewartering.
3	· On the AS side AS 19 of -22 had Sticky floats AS-18
4	and -21 read 0
5	· could not demoter to day due to a malfunctioning
6	pund from Pire (solingt more peri pund)
7 11:15	
8	· Since the Part vers shut down, what out to zere
9	5 to inspect a few AS Wells.
10	- AS-26 had a 0-10 psi pressure gave ontop of a
11	mini ball valve preaded into a bushing in the well
12	Gub . ne garge rend ~ 9 PSI aven though the
. 13	2015 was off It read O at the manifold, 50
14	likely a broken javge?
15	- AS-25 was full of water, but I could feel the
16	Some sort of gauge assembly. Could not see
17	he youre to deck its sealing.
18 11:30	officite for QTA.
19	
20	
21	
22) C.E.
23	(61)
24) 12/9/22
25	

Date:	12191	m FAB				AS & SVE Man			Time: 👔 Equipmen	045		·	
ield Teo		RAS	L		u <u>i</u>	SVE V			cquipmen				
Well ID	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Dewater (Gal)	PID (ppmv)	Comments	Well ID	Vacuum ("H2O)	Flow (SCFMG)		Dewater (Gal)	PID (ppmv)	Comments
ISVE-2	34	81	25	-	D.G	good	SVE-10	78	20	100	-	0.5	balacing 5-25
ISVE-3	40	12	25	-	3.1	5802	SVE-9	74	6	wo	-	0.0	water, dirty
SVE-4	72	14	100	-	1.3	bouncing, while the	SVE-8	89	0	100	-	0.0	not stuck?
SVE-5	66	07.	100	-	3.2	staken 108 of MD	SVE-6	40	10	100	-	6.0	water
SVE-7	68	17	100	-	0.3	conter	HSVE-1	15	78	10	-	0.5	good
		1					11						
Well	Pressure	Flow	Valve Pos.			AS V	Vells Well	Pressure	Flow	Valve Pos.		1	
ID	(PSIG)	(SCFMG)	(% Open)		Com	ments	ID	(PSIG)	(SCFMG)	(% Open)	4	Com	iments
45-7			Zon	e 2			AS-17	a a	5.3	Zone	e 4		
45-7 45-8							AS-18	8.0	-	100	-		
							AS-19		0		5101	2 Plo	at
								5.0 58.5	2.3			<u> 5 i</u> .	
	-						1.0 20	Dis		┼─╂───			
AS-10								ar	$\mathbf{\Lambda}$				
AS-10				T	0.7.5	1	AS-21	9.5	0		shi	K. flu	lat
AS-10			Zon	e 3				9.5	0 3.0	Zone	5 `	Ky fle	Int
AS-10 AS-11			Zon	e 3			AS-21			Zon		Ky fle	lat
AS-10 AS-11 AS-12			Zon	e 3			AS-21 AS-22			Zoni		Kz fle	lat
AS-10 AS-11 AS-12 AS-13			Zon	e 3			AS-21 AS-22 AS-1			Zon		Ky flu	lat
AS-10 AS-11 AS-12 AS-13 AS-14			Zon	e 3			AS-21 AS-22 AS-1 AS-2			Zon		Kz flu	lat
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15			Zon	e 3			AS-21 AS-22 AS-1 AS-2 AS-2 AS-3			Zon		Kz flu	lat
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15			Zon				AS-21 AS-22 AS-1 AS-2 AS-3 AS-4			Zon		12 flo	1014
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16							AS-21 AS-22 AS-1 AS-2 AS-3 AS-3 AS-4 AS-5			Zon		Kg flo	1014
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16 AS-23							AS-21 AS-22 AS-1 AS-2 AS-3 AS-3 AS-4 AS-5			Zon		12 flo	101 <u>1</u>
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16 AS-23 AS-24							AS-21 AS-22 AS-1 AS-2 AS-3 AS-3 AS-4 AS-5			Zon		Kg {lo	
AS-9 AS-10 AS-11 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16 AS-23 AS-24 AS-25 AS-26							AS-21 AS-22 AS-1 AS-2 AS-3 AS-3 AS-4 AS-5			Zon		12 fle	
AS-10 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16 AS-23 AS-24 AS-25							AS-21 AS-22 AS-1 AS-2 AS-3 AS-3 AS-4 AS-5			Zon		14 flo	

Abbreviations:

% = Percent

" H₂O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable ppmv = Parts per million volume PSIG = Pounds per square inch gauge SCFMG = Standard cubic feet per minute gauge



Date: 12/9/22	Field Tech(s): GF, Ai	R	Analaient: 39°E
Actual Time:	AS/SVE HMI Time:	0	1.
SVE/AS System	Martin Martin		
VE Blower VFD Setpoints	the heater -	AS Blower VFD Setpoints	62 h 1 logo
Hertz/Amps/Torque %) - VFD	42/16.4/60,5	(Hertz/Amps/Torque %) - VFD	52/10.1/88.2
SVE Blower Runtime	100724	AS Blower Runtime	9144.3
Hours)	16572.4	(Hours) - Sparge Blower	HM
Fransfer Pump Runtime Hours) - <i>MS Pump</i>	3.0	AS Heat Exchanger Runtime (Hours)	9141.5
Sparge Zone 1 Time		Sparge Zone 4 Time	1230
Span(s) Operational:	1700-22-30	Span(s) Operational:	0720-0130 HM
parge Zone 2 Time		Sparge Zone 5 Time	1200
Span(s) Operational:	2200-0320 HM	Span(s) Operational:	0000-1730
sparge Zone 3 Time	0300 - 0800	Sparge Zone Active:	4
Span(s) Operational:	0,00 0000	SVE Blower Filter Differential	
AS Blower Intake Ressure VAC	1.0	Pressure (" H20) - DPI-200	0.25 -70.43 1.50 -7 1.75
AS Blower Discharge Pressure		SVE Blower Inlet Differential	A.m. 17.
(PSI) - <i>PI-501</i>	8.25	Pressure (" H20) - FI-200	1.50 -> 1.15
AS Bleed Valve		Transfer Pump Discharge Pressure	(2)
# turns open) -		(PSI) - PI-300	0
AS Heat Exchanger Discharge Temp °F) - TI-500	60	SVE Blower Discharge Pressure ("H ₂ O) - PI-400	9.8
SVE Blower Inlet Temperature		SVE Blower Discharge Temperature	1. 0
(°F) - <i>TI-200</i>	250	(°F) - <i>TI-400</i>	97
5VE Blower Inlet Vacuum	6.	SVE Blower Dilution Valve	
" H ₂ 0) - <i>VI-200</i>	90	(# turns open) -	0
Dxidizer System			
Dxidizer Inlet Differential Pressure	010	Combustion Valve Position (%)	5.7
(" H2O) - <i>FI-1</i>	0.15		The data of the second se
nlet Temperature (°F)	60	Process Blower Runtime (Hours)	22420
Burner Chamber Temperature (°F)	686	Combustion Fan Runtime (Hours)	21421
Outlet Temperature (°F)	631	Burner Runtime (Hours)	82409
Inlet Limit Controller Temperature	686	Processing Vapors Runtime (Hours)	22393
(°F) Outlet Limit Controller			
Temperature (°F)	639	Panel Temperature (°F)	5 9
Process Fan Valve Position	open		60
(Open/Closed)	HN	Flame Signal (Volts)	5.0
Dilution Valve Position (%)	0		
SVE Discharge PID		Oxidizer Discharge PID	
(ppmv)	11.8	(ppmv)	1.0
Other Components			
Knockout Tank Level	0 40		27
(Sightglass % Full) ¹	UN	Propane Tank A Level (%)	
Water Depth in Storage Tank ²	LATE		22
(DTF/WD (calc in ft))	EUI TT.	Propane Tank B Level (%)	Va

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit PSI = Pounds per Square Inch % = Percent DTF - Depth to Fluid

DTB - Depth to Bottom MP - Measuring Point WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring DTF from the MP and

then subtracting that from 6.92 ft (DTB).





T-30 Vapor Sampling Field Form

Project: <u>Terminal 30</u>	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: 12/9/22	Field Personnel: GF, AB
Weather: 40 Sm	Weather Barometric Pressure (in Hg):
Sample ID: Discharge -	120922 (INLET/DISCHARGE-mmddyy)
Sample Port Description: 5	VE discharge/ox inlet sample port

Conditions at Sample Port:

Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)
C	637	1.0	15572.4

Before Sampling:

Summa Can Leak Test¹:

Purge the tubing (30-60 seconds)	N	29	2 min	29
Install clean tubing on the sampling port	Y	Reading (in-Hg)	Test (2 min recommended)	Reading (in-Hg)
	Yes of No (Y/N)	Initial Canister	Duration of	Final Canister

NL- (NZAD)

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Time	Date	Final Canister Reading (in-Hg) ³
000-			00	Sam	ole Start	黄山
2295	101	16	29	1032	12/9/22	84
L	I		Samp	le End	1.1.1	
	r should be for a 4-5 n l using a standard vac	10 38	12/9/22			

Sample Collection Notes and General Observations:

Analyses: APH, TOIS-BTEX



T-30 Summa Can Vapor Sampling Field Form

Project: Terminal								
Date: 2/9/2:	۲ Fie	Field Personnel: GFAB						
Weather: 40	Sm	Weather B	arometric Pressure (in Hg): _	30				
Sample ID: Th	1et-120922	(INLET/D	DISCHARGE-mmddyy)					
Sample Port Desc	ription: SVE di	schare/ox inlet	- Gample part					
	-	J	ſU					
Conditions at S	ample Port:			_				
Pressure (P81)								
9.%	8 97 11.4		15572.4					

Before Sampling:

Summa Can Leak Test¹:

	Yes or No (Y/N)	Initial Canister	Duration of	Final Canister
Install clean tubing on the		Reading	Test (2 min	Reading
sample port	Y	(in-Hg)	recommended)	(in-Hg)
Purge the tubing (30-60	A)	20		
seconds)		30	2 min	30

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³		
10.00		. 1		Samp	ole Start			
3252	111	11	30	10:32	12/9/22	45		
				Samp	le End			
Analyses Requested: APH, 7015-BTEX 10:38 12/9/22								

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

SAMPLE CHAIN OF CUSTODY

Participa	For Part Kelinan Gus Frildman SAMPLERS (signature) Grap]		Page #							
										_	TURNAROUND TIME						
Company MECOM				- P					No		PO	#			RU	- CAULA V	1
Address Illy 2rd An	e <	ste 160	70	-	1-7	D for	404	Senta	ne Ne					F	lush	charg	ges authorized by:
City, State, ZIP_Senth	e, v.	A arelo	1	N	VOTES	S:				IN	VOIC	CE T	0				IPLE DISPOSAL Clean following
Phone 206 - 438 - 2709En	nail P	avl.Kali	na QG	e conta	m										fina	l rep	ort delivery e may apply):
SAMPLE INFORMATION		gus. fried	man (c	al am	.com					I		TVC	TC D	EQU			
	<u> </u>										AINE			.EwC	1631		
			Flow	Report Leve IA=Indo	əl:		Initial	Field	Tri	Field	r015 Full Scan	TO15 BTEXN	TO15 cVOCs	APH	Helium	S BTEX	
	Lab	Canister	Cont.	SG=Soi	l Gas	Date	Vac.	Initial	Final Vac.	Final	TOI	TO	TO			Told	
Sample Name	ID	ID	ID	(Circle	One)	Sampled	("Hg)	Time	("Hg)	Time						·	Notes
Thelat - Ogthoa		3252	-th	TA-	67-	12/4/22	30	\sim		\sim	\square		\sim	X	\sim	X	
Discharge-09140	\sim	\sim	\frown	IA /	6	states	\sim			\sim			/	X	\langle	×	10
Inlet-120922		3252	In	IA /	SG)	12/9/22	30	10:32	5	(0:246				\prec		بح	
Discharge - 12092		2295	101	IA /	G	12/4/22	29	10:32	4	10:246				×		×	
V				IA /	SG												
				IA /	SG												
				IA /	SG												
				IA /	SG												

Friedman & Bruya, Inc.	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
5500 4 th Avenue South	Relinquished by	Grus Frildman	AECOM	0/9/22	19:28
Seattle, WA 98108	Received by:	ANHPHAN	F&B	12/09/22	15:28
Ph. (206) 285-8282	Relinquished by:				
Fax (206) 283-5044	Received by:				
FORMS\COC\COCTO-15.DOC	L				

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instru	ment ID 1899	93					
Des	cription Mini	iRae 3000_V2.22A					
Ca	librated 12/6	/2022 4:42:35PM					
Manut	facturer Rac	Systems		State Certi	fied		
Model 1	Number PGM	1-7320		Sta	atus Pass		
	ber/ Lot 592-	906428		Temp	o °C 16		
	Number	1			0/ 41		
	ocation Seats	tie		Humidity	y % 41		
		Calibr	ration Specifications				
	Group # 1		I	Range Acc 4	% 0.0000		
Gr	oup Name Is	oButylene	Ro	ading Acc ⁴	% 3.0000		
S	tated Accy Po	ct of Reading		Plus/Min	us 0.00		
<u>Nom In Val / In V</u>	/al In Ty	pe Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	PPM	100.00	PPM	103.90	100.10	0.10%	Pass
						1.35.2.1	10.508
<u>Fest Instruments</u>	Used During	the Calibration			<u>(As</u>	Of Cal Enti	y Date)
Fest Standard ID	Description	Manufacture	n Model Number	Serial Nu			ext Cal Date
rest Standard ID		<u>Manufacture</u>	r Model Number	Lot Numl		t Cal Date/ Ex ened Date	piration Da
SEA ISO 100		C4H8) 100 Airgas	x02ai99cp34206		67314	6/	13/2026
PPM	PPM			୍ <u>-</u> 1			
04-402467314-							

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pinc Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	12/9/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	SODO
Attendees (Workers)	Friedman, Gus;Bragg, Austin;
Attendees (Visitors)	
Tasks to be performed	Completion of 4Q O&M
Hazards to be considered today	pressure, noise, motion
Will there be Lone Workers?	No
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Winter Driving
Other topics discussed	
Mid day reviews	
End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All tasks completed safely and successfully
Hazards	• <u>Motion</u> • <u>Noise</u> • <u>Pressure</u>

Project Information	Page of
Project Name:	T-30 Location: Seartile
Project/Task No.:	Weather: 49 clover / sain
Date:	12/29/22 Personnel: GFCB
Observations	
Time	Observation Description
1 1330	·GFICB angite
2	Scope: bineeld, Odm + SVE emissions stock analysis
3	tsvé hose analysis
4	· Safety fillgate, Slips rips, electric when in control powel
5	· System OFF on arrival
6	~ Moisture Separator LAM @ K626 m 12/28/22
7	- SVELAS Failed to run + Oxid.zer Alarm path at 1827 on 12/2
8	> This was resed. for Sightglass was " 12 full, so how could
9	the LAH have triggered ?
10	IT This was a 2.5 hrs after Marine Said she restarted it
11	(~ 1630 on 12/28)
12	· System torned to OFF for transleshooting. Turned transfor
13	pump to HAND to test functionality or water started garaging
14	even, where. Tured OFFA inspected. A union broke in
15	half behind the SVE blover, presumably due to freezing
16	last welk. Dolarit explain why he NOT LAH alarm
17	trickered
18	- 173T drain values adjusted to recirculate + VOT floats
19	vere testle. They accurately started the pump of
20	Ner activited, so pre darm remains a mystery.
21	. Pick found in the callo + placed over the spillpuddle to
22	Souk it up a limit garead of speen/product.
23 1440	· Sustem restarted
24	· CB office to purchase formed pipe require parts
25	. GF eplaced sue inlet may gauge wil the replacement
Comments / Site	Activities / Personnel Tracking

Project Information	Page <u>2</u> of <u>5</u>
Project Name:	1-30 Location:
Project/Task No.:	Weather:
Date:	12/29/22 Personnel:
Observations	
Time	Observation Description
1	0-5" Ho Gale Marine purchased
2	- Sile also purchased give parts for SVE monifold but
3	the ball bolines are not threaded. Need to rectify.
4 1515	CB ansite. Started repairing pipe.
1 1545	. GF storted taking down system readings
6	- 13 Started setting of peri pump for devestering. Pump was
7	Spotty again only gone times toming on Ultimetely it
8	was usable, but not sure what changed.
à	· Zore 5 active. 3.9 Sc Fmg total getting out to
10	wellfield. Freedman
11	JAS-24 Plant new Shicky
12	· Also EN1315 noticed that the 2007 was up to the 100 to
13	mark but oras not dreaming. Not sure why. Manually
14	activated the pup & drailed down to wast.
15 1615 5	·SVE dematering. Praired dandlegs of SVE -4, -6, -8
16	and -9. All were full which ~ 0.5 gal per.
17	> pater pretty quickly (whin minutes) reappeared in
18	the referretors This was consistent of how
19	quickly the KOT was filling. Did not attempt to
20	punp danse out the pipes just did the manifold.
21 1645	
22	SIJeally we have smaller ser GUE huses up I high point
23	& the comlocks us the low points so there is nowhere
24	for the water to collect.
25 **	* Neld to recide what to recommend for the elevertion Structure

Projec	ct Information	Page <u>3</u> of <u>5</u>
Project	t Name:	T-36 Location:
Project	t/Task No.:	Weather:
Date:		Personnel: GF.CB
Obser	vations	
1	lime	Observation Description
1	**	-> Neld to buy Small pieces of strut to fit into the gap
2		abure the new AS sotaneters. Also potts to secure
3		never strut to the cristing.
4		> SVE stack options
5		. # 1) PVC stack voing a Encopost for Structural
6		Supposet. Easiest install but only if stark can
7		be sharter (10 ft?). Fence is only r6 ft tall.
8		· #2) Steel or PVC stack second to the oxidizer,
9		attaching to the existing vertical piece at the or.
10		Best to al replace the elbow up a tee to retain
11		structural sport of the existing value assembly.
12		* This should be fersible, but disastembly of painted
13		piping likely want be easy
14		1#3) Stuck outside ne fence Superter by the light pust
15		1 # 3) Stack outside ne fence Superter by the light put Not sure the pushback this would receive hight be
16		our best bet if we end ip needing a fall (20ft?)
17		Stack.
18		* NOTE: Intellistice advised against running vapars
19		thrown the oxidized while it is off. Friman concern
20		was avining the cartalyst due to moisture It
21		pould regime the process value after -
22		dilution value closed of they said they'd only share
23		dilution value closed of they said they'd only share the "How" of it if we put in writing that de wanted to do this of inderstand the rights.
24		wanted to do this of understand the rights.
25	1720	(3 offsite

Comments / Site Activities / Personnel Tracking

Project Informat	tion		Page <u>4</u> of <u>6</u>
Project Name:	Lo	cation:	
Project/Task No.:	: Wo	eather:	
Date:	12/28/22 Per	sonnel:	GIFICB
Observations			
Time	Obse	rvation Description	
1	· PID had a Pump error	on ste	rtyp & was unusable.
2	Called Larry & Pine	but he	had no idea. He was
3	able to drive a replace	mento	ot.
4 7730	0 - het Long for Acu-PI	0	
5 1740	< · outlet not providing f	Tomes C.	He system. Had to
6	reset the gfci to rea	tore po	ver
7	· TOOK all PZD mersus		
8	= 10,1 ppmv mlet		
9	- 1.2 ppmv outlet		
10	- Successfully got re	adnuss (2 manifold again.
11	water was fully be	ukin 1	re pipes/rotameters_
12	- Skipped SNE-5,	Which .	was so stock that
13	it was preventing	flow a	rgain
14	the Marine Said	he order	- fer the floor pumpers
15	was in the work	is uffh	e up was shill figuring
16	it out.		
17 1815			
18	taming the system off f	er exten	ded perizes up Ecology
19	taming the system off f approval, but over the	veekend	I intil we get a plan
20	in place should be fre	-	5 .
21 1530) · Shut the system down.	Triggerte	1 an oxidizer alarm.
22	· KOT back of to the 10	o'to mark	con the sideslass. It
23	was previously draited d	own to	25 % Git 1715. Lots
24	of vato accumulating	quickl.	h
25	. Tried moving the floort	apcrati	Sarand in the sightshas
Comments / Site	Activities / Personnel Tracking		

Project Information	Page 5 of 5
Project Name:	<u>T-26</u> Location:
Project/Task No.:	Weather:
Date:	12/29/22 Personnel: G7F, CB
Observations	
Time	Observation Description
1	to make sure the bottom float is it welged & Sturk
2	down. No matter how I adjusted it it would not
3	float le previously blogened a dent in it, so it's
4	possible it has a crack of filled w/ water. How?
5	unknown. Maybe Froze?
6	- > No that functioning the KOT can't Self-tain.
7	-Julo that functioning the KOT can't Self-train. with, it filling up in an hour it makes the
8	System pretty musable.
9	· fumped the KOT down to ~50%.
10 1845	
11 1900	·offsile
12	Take-aways
13	·Troubleshoot KOT float repair
14	· Develop SVE Stack plan
15	· MC order new threaded SWE pull values
16	· MC order some small strut pilcos?
17	· DRINGLUD SUF LASE Alon of instant MC. on ordering
18	· Keep system off intil float is repaired, maybe intil Stack is built.
19	Starck is built.
20	
_21	
22	(F
23	lalaglizo
24	
25	5
Comments / Site Act	tivities / Personnel Tracking

Date: 12/29/22	Field Tech(s): GIF, C	51	
		5	
13-11	AS/SVE HMI Time: 623		
SVE/AS System			
SVE Blower VFD Setpoints	47/1-7/10-2	AS Blower VFD Setpoints	52/10.2/89.5
Hertz/Amps/Torque %) - VFD	· - / / / / / / / / / /	AS Blower VPD Setpoints (Hertz/Amps/Torque %) - VFD AS Blower Runtime	20110 2101.3
SVE Blower Runtime Hours)	10-77/2 4	(Hours) - Sparge Blower	9301.8
Transfer Pump Runtime		AS Heat Exchanger Runtime	1,30,100
Hours) - MS Pump	3.1 нмі	(Hours)	929910
Sparge Zone 1 Time Span(s) Operational:	1700-1030	Sparge Zone 4 Time Span(s) Operational:	0720-1230
parge Zone 2 Time	1000 -	Sparge Zone 5 Time	1
Span(s) Operational:	1000-0330	Span(s) Operational:	1200-1730
parge Zone 3 Time pan(s) Operational:	0200-0800	Sparge Zone Active:	5
AS Blower Intake Pressure		SVE Blower Filter Differential	
" H2O) - <i>DPI-500</i>	1.0	Pressure (" H20) - DPI-200	0.25
AS Blower Discharge Pressure	20	SVE Blower Inlet Differential	1 -7
PSI) - <i>PI-501</i>	1. 7.75	Pressure (" H20) - FI-200	1.7
AS Bleed Valve	1	Transfer Pump Discharge Pressure	. 0
# turns open) -	}	(PSI) - <i>PI-300</i>	0
S Heat Exchanger Discharge Temp	(6	SVE Blower Discharge Pressure	9.8
°F) - <i>TI-500</i>	65	(" H ₂ O) - <i>PI-400</i>	1. 0
VE Blower Inlet Temperature °F) - <i>TI-200</i>	450	SVE Blower Discharge Temperature (°F) - T/-400	1.00
SVE Blower Inlet Vacuum		SVE Blower Dilution Valve	
" H ₂ 0) - VI-200	6010	(# turns open) -	0
Dxidizer System			
Dxidizer Inlet Differential Pressure (" 120) - FI-1	GTP 6.2	Combustion Valve Position (%)	8 .7 _{HI}
nlet Temperature (°F)	670 нмі	Process Blower Runtime (Hours)	22579
Burner Chamber Temperature (°F)	670 HMI	Combustion Fan Runtime (Hours)	77550
Dutlet Temperature (°F)	652 HM	Burner Runtime (Hours)	87568 HI
nlet Limit Controller Temperature °F)	675 нмі	Processing Vapors Runtime (Hours)	22551 HI
Outlet Limit Controller Temperature	64 d	Panel Temperature (°F)	65
°F) Process Fan Valve Position		1	
Open/Closed)	орем	Flame Signal (Volts)	Ş.0 HI
Dilution Valve Position (%)	0		
other Components			
nockout Tank Level	100		-1
Sightglass % Full) ¹	/**	Propane Tank A Level (%)	75
Vater Depth in Storage Tank ²			59)
DTF/WD (calc in ft))	~0	Propane Tank B Level (%)	

PORT OF SEATTLE - TERMINAL 30

Abbreviations:

" H₂O = Inches of Water

°F = Degrees Fahrenheit

PSI = Pounds per Square Inch % = Percent DTF - Depth to Fluid DTB - Depth to Bottom MP - Measuring Point WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.

2. Calculate the water depth by measuring $\ensuremath{\mathsf{DTF}}$ from the MP and

then subtracting that from 6.92 ft (DTB).



Date:	12	129100	1		AS & SVE M				546		
Field Te	ch(s):	Gr. C	3					Equipmen		8993	
Ovidizor	Inlet VOC (normy) PID	40	10.	COLUMN TO A DESCRIPTION OF A DESCRIPTION	oncentratio	ns	-		-	
	Discharge \	and the second se		12							
244-11	1	Fla	Males Day	Deverte		E Wells Well	Vacuum	Flow	Valve Pos.	Dewater	
Well ID	Vacuum ("H2O)	Flow (SCFMG)	Valve Pos. (% Open)	Dewater (Gal)	Comments	ID	("H2O)	(SCFMG)	(% Open)	(Gal)	Comments
HSVE-2	34	76	10		V	SVE-10	80	23	100		borning
HSVE-3	40	72	10		V	SVE-9	85	0	100	0.5	* water
SVE-4	451	M	100	0.5	dir in brinding	SVE-8	93	0	W	0.5	no fito
SVE-5	<u>.</u>	-	100	13 29	Shake Gatt,	SVE-6	84	1	1.00	0.5	where barn
SVE-7	72	23	103		Water; sawaing	HSVE-1	24	15	10		V
Well	Pressure	Flow	to gui ct full		pried op w/ w hr, so lota	S Wells Well	Pressure		Valve Pos.		
ID	(PSIG)	(SCFMG)	(% Open)		Comments	ID	(PSIG)	(SCFMG)	(% Open)		Comments
			Zone 2	-					Zone 4		
AS-7				-		AS-17				-	
AS-8						AS-18				-	
AS-9					1	AS-19					
AS-10						AS-20					_
						AS-21					
AS-11	C-0114	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Zone 3	1. Shine		AS-22			Zone 1		
AS-11	in variant					45.1	1	1	20110 1		
			20112 3			IAS-1					
AS-12					1 1	AS-1 AS-2					<u>N</u>
AS-12 AS-13			20112 3		1	AS-1 AS-2 AS-3					
AS-12 AS-13 AS-14						AS-2					
AS-12 AS-13						AS-2 AS-3					
AS-12 AS-13 AS-14 AS-15			Zone 5			AS-2 AS-3 AS-4					
AS-12 AS-13 AS-14 AS-15		0	Zone 5			AS-2 AS-3 AS-4 AS-5					
AS-12 AS-13 AS-14 AS-15 AS-16	A.O 4.0	0		grick	float	AS-2 AS-3 AS-4 AS-5					
AS-12 AS-13 AS-14 AS-15 AS-16 AS-23 AS-24	8.0		Zone 5	grick		AS-2 AS-3 AS-4 AS-5					
AS-12 AS-13 AS-14 AS-15 AS-16 AS-23	4.0 6.5	1.34	Zone 5	grick		AS-2 AS-3 AS-4 AS-5				4	
AS-12 AS-13 AS-14 AS-15 AS-16 AS-23 AS-24 AS-25	8.0	1.4	Zone 5	grick		AS-2 AS-3 AS-4 AS-5				4	

Abbreviations:

% = Percent " H₂O = Inches of water N/A = Not applicable

SCFMG = Standard cubic feet per minute gauge

AECOM

deg F - degrees Fahrenheit

ppmv = Parts per million volume PSIG = Pounds per square inch gauge

Page 2 of 3



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Tereterre	nent ID 18993						
		V2 22A					
	ription MiniRae 3000						
Cali	ibrated 12/29/2022 8:	01:12PM					
Manufa	acturer Rae Systems			State Certif	ied		
Model N	umber PGM-7320			Sta	tus Pass		
Serial Numb	er/ Lot 592-906428			Temp	°C 22		
. N	lumber						
L	ocation Seattle			Humidity	% 41		
Depa	rtment						
Gre	Group # 1 oup Name IsoButylene			Range Acc % ading Acc %			
St	ated Accy Pct of Read	ing		Plus/Minu	s 0.00		
Nom In Val / In V	al In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	PPM	100.00	PPM	99.80	100.00	0.00%	Pass
Fest Instruments	Used During the Calib	oration			<u>(As (</u>	Of Cal Ent	ry Date)
<u>Fest Standard ID</u>	Description	Manufacturer	Model Number	<u>Serial Nur</u> Lot Numb	er Last		ext Cal Date / xpiration Dat
SEA ISO 00PPM 004-402206886-	Isobutylene (C4H8) 10 PPM	0 Airgas	x02ai99cp342066	5 304-4022 -1			/16/2025

Pine Environmental Services, Inc.

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663 www.pine-environmental.com

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc. Instrument ID 46330 Description Solinst Pump Calibrated 12/29/2022 1:49:00PM **State Certified** Manufacturer Solinst Status Pass Model Number Pump Temp °C 17 Serial Number/ Lot na Number Humidity % 49 Location Seattle Department **Calibration Specifications** Group# 1 Group Name Test Performed: Yis As Left Result: Pass As Found Result: Pass Test Instruments Used During the Calibration (As Of Cal Entry Date) Serial Number / Next Cal Date / Test Stanard ID Description Last Cal Date/ Expiration Date Manufacturer Model Number Lot Number **Opened** Date Notes ab this calibration

Caion Result Calibration Successful Calibrated Jose Arroyo

Alluments are calibrated by Pine Environmental Services LLC according to the manufacturer's specific, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Note Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	12/29/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Friedman, Gus

Shift Summary

Location	Seattle
Attendees (Workers)	Friedman, Gus;Brown, Cary;
Attendees (Visitors)	
Tasks to be performed	Biweekly O&M SVE stack brainstorm
Hazards to be considered today	pressure, noise, motion, mechanical
Will there be Lone Workers?	No
Hierarchy of controls	engineering, administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Know Your Car Tires
Other topics discussed	
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All to completed safely and successfully. Had to troubleshoot a broken pipe and broken knockout tank float as well in addition to the expected scope.
Hazards	 <u>Mechanical</u> <u>Motion</u> <u>Noise</u> <u>Pressure</u>

Appendix B

Vapor Sampling Field Forms

Vapor Sampling Field Form

Site Address: 1901 East Marginal Way South, Seattle, WA

Project No.: 60681370 Project: 7-30

Date: 6/24/22 Field Personnel: N. Gwyn, S. Brand

Surface Conditions: Overcost Breezy Dry 60's

				Sample Start		Sample End				
Sample ID	Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ¹	Time	Date	Final Canister Reading (in-Hg) ¹	Time	Date	PID Field Reading
Inlet - 062922	4183	305	1 L: HM	28.5)123	6/29	5.0	1128	6/29	18.4
Discharge -062922	9562	62	2 1.200	30.0	1133	6/29	5.0	1138	6/29	0.7

¹ Canisters measured using a standard vacuum gauge

Initial	Piul Field Readings were low inter - 0.0 Discharge - 0.5	
sve on	But As off due to The Alera 6/25/22	
	K on after alarm cland and resample pid realings after ≈ 30 min Discharge - 0,7	
These the	realizes soon to Be none inline with previous enes so proceed to Sample collections	
Sample	Collecting west well with no issues	



T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: 9/14/2	Field Personnel: GFACCR
Weather: 65 doud	
Weather: 65 doub Sample ID: $I_n e + -0914$	72 (INLET/DISCHARGE-mmddyy)
Sample Port Description: De.	signed oridizer inlet upper part
	0 8

Conditions at Sample Port:

•••••••	The second secon		
Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)
0	112°f	4,5	13567.8

Before Sampling:

	Yes or No (Y/N)
Install clean tubing on the sample port	Y
Purge the tubing (30-60 seconds)	Y

Summa Can Leak Test¹:

Initial Canister	Duration of	Final Canister
Reading	Test (2 min	Reading
(in-Hg)	recommended)	(in-Hg)
30	2 mip	30

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

All good

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³
3230	204	1L	30	Samp	le Start 9/14 /22	5
6				Sampl	e End	
Analyses Requested:		l		/131	9/14/22	

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

AECOM

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: <u>9/14/22</u>	Field Personnel: AC, GF, CB
Weather: 65 cloudy	Weather Barometric Pressure (in Hg): <u>30</u>
Sample ID: Discharge 09	1422 (INLET/DISCHARGE-mmddyy)
Sample Port Description:	ficated Oxidizer discharge vapor port

Conditions at Sample Port:

Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)	
0	NIA	0.5	13567.8	

Before Sampling:

	Yes or No (Y/N)
Install clean tubing on the	V
sample port	
Purge the tubing (30-60	V
seconds)	1

Summa Can Leak Test¹:

Initial Canister	Duration of	Final Canister
Reading	Test (2 min	Reading
(in-Hg)	recommended)	(in-Hg)
29,25	2 min	29.25

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

All good

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³
		-		Samp	ole Start	
3540	206	11	29,25	1125	9/14/22	2
				Samp	le End	
Analyses Requested: TO-15 BTEXN, APH				1131	9/14/22	

² The flow controller should be for a 4-5 minute integrated sample

³Canisters measured using a standard vacuum gauge



T-30 Vapor Sampling Field Form

Project: <u>Terminal 30</u>	Site Address: 1901 East Marginal Way South, Seattle, WA
Date: 12/9/22	Field Personnel: GF, AB
Weather: 40 Sm	Weather Barometric Pressure (in Hg):
Sample ID: Discharge -	120922 (INLET/DISCHARGE-mmddyy)
Sample Port Description: 5	VE discharge/ox inlet sample port

Conditions at Sample Port:

Pressure (PSI)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)
C	637	1.0	15572.4

Before Sampling:

Summa Can Leak Test¹:

Purge the tubing (30-60 seconds)	N	29	2 min	29
Install clean tubing on the sampling port	Y	Reading (in-Hg)	Test (2 min recommended)	Reading (in-Hg)
	Yes of No (Y/N)	Initial Canister	Duration of	Final Canister

NL- (NZAD)

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Time	Date	Final Canister Reading (in-Hg) ³
000-			00	Sam	ole Start	黄山
2295	101	16	29	1032	12/9/22	84
L	I	1		Samp	le End	1.1.1
 ² The flow controller should be for a 4-5 minute integrated sample ³ Canisters measured using a standard vacuum gauge 			10 38	12/9/22		

Sample Collection Notes and General Observations:

Analyses: APH, TOIS-BTEX



T-30 Summa Can Vapor Sampling Field Form

Project: Terminal			rginal Way South, Seattle, W	<u>/A</u>			
Date: 2/9/2:	۲ Fie	Field Personnel: GFAB					
Weather: 40	Sm	Weather Barometric Pressure (in Hg): 36					
Sample ID: Thilt-120972 (INLET/DISCHARGE-mmddyy)							
Sample Port Desc	ription: SVE di	schare/ox inlet	- Gample part				
Conditions at Sample Port:							
Pressure (P81)	Temperature (°F)	VOCs via PID (ppmv)	SVE Runtime (hrs)				
9.%	97	116	15572.4				

Before Sampling:

Summa Can Leak Test¹:

	Yes or No (Y/N)	Initial Canister	Duration of	Final Canister
Install clean tubing on the		Reading	Test (2 min	Reading
sample port	Y	(in-Hg)	recommended)	(in-Hg)
Purge the tubing (30-60	A)	20		
seconds)		30	2 min	30

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

Sample Canister LAB ID	Flow Controller LAB ID	Sample Canister Size	Initial Canister Reading (in-Hg) ³	Sample Times	Sample Date(s)	Final Canister Reading (in-Hg) ³
10.00		. 1		Samp	ole Start	
3252	111	11	30	10:32	12/9/22	45
				Samp	le End	
Analyses Requested:	US-BTEX			10:38	12/9/22	

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

<u>Appendix C</u> Vapor Sampling Laboratory Analytical Reports

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 5500 4th Avenue South Seattle, WA 98108 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

December 22, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on December 9, 2022 from the T-30 Port of Seattle, F&BI 212171 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Colo

Michael Erdahl Project Manager

Enclosures c: Gus Friedman AEC1222R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 9, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 212171 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
212171 -01	Inlet-120922
212171 -02	Discharge-120922

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-120922 12/09/22 12/09/22 12/16/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle, F&BI 212171 212171-01 1/38 121532.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 93	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph				

APH EC9-10 aromatics <950

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-120922 12/09/22 12/09/22 12/16/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle, F&BI 212171 212171-02 1/5.0 121530.D GCMS7 bat
Surrogates: 4-Bromofluoroben:	% Recovery: zene 83	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 aliphatics<370APH EC9-12 aliphatics170APH EC9-10 aromatics<120				

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 12/15/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle, F&BI 212171 02-2968 MB 121511.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	Recovery: zene 84	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph				

APH EC9-10 aromatics <25

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-120922 12/09/22 12/09/22 12/16/22 Air ug/m3	Clien Proje Lab 1 Data Instr Oper	ect: ID: File: ument:	AECOM T-30 Port of Seattle, F&BI 212171 212171-01 1/38 121532.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 92	Lower Limit: 70	Upper Limit: 130	
Compounds:	Conce ug/m3	ntration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	<12 <720 <17 <33 <17	<3.8 <190 <3.8 <7.6 <3.8		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-120922 12/09/22 12/09/22 12/16/22 Air ug/m3	Clien Proje Lab I Data Instr Oper	ct: D: File: ument:	AECOM T-30 Port of Seattle, F&BI 212171 212171-02 1/5.0 121530.D GCMS7 bat
Surrogates: 4-Bromofluorobenz		Lower Limit: 70	Upper Limit: 130	
Compounds:	ug/m3	ntration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	<1.6 <94 <2.2 <4.3 <2.2	<0.5 <25 <0.5 <1 <0.5		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 12/15/22 Air ug/m3	Clien Proje Lab I Data Instr Opera	ct: D: File: ument:	AECOM T-30 Port of Seattle, F&BI 212171 02-2968 MB 121511.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 83	Lower Limit: 70	Upper Limit: 130	
Concer		ntration		
Compounds:	ug/m3	ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene	<0.32 <19 <0.43 <0.87	<0.1 <5 <0.1 <0.2		
o-Xylene	<0.43	< 0.1		

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/22 Date Received: 12/09/22 Project: T-30 Port of Seattle, F&BI 212171

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 212171-02 1/5.0 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
APH EC5-8 aliphatics	ug/m3	<370	<370	nm
APH EC9-12 aliphatics	ug/m3	170	190	11
APH EC9-10 aromatics	ug/m3	<120	<120	nm

Laboratory Code: Laboratory Control Sample

Laboratory Code. Laboratory Con	or or sumpro		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
APH EC5-8 aliphatics	ug/m3	67	75	70-130
APH EC9-12 aliphatics	ug/m3	67	92	70-130
APH EC9-10 aromatics	ug/m3	67	97	70-130

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/22 Date Received: 12/09/22 Project: T-30 Port of Seattle, F&BI 212171

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 212171-02 1/5.0 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
Benzene	ug/m3	<1.6	<1.6	nm
Toluene	ug/m3	<94	<94	nm
Ethylbenzene	ug/m3	<2.2	<2.2	nm
m,p-Xylene	ug/m3	<4.3	<4.3	nm
o-Xylene	ug/m3	<2.2	<2.2	nm

Laboratory Code: Laboratory Control Sample

Lasoratory coue. Lasoratory	control sample		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/m3	43	95	70-130
Toluene	ug/m3	51	93	70-130
Ethylbenzene	ug/m3	59	92	70-130
m,p-Xylene	ug/m3	120	92	70-130
o-Xylene	ug/m3	59	94	70-130

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

September 29, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on September 19, 2022 from the T-30 Port of Seattle, F&BI 209275 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Colo

Michael Erdahl Project Manager

Enclosures AEC0929R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 209275 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
209275 -01	Inlet-091422
209275 -02	Discharge-091422

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-091422 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-091422 09/19/22 09/14/22 09/23/22 Air ug/m3	Client: Project Lab ID Data F Instru: Operat	t:): File: ment:	AECOM T-30 Port of Seattle 209275-01 1/19 092322.D GCMS7 bat
Surrogates: 4-Bromofluoroben:	% Recovery: zene 101	Lower Limit: 70	Upper Limit: 130	
Compounds: APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics 8,100			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-091422 09/19/22 09/14/22 09/23/22 Air ug/m3	Client Projec Lab II Data I Instru Opera	t:): File: ment:	AECOM T-30 Port of Seattle 209275-02 1/6.5 092321.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 90	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics 1,200			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 09/23/22 Air ug/m3	Clien Projec Lab I Data Instru Opera	et: D: File: ument:	AECOM T-30 Port of Seattle 02-2178 MB 092312.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 90	Lower Limit: 70	Upper Limit: 130	
	Concentration			
Compounds:	ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics <25			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-091422 09/19/22 09/14/22 09/23/22 Air ug/m3	Client Projec Lab II Data I Instru Opera	t: D: File: ment:	AECOM T-30 Port of Seattle 209275-01 1/19 092322.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 108	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concent ug/m3	cration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	<6.1 <360 <8.3 <17 <8.3	<1.9 <95 <1.9 <3.8 <1.9		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-091422 09/19/22 09/14/22 09/23/22 Air ug/m3	/22Project:/22Lab ID:/22Data File:Instrument:		AECOM T-30 Port of Seattle 209275-02 1/6.5 092321.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 89	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concent ug/m3	ration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	<2.1 <120 <2.8 <5.6 <2.8	<0.65 <32 <0.65 <1.3 <0.65		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 09/23/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle 02-2178 MB 092312.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 89	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concent ug/m3	cration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	<0.32 <19 <0.43 <0.87 <0.43	<0.1 <5 <0.1 <0.2 <0.1		

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/22 Date Received: 09/19/22 Project: T-30 Port of Seattle, F&BI 209275

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 209338-03 1/7.2 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
APH EC5-8 aliphatics	ug/m3	770	700	10
APH EC9-12 aliphatics	ug/m3	990	990	0
APH EC9-10 aromatics	ug/m3	<180	<180	nm

Laboratory Code: Laboratory Control Sample

Laboratory Couc. Laboratory Con	cioi sumpio		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
APH EC5-8 aliphatics	ug/m3	67	102	70-130
APH EC9-12 aliphatics	ug/m3	67	121	70-130
APH EC9-10 aromatics	ug/m3	67	96	70-130

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/22 Date Received: 09/19/22 Project: T-30 Port of Seattle, F&BI 209275

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 209338-03 1/7.2 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
Benzene	ug/m3	2.5	2.6	4
Toluene	ug/m3	<140	<140	nm
Ethylbenzene	ug/m3	21	21	0
m,p-Xylene	ug/m3	81	82	1
o-Xylene	ug/m3	85	87	2

Laboratory Code: Laboratory Control Sample

Laboratory coue. Laboratory	control sample		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/m3	43	101	70-130
Toluene	ug/m3	51	102	70-130
Ethylbenzene	ug/m3	59	100	70-130
m,p-Xylene	ug/m3	120	104	70-130
o-Xylene	ug/m3	59	108	70-130

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

July 11, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on June 29, 2022 from the NA (Non-PO), AECOM PN 60667994.3, F&BI 206518 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

ale

Michael Erdahl Project Manager

Enclosures AEC0711R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 29, 2022 by Friedman & Bruya, Inc. from the AECOM NA (Non-PO), AECOM PN 60667994.3, F&BI 206518 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
206518 -01	Inlet-062922
206518 -02	Discharge-062922

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-062922 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-062922 06/29/22 06/29/22 07/02/22 Air ug/m3	Client Projec Lab II Data Instru Opera	et: D: File: ument:	AECOM 60667994.3, F&BI 206518 206518-01 1/46 070128.D GCMS7 bat
Surrogates: 4-Bromofluoroben:	% Recovery: zene 93	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom				

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-062922 06/29/22 06/29/22 07/02/22 Air ug/m3	Projec Lab I Data	et: D: File: ament:	AECOM 60667994.3, F&BI 206518 206518-02 1/6 070127.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 81	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics <150			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 07/01/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM 60667994.3, F&BI 206518 02-1506 MB 070111.D GCMS7 bat
Surrogates: 4-Bromofluoroben:	% Recovery: zene 82	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3 tics <75			
APH EC5-8 aliphatics APH EC9-12 aliphatics APH EC9-10 aromatics				

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-062922 06/29/22 06/29/22 07/02/22 Air ug/m3	Instr	ect:	AECOM 60667994.3, F&BI 206518 206518-01 1/46 070128.D GCMS7 bat
	%	Lower	Upper	
Surrogates:	Recovery:	Limit:	Limit:	
4-Bromofluorobenz	ene 95	70	130	
	Concent	cration		
Compounds:	ug/m3	ppbv		
Benzene	<15	<4.6		
Toluene	<870	<230		
Ethylbenzene	20	4.6		
m,p-Xylene	<40	< 9.2		
o-Xylene	<20	<4.6		
Naphthalene	<2.6 j	<0.51 j		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-062922 06/29/22 06/29/22 07/02/22 Air ug/m3	Instr	ect:	AECOM 60667994.3, F&BI 206518 206518-02 1/6 070127.D GCMS7 bat
	%	Lower	Upper	
Surrogates:	Recovery:	Limit:	Limit:	
4-Bromofluorobenz	ene 82	70	130	
	Concent	ration		
Compounds:	ug/m3	ppbv		
Benzene	<1.9	< 0.6		
Toluene	<110	<30		
Ethylbenzene	<2.6	< 0.6		
m,p-Xylene	<5.2	<1.2		
o-Xylene	<2.6	< 0.6		
Naphthalene	<1.6	< 0.3		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 07/01/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM 60667994.3, F&BI 206518 02-1506 MB 070111.D GCMS7 bat
	%	Lower	Upper	
Surrogates:	Recovery:	Limit:	Limit:	
4-Bromofluorobenz	ene 84	70	130	
	Concen	tration		
Compounds:	ug/m3	ppbv		
D	.0.00	.0.1		
Benzene	< 0.32	< 0.1		
Toluene	<19	<5		
Ethylbenzene	< 0.43	< 0.1		
m,p-Xylene	< 0.87	< 0.2		
o-Xylene	< 0.43	< 0.1		
Naphthalene	<0.057 j	<0.011 j		
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ENVIRONMENTAL CHEMISTS

Date of Report: 07/11/22 Date Received: 06/29/22 Project: NA (Non-PO), AECOM PN 60667994.3, F&BI 206518

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 206542-01 1/5.4 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
APH EC5-8 aliphatics	ug/m3	1,800	1,800	0
APH EC9-12 aliphatics	ug/m3	1,000	1,000	0
APH EC9-10 aromatics	ug/m3	<130	<130	nm

Laboratory Code: Laboratory Control Sample

Laboratory code. Laboratory con	uoi sumpio		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
APH EC5-8 aliphatics	ug/m3	67	87	70-130
APH EC9-12 aliphatics	ug/m3	67	118	70-130
APH EC9-10 aromatics	ug/m3	67	94	70-130

ENVIRONMENTAL CHEMISTS

Date of Report: 07/11/22 Date Received: 06/29/22 Project: NA (Non-PO), AECOM PN 60667994.3, F&BI 206518

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 206542-01 1/5.4 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
Benzene	ug/m3	3.1	3.1	0
Toluene	ug/m3	100	110	10
Ethylbenzene	ug/m3	4.1	4.1	0
m,p-Xylene	ug/m3	7.3	7.4	1
o-Xylene	ug/m3	<2.3	<2.3	nm
Naphthalene	ug/m3	<1.4	<1.4	nm

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/m3	43	95	70-130
Toluene	ug/m3	51	102	70-130
Ethylbenzene	ug/m3	59	93	70-130
m,p-Xylene	ug/m3	120	102	70-130
o-Xylene	ug/m3	59	105	70-130
Naphthalene	ug/m3	71	112	70-130

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Discharge -062422	62	9562	62	IA	16	6/29/22	30.0	1133	5.0	1138		X		X			
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Seattle, WA 98119-2029	W. Moadow	Windy Madden	1 TIO J		
Ph. (206) 285-8282	Relinquished by:		Samples rec	eived at 22	<u>e</u> c
Fax (206) 283-5044	Received by:			ļ	L

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

April 19, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on March 31, 2022 from the T-30 Port of Seattle, F&BI 203576 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Colo

Michael Erdahl Project Manager

Enclosures AEC0419R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 31, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 203576 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
203576 -01	Inlet-033122
203576 -02	Discharge-033122

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-033122 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-033122 03/31/22 04/14/22 04/15/22 Air ug/m3	Client Projec Lab II Data I Instru Opera	t: D: File: .ment:	AECOM T-30 Port of Seattle 203576-01 1/42 041442.D GCMS7 bat
Surrogates: 4-Bromofluoroben:	% Recovery: zene 104	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics 12,000			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-033122 03/31/22 04/14/22 04/15/22 Air ug/m3	Projec Lab II Data	et: D: File: ament:	AECOM T-30 Port of Seattle 203576-02 1/6.1 041441.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 94	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics <150			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 04/14/22 Air ug/m3	Client Projec Lab II Data Instru Opera	et: D: File: ument:	AECOM T-30 Port of Seattle 02-0801 mb 041336.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: zene 92	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concentration ug/m3			
APH EC5-8 alipha APH EC9-12 aliph APH EC9-10 arom	atics <25			

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Inlet-033122 03/31/22 04/14/22 04/15/22 Air ug/m3	/22Project/22Lab ID/22Data FInstrum		AECOM T-30 Port of Seattle 203576-01 1/42 041442.D GCMS7 bat
Surrogates: 4-Bromofluorobenz	% Recovery: ene 104	Lower Limit: 70	Upper Limit: 130	
Compounds:	Concent ug/m3	tration ppbv		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene Naphthalene	<13 <790 <18 <36 <18 4.4	<4.2 <210 <4.2 <8.4 <4.2 0.84		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Discharge-033122 03/31/22 04/14/22 04/15/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle 203576-02 1/6.1 041441.D GCMS7 bat
	%	Lower	Upper	
Surrogates:	Recovery:	Limit:	Limit:	
4-Bromofluorobenz	ene 95	70	130	
Compounds:	Concent ug/m3	ration ppbv		
Compounds.	ug/mo	pppv		
Benzene	<1.9	< 0.61		
Toluene	<110	<30		
Ethylbenzene	<2.6	< 0.61		
m,p-Xylene	<5.3	<1.2		
o-Xylene	<2.6	< 0.61		
Naphthalene	<1.6	< 0.3		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Collected: Date Analyzed: Matrix: Units:	Method Blank Not Applicable Not Applicable 04/14/22 Air ug/m3	Client: Project: Lab ID: Data File: Instrument: Operator:		AECOM T-30 Port of Seattle 02-0801 mb 041336.D GCMS7 bat
	%	Lower	Upper	
Surrogates:	Recovery:	Limit:	Limit:	
4-Bromofluorobenz	ene 92	70	130	
Compounds:	Concent ug/m3	ration ppbv		
Compounds.	ug/m5	ppn		
Benzene	< 0.32	< 0.1		
Toluene	<19	<5		
Ethylbenzene	< 0.43	< 0.1		
m,p-Xylene	< 0.87	< 0.2		
o-Xylene	< 0.43	< 0.1		
Naphthalene	< 0.1	< 0.02		
Naphthalene	<0.1	< 0.02		

ENVIRONMENTAL CHEMISTS

Date of Report: 04/19/22 Date Received: 03/31/22 Project: T-30 Port of Seattle, F&BI 203576

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 203541-01 1/8.3 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 30)
APH EC5-8 aliphatics	ug/m3	930	810	14
APH EC9-12 aliphatics	ug/m3	410	380	8
APH EC9-10 aromatics	ug/m3	<210	<210	nm

Laboratory Code: Laboratory Control Sample

Laboratory Coue. Laboratory Con	uoi sumpio		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
APH EC5-8 aliphatics	ug/m3	67	83	70-130
APH EC9-12 aliphatics	ug/m3	67	119	70-130
APH EC9-10 aromatics	ug/m3	67	104	70-130

ENVIRONMENTAL CHEMISTS

Date of Report: 04/19/22 Date Received: 03/31/22 Project: T-30 Port of Seattle, F&BI 203576

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 203541-01 1/8.3 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	14	14	0
Toluene	ug/m3	<160	<160	nm
Ethylbenzene	ug/m3	4.4	4.3	2
m,p-Xylene	ug/m3	16	15	6
o-Xylene	ug/m3	6.1	5.9	3
Naphthalene	ug/m3	5.6	5.7	2

Laboratory Code: Laboratory Control Sample

haberatory coue. haberatory con	iteror sample		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/m3	43	105	70-130
Toluene	ug/m3	51	110	70-130
Ethylbenzene	ug/m3	59	96	70-130
m,p-Xylene	ug/m3	120	102	70-130
o-Xylene	ug/m3	59	103	70-130
Naphthalene	ug/m3	71	118	70-130

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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<u>Appendix D</u>

Vapor Sampling Summary Data Quality Review Reports



AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 www.aecom.com 206 438 2700 tel 866 495 5288 fax

Memorandum

То	Paul Kalina, Project Manager	Info	FINAL
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	Vapor Sampling – March 2022		
	Amelia McArthur, Chemist		
From	Lucy Panteleeff, Chemist		
Date	June 14, 2022		

The summary data quality review of two vapor samples collected on March 31, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-033122). The following samples are associated with Friedman & Bruya, Inc. laboratory group 203576:

Sample ID	Laboratory ID		
Inlet-033122	203576 -01		
Discharge-033122	203576-02		

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR Do Not Report. Another result is available that is more reliable or appropriate.



Summary Data Quality Review Port of Seattle - T 30 Vapor Sampling – March 2022 Laboratory Group: 203576

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-ofcustody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable
- 4. Laboratory Control Sample (LCS) Acceptable
- 5. Laboratory Duplicate Acceptable

<u>General</u> – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag "ve" to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged 'J' due this instrument exceedance.

The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 203576 is 100%.

Table 1. Summary of Qualified Data

Sample ID	Lab ID	Analyte	Result	Units	Final Result
Inlet-033122	203576-01	APH EC5-8 aliphatics	88,000	ug/m³	88,000 J



AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 www.aecom.com 206 438 2700 tel 866 495 5288 fax

Memorandum

То	Paul Kalina, Project Manager	Info	FINAL
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	Vapor Sampling – December 2022		
	Lucy Panteleeff, Chemist		
From	Jennifer Garner, Chemist		
Date	February 6, 2023		

The summary data quality review of two vapor samples collected on September 14, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 212171:

Sample ID	Laboratory ID
Inlet-120922	212171 -01
Discharge-120922	212171 -02

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR Do Not Report. Another result is available that is more reliable or appropriate.



Summary Data Quality Review Port of Seattle - T 30 Vapor Sampling – December 2022 Laboratory Group: 212171

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-ofcustody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable
- 4. Laboratory Control Sample (LCS) Acceptable
- 5. Laboratory Duplicate Acceptable

<u>General</u> – Laboratory duplicates were performed using Discharge-120922. Results were comparable.

6. Reporting Limits – Acceptable

<u>General</u> – The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 212171 is 100%.

Table 1. Summary of Qualified Data

Sample ID	Lab ID	Analyte	Result	Units	Final Result				
No Data Qualifiers Were Assigned Based on This Data Review.									



AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 www.aecom.com 206 438 2700 tel 866 495 5288 fax

Memorandum

То	Paul Kalina, Project Manager	Info	Final
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	Vapor Sampling – June 2022		
	Lucy Panteleeff, Chemist		
From	Jennifer Garner, Chemist		
Date	October 12, 2022		

The summary data quality review of two vapor samples collected on June 29, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 206518:

Sample ID	Laboratory ID
Inlet-062922	206518-01
Discharge-062922	206518-02

Data were evaluated based on validation criteria established in the National Functional Guidelines for Organic Superfund Methods Data Review, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR Do Not Report. Another result is available that is more reliable or appropriate.



Summary Data Quality Review Port of Seattle - T 30 Vapor Sampling – June 2022 Laboratory Group: 206518

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-ofcustody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable
- 4. Laboratory Control Sample (LCS) Acceptable
- 5. Laboratory Duplicate Acceptable

<u>General</u> – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag "ve" to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged 'J' due this instrument exceedance.

The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 206518 is 100%.

Table 1. Summary of Qualified Data

Sample ID	Lab ID	Analyte	Result	Units	Final Result
Inlet-062922	206518-01	APH EC5-8 aliphatics	51,000	ug/m³	51,000 J



AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 www.aecom.com 206 438 2700 tel 866 495 5288 fax

Memorandum

То	Paul Kalina, Project Manager	Info	Final
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	Vapor Sampling – September 2022		
	Lucy Panteleeff, Chemist		
From	Jennifer Garner, Chemist		
Date	October 12, 2022		

The summary data quality review of two vapor samples collected on September 14, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 209275:

Sample ID	Laboratory ID
Inlet-091422	209275-01
Discharge-091422	209275-02

Data were evaluated based on validation criteria established in the National Functional Guidelines for Organic Superfund Methods Data Review, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR Do Not Report. Another result is available that is more reliable or appropriate.



Summary Data Quality Review Port of Seattle - T 30 Vapor Sampling – September 2022 Laboratory Group: 209275

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-ofcustody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable
- 4. Laboratory Control Sample (LCS) Acceptable
- 5. Laboratory Duplicate Acceptable

<u>General</u> – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

<u>APH by MA APH</u> – The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag "ve" to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged 'J' due this instrument exceedance.

<u>General</u> – The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 209275 is 100%.

Table 1. Summary of Qualified Data

Sample ID	Lab ID	Analyte	Result	Units	Final Result
Inlet-091422	209275-01	APH EC5-8 aliphatics	24,000 ve	ug/m³	24,000 J

<u>Appendix E</u> LNAPL Gauging and Recovery Field Notes

Port of Seattle Terminal 30 LNAPL Gauging Event (January 18, 2022)

					7.87	
		Depth to	Depth to	LNAPL	Corrected	
	Time of	LNAPL	Water	Thickness	DTW ¹	
Well ID	Gauging	(Feet BTOC)	(Feet BTOC)	(Feet)	(Feet BTOC)	Comments
MW-35		NM	NM	0.00		Well inaccessible
MW-36	1736	NM	8.37	0.00	8.37	
MW-36A		NM	NM	0.00		Well inaccessible
MW-39A	1747	ND	8.07	0.00	8.07	
MW-59	1708	7.80	8.19	0.39	7.91	
MW-89		NM	NM	0.00		Well inaccessible
MW-93	1644	ND	8.25	0.00	8.25	
RW-1		NM	NM	0.00		Well inaccessible
RW-12	1651	8.26	8.33	0.07	8.28	
RW-101	1721	ND	7.29	0.00	7.29	
RW-102		NM	NM	0.00		Well inaccessible
RW-103	1657	7.12	8.41	1.29	7.47	
RW-104	1736	ND	7.42	0.00	7.42	
RW-105	1715	ND	7.67	0.00	7.67	
RW-106	1705	7.26	9.11	1.85	7.76	
RW-107	1649	7.56	9.01	1.45	7.95	
RW-108	1637	ND	7.75	0.00	7.75	
RW-109	1641	ND	7.97	0.00	7.97	
RW-110	1645	ND	7.96	0.00	7.96	

Avg

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

			Initial Gaugi	ng				F	irst Remov	ral					Sec	ond Remo	val					Т	nird Remov	al									End of D)ay					
	Time of	Initial Depth to LNAPL	Initial Depth to Water	LNAPL Thickness	Corrected Depth to Water ²	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	Time Lapse Since Extraction	% of Initial LNAPL Thickness	LNAPL Extraction Duration	Extraction Star Time	Extraction End Time		-	Depth to Water	
/ell ID	Gauging 1842	(Ft BTOC) 8.57	(Ft BTOC) 8.62	(Feet)	(Ft BTOC) 8.58	(Minutes) 60	(Approx.) 1905	(Approx.) 2008	Gauging 2020	(Ft BTOC)	(Feet TOC) 9.06	(Feet)	(Minutes)	(Approx.)	(Approx.)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(Minutes)	(Approx.)	(Approx.)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet) 	(minutes)	(%)	(Minutes)	(Approx.)	(Approx.)	Time of Gaugin	(Ft BTOC)	(Ft BTOC)	(Feet)
1W-35				0.05																																		<u> </u>	_
1W-36	1835	ND	8.93	0.00	8.93																																	<u> </u>	
1W-36A	1831	ND	9.40	0.00	9.40																																		
1W-39A	1848	ND	8.91	0.00	8.91	20	2035	2120	2125	10.11	10.12	0.01			-						-																		
1W-59	1700	8.50	9.86	1.36	8.87	20	1700	1720	1922	9.42	9.43	0.01			-						-																	-	
1W-89	1908	ND	9.38	0.00	9.38		-			-					-						-			-		1													
1W-93	1855	ND	9.04	0.00	9.04										-						-			-															
W-1	1859	8.38	8.44	0.06	8.40																-																		
W-12	1645	9.15	9.20	0.05	9.16																																		
W-101	1923	ND	7.83	0.00	7.83																																		
W-102	1620	ND	8.12	0.00	8.12	60	1818	1904	2016	8.47	8.49	0.02																											
W-102	1020	NM	NM			60	1720	1810	1916	8.65	8.67	0.02																										<u> </u>	
W-103	1817	ND	7.90	0.00	7.90						0.07	0.02			-																								
W-104	1817	ND	8.42	0.00	8.42																																	<u> </u>	
									-																													<u> </u>	
W-106	1655	8.03	8.95	0.92	8.28	20	2010	2030	2035	Trace	9.05	TRACE																										<u> </u>	
W-107	1642	8.40	9.05	0.65	8.58																																		
W-108	1800	ND	8.39	0.00	8.39																																		
W-109	1755	ND	8.71	0.00	8.71																																		
W-110	1739	8.85	8.87	0.02	8.86																																	-	
prior to hold	ling tank) (VACUUM TRUE	K MEASURED AN	ID APPROXIMA	TED TOTALS		NM			COMMENT	S:																										
ncluding ho									NM																														
stimated co	mbined vo	olume, mea:	sured by DH	the followin	g day (gal):				1104.16																														
-	-> Estimate	ed product	portion (gal):					31.48																														
-	-> Estimate	ed water po	ortion (gal):						1072.69																														
idelines:	Abbreviations & Formatting																																						
	kness is 0.01 - 0.25 ft, vac for approx 20 min BTOC = Feet below top of well casing.							-																															
		i is 0.26 - 0.5 ft, vac for approx 30-40 min LINAPL = Light Non-Aqueous Phase Liqu																																					
		greater than 0.51 ft, vac for approx 60 min ND = LNAPL not detected using interface																																					
		ster trans 1.1, vie for approxium in ND = LNAPk. not detected using interface provided in the start transition of the start of the star																																					

1. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Port of Seattle Terminal 30 LNAPL Gauging Event (April 14, 2022)

Closest Lov	v Tide:	22:21			Avg	
Closest Hig	gh Tide:	16:20			8.74	
	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	Corrected DTW ¹	
Well ID	Gauging	(Feet BTOC)	(Feet BTOC)	(Feet)	(Feet BTOC)	Comments
MW-35	1951	ND	8.64	0.00	8.64	
MW-36	1931	ND	9.17	0.00	9.17	
MW-36A	1928	ND	9.73	0.00	9.73	
MW-39A	1937	ND	9.40	0.00	9.40	
MW-59	1857	ND	8.82	0.00	8.82	A sheen was observed in the water in the monument. Well was re-gauged during low tide the following day and 0.01 ft of LNAPL was measured from 9.24 to 9.25 ft BTOC.
MW-89	1957	ND	9.92	0.00	9.92	
MW-93	1940	ND	9.66	0.00	9.66	
RW-1	1947	8.42	8.45	0.03	8.43	LNAPL observed to be a dense layer. Probe was covered with a copper-brown layer on removal.
RW-12	1849	9.04	9.10	0.06	9.06	
RW-101	1835	ND	7.83	0.00	7.83	
RW-102	1837	ND	8.21	0.00	8.21	
RW-103	1841	7.96	8.56	0.60	8.12	
RW-104	1827	ND	7.86	0.00	7.86	
RW-105	1859	ND	8.45	0.00	8.45	
RW-106	1855	8.06	9.18	1.12	8.36	
RW-107	1846	8.36	9.16	0.80	8.58	
RW-108	1905	ND	8.47	0.00	8.47	
RW-109	1912	ND	8.72	0.00	8.72	
RW-110	1922	ND	8.70	0.00	8.70	

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

			Initial Gaug	ing	9.10			6	irst Remov	/al					Sara	ond Remov	val					Th	ird Remova	al									End of D	av					
ell ID	Time of Gauging	Initial Depth to LNAPL (Ft BTOC)	Initial Depth to Water (Ft BTOC)	LNAPL Thickness (Feet)	Corrected Depth to Water ² (Ft BTOC)	LNAPL Extraction Duration (Minutes)	Extraction Start Time (Approx.)	Extraction End Time (Approx.)	Time of	Depth to LNAPL (Ft BTOC)	Depth to Water (Feet TOC)	LNAPL Thickness (Feet)	LNAPL Extraction Duration (Minutes)	Extraction Start Time	Extraction End Time (Approx.)	Time of Gauzing	Depth to LNAPL (Ft BTOC)	Depth to Water (Ft BTOC)	LNAPL Thickness (Feet)	LNAPL Extraction Duration	Extraction Start Time (Approx.)	Extraction End Time	Time of Gauging	Depth to LNAPL (Ft BTOC)	Depth to Water (Ft BTOC)	LNAPL Thickness (Feet)	Time of Gauging	Depth to LNAPL (Ft BTOC)	Depth to Water (Ft BTOC)	LNAPL Thickness (Feet)	Time Lapse Since Extraction	% of Initial LNAPL Thickness (%)	LNAPL Extraction Duration (Minutes)	Extraction Start Time (Approx.)	Extraction End Time (Approx.)	Time of Gauging	Depth to LNAPL (Ft BTOC)	Depth to Water (Ft BTOC)	r LNAPL T
w-35	1831	ND	8.71	0.00	8.71																																		,
W-36	1858	ND	9.32	0.00	9.32																																		-
W-36A	1853	ND	10.24	0.00	10.24																										-						-		
W-39A	1915	ND	9.66	0.00	9.66					-	-	-						-		-			-	-		-					-				-	-			
W-59	1706	ND	9.36	0.00	9.36																																		
W-89	1932	ND	9.94	0.00	9.94	-						-						-													-								
W-93	1910	ND	9.77	0.00	9.77	-	1					-						-													-		-						
N-1	1903	8.64	8.72	0.08	8.66	20	1916	1936	1938	TRACE	10.26	<0.01						-								-													
W-12	1721	9.49	9.58	0.09	9.51	20	1744	1800	1804	ND	11	0.00														-													
W-101	1822	ND	7.96	0.00	7.96													-													-								
V-102	1618	ND	8.84	0.00	8.84																										-								
V-103	1734	8.57	8.86	0.29	8.65	30	1844	1912	1919	ND	8.77	0.00						-			-					-	2032	TRACE?	8.6	<0.01	73.00	0%							
W-104	1812	ND	7.97	0.00	7.97																																		
W-105	1815	ND	9.01	0.00	9.01													-																					
V-106	1653	8.62	9.00	0.38	8.72	30	1707	1740	1745	ND	9.01	0.00															2024	8.82	8.84	0.02	164.00	5%							_
N-107	1712	8.82	9.57	0.75	9.02	45	1800	1843	1847	ND	9.22	0.00															2037	9.09	9.35	0.26	110.00	35%							-
W-108	1806	ND	9.05	0.00	9.05													-													-								_
N-109	1751	ND ND	9.28 9.21	0.00	9.28													-			-					-					-								_
N-110	1740	ND		0.00	9.21 IEASURED A							 COMMENT														-												-	
rior to hol timated ve	ding tank) (gal): c truck at e	er completio	n of LNAPL I					343 gal 430				t smoothly. Ir	iitial round	of removal	successfull	y got all m	easurable LI	NAPL at eac	h affected v	vell. A secon	d round was	not necess	ary.															
			-	I the followi	ng day (gal):				527.57																														
				1.																																			
lelines: roduct thick roduct thick roduct thick	ess is greater than 0.51 ft, vac for approx 60 min ND = LNAPL not detected using inte							ll casing. Phase Liquid ng interface prot																															
erform an end tes:	-of-day DTW/pr	reater than 0.51 ft, vac for approx 60 min ND = LNAPL not detected using interface							o detect or meas ent, but no accur	sure) rate measuremen																													

2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Closest Lov	v Tide:	5:25			Avg	
Closest Hi	gh Tide:	10:07			9.02	
Well ID	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Corrected DTW ¹ (Feet BTOC)	Comments
MW-35	8:31	ND	8.73	0.00	8.73	
MW-36	9:47	ND	9.08	0.00	9.08	
MW-36A	9:50	ND	9.50	0.00	9.50	
MW-39A	9:59	ND	9.33	0.00	9.33	
MW-59	9:20	8.68	8.80	0.12	8.71	
MW-89	10:14	ND	9.48	0.00	9.48	
MW-93	10:06	ND	9.41	0.00	9.41	
RW-1	10:08	8.57	8.65	0.08	8.59	LNAPL observed to be a dense layer. Probe was covered with a copper-brown layer on removal.
RW-12	9:25	9.20	9.21	0.01	9.20	
RW-101	8:40	ND	8.50	0.00	8.50	
RW-102	8:53	ND	8.80	0.00	8.80	
RW-103	9:32	ND	8.74	0.00	8.74	No J-plug / cap
RW-104	8:38	ND	8.58	0.00	8.58	
RW-105	8:50	ND	8.96	0.00	8.96	
RW-106	9:02	ND	8.76	0.00	8.76	
RW-107	9:14	ND	9.03	0.00	9.03	No J-plug / cap
RW-108	8:44	ND	9.04	0.00	9.04	
RW-109	9:00	ND	9.70	0.00	9.70	
RW-110	9:09	ND	9.31	0.00	9.31	
MW-64	9:38	ND	8.55	0.00	8.55	Vault slightly damaged, lip bent over lid.

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of S		minal 30 LN July 14, 202	IAPL Remov 22)	val Event	Avg DTW 8.82																			
		Initial	Gauging		8.83		First R	emoval			Post-I	Removal				Second F	lemoval					End of D	ау	
	Time of	Initial Depth to LNAPL	Initial Depth to Water	LNAPL Thickness	Corrected DTW (ft BTOC)	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Estimated Total Fluid Removal	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Time of	Post-Removal Depth to LNAPL	Post-Removal Depth to Water	Time of	Depth to LNAPL	Depth to Water	LNAPL Thickness	Time Lapse Since Extraction
Well ID	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(Ft BTOC)	(Minutes)	(Approx.)	(Approx.)	(Gallons)	Gauging	(Ft BTOC)	(Feet TOC)	(Feet)	(Minutes)	(Approx.)	(Approx.)	Gauging	(Ft BTOC)	(Ft BTOC)	Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(minutes)
MW-35	1714	ND	8.80	0	8.80																			
MW-36	1815	ND	9.00	0	9.00																			
MW-36A	1817	ND	9.87	0	9.87																			
MW-39A	1718	ND	8.50	0	8.50																			
MW-59	1648	ND	9.12	0	9.12																			
MW-89	1812	ND	9.32	0	9.32																			
MW-93	1722	ND	8.74	0	8.74																			
RW-1	1806	8.51	8.60	0.09	8.53	20	2027	2047	NM	2048	ND	10.55	0											
RW-12	1820	9.45	9.58	0.13	9.49	20	1956	2016	NM	2018	ND	10.01	0											
RW-101	1708	ND	8.15	0	8.15																			
RW-102	1706	ND	8.61	0	8.61																			
RW-103	1644	8.4	8.67	0.27	8.47	30	1835	1905	NM	1912	ND	8.63	0							2142	8.48	8.49	0.01	157
RW-104	1712	ND	8.13	0	8.13																			
RW-105	1703	ND	8.76	0	8.76																			
RW-106	1651	8.45	9.27	0.82	8.67	45	1741	1826	NM	1827	ND	8.87	0							2140	8.67	8.74	0.07	194
RW-107	1629	8.78	9.39	0.61	8.95	45	1650	1735	NM	1736	ND	8.98	0							2145	8.86	9.28	0.42	250
RW-108	1659	ND	8.72	0	8.72																			
RW-109	1654	ND	8.96	0	8.96																			
RW-110	1656	ND	9.04	0	9.04								 COMMENT											
Estimated v			er completi					~350						de 1155	-4.01 12.29									
(prior to hol Estimated vo (including ho	olume in v	ac truck at	end of day				~425							ide 0050 7/15										
			asured by D	H the follow	ring day (gal)	:	439.55							ll difficult to					l even after					
	> Estim	ated produc	ct portion (g	;al):			10.12						Stinger fro	n vac Truci	k lost down	RW-103 DU	t we even	tually were	able to fish	it out and	continue va	icing.		
	> Estim	ated water	portion (gal):			429.43						1											
Guidelines:								Notes:					1											
- If product thickn									op of well casing															
 If product thickn If product thickn 									Ion-Aqueous Pha detected using i															
- Repeat vac even					n completed			NM = Not Meas		internace probe														
- Perform an end-	of-day DTW/p	roduct gauge for	any well that initi	ially had >0.25 ft	of product			TRACE = LNAPL	present but no a	iccurate measu	rement													
Red wells extracte	ed by DH Envir	onmental with va	cuum truck.					= measurem	ent not needed															

Port of Seattle Terminal 30 LNAPL Gauging Event (August 11, 2022)

Closest Lov	v Tide:	10:53			Avg	
Closest Hi	gh Tide:	18:25			8.98	
Well ID	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Corrected DTW ¹ (Feet BTOC)	Comments
MW-35	17:11	8.86	8.87	0.01	8.86	
MW-36	17:12	ND	9.13	0.00	9.13	
MW-36A	17:14	ND	9.85	0.00	9.85	
MW-39A	17:19	ND	6.65	0.00	6.65	
MW-59	16:50	ND	9.17	0.00	9.17	
MW-89	17:23	ND	9.95	0.00	9.95	
MW-93	17:18	ND	6.18	0.00	6.18	
RW-1	17:16	8.81	8.87	0.06	8.83	
RW-12	16:45	9.42	9.59	0.17	9.47	
RW-101	16:57	ND	8.95	0.00	8.95	
RW-102	16:40	ND	9.10	0.00	9.10	
RW-103	16:51	ND	8.99	0.00	8.99	
RW-104	17:00	ND	8.82	0.00	8.82	
RW-105	16:53	ND	9.25	0.00	9.25	
RW-106	16:48	9.03	9.08	0.05	9.04	
RW-107	16:42	9.31	9.80	0.49	9.44	
RW-108	17:02	ND	9.38	0.00	9.38	
RW-109	17:06	ND	9.92	0.00	9.92	
RW-110	17:08	ND	9.60	0.00	9.60	

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event

(September 8, 2022)

Avg

9.53

--- = measurement not needed

Third Removal Initial Gauging First Removal Post-Removal Second Removal End of Day LNAPL LNAPL ost-Remov Post-Remo LNAPL Post-Remo Post-Remo Initial Dept Initial Dept LNAPL Extraction Extraction Extraction Depth to Depth to LNAPL Extraction Extraction Extraction Depth to Depth to LNAPL Extraction Extraction Extraction Depth to Depth to LNAPL Depth to Depth to ime Lapse Sin to LNAPL Corrected DT End Time LNAPL Thickness Start Time End Time LNAPL Water Thicknes Duration Start Time End Time LNAPL LNAPL NAPL Thick to Water Thickness Duration Start Time Water Duration Water Thickness Water Extraction Time of Time of Time of Time of Time of Well ID (Ft BTOC) (Ft BTOC) (Ft BTOC) (Feet TOC) (Ft BTOC) (Ft BTOC) (Ft BTOC) (Ft BTOC) (Ft BTOC) (Ft BTOC) Gauging (Feet) (Feet) Minutes (Approx. (Approx. Gauging (Feet) (Minutes) (Approx (Approx.) Gauging (Feet) (Minutes (Approx. (Approx.) Gauging (Feet) Gauging (Feet) (minutes) MW-35 1719 9.11 9.11 9.11 Sheen --MW-36 1741 ND 9.35 0.00 9.35 ---1739 10.02 10.02 MW-36A ND 0.00 --1743 ND 10.32 10.32 MW-39A 0.00 --MW-59 1656 9.39 9.58 0.19 9.44 20 1834 1854 1856 9.58 9.59 0.01 -----------------------------------2132 9.38 9.41 0.03 158 -------------------1745 ND MW-89 10.11 0.00 10.11 ---MW-93 1747 ND 10.60 0.00 10.60 ---2027 2045 10.63 RW-1 1749 9.11 9.21 0.10 9.14 15 2042 10.64 0.01 ---RW-12 1647 9.55 9.87 0.32 1729 1804 1805 9.55 9.57 0.02 22 1956 2018 2019 11.05 11.05 Sheen 2134 10.08 10.12 76 9.64 35 ----------------------------0.04 RW-101 1713 ND 9.04 0.00 9.04 ---1711 RW-102 ND 9.24 0.00 9.24 --RW-103 1644 ND 9.11 0.00 9.11 --RW-104 1715 ND 8.95 0.00 8.95 --RW-105 1710 ND 9.37 0.00 9.37 ---RW-106 1654 9.15 9.19 0.04 9.16 20 1854 1914 1916 9.62 9.63 0.01 ---2131 9.40 9.42 0.02 137 9.90 40 1728 10.26 0.41 30 1804 1834 1836 0.40 0.37 2136 9.64 10.03 0.39 93 RW-107 1640 9.41 0.49 9.54 1645 1725 9.85 9.91 10.31 41 1915 1956 1958 10.03 10.40 RW-108 1707 ND 9.38 0.00 9.38 ---RW-109 1701 ND 9.75 0.00 9.75 --RW-110 1703 ND 9.76 0.00 9.76 --VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS COMMENTS: Estimated volume in vac truck after completion of LNAPL recovery Low Low Tide 0949 -1.70' NM (prior to holding tank) (gal): High High Tide 1713 11.46 Estimated volume in vac truck at end of day High Low Tide 2247 5.45' ~700 (including holding tank) (gal): Vaced on RW-107 multiple times with little success of removing product, not sure why this was happening (perhaps something with high tide) verified that we were vacing up product kept adjusting stinger lenth with little success in Estimated combined volume, measured by DH the following day (gal): 647.71 removing significant product. --> Estimated product portion (gal): 11.14 --> Estimated water portion (gal): 636.56 Guide - If product thickness is 0.01 - 0.25 ft, vac for approx 20 min BTOC = Below top of well casing - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min LNAPL = Light Non-Aqueous Phase Liquid - If product thickness is greater than 0.51 ft, vac for approx 60 min ND = LNAPL not detected using interface probe - Repeat vac events until product thickness is <0.01 ft or three vac events have been completed NM = Not Measured - Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product TRACE = LNAPL present but no accurate measurement Red wells extracted by DH Environmental with vacuum truck.

Port of Seattle Terminal 30 LNAPL Gauging Event (October 13, 2022)

Closest Lo	w Tide:	19:11			Avg							
Closest H	igh Tide:	14:04			9.44							
Well ID	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Corrected DTW ¹ (Feet BTOC)	Comments						
MW-35	17:19	9.42	9.44	0.02	9.43	Strong odor						
MW-36	17:58	ND	9.48	0.00	9.48	Strong odor						
MW-36A	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
MW-39A	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
MW-59	17:37	ND	9.40	0.00	9.40							
MW-89	Removed ;	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
MW-93	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-1	18:12	9.13	9.19	0.06	9.15	Very strong odor						
RW-12	17:52	9.71	10.00	0.29	9.79	Strong odor						
RW-101	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-102	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-103	17:45	ND	9.23	0.00	9.23							
RW-104	17:27	ND	9.15	0.00	9.15	No cap on stinger (~4 in above well cap). Procurement underway.						
RW-105	Removed ;	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-106	17:40	9.27	9.28	0.01	9.27							
RW-107	0717:479.559.960.419.66No cap on stinger (~4 in above well cap). Procurement underway.											
RW-108	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-109	Removed	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-110	18:07	ND	9.89	0.00	9.89	Moderate odor						

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Gauging Event (November 10, 2022)

Closest Lov	w Tide:	23:54			Avg							
Closest Hi	gh Tide:	16:51			8.68							
Well ID	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Corrected DTW ¹ (Feet BTOC)	Comments						
MW-35	18:00	9.07	9.07	0.00	9.07	Sheen						
MW-36	18:41	ND	9.27	0.00	9.27	This marks 1 year of no product present						
MW-36A	Removed ;	from LNAPL m	nonitoring prot	tocol follow	ning 9/8/22 ev	rent						
MW-39A	Removed ;	from LNAPL m	nonitoring prot	tocol follow	ring 9/8/22 ev	rent						
MW-59	18:17	ND	8.59	0.00	8.59							
MW-89	Removed ;	from LNAPL m	nonitoring prot	tocol follow	ning 9/8/22 ev	rent						
MW-93	Removed ;	from LNAPL m	nonitoring prot	tocol follow	ing 9/8/22 ev	rent						
RW-1	18:49	8.99	9.06	0.07	9.01							
RW-12	2 18:30 9.16 9.49 0.33 9.25 Monument silted in											
RW-101	Removed ;	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	ient						
RW-102	Removed ;	from LNAPL m	nonitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-103	18:21	8.13	8.41	0.28	8.21							
RW-104	18:04	ND	8.31	0.00	8.31							
RW-105	Removed ;	from LNAPL m	nonitoring prot	tocol follow	ing 9/8/22 ev	vent						
RW-106	18:07	7.11	9.20	2.09	7.68	The interface probe gave a fast beep starting at 9.05 ft btoc, and a slower beep at 9.35 ft. 9.20 ft is the average of the two.						
RW-107	18:24	8.60	8.78	0.18	8.65							
RW-108	Removed ;	from LNAPL m	onitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-109	Removed ;	from LNAPL m	onitoring pro	tocol follow	ing 9/8/22 ev	vent						
RW-110	18:33	ND	8.80	0.00	8.80							

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event <u>Avg DTW:</u>

(December 8, 2022)

	(cember 0, 1			8.79																									
		Initia	Gauging			I	irst Remov	al		Post-	Removal				Sec	ond Remo	oval					Third F	emoval					End of D	ay	
		Initial Depth to LNAPL	Initial Depth to Water	LNAPL Thickness	Corrected DTW	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time		Depth to LNAPL	Depth to Water	LNAPL Thickness	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time		Post-Removal Depth to LNAPL	Post-Removal Depth to Water	LNAPL Thickness	LNAPL Extraction Duration	Extraction Start Time	Extraction End Time	Post-Removal Depth to LNAPL	Post-Removal Depth to Water	LNAPL Thickness		Depth to LNAPL	Depth to Water	LNAPL Thickness	Time Lapse Since Extraction
Well ID	Time of Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(Feet BTOC)	(Minutes)	(Approx.)	(Approx.)	Time of Gauging	(Ft BTOC)	(Feet TOC)	(Feet)	(Minutes)	(Approx.)	(Approx.)	Time of Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(Minutes)	(Approx.)	(Approx.)	(Ft BTOC)	(Ft BTOC)	(Feet)	Time of Gauging	(Ft BTOC)	(Ft BTOC)	(Feet)	(minutes)
MW-35	1750	9.04	9.07	0.03	9.05	20	1955	2015	2032		10.52	0.0																		
MW-36					ollowing 11/.																									
MW-36A					ollowing 09/																									
MW-39A	Removed	I JIOM LINAP	Linonitoring	protocol je	ollowing 09/	08/22 event		I	r					r				I	r	r	I	r		I	r	r			ر	
MW-59	1651	9.1	9.15	0.05	9.11	20	1705	1725	1813		9.14	0.0																		
MW-89					ollowing 09/																									
MW-93 RW-1	1753	8.64	8.68	0.04	8.65	20 22 event	2040	2100	2105		10.14	0.0																		
RW-12	1732	9.25	9.63	0.38	9.35	45	1845	1930	1951	9.4	9.55	0.15	20	2015	2030	2035	10.4	10.4	<0.01							2135	9.69	9.72	0.03	65
RW-101	Removed	from LNAP	L monitorino	a protocol fo	ollowing 09/	08/22 event																							I	
RW-101					ollowing 09/																									
RW-103	1716	8.4	8.55	0.15	8.44	20	1755	1815	1841		8.42	0.0																		
RW-104	1743		8.12	0.00	8.12																									
RW-105	Removed	from LNAP	L monitoring	g protocol fo	ollowing 09/	08/22 event																								
RW-106	1653	8.5	8.82	0.32	8.59	30	1725	1755	1815		8.65	0.0																		
RW-107	1729	8.74	9.18	0.44	8.86	30	1815	1845	1925	8.75	8.89	0.14	20	1930	1950	2011		8.8	0.0							2130	8.8	8.92	0.12	100
RW-108 RW-109					ollowing 09/0 ollowing 09/0																									
					J ,									I		1			1	I		1			1	I			<u>г</u>	
RW-110	1736		8.97	0.00	8.97																									
Estimated v (prior to ho					recovery	AND APPRO		NM, est ~13	328 assum 1 the poly		1	COMMENT	S:					-		-			·							
Estimated v	olume in v	ac truck at e	end of day						2328	W																				ľ
(including h Estimated c	-	-	sured by DI	H the follow	ing day (gal)	:			2369.32																					
>	Estimated	product po	rtion (gal):						48.55																					
>	Estimated	water porti	on (gal):						2320.77																					
Guidelines:								Abbreviations &	& Formatting			1																		ł
- If product thick	ness is 0.01 - 0.	25 ft, vac for app	rox 20 min					BTOC = Feet be		l casing.																				ł
- If product thick	ness is 0.26 - 0.	5 ft, vac for appr	ox 30-40 min					LNAPL = Light N	lon-Aqueous P	hase Liquid																				
- If product thick	ness is greater f	than 0.51 ft, vac	for approx 60 mir	ı				ND = LNAPL not	detected usir	g interface prob	2.																			
- Repeat vac eve	nts until produc	t thickness is <0	01 ft or three vac	events have be	en completed			NA - Not Availa	ble (not able t	o detect or meas	ure)																			
- Perform an end	-of-day DTW/p	ay DTW/product gauge for any well that initially had >0.25 ft of product TRACE, MINOR - LNAPL present, but no accurate n																												
Notes:								Red wells extra	cted by DH Env	vironmental with	vacuum truck.																			

1. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. 2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321. <u>Appendix F</u> Groundwater Sampling Field Forms

AECOM

Americas

Daily Tailgate	Meeting	S3AM-209-FM5
attendance of all AECOM emp	ng prior to sending crews to individual tasks ployees and subcontractors. Invite personne coordination purposes. Review scope of wo	Phone Number:
	pplicable topics. This meeting is a daily re pecific discussions associated with Task H	
	meeting at the task location immediately be	
Date: 4/14/22	Project Name/Location: 7.30	Project Number:
Teday's Saana of Works	is: Rw-11A Sampline	g (Day 1 garing '22 sampling)
Muster Point Location:	First Aid Kit Location:	Fire Extinguisher Location: Spill Kit Location:
1. Required Topics		2. Discuss if Applicable to Today's Work
-/	rements, all sign in / sign out	Check 🕼 as reviewed or mark 🔳 as not applicable
-	I. task specific) completed and current	t Biological/ Chemical / Electrical Hazards
\equiv	nderstood, reviewed, signed by all	Ergonomics - Lifting, Body Position
(incl. scope, preplanni	ing hazard assessments / risk	Lock Out/ Tag Out
_/*	ocedures, requirements, etc.)	Short Service Employees - visual identifier and mentor/
	ments (THAs) are to be reviewed and ask immediately prior to conducting	oversight assignment
	Responsibility- all task	Simultaneous/ Neighbouring Operations
	nditions re-assess with THA	Slip/ Trip/ Fall Hazards
Requirement to report damage, near miss, u	t to supervisor any injury, illness, unsafe act / condition	Specialized PPE Needs Traffic Control
first aid kit, fire extingu	e Plan – including muster point, uisher, clinic/hospital location	Weather Hazards / Heat Stress / Cold Stress
hazard assessments i	Equipment (PPE) - Required items per in good condition / in use by all	procedures, reporting, etc.)
and in good condition	 / inspected (documented as required) - operators properly trained/certified I demarcation/ barricades in place to 	Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place,
protect workers, site s	staff, and the public	understood (identify/attach):
	ecords available, understood (describe	e): Other Topics (describe/attach):
Lessons Learned / SH	H&E improvements (describe):	
		Client specific requirements (describe):
3. Daily Check Out by S	àite Supervisor	
	nisses, observations or Stop Work	Describe Lessons Learned/ Improvement Areas from today:
interventions from today:	in and the second of the secon	Land on where constructions and a second s
The site is being l	eft in a safe condition and work cre	w checked out as fit unless otherwise specified as above.
Site Supervisor Name	non Signature	- Date 4/11/t/2.2 Time (at end of day / shift)
Daily Tailgate Meeting (Revision 9 January 15,	S3AM-209-FM5) 2019	cable to this meeting are on reverse and, if applicable, attached.



All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

• Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
 * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning: * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.

* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
Gues Friedman AECOM	Gufi	In & Fit 1645 GF	Out & Fit
Gues Friedman AELOM Nome Garys	his bais	In & Fit 1645 NG	Out & Fit
<i>j</i> , <i>i</i>		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
E		In & Fit	Out & Fit
	/U=	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Name	Company Name	Arrival Time	Departure Time	Signature
	2			
-				9 H

Daily Tailgate Meeting (S3AM-209-FM5) Revision 9 January 15, 2019 PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

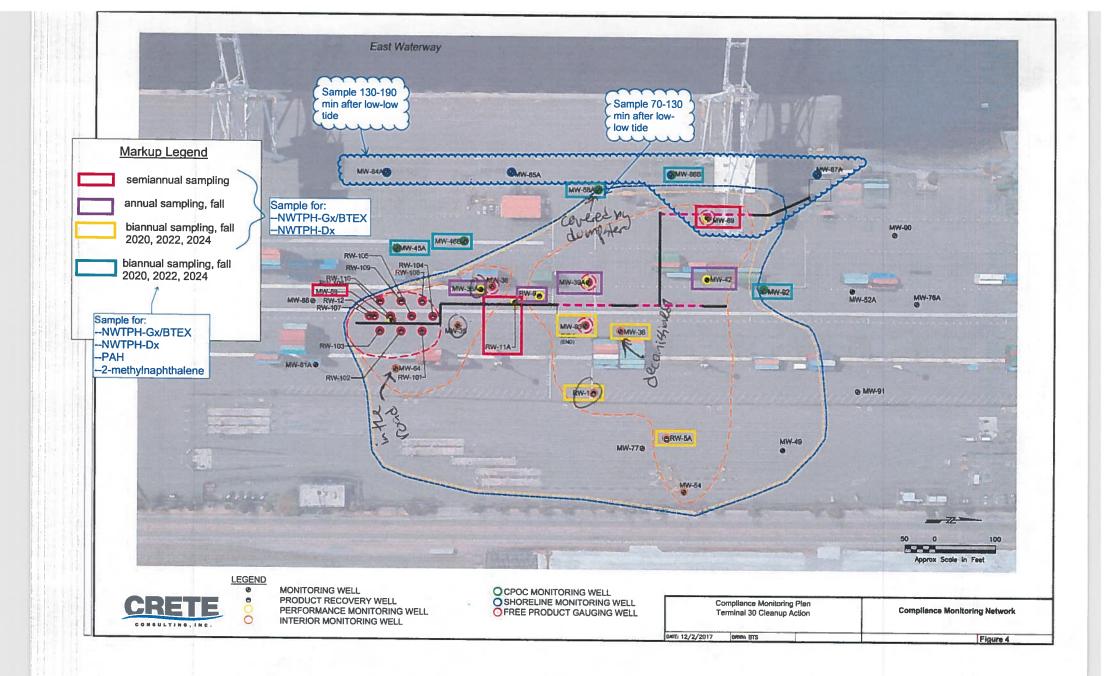
Proj	ect Information	Page / of 2
Proj	ect Name:	T-30 Location: Sentetle
Proje	ect/Task No.:	Weather: 45 cloudy
Date	:	4/14/22 Personnel: C1F, NG
Obs	ervations	
	Time	Observation Description
1	Q1645	Onlite J- Thursday no port activity
2		Onsite 2nd Thursday, no port activity Scope: LNAPL Sausing, PW-11A sampling. Will return to
3		Site tomorrow for MW-89 sampling.
4		Tailgate: ergonomics. Traffic hozards minimal
5		· Gustem Aut OFF. SVE W neter 10785.6
6		AS hr neter 5176.0
7		Lost zore on: Zone 4. Pressures 6.5-7.5
8		· Amy successfully uncovered RW-101, Flows 15-4.3
9	<u> </u>	· NG will sample GF will givinge.
10		·NG starting on 11A
11		· GF & Labeling monuments
		I ALAN MONUMENTS
12	·	-main LNAPL Group is DZIG-DZZG
13		- MW-36 both zer CZOG-C310, both The labels of outside
14		Container area.
15		- MW-341A + -93 are outside of antainer stalls, shouldn't
16		be caread.
17		MW-SG is at A257, outside container Stall.
18		* hors MU-38 been decomissioned . Comit find it but there
19		is a patch where it could have been. It is on the
20		2-year Sampling Schedule (would be sampled this Fall)
21		. We reld to Gample MW-sa tomorrow tit is not
22		ant on opron as initially thought. Need to
23		contact Amy to gue d work @ 4257 tomarray
24		@ 100 12:45
25	1510	Non collected Gamples @ NEW-11/A
Comn	nents / Site Activ	vities / Personnel Tracking

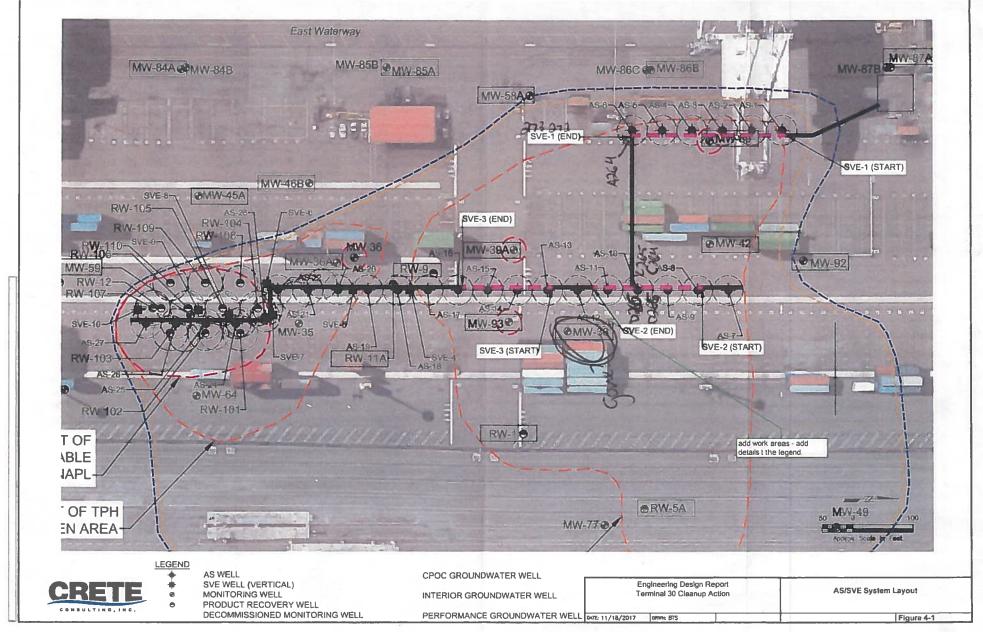
Project Name: 7-20 Location: Project Name: 7-20 Location: Project Task No.: Weather: Date: 44/14/22 Personnel: Observation Description 1 2000 * Finlighted cynucging the LNAPL well's 2 Ket Several an the 1.st where crossed of f dwing last 3 Robert two orbits where crossed of f dwing last 4 Longer predding gauging the - 25, 7241, and - 1. And 5 Row-103. 6 XH Several wills on the list are not not realized as free 7 Product gauging or product we care wills on the 8 Righter what are they included? Mth-35, -764, d RW-1. 9 Same list as above minus RW 100. 10 KH We re-read the comp of X Selemis willer. F gauging 11 Notwell of the formed to see to subte clear the 13 20 cs Returned to system to see to attempt cleaning. 14 removed for cloaning confirmed both of types can. 15 Plan to come back tomorrow to attempt cleaning. 16 X Femail Marina to ensure system does not get 17 restanded. 18 20 40 GF, NG2 of Egite 19 20 21	Project Informatio	Page 2 of 2
Date: 4/14/22 Personnet: Observations Time Observation Description 1 2000 - Finisfield gavging the LNAPL well's 2 KK Several on the 1.st where crossed of f dwing last 3 Rever a longer predding gavging. Mu - 75, -744, and - 1. And 4 Longer predding gavging. Mu - 75, -744, and - 1. And 5 Rev-103. 6 KK Several wells on the list of not indicated as free 7 product gavring or product records wells on the 8 figure while on they included? Mt - 35, -764, d RW-1. 9 Some list as above minus RW 100. 10 KK we re-cool the could a selenis willer. F gavging 11 Wether recover events is required to build cleak 12 Mi.s. 13 2000 Returned to system to see & steward bath Styles can. 14 removed for cleaning confirmed bath Styles can. 15 Plan to come back tomorrow to attempt cleaning. 16 K Email Marina to evenue system does not get 17 restored. 18 2040 GF, NG of Exite 19	Project Name:	772
Observations Time Observation Description 1 2000 "Finished any life LNAPL well's 2 4 Event & be adont side why. Covered by container ? 1/3 4 Longer reading gauging? MW-35, -264, and -1 And 5 6 XKK-Everal wills on the list at not cattle as free 7 product gauging or product recares wells on the 8 figure why call they include? My-35, -264, d RU-1, 9 Some (ist as above minus RW 100) 10 KK We re-read the comp of X Seems unclear. F gauging 11 between recover events is required buttle clear. 12 th.s 13 2005 Returned to system to see & ptaweters can be 14 removed for Upaning Confirmed both Styles can. 15 Plan to come back tomorrow to attempt clearing. 16 K Email Marina to even is stem clear stempt clearing. 18 20th GF, NG officile 19 20 21 22	Project/Task No.:	Weather:
Time Observation Description 1 2000 "Finisfed gauging the LNAFT well's 2 KK Several on the 1.st where crossed of f during last 3 Event to be order to where crossed of f during last 4 Longo yreading gauging TMW-35, -26A, and -1. And 5 Ew-102. 6 XK Several wells on the list are but no catter as free 7 product young or they include? My-35, -26A, d rw-1. 9 The figure when and they include? My-35, -26A, d rw-1. 9 Same list as above minus rew 102. 10 XK we re-read the comp of X seems willer. F gauging 11 Whether recover events is required to catter of they include the clear they are the seems will be and they are they include the they are the seems will be an the figure. They are they are they are they are the seems will be an the the figure. They are the they are they are they are the they are the they are they are the they are they	Date:	(4/1×(22 Personnel:
1 2000 Finisfiel control of the LNAPL vells 2 KK Several on the 1.5t were crossed of f dwing last 3 longer reeding gauging the LNAPL could be container? too 4 longer reeding gauging the main of container? too 5 Rev 102. 6 KK Several wills on the list at hot volicated as free 7 product coursing or product recover wells on the 8 figure when at they included? Maints -35 -364 d RW-1. 9 Same list as above minus RW 100. 10 KK we re-lead the could of the sevent veller of gauging 11 Whether recover events is required both cleak 12 this	Observations	
2 2 2 2 2 2 2 2 2 2 2 2 2 2	Time	Observation Description
3 Event & be order & side why. Covers by cantainer ? No 4 Conser preding gausing? MW-35, -364, and -1. And 5 EW-103. 6 XXXShead wills on the list are not rated as free 7 Product gausing ausing? MW-35, -364, and -1. And 8 Figure units on the list are not rated as free 7 Product gausing are first are not rated as free 8 Figure units on the list are not rated as free 9 Same list as above minus PW 103 10 XXX we re-read the courf of X seems valles. F gausing 11 Vehrein recover events is required both styles can. 12 Hh.s 13 20 as included for clone back to morrow to attempt cloning. 14 removed for clone back tomorrow to attempt cloning. 15 Plan to come back tomorrow to attempt cloning. 16 X Email Marina to evalue system daes mat get 17 restarted. 18 2040 GF, NG at Eaite 19 20 21 22	1 2000	"Finisted gauging the LNAPL well's
3 Event & be order & side why. Covers by cantainer ? No 4 Conser preding gausing? MW-35, -364, and -1. And 5 EW-103. 6 XXXShead wills on the list are not rated as free 7 Product gausing ausing? MW-35, -364, and -1. And 8 Figure units on the list are not rated as free 7 Product gausing are first are not rated as free 8 Figure units on the list are not rated as free 9 Same list as above minus PW 103 10 XXX we re-read the courf of X seems valles. F gausing 11 Vehrein recover events is required both styles can. 12 Hh.s 13 20 as included for clone back to morrow to attempt cloning. 14 removed for clone back tomorrow to attempt cloning. 15 Plan to come back tomorrow to attempt cloning. 16 X Email Marina to evalue system daes mat get 17 restarted. 18 2040 GF, NG at Eaite 19 20 21 22	2	the Several on the 1.st were crossed of f during last
4 Longer relding gauging ¹⁰ MW-35, -ZWA, and -1. And 5 RW-102. 6 XXKSelveral wills on the list are not rated as free 7 product gauging or product recared wills on the 8 figure, why are they included? MW-35, -36A, d RW-1. 9 Same (ist as above minus RW 102 10 XXK we re-read the could a K-seems valler. F gauging 11 Vetween recover events is required both cleak 12 Hh.s 13 20 as Returned to sugsten to see E attempt cleaning. 15 Plan to come back tomorrow to attempt cleaning. 16 X Email Marina to every firsten daes not get 18 2040 GF, NG of Faite	3	event the orent sure why. Covered to container? No
s QW-102. 6 XXXSeveal wills on the list are not indicated as free 7 product yawing or product vecares wills on the 8 figure inter or product vecares wills on the 9 Same (ist as above minus PW 102 10 XX we recread the CMP of X Geems valler. Figure 11 Netwein recover events is required to care for the clear of the cover events is required to care for the clear of the cover events is required to care for the clear of the cover events is required to care for the clear of the cover of the clear of the cover of the clear of the clear of the clear of the cover of the clear of the cover of the clear o	4	longer reeding gauging May-35 -264 and -1 Ans
6 XX Selved wills on the list are not indicated as free 7 product gauging or product recores wills on the 8 figure why are they included? Mis-35,-36, 4 RW-1. 9 Some list as above minus RW 102. 10 XX we re-read the CMP & X Geems vicilear of gauging 11 Wetween recover events is required bounde cleak 12 Khis 13 20 cs Returned to system to see & rotaveturs can be 14 removed for cleaning confirmed bath Styles can. 15 Plan to corre back tomorrow to attempt cleaning. 16 X Femail Marina to ensure system class with get 17 jestanted. 18 2040 GF, NG2 of Faite	5	
7 product gauging or product records wells on the 8 figure, why are they included? Min-35, -364, d RW-1. 9 Same list as above minus RW 100. 10 it is a chose minus RW 100. 11 Netwein recover events is required to sugger to bothe cleak. 12 Ih.s. 13 20 as interved to sugger to see & retained both styles can. 15 Plan to come back to morrow to attempt cleaning. 16 # Email Marina to ensure system does not get 17 festoried. 18 2040 GIF, NG of Faile	6	* Kseveral wills on the list are not indicated as free.
8 figure why are they included? Mth-35-36A, d RW-1. 9 Same (ist as above minus RW 102. 10 KK we acread the comp d & Gelems unclear of gauging. 11 Netwein recover events is required bounde cleak. 12 th.s. 13 20 as Returned to system to see & otavetors can be 14 emoved for cloaning confirmed both Styles can. 15 Plan to come back tomorrow to attempt cleaning. 16 * Email Marina to evene system does not get 17 festanted. 20 21	7	
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14 removed for abouting antimod both Styles can. 15 Plan to come back tomorrow to attempt cleaning. 16 It Email Marina to ensure system does not get 17 restarted. 18 2040 GF, NG2 of Faite 19 20 21 22	12	this this
15 Plan to come back tomorrow to attempt cleaning. 16 X Email Marina to ensure Gystem does not get 17 restanted. 18 2040 GIF, NG2 officite 19 20 21 22	13 2005	Returned to susten to see & rotaneters can be
16 X Email Marina to ensure system does not get 17 festanted. 18 2040 GF, NG2 offile 19 20 21 22	14	removed for apaning confirmed both styles can.
17 restanted. 18 20120 GF, NG2 offsite 19 20 21 22 22 22 22 22 22 22 22 22	15	Plan to come back tomorrow to attempt cleaning.
17 restanted. 18 20120 GF, NG2 offsite 19 20 21 22 22 22 22 22 22 22 22 22	16	* Email Marina to engure Sustem does not get
19 20 21 22	17	restarted.
19 20 21 22	18 2040	GF, NG offite
21 22	19	
22	20	
	21	
23 GF	22	
	23	GF
24	24	
25	25	
Comments / Site Activities / Personnel Tracking	omments / Site Acti	vities / Personnel Tracking

					First Rem	IOAGI			Post R	Remo
Location	Time of Gaging	Initial Depth to LNAPL	Initial Depth to Water	LNAPL	LNAPL	Extraction Start/End Times	Estimated Total Fluid Removal	Time of Gaging	Depth to LNAPL	De
		(Feet TOC)	(Feet TOC)	Thickness	Extraction Duration	(Approx.)	(Gallons)	~	(Feet TOC)	
				(Feet)	(Minutes)					
/W-35	1951	NA	8.64	0	~					T
/W-36	1931	NA	9,17	0						レ
/W-36A	1928	MA	973	0	-				7	1
/W-39A	1037	NA	9.40	0					/	T
/W-59	1857	NA	4,42	0	iv order in	monuma	KWIas	leen.	/	T
1W-89 ³	10ter	NA	9.92	Ø	8×.		<u> </u>			t
4W-93	1940	NA	9.60	0				7		t
W-1	1947	8,42	45,45	0.03	dense l	nyor		K T		t
W-12	1449	9.04	910	0.06		9	/			T
W-101	1835	NA	1.53	0		1.1	/			t
RW-102	1537	NA	5.21	0		14	/			t
W-103	15641	7.96	\$56	0.40			/	1 1		t
W-104	1827	NA	756	0		1				t
W-105	1459	NA	8.45	Ö		/	·		/	t
W-106	1455	804	9.18	1.12		/		1		\checkmark
W-107	Y5 46	5.36	9.16	0.40						t
W-108	1905	NA	8.47	0						F
W-109	1912	NA	5.72	Õ	/			a star	1000	t
W-110	1922	NA	5.70	Ò	/					t
-									2	t
	v	ACUUM TRUCK M	EASURED AND AP	PROXIMATED TOT	ALS ⁹ :					F
COMBINED	APPROXIMATED T	OTALS IN VACUUM	M TRUCK (INCLUDI	NG HOLDING TAN	K) ¹⁰ :			1.12		F
ter.	COMBINED AP	PROXIMATED TO	TALS A MEASURED	BY DH on 11/12/	2021		8			⊢
otes:										
Feet TOC = Fee	t below top of well	casing.						K		
LNAPL = Light /	Non-Aqueous Phase	e Liquid				re-ga	veget on	4/K dr	ring low.	tic
. Groundwater r	neasurements take	n at throughout th	e evening			DTP	: 9.74	ft bloc	U	
NL = LNAPL not	detected using int	erface probe.				011		ft bloc		
For drum vacu	umed wells, total re	emovals calculated	from drum volume	es from each well	post-recovery at ea	ich well.	: 9,25	ft 610 -		
NA - Not Availa	ble (not able to de	tect or measure)				LA	MOI The	dance:	001 Ft	-
TRACE, MINOR	, VERY TRACE - Indi	cations of LNAPL p	resent, but no accu	urate measuremer	nt or below measu	rable amount.				
8. MW-35 total depth tagged at 13.90-ft TOC.										
9. DH Vacuum Truck removal volumes only (stick measured in vac truck tank).										
			s) in the holding ta		l.					
		ental with vacuum	the second second second	-eb 17 a						

Guying April 14 Port of Seattle Terminal 30 LNAPL Removal Event (February 17, 2022)

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ΑΞϹΟΜ

Americas

Daily Tailgate Meeti	ng				S3AM-209-FM
Instructions: Conduct meeting prior to attendance of all AECOM employees an	nd subcontractors. Invite personnel	from	AECOM Superv Phone Number:		me: Aul Kiling
simultaneous operations for coordination briefly discuss required and applicable to not a full orientation. Task-specific dis	opics. This meeting is a daily refu cussions associated with Task Haz	resher, ard	AECOM SH&E F Phone Number:		me: Anàrch forynter
Assessment (THA) follow this meeting a individual task is started.	it the task location immediately before	ore	Meeting Leader	: Gu	s Friedman
Date: 4/15/22 Project	Name/Location: T30	1.9	see of the bits	Project	Number:
Today's Scope of Work:					
"Clean System Pote	mpters				
Sample norsa f	er day 2 of Spri	ng 4	impline		
Muster Point Location: F	irst Aid Kit Location:	Fire E	xtinguisher Loca	tion:	Spill Kit Location:
Front gate	(ovex	Sur	stem anclo	sure	- A
1. Required Topics			cuss if Applicab		
Fitness for Duty requirements,	all sign in / sign out				d or mark as not applicable
Required training (incl. task sp					lectrical Hazards
SH&E Plan onsite - understood		ITT	Ergonomics - Li		
(incl. scope, preplanning hazar	d assessments / risk	리미	Lock Out/ Tag C	-	
registers, controls, procedures,	requirements, etc.)				es - visual identifier and mentor/
Task Hazard Assessments (TH completed for each task immed			oversight assigr	nment	
STOP WORK Right & Response		HAF			uring Operations
changes/changed conditions re	e-assess with THA	Slip/Trip/Fall Hazards Specialized PPE Needs			
Requirement to report to super damage, near miss, unsafe act					
Emergency Response Plan – in first aid kit, fire extinguisher, cli			Waste Manager Wéather Hazard		econtamination t Stress / Cold Stress
Personal Protective Equipment hazard assessments in good co	ondition / in use by all		Subcontractor R procedures, rep		nents (e.g., JHAs. THAs, etc.)
Equipment/machinery inspecte		Work Permits / Plans required (e.g., Fall Protection Confined Space, Hot Work, Critical Lifts etc.): in place.			
Work area set up and demarca			understood (ider		
Required checklists/records av	ailable, understood (describe):		Other Topics (de	escribe/	attach):
Lessons Learned / SH&E impro	ovements (describe)		/		
	,		Client specific re	auirem	ents (describe):
				- qui o i i	
3. Daily Check Out by Site Supe	rvisor				Michigan and 2 1078
Describe incidents, near misses, ob interventions from today:		Descrit	e Lessons Learne	ed/ Impr	ovement Areas from today:
The site is being left in a sa	afe condition and work crew	checked	l out as fit unles:	s other	vise specified as above.
Site Supervisor Name	Signature			Date 4	4/195/22
Guis Ropdenan	Guffi			Time (a	it end of day / shift)
Worker Acknowledgement / Sigr Daily Tailgate Meeting (S3AM-209-F Revision 9 January 15 2019 PRINTED COPIES ARE UNCO					



È.

All employees:

STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.

Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.

Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand: * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).

* The hazards & control measures associated with each task you are about to perform.

* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).

* That no tasks or work is to be performed without a hazard assessment.

* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

* You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.

- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.

* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Out Time
		In & Fit	Out & Fit
Nate Guys Accon Guis Frildman AECOM	home 3 Am	NZI agis	
	-	In & Fit	Out & Fit
Guis Friedman AECOM	Gug	GF 0425	
	0	In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
-		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
			1

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets:

Signature		E VISITOR / SITE REPRESENTATIVE						
orginature	Departure Time	Arrival Time	Company Name	Name				
		_						

Project Information	Page of 3
Project Name:	T-30 Location: Secrette
Project/Task No .:	Weather: 45, overcast
Date:	4/15/22 Personnel: <u>GF</u> , NG
Observations	
Time	Observation Description
1 0925	"Eifonsite NG already onsite prepping materials
2	Supe: Clean Otameters
3	Sumple MW-89 (Spring Gampling Day 2)
4	1911gate Wattic huzards - part activity is live
5	· Called Amy Spunberg to confirm portwant need to
6	work around MW-sed miss after noon and she confirmed
7	> Also OK'd re-gauging MW-59 during lunch hour / low
8	tide. PK + RK vere curious if LNAPE might present now
9	even though it didn't at high tide last night.
10	· SVE-10 has a crack in the bottompiece that threads
11	into the rotameter column (king model 0-60 SCFM)
12 125	·GF + NG to gauge MW-59 again (low tide 1105)
13	3 product at 9.24 Ft bloc to product
14	water at 9.25 fd bloc
15	0.01 ft of product
16 11 45	· Frack to cleaning rotaneters
17	· Not all SVE prequire gauges are reading zero
18	SVE-4: 13 H20 7 all polaced w/ Spares
19	SVE-5: 7" HDO From Corex
20	SVE-7: 15 " M20 [
21	SVE -10 27 " H20 /7 total. Can't ugust, need replacing.
22	SVE-9: 10 " HOO (Winters brand 0-100 " HOO
23	SVE-6: 7" HOO bottom mount.
24	SVE-6: 5" H20 Still herds replacing order
25	· All AS gauges are zeroed out. more gauges.

Comments / Site Activities / Personnel Tracking

Project Information				Page a of 3
Project Name:	T-30	Location:		
Project/Task No.:		Weather:		
Date:	4/15/22	Personnel:	GE NG	

Observations

	ervations	
1	Time	Observation Description
1	1215	· PVC night at paire of GVE- & rotameter Snapped during removal
2		of upper value - fir was too fight
3	ļ	- Same thing broken an EVE-5 though unilear if break was
4		pre-existing.
5	1315	- Called Marina to see if ve can use the spore plessure gauges in the canex t order replacement nipples. No
6	ļ	gauges in the ranex & order replacement nipples. No
7		argues left message
8	1415	
9		installed the G pares we had on site. SVE-6 still
10		needs a replacement
11	- XX	. On SVE-5 and -9, the lover rotaneter rod sheath and
12		orrive bumber were missive allowing the float to drop all the
13		way to bottom. PK recommends calling King to see if
14		replacement parts are available.
15		> If we have to replace SVE-10 due to the crack in the base
16		Re could steal the speath / Stapper fromit
17	1530	· Place order for 4 her gh 80 i' close nipples with Ferguson
18		Port be ready for pickup contil Monday.
19		· SVE-7 removed for deaning and its nighte brake as well
20		If the value is in there too tight all the strain of remains
21		it tails on the nipple at the base
22		· Call PK the gives the go-alend to restart 5 stem at EOD with those 3 GVE hells closed off. Will return Monday
23		with those 3 GVE hells closed off. Will return Mandey
24		which To trouble shoot the tit
25	(000)	· Diameter of rotaneter rod - "18"

Comments / Site Activities / Personnel Tracking

Proje	ct Information	Page $\overline{\zeta}$ of $\overline{\zeta}$
Projec	t Name:	T-30 Location:
Projec	t/Task No.:	Weather:
Date:		4/15/22 Personnel: GFNG
Obser	vations	
	lime	Observation Description
		· Length of top pumper sleath: 3/4" bottom bumper sleath: 1/4"
2		bottom bumper sleath: "b"
3	1610	"Did not clean SVE -1 -2 or -3 as they were not fulled
4		· Valves reinstalled on SVE-5, -7, and -8 in the OFF
5		position.
6		. NG finisled cleaning AS votoneters Several had defarmed
7		0-rings that need replacing order a pack of spares?
8		-7 AS-12 AS-13 AS-27 at least.
9		· ~12 gal of ringewater emphild into polytenk
10	1620	Marms on HMI wait clear for restart. PAH on SVE blower
11		also VAL.
12		· Call PK. CB, no one is sure. will leave system off until
13		return to site Monday to finish repairs.
14	1035	·Clean p, lock op
15	1045	GENG OFFICE
16		
17		
18		
19		
20		
21		
22		
23		
24	-)GF
25		

Comments / Site Activities / Personnel Tracking

SAMPLE CHAIN OF CUSTODY

				- UTATILITY		00.	JIC		•									
Report To Paul Kalina			SAMPL	SAMPLERS (signature) PROJECT NAME PO #									Page # of					
Company AECOM Address 1111 3rd Ave, Suite 1600			- T-	PROJECT NAME $T-30$				PO#						0	TURNAROUND TIME Standard turnaround RUSH Rush charges authorized by:			
City, State, ZIP Scattle, WA 98101			REMAR	REMARKS			INVOICE TO						_	SAMPLE DISPOSAL				
Phone 206-438-270 mail Paul Kalina @ Accon. Ca				Project specific RLs? - Yes / No										0	 Archive samples Other Default: Dispose after 30 days 			
						- ANALYSES REQUES					EQU	ESTE	STED					
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 6021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					Notes	
RW-11A-0422		4/14/22	1810	Gw	Ц	$\boldsymbol{\times}$		×									with & without # Silles gel Clanup on DX	
RW-11A-0422-MS		4/14/22	1810	Gw	4	×	×	×										
RW-11A-0422-ms0		4/14/22	1810	GW	Ч	×	\times	\times					4	-				
MW-100-0422		4/15/22	1230	Gw,	Ц	×	$\boldsymbol{\times}$	×										
MW-89-0422		4/15/22	1330	Gw	4	×	×	×										
			_															
	A	- 0472	Â ⁱ c	12									T					
	· Les		May-	11-24	3.7				a la	14	an		4					
					1171						_			_		_		

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Friedman & Bruya, Inc. Ph. (206) 285-8282	Relinquished by: Gran	Gus Friedman	AECOM	4/15/22	1710
	Received by:	Yelena Araukine	FIFB	1/15/22	1710
1	Relinquished by: Received by:				
	Received by:				

DAILY FIELD LOG

Project Information	Page of
Project Name:	7-20 Location: Seattle
Project/Task No.:	Weather: 70 Sonny & Smoly
Date:	10/13/22 Personnel: GIFACER
Observations	
Time	Observation Description
1 1630	GF& ER arrive onsit. AC already Love from System
2	Ot M earlier in the day.
3	-95 stem Shut down ~ 1550. Only SVE had been on AS
4	·Scape: Oct LNAPL gauging down for 71 week
5	act aw sompling
6	"Safety tailgate. Terming has stop-work active so
7	traffin hozards are minimal. Exposure hursards to
8	LNAPL Egonomic hazarts during scompling
9	· AQ + FRE Distribute Supples + equipment at go over
10	the gauging of sampling plan
11 1730	· ACTER LNAPL Game
12 1730	·GF started Sampling at MW-93
13	-7 MW-93-1072 Sampled at 1900
14 620	· ER start & sanding at MW-36 A
15	-> MW-36A-1072 Sampled at 1920
16 1845	· AC standed bampling at RW-11A. RW-114-1022 & Dop1-1022
17 1950	
18	W MW-42 Neiner marked MW-42 had old tubing
19	in the sell.
20	>mw-92-1022 Sampled at 2045
21 2000	ER stand sampling at MW-46B. Had to remove old CRETE - SMW-46B-1022 complet at 2100 tubing.
22	-5 March 6B-1022 complet at 2100 tubing.
23 2 0 20	AL started sampling at RW-9
24	> 2w-9-1022 Sundled at 2/17
25 2 05	GF started sampling at MW-42

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Proje	ct Name:	7-30	Location:	
2	ct/Task No.:		Weather:	
Jate:		10/13/22	Personnel:	GFAC, ER
Obse	rvations			
	Time		Observation Descrip	otion
1		>DT3 measured	after Sampli	ng: 19.1 ft bgs
2		> mw-42-1022	Sampled at	2203
3	2125	ER storted Sompling		
4		- MW-45A-1022 4		2200 ~1 MS/MSD
5	2245	GF located & star	ted settine a	12 on RW-5A in mide
6		of entry road	5	0
7		-> PW-51-1072 "	sempled ait	2200 00 2340
8		> nonument was	filled of	~ 3 incles of find dir
9			·	scooped out as much
10		as potride, +		
11	2250	ER offsite for the		
12	2305	Ac offsite for the	night	
 13	~2145	AC Started Sandi		39A
14		> MW-39A-1002 5	ompled at 2	229
15	2400	GF finished at Ro	w-5A. If n	els a new 4-in
16		J-dug. The tubidi	the sanger o	n the KSI also may
17		have gove paymin	L'at pe e	nd impire betalen
18		~60 to 200 pe	n back to	100 in the span of
19		20 Se condy or so	, after sta	bilizing around 200.
20		All other purame		table so I sampled it
21	0015	System restarted.	Mad to clea	ar a foult on the AS
22		VED & MA. Dress	"start" on	the VFD itself to
23		turn the AS such	em buck	an. Fault code was
24		F0009.		1
25	0020	GF Offsite. Sis	Em sate of	conex nere all locked.
om	nents / Site Acti	vities / Personnel Tracking	0	

C M/sers/gus friedman/Documents Field Forms - GENERAL Field Forms - GF xls(Daily Field Log) 3/22/2021

)GF

Port of Seattle Terminal 30 LNAPL Gauging Event											
-		Jit of Seat			INAT L'OBUGING LVEIR						
Field Teo	chnician(s): 2. AC			Client:	Port of Seattle						
Date: 10	0/13/20	22		Location:	Terminal 30, Seattle						
groject Nu	umber:	60681370		Weather: (ols, sunny, smalle.						
Closest Hi	gh Tide:	1404		Closest Low	1 Tide: 1911						
Location	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Comments						
MW-35	1719	9.42	9.44	0.02	strong oder						
MW-36	1758	ND	9.48	-	strong odor						
MW-59	1737	8 -ND	9.40								
RW-1	1812	9.13	9.19	90.0	Very Strong Odor						
RW-12	1752	9.71	10.00	0.29	strong odor						
RW-103	1745	ND	9.23	٢	no hel on well is						
RW-104	1727	JID	9.15	-							
RW-106	1740	9.27	9.28	0.01	tracelwiner LNAPL						
RW-107	1747	9.55	9.96	0.4)	ns hid						
RW-110	1807	ND	9.89	-	moderate a do 2						

62 L

Notes:

1. Feet BTOC = Feet below top of well casing.

2. LNAPL = Light Non-Aqueous Phase Liquid

3. ND = LNAPL not detected using interface probe.

4. NA - Not Available (not able to detect or measure)

5. TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.

6. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. This pertained to MW-36A, -39A, -89, -93, and RW-101, -102, -105, -108, and -109.

Port of Seattle Terminal 30 Biannual Interior Well Gauging Event											
	hnician(s): $AC_{j}ER_{j}$, GF		Client:	Port of Seattle						
Date:	16-13-	2022		Location:	Terminal 30, Seattle						
Project Nu	umber:	60681370		Weather:							
Closest Hi	gh Tide:			Closest Low	v Tide:						
Location	Time of Gauging	Depth to LNAPL (Feet BTOC)	Depth to Water (Feet BTOC)	LNAPL Thickness (Feet)	Comments						
MW-35 ¹	1.1	1			Gauging information can be found in the LNAPL gauging field form						
MW-36 ¹	.1	1			Gauging information can be found in the LNAPL gauging field form						
MW-54	1819	_	8.69	0	Good condition; some dirt built Up in moniment						
MW-64	1733		9,18	0	Monument worked but shill functional. Strong oder but						
Abbreviation	15:				no product detected						

BTOC = below top of well casing

LNAPL = Light Non-Aqueous Phase Liquid

NA - Not Available (not able to detect or measure)

ND = LNAPL not detected using interface probe.

TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.

Notes:

1. Well is in the LNAPL gauging protocol due to LNAPL measured >0.01 ft within the last year.

Well ID:

Project Name:

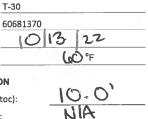
Project Number:

Date: Weather:

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:

PURGING INFORMATION Start Purge Time: 1849



10.9

2

PVC

Sample ID: Well Condition: Sampled by:

MW-36A MW-36A- 022 [Well ID-MMYY] to ER

Purge/Sample Method: Purge/Sample Equipment: Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft): Sampling Tube Material:

Low-Flow Peristaltic Pump 20.5 5-20

LPDE Pire equipment IDS Probe: 7481

VSI: 46376

-			-			(-)		v		
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (~C)	Conductivity (# j \$/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
1850	N200	10.0	Ø	19.8	1984	317	684	-87.8	270	turbidity all over the pla
858	200	11.1	N0.5	19.9	1966	1.14	6.95	-117.8	2.10)r M
1856	NISO	11.08	NB.75	19.8	1954	0.76	6.99	-1265	125	
1859	N150	11.05	N	19.7	P47	0.48	7.00	-1313	132	
1902	NISO	11.05	NIOS	19.6	1931	0.31	7.01	-135	97	
1905	~150	11.05	NKE	19.6	1920	0.25	7.01	-137	85	
1908	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	11.7	~13	19.5	1911	0.72	7.01	-1382	80	
1911	NEGO	11.7	~1S	195	1905	0.20	7.00	-138.9	79	
1914	NISO	11.7	N1.S	19,4	1902	0.19	6.99	139	73	

SAMPLING INFORMATION

Sample ID(s)	Sample D(s) time(s) Analysis		Method	Container	No. of bottles	Preservative
MW-36A-1022	.010	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
	192		NWTPH-Dx	500 mL Amber	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

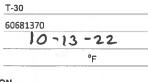
Field parameter meter calibration results are recorded in the field book.

Project Name: Project Number:

Date:

Weather:

PRE-PURGE INFORMATION Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:



9.23 2 PVC

Well ID:	MW-39A
Sample ID:	MW-39A-
Well Condition:	G
Sampled by:	F

39A- 1022 [Well ID-MMYY] (5000 AC

Purge/Sample Method: Purge/Sample Equipment: Total Well Depth* (ft bgs): Screened Interval* (ft bgs):

Low-Flow Peristaltic Pump 20.5 5-20

Tubing Inlet Depth* (ft): Sampling Tube Material:

15 Ff LPDE Pire (Interface Probe ID: 40206 VSI ID: 51292

PURGING INFORMATION

2151 Start Purge Time:

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
2154	250	9.27		21.1	1.574	1.20	7.05	-128.2	15.82	
2159	150	9.25		21,2	1,558	0.38	7.04	-135.5	11.33	
2204	150	9.25		21.0	1.526	0.22	7.01	-139.(10,24	
2209	150	9.25		20.9	1.493	0.15	6.99	-141.1	9.99	
2214	150	9,25		20,9	1.461	0.13	6.96	-141.5	9.44	
2217	150	9.25		20.9	1.452	0.11	6.95	-141.7	9,39	
2220	150	9.25		20.9	1.440	0.11	6.93	-141.6	9.26	
2223	150	9.25		20.8	1.433	0.11	6.93	-141.7	9.22	
2226	150	9.25	V	20.8	1.426	0.10	6.92	-141.8	9.46	
			2							

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
MU2-39A-1022	2229	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
		Dx	NWTPH-Dx	500 mL Amber	1	=

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit

Redox Potential: +/- 10%

Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

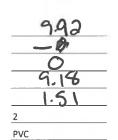
Project Name: Project Number: Date:

Weather:

T-30 60681370 10/13 (D2 600 °F Smole

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:



 Well ID:
 MW-42

 Sample ID:
 MW-42- 10

 Well Condition:
 6-004

 Sampled by:
 GF

MW-42-1032 [Well ID-MMYY]

13.5

LPDE

335

90

Purge/Sample Method: Purge/Sample Equipment: Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Low-Flow
Peristaltic Pump

Assumed ~20 ft bgs. Unknown. Assumed to match other wells on site, ~5-20 ft bgs. DT3 = [9.] ft bc

Tubing Inlet Depth* (ft): Sampling Tube Material:

Pire Equipment

1:039

PURGING INFORMATION

Start Purge Time: 2125

							and the second se		
Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (˘C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
	10.78		19.2	1498	0.44	6.75	-96.8	2.8	
	10.80		19.2	1500	0.34	6.74	-103.3	9.2	
			19.2	1500	0.28	6.73	-108,1	27.0	
			p.1		0.25	6.73	-111.9	420	
	–		19.1		0.24	6.73		47.2	
	10,84		19.1	1497	0.23	6.73	-114.4		
	10.85	n.	19.1	1496	0.23	6.73	-115.58	51.9	
		4	inde	ć					
			5						
			ETE						
	Rate	Rate (mL/min) Water (ft) (0.7% 10.% 10.% 10.% 10.% 10.% 10.%	Rate (mL/min) Water (ft) Purged (gal) (0.7% (0.80) (0.80) (0.81) (0.81) (0.83) (0.85) (0.85) (0.864) (0.864) (0.864) (0.865)	Rate (mL/min) Water (ft) Purged (gal) Temp (°C) (0.76% 19.2 10.80 19.2 10.80 19.2 10.80 19.2 10.81 19.2 10.83 19.1 10.84 19.1 10.85 19.1 10.864 19.1 10.855 19.1	Rate (mL/min) Water (ft) Purged (gal) Temp (°C) Conductivity (mS/m) 10.756 19.2 14.956 10.800 19.2 15000 10.81 19.2 15000 10.82 19.2 15000 10.83 19.1 14.956 10.953 19.1 14.956 10.864 19.1 14.956	Purge Rate (mL/min) Depth to Water (ft) Volume Purged (gal) Temp (°C) Conductivity (mS/m) Dissolved Oxygen (mg/L) 10.758 19.2 14958 0.44 10.80 19.2 1500 0.34 10.80 19.2 1500 0.25 10.81 19.2 1500 0.25 10.833 19.1 1495 0.35 10.84 19.1 1495 0.25 10.854 19.1 1497 0.23 10.855 19.1 1497 0.23	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
MW-42-1022	2207	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
	2203		NWTPH-Dx	500 mL Amber	1	

STABILIZATION RANGES Dissolved Oxygen: +/- 10% COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

purgewater has an odor. No shell, no color.

Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10%

Conductivity: +/- 10%

Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

Project Name: T-30		T-30				Well ID: MW-45A			+ MS/MSD	
Project Num	ber:	60681370				Sample ID:	MW-45A- (0	122	_ [Well ID-MM	YY]
Date:		1012	122			Well Condition:	mudo	ly		
Weather:			60 °F	:		Sampled by:	FI	R		
PRE-PURGE		ON								
	to Water* (ft l		:D.1	5		Purge/Sample Me	thod:	Low-Flow		
	duct* (ft btoc)		10-	-	-	Purge/Sample Equ		Peristaltic P		
Product Thic				-	-	Total Well Depth*		20.1	ump	
Water Colum	. ,		9.0	19	-	Screened Interval		5.1-20.1		
	ne in Well (gal)			<u> </u>	-	Tubing Inlet Depth		5.1-20.1		
	Diameter (Incl		2		-	Sampling Tube Ma		LPDE		
Inner Casing			PVC		_		imont	JOS		
PURGING IN	FORMATION					Probe: -	7481			
Start Purge T	ime: 21	25				YSI: 1	16376			
	Purge	Depth to	Volume			Dissolved	T	[ĪĪ	
Time	Rate (mL/min)	Water (ft)	Purged (gal)	Temp (°C)	Conductivity (r6/m)	Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
2127	NISO	10.40		17.7	866	0.60	6.70	-47.6	15.27	-
2137	N190	0104	0.9	17.8	859	0.29	6.67	-726	9.81	с.
2147	N156	10.48	1.0	17.7	866	0.22	670	-86.1	757	
2150	N150	10.48	1.25	177	871	0.20	10.71	-897	1.55	
253	NISD	10.51	15	177	875	0 19	673	-931	4.87	
14.	NISO	10.51	1.25	h (871	219	1 72	-951	6,45	
-6.20-	~150	19.2	1.15	1. 1. 10	014	-0.1	6.7		3,43	
							ļ			
SAMPLING I	NFORMATIO	N				14 C				for MS/MGD
1		Sample							No. of	/
	le ID(s)	time(s)		OC BTEX		Aethod	Cont		bottles	the second se
MW-45	A-1022	2200		Dx		PH-G/BTEX VTPH-Dx	40 mL		9=3+6	HCL
		000		s & 2-		SVOCs	1 L Ar			
			methylna	phthalene	. ·		ILA	Indiel	3=1+2	_
STABILIZATI	ION RANGES		COMMENT	S & OBSER	RVATIONS: (s	low recharge, turi	oidity, odor, sh	ieen, PID rea	idings)	
Dissolved Oxy	-							14		
Conductivity:										
Temperature: +/- 10 % pH: +/- 0.1 unit										
	Redox Potential: +/- 10%									
Turbidity: +/-	Turbidity: +/- 10%									
	* = Measured from top of inner casing DTW - Depth to Water						2" caring, 1 &	-0164	0.621	
Initial purge 1	5 minutes, the						2" casing: 1 ft 4" casing: 1 ft			
	Measured with						1 gal = 3785.4			
Field paramet	er meter calib	ration results	are record	ed in the fiel	d book.					

ł

spl. 10 = same for all MS (MSD)

2.20 1913

Project Nam	e:	T-30				Well ID:	MW-46B			
- Project Num		60681370				Sample ID:	MW-468- [022	- [Well ID-MN	IYY]
Date:		10/13	122			Well Condition:	good	-		
Weather:			360°F		-	Sampled by:	ER	,	-	
PRE-PURGE		ON		_						
Initial Depth	to Water* (ft b	toc):	<u>9.7</u>	7		Purge/Sample Me	thod:	Low-Flow		
Depth to Pro	duct* (ft btoc)	:	N.	A		Purge/Sample Equ	upment	Peristaltic P	ump	
Product Thic	kness (ft):		1	AL		Total Well Depth*	(ft bgs):	20.3		
Water Colum	nn (ft):		_10.	53		Screened Interval	*'(ft bgs):	5.3-20.3		
Water Volum	ne in Well (gal)		2		· · · · ·	Tubing Inlet Depth				
-	Diameter (Inch	1):	2			Sampling Tube Ma	aterial:	LPDE		+ 7.
Inner Casing	Material:		PVC	-	19.1	20.30	1	ine el	rome	n. 203
PURGING IN	FORMATION	2.0			-	-977	- 6	robe	: 748	
Start Purge T	ime: 20	20		- 12	A	10.5	3 1	151	: 463	76
	Purge Rate	Depth to Water	Volume Purged	Temp	Conductivity	Dissolved Oxygen	рН	ORP	Turbidity	
Time	(mL/min)	(ft)	(gal)	(°C)	(MS/m)	(mg/L)	(SI Units)	mV	(NTU)	Comments
2025	~150	10.47	0	176	1088	2.52	6.80	-26.9	13.75	
2028	NED	10.45	0.25	17.8	1092	2.32	6,74	-33.4	12.5	
2031	NGO	10.45	0.5	180	1092	2.18	6.71	-41.7	11.58	
203A	NIGO	10.145	0.10	17.8	1091	1.84	6.70	-46.9	7.85	
2037	NISO	10.48	0.75	17.8	1089	1.70	6.69	-50.6	7.02	
2040	NED	10:19	0.85	17.8	1085	1.59	6.69	-53.9	6.38	
2043	~150	10.52	1.0	17.8	1081	1.46	6.69	-560	6.20	
2046	NIGO	10.55	1.15	17.8	1077	129	6.70	-98.2	6.36	10 m
2049	N150	10.58	1.30	17.8	1077	1.18	6.70	-600	6.45	
2052	N150	10.61	1.45	IFF	1078	1.08	6.70	-619	6.30	26
2055	N150	10.64	1.60	17.7	1080	1.01	6.71	-63.5	6.45	1
SAMPLING	INFORMATIO	N		1.0		1. A.		20.00		÷
		Sample			1000				No. of	
	le ID(s)	time(s)	Gx/	OC BTEX		1ethod PH-G/BTEX	Cont 40 ml	ainer L VOA	bottles 3	Preservative HCL
Mw-46	3-1022	0	- (Эх		/TPH-Dx		Amber	1	· · · ·
		100		s & 2- phthalene	9	VOCs	1 L Ar	mbler	1	
STABILIZAT	ION RANGES		COMMENT	S & OBSER	VATIONS: (s	low recharge, tur	bidity, odor, s	heen, PID rea	adings)	
	ygen: +/- 10%					1 100 3				
Conductivity: Temperature		~								
pH: +/- 0.1 ur				-						

USEFUL INFORMATION

Redox Potential: +/- 10% Turbidity: +/- 10%

* = Measured from top of inner casing DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

Project Name:	T-30	Well ID:	MW-59		
Project Number:	60681370	Sample ID:	MW-59-	[Well ID-N	1MYY]
Date:		Well Condition:			
Weather:	۴	Sampled by:			
PRE-PURGE INFORMATI	ON				
Initial Depth to Water* (ft	btoc):	Purge/Sample Me	thod:	Low-Flow	
Depth to Product* (ft btoc):	Purge/Sample Eq	uipment:	Peristaltic Pump	
Product Thickness (ft):		Total Well Depth	(ft bgs):	Assumed ~20 ft bgs.	
Water Column (ft):		Screened Interval	* (ft bgs):		match other wells on site
Water Volume in Well (gal)	:			~5-20 ft bgs.	
Inner Casing Diameter (Inc	h): <u>2</u>	Tubing Inlet Dept	h* (ft):		
Inner Casing Material:	PVC	Sampling Tube M	aterial:	LPDE	
Product Thickness (ft): Water Column (ft): Water Volume in Well (gal) Inner Casing Diameter (Inc	: h): <u>2</u>	Total Well Depth Screened Interval Tubing Inlet Dept	* (ft bgs): * (ft bgs): h* (ft):	Assumed ~20 ft bgs. Unknown. Assumed to ~5-20 ft bgs.	match other wells o

PURGING INFORMATION

Start Purge Time: ____

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
										_
			Well n	ot sampled;	: LNAPL present v	within the last yea	ar (9/8/22 most	recently)		
2										
-				~						_

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
		Dx	NWTPH-Dx	500 mL Amber	1	-

STABILIZATION RANGES	COMMENTS & OBSERVATIONS: (slow recharge	a, turbidity, odor, sheen, PID readings)
Dissolved Oxygen: +/- 10%		
Conductivity: +/- 10%		
Temperature: +/- 10 %		
pH: +/- 0.1 unit		
Redox Potential: +/- 10%		
Turbidity: +/- 10%		
USEFUL INFORMATION		
* = Measured from top of inner casing		
DTW - Depth to Water		2" casing: 1 ft = 0.164 gal = 0.62 L
Initial purge 15 minutes, then measure a	t 3 minute intervals	4" casing: 1 ft = 0.656 gal = 2.48 L
Water Levels Measured with an Electron	ic Water Level Meter	1 gal = 3785.4 mL
Field parameter meter calibration results	s are recorded in the field book.	

Project Name:

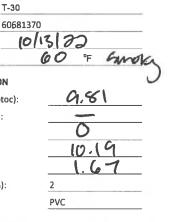
Project Number:

Date:

Weather:

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:



Well ID: MW-92 Sample ID: MW-92-Well Condition: Sampled by:

[Well ID-MMYY] Ø 7000 G

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft): Sampling Tube Material: Pice Equipment VGT: 038335

Probe: 32690

Low-Flow Peristaltic Pump 20 5-20 12.5 LPDE

PURGING INFORMATION Start Purge Time: 2000

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (ans/m) f	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
2010	250	9.90		16,2	951	0.48	668	-139.3	1.9	the odor
2015	81	9.93		18.0	945	0.36	6.65	-137.2	38.1	maybe a
2070	ti -	9.93		17.9	943	0.32		-136.1	47.3	slight
2025	6.5	11		17.9	G41	0.29	6.61	134.6	85.8	suen.
20246	1	1		17.9	939	0.25	6.61	-134.1	\$5.3	
2031		N		17.9	9346	0.24	6.61	-133.8	137.0	
2034		10		17.8	936	0.23	6.60	-133.3	219.5	
2037		u		17.8	935	0.22	6.60	-133.1	235.2	9002
2041	V	15		17.8	933	0.20	6.00	-132,6	253.1	1000
-		AM	LED-							
										*

SAMPLING INFORMATION

Sample				No. of	
time(s)	COC	Method	Container	bottles	Preservative
	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
anus	Dx	NWTPH-Dx	500 mL Amber	1	
2010	PAHs & 2- methylnaphthalene	SVOCs	1 L Ambler	1	
3					- 1074
	Slight ador regulation fro	at times. Sligh	it sheen, but	Could	nore beer
	time(s)	time(s) COC Gx/BTEX Dx PAHs & 2- methylnaphthalene COMMENTS & OBSERV/	time(s) COC Method Gx/BTEX NWTPH-G/BTEX Dx NWTPH-Dx PAHs & 2- methylnaphthalene SVOCs COMMENTS & OBSERVATIONS: (slow recharge, turk	time(s) COC Method Container Gx/BTEX NWTPH-G/BTEX 40 mL VOA Dx NWTPH-Dx 500 mL Amber PAHs & 2- methylnaphthalene SVOCs 1 L Ambler COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID read 10 methylow	time(s) COC Method Container bottles Gx/BTEX NWTPH-G/BTEX 40 mL VOA 3 DX NWTPH-Dx 500 mL Amber 1 PAHs & 2- methylnaphthalene SVOCs 1 L Ambler 1 COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings) Slight ad or at times. 6(sht Speen but could

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

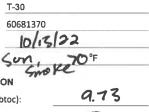
Project Name: Project Number: Date: Weather:

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:

PURGING INFORMATION

Start Purge Time:



2

805

PVC

Well ID: I Sample ID: I Well Condition:

Sampled by:

MW-93 MW-93- 1022 [Well ID-MMYY] Good CIP

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft): Sampling Tube Material: Low-Flow Peristaltic Pump 20.5 5-20 12.5 ft bg S LPDE

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI-Units)	ORP mV	Turbidity (NTU)	Comments
1815	200	9.50		21.2	1277	205	6.52	-107.9	58.6	
1820	w	9.85		20.6	1267	1.63	6.49	-97.7	95.0	
1825	н	9.43		205	1259	1.52	6.48	-93.5	87.4	
1830	N/	9-501		20.6	1244	1.31	6.47	-85.5	59.1	
1835	1.	9.80		2026	1231	1.15	6.46	-82.1	85.0	
1840	6	9.77		205	1223	1.03	6.45	-79.8	75.1	
1845	**	9.76		20.5	1214	0.94	6.45	-76.9	90.9	
1848	61	9.75		20,5	1209	0.90	6.45	-75.7	100.3	-
1658	~1	9.75		20.5	1204	0.75	6.44	-73.4	104.1	
1856		9.74		20.5	1201	0.73	6.44	-72.5	108.2	
1859	5	9.74		20.5	1198	0.68	6.44	-71-6	103.8	Lood

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
10-93-622	1900	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
	1100	Dx	NWTPH-Dx	500 mL Amber	1	-

No noniceable odor, color, or steen.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L

Project Name: T-30	Well ID:	RW-1	
Project Number: 60681370	Sample ID:	RW-1-	[Well ID-MMYY]
Date:	Well Conditio	n:	
Weather:	°F Sampled by:		
PRE-PURGE INFORMATION			
Initial Depth to Water* (ft btoc):	Purge/Sample	Method:	Low-Flow
Depth to Product* (ft btoc) :	Purge/Sample	e Equipment	Peristaltic Pump
Product Thickness (ft):	Total Well De	pth* (ft bgs):	Assumed ~20 ft bgs.
Water Column (ft):	Screened Inte	rval* (ft bgs):	Unknown. Assumed to match othe
Water Volume in Well (gal):			wells on site, ~5-20 ft bgs.
Inner Casing Diameter (Inch): Unkno	wn Tubing Inlet D	epth* (ft):	
Inner Casing Material: PVC	Sampling Tub	e Material:	LPDE

PURGING INFORMATION

Start Purge Time:

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
rime		(11)	(gai)	(0)	(ms/m)	(mB\r)	(SI UNICS)	mv	(NTO)	Comments
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			Well not s	ampled: I N	JAPI precent withi	in the last year (9	/8/22 most rece	nthy)	_	
			Well not sa	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)	-	
			Well not s	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)	_	
			Well not sa	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)	-	
			Well not sa	ampled; LN	IAPL present withi	in the last year (9,	/8/22 most rece	ntly)	-	
			Well not sa	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)	-	
			Well not s	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)	-	
			Well not s	ampled; LN	IAPL present withi	in the last year (9	/8/22 most rece	ntly)		

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
		Dx	NWTPH-Dx	500 mL Amber	1	-

STABILIZATION RANGES COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings) Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% USEFUL INFORMATION * = Measured from top of inner casing 2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL DTW - Depth to Water Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

Well ID:

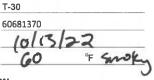
Sampled by:

Project Name: Project Number: Date:

Weather:

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:



8.83 0 ~ 10.27 1086.74 4 PVC



G

Sample ID: Well Condition:

RW-5A- 1022 [Well ID-MMYY] Well ID-MMYYJ full of dirt. Needs a new J-plug (4-in) Well squit

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft): Sampling Tube Material:

YSA : 038235 0H1 probe: 32690

Peristaltic Pump 20 5-20 12.5 ft LPDE

Low-Flow

PURGING INFORMATION 2255 Start Purge Time:

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (˘C)	Conductivity	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
0305	-	& .87		17.3	917	0.39	6.81	-129.8	17.8	
2310		-8 .88	*	17.2	914	0.3	6.79	-131.7	35.4	
2315		N.		17.0	907	6.27	6.80	-137.3	527	
2320		11		16.8	900	0.24	6.80	-135.2	73.7	
2323		"		16.7	845	0.23	6.80	-136.1	83.0	
2326	د	h		16.4	884	0.21	6.80.	-177.4	106.8	
2329		- 14		16.6	881	6.20	6.50	-135.1	294	
2332		h		16.6	8-19	0.20	6.80	-1384	3002	Garl
2335		н		16.6	878	0.70	6.80	-138.6	320.5	10-2
		- 6			~	/			6750	e connents likely rea
			PAN	1.00					Torb	itity likely rea

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
Rw-544022	2240	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
15 X	1740	Dx	NWTPH-Dx	500 mL Amber	1	-

STABILIZATION RANGES Dissolved Oxygen: +/- 10%

Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% USEFUL INFORMATION * = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings) 0.55 ft Bron ground Scrface to TUC. DTN initially ~9.73 ft bys. ~2.75 ft water initially above fulling inlet. Twoidity sencer anight be off-droppled from 320 down to 50 right before sampling.

Pglof 1

LOW-FLOW GROUND WATER SAMPLING FORM (CONTD)

Project Name:

T-30 60681370

RW-9 Well ID: Sample ID: RW-9-1022

PURGING IN	FORMATION			Purge:	20'39		nitral [JTW: Y	. 30	
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
2042	250	9.35		22.5	1.063	0,88	6.97	-98.7	14.03	
2047	200	9.35		23,1	1.068	0.74	6.96	-113.5	1,55	
2052	200	9.31		23.1	1.068	0.43	6.95	-118.2	1,08	
2057	200	9.31		23.0	1,070	0.2]	6,95	-122.9	1.56	
2102	200	9.3)		23.0	1.070	0,18	6.95	-124.)	0.59	
105	200	9.32		22.9	1.070	0.17	6.95	-125.0	0.34	
2108	200	9.31		23,1	1.071	0.14	6.94	-126.9	0119	
2111	200	9.31		23.0	1.071	0.14	6.94	-127,0	0.84	
2114	200	9.33	\checkmark	23.1	1.072	0.13	6.94	-127,5	0.86	
			2.0				,			
					-					
						-				

STABILIZATION RANGES Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% USEFUL INFORMATION

* = Measured from top of inner casing DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings) Sample ID: Rw-9-1022 (1, B112×

Sample time: 2117

Dx

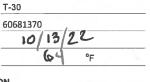
Pire Equipment Tuterface Probe ID: 40206 YSI ID : 51292

Project Name: Project Number: Date:

Weather:

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc) Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:



9465

4 PVC



+ Dup 1 **RW-11A** [Well ID-MMYY] RW-11A- 1022 6000 V

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft): Sampling Tube Material:

Low-Flow Peristaltic Pump 20 5-20 15 Ft LPDE

Interface Probe ID: 40206) Pine 451 ID: 51292

PURGING INFORMATION 1909 Start Purge Time:

Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (Sl Units)	ORP mV	Turbidity (NTU)	Comments
1911	300	9.78		21.3	1,388	0.99	6,97	19.4	3.81	
1916	200	9.87	<i>#</i>	21,4	1.383	0.46	6.96	-5.2	4,56	
1921	150	9.89	~	21,3	1.382	0.36	6.96	-14.2	4,23	
1926	150	9.89		21.4	1.384	0.28	6.95	-23,7	4.99	
1931	150	9.90	~	21.3	1.387	0.26	6.94	-26.9	4.34	
1934	150	9,90		21.3	1.387	0.25	6.94	-72.4	3.08	
1937	150	9.91		21.3	1,388	0.23	6.93	-28,1	3.10	
1940	150	9.90	J	21.2	1.390	0.22	6.92	-29.4	3.45	
			1.25							
-	L							<u> </u>		6 Dup

SAMPLING INFORMATION	N						, ter vap
Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles		Preservative
RW-11A-1022	1642	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	ζ	HCL
Dup1-1022	2000	Dx	NWTPH-Dx	500 mL Amber	1	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings) STABILIZATION RANGES Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% **USEFUL INFORMATION** * = Measured from top of inner casing DTW - Depth to Water Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

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Report To Paul Valina			SAMPL	ERS (sign	ature)	-								٦.		Page #	#	_of	<u> </u>
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Phone_ <u>206-510-50°1_</u> Email_	gus fr.ed	mandaela	Project	Project specific RLs? - Yes / No											Oth Defai	ilt: [ispose af	ter 30 da	uys
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	T I TD	Date	Time	Sample	# of	NWTPH-D _x	NWTPH-Gx	A 8(IWTPH-HCID	A 82	A 82	A 80							
Sample ID	Lab ID	Sampled	Sampled	Туре	Jars	[dT]	IT'PI	EP	'PH.	EP	EP	EP.	EPA				1	Notes	
						M	NN	BTEX EPA 8021	LWV	OCs EPA 8260	AHs EPA 8270	PCBs EPA 8082	X		5	Analy	ze Dx both	with and	\sim
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MW-36A-10221-	0.22	10/13/22	1920	Sω	h T	×	×						×		PAHS ch D-Wethy Workh			Satha	Kyre
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MV-42-1022 Value	Gerico	10/13/22	2203	gwoo	4	×	×						Y	1			0.1)	
12W-9-1022 edin.	Caero	10/13/22	2117	gw	4	×	×						×				1		
MW-93-1022		10/13/22	1900	gw	4	×	×						×				1		-
1212-5A-1022		10/13/22	2340	Śω	4	×	×						×				l		-
MW-45A-1022		10/13/22	2200	gw	15	×	×				\times		>				RANGE	and MS	MGD
MW-4613-1022		10/13/22	2100	900	5	×	×				7		×				ALL C		
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and the second s	Sample ID		Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars		NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	NCA FILL X LI			Nc	otes	
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	Friedman & Bruya, Inc.	Relin	quished by:	An	-	Gus							A	2(0)			-	10/14/22	1240	
	Ph. (206) 285-8282	Recei	ved by:	De la							_		/				_	1919170		-
	Relinquished by:				+INHPHAN FZB				B 10/14/22/12:40											
	Received by:																			
													_		_					1



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID	51292						
Description	Pro DSS Displa	ay					
Calibrated	10/10/2022 4:	54:48PM					
Manufacturer	YSI	<u></u>		State Certified			
Model Number	Pro DSS			Status	Pass		
Serial Number/ Lot	21D221618			Temp °C	25		
Number							
	Colorado			Humidity %	16		
Department							
		Calibra	tion Specification	<u>IS</u>			
Group	#			Range Acc %			
Group Nar	ne		F	Reading Acc %			
Stated Ac	cy			Plus/Minus			
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	<u>Fnd As</u>	ft As 1	Dev%	Pass/Fail
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>	_	<u>ration</u> <u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number		<u>Ne</u> Date/ Ex	y Date) xt Cal Date / piration Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin

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Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Des	ment ID 51293 cription YSI Pro DSS S librated 10/10/2022 4:5			under an		0 namp atar 20	
	Group # 5 roup Name Dissolved O tated Accy Pct of Reading			Range Acc % Reading Acc % Plus/Minus	3.0000	in the Bridge print of the Bridge MCI Layour d	la def Nered
<u>Nom In Val / In V</u> 100.00 / 100.00	/al <u>In Type</u> %	<u>Out Val</u> 100.00	<u>Out Type</u> %	<u>Fnd As</u> 102.30	<u>Lft As</u> 100.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments	Used During the Calib	ration			(As	Of Cal Enti	ry Date)
<u>Test Standard ID</u>	Description	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number	Last		ext Cal Date / opiration Date
CO 126/124 NTU	CO 126/124 YSI NTU 21L21440187	YSI	607300	22A214601			30/2023
(22A214) CO AUTO CAL 0NTU/PH4 18262406	CO AUTO CAL 0NTU/PH4 18262406	AMCOCLEAR		18262406			
CO COND 1.413(2GG653)	1413 COND STND LOT	AquaPhoenix Scientific	31986	2GG653		7/:	30/2023
CO ORP 240MV(2GI207)	ORP SOLUTION 240 mV	Pine Environmental Services, Inc.	32001	2GI207		6/	1/2023
CO PH 4 1GF009	CO PH 7	AquaPhoenix Scientific		1GF009		6/	1/2023
CO PH10 1GD492	CO PH10	AquaPhoenix Scientific		1GD492		4/	1/2023
CO PH7 1GF460	CO PH 7	AquaPhoenix Scientific	BU5007-T			6/	1/2023
CO ZERO DO	CO Zero Dissolved Oxygen Solution	Hanna	HI7040L	S0021/18		3/	1/2023

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

	ID 51293 ion YSI Pro DS ted 10/10/2022			nite inge	C.M	na na ma Diagonalia Diagonalia Diagonalia	h
Manufactur Model Numb Serial Number/ I Numb Locati Departme	Der Pro DSS Lot 21E100011 Der ion Colorado			State Certifie Statu Temp ° Humidity 9	is Pass C 25	Annes Promess Trad and of	
acosta atmà ha d	10.0	Calil	bration Specific	ations	. carro	i frank dan s	en <u>popt</u> tier
Group I	oup#1 NamePH AccyPctofRe	eading		Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 7.00 / 7.00 4.00 / 4.00 10.00 / 10.00	In Type PH PH PH PH	<u>Out Val</u> 7.00 4.00 10.00	<u>Out Type</u> PH PH PH	Fnd As 6.94 4.23 9.83	Lft As 7.00 4.00 10.00	Dev% 0.00% 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass Pass
Group I	oup#2 Name Turbidity Accy Pct of Re		arkji (Läpte	Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 0.00 / 0.00 124.00 / 124.00	<u>In Type</u> NTU NTU	<u>Out Val</u> 0.00 124.00	<u>Out Type</u> NTU NTU	<u>Fnd As</u> 0.00 126.00	<u>Lft As</u> 0.00 124.00	<u>Dev%</u> 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass
Group I	oup#3 Name Conduct Accy Pct of Re		101.4	Range Acc % Reading Acc % Plus/Minus	3.0000	en e	THE .
<u>Nom In Val / In Val</u> 1.413 / 1.413	<u>In Type</u> ms/cm	<u>Out Val</u> 1.413	Out Type ms/cm	<u>Fnd As</u> 1.430	<u>Lft As</u> 1.413	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Group N	oup # 4 Name Redox (C Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 240.00 / 240.00	<u>In Type</u> mv	<u>Out Val</u> 240.00	<u>Out Type</u> mv	<u>Fnd As</u> 243.50	<u>Lft As</u> 240.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Gro Group N	oup # 5 Name Dissolve Accy Pct of Re	d Oxygen Span	111 Y	Range Acc % Reading Acc % Plus/Minus	0.0000 3.0000	0.0078	1 433
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Instrument ID 40206 Description Solinst IP (200 ft) Calibrated 10/11/2022 5:41:18PM Manufacturer Solinst **State Certified** Model Number N/A Status Pass Serial Number/ Lot 312227 Temp °C 23 Number Humidity % 43 Location Seattle Department **Calibration Specifications** Group # Range Acc % **Group Name Reading Acc % Stated Accy Plus/Minus** Nom In Val / In Val In Type Out Val Out Type Fnd As Lft As Dev% Pass/Fail **Test Instruments Used During the Calibration** (As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Serial Number / Test Standard ID Description Manufacturer **Model Number** Lot Number **Opened Date**

Pine Environmental Services, Inc.

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	51630			
Description	Pine Environmental Peristaltic Pu	mp		
Calibrated	10/11/2022 1:03:56PM			
Manufacturer	Pine Environmental Services, Inc	•	State Certified	
Model Number			Status H	Pass
Serial Number/ Lot	n/a		Temp °C 2	23
Number				
Location	Seattle		Humidity % 4	16
Department				
Group Group Nar Test Performed: Yes)# 1	on Specification	s As Left Result: P	ass
Test Instruments Used D Test Standard ID Descrip		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	<u>(As Of Cal Entry Date)</u> <u>Next Cal Date /</u> <u>Last Cal Date/ Expiration Date</u> <u>Opened Date</u>

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	38335			
Description	YSI PRO DSS Display			
Calibrated	10/12/2022 1:03:53PM			
Manufacturer	YSI		State Certified	
Model Number	PRO DSS Display		Status P.	ass
Serial Number/ Lot	16M101962		Temp °C 22	2
Number				
Location	Seattle		Humidity % 4	4
Department				
	Calibrati	on Specification	S	
Group	# 1			
Group Nan	ne Dataloging			
Test Performed: Yes	As Found Result: Pass		As Left Result: Pa	ISS
Test Instruments Used D Test Standard ID Descrip		Model Number	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Dese	nent ID 34563 cription YSI ProDSS So librated 10/12/2022 1:0					dir unon orient noontypine it konsettiin
	Group # 5 oup Name ORP tated Accy Pct of Readir	ng		ange Acc % ding Acc % Plus/Minus	3.0000	
<u>Nom In Val / In V</u> 240.00 / 240.00	<mark>/al <u>In Type</u> mv</mark>	<u>Out Val</u> 240.00		<u>nd As</u> 30.00	<u>Lft As</u> 240.00	Dev%Pass/Fail0.00%Pass
Test Instruments	Used During the Calibr	ation	er Guiltiontion specifi		(/	As Of Cal Entry Date)
Test Standard ID	Description	<u>Manufacturer</u>	Model Number	<u>Serial Numb</u> Lot Number	L	<u>Next Cal Date</u> ast Cal Date/ Expiration Da pened Date
SEA AUTOCAL 22140172	SEA AUTOCAL AMCO Clear	GFS	8483	22140172	<u>v</u>	4/30/2023
SEA COND 1.413 μS/CM 2GE259	Conductivity solution 1.413 µS/cm	AquaPhoenix Scientific	Conductivity 1.413 mS/cm	3 2GE259		5/31/2023
SEA NTU 126 22G22290021	SEA 126 NTU turbidity for YSI	YSI	607300	22G222900	21	7/31/2023
SEA ORP 240 2GG459	240 mV ORP Solution	AquaPhoenix Scientific	32001	2GG459		4/30/2023
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018		7/24/2024
SEA PH 7 2GB314	pH 7 Buffer Solution	AquaPhoenix Scientific	32025	2GB314		2/29/2024
SEA PH4 2GG184	pH 4 Buffer Solution	AquaPhoenix Scientific	32017	2GG184		7/31/2024

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

_	04560						
Instrument							
•	ion YSI ProDS						
Calibra	ted 10/12/2022	1:07:11PM					
Manufactu	rer YSI			State Certific	d		
Model Num	ber Pro DSS So	onde		Statu	is Pass		
Serial Number/	Lot 18C104218			Temp °	C 22		
Num							
	ion Seattle			Humidity 9	6 45		
Departm	ent						
		Calib	oration Specific	ations			
Gr	oup#1			Range Acc %	0.0000		
Group	Name Ph			Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.36	7.02	0.29%	Pass
4.00/4.00	PH	4.00	PH	4.01	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.87	10.05	0.50%	Pass
Gr	oup # 2			Range Acc %	0.0000		
Group	Name Condtivi	ty		Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.000		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.195	1.413	0.00%	Pass
Gr	oup # 3			Range Acc %	0.0000		
Group	Name Turbidity	y		Reading Acc %	3.0000		
Stated	Accy Pct of Re	cading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	<u>Lft As</u>	Dev%	<u>Pass/Fail</u>
0.00/0.00	NTU	0.00	NTU	-0.30	0.00	0.00%	Pass
124.00 / 124.00	NTU	124.00	NTU	41.80	124.00	0.00%	Pass
Gr	oup # 4			Range Acc %	0.0000		
Group	Name Disolved	l Oxygen		Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	101.40	100.00	0.00%	Pass
	oup # 5			Range Acc %			
•	Name ORP			Reading Acc %			
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	46801			
Description	Geotech Peristaltic Pump			
Calibrated	10/11/2022 1:06:32PM			
Manufacturer	Pine Environmental Services, Inc	. S	tate Certified	
Model Number	Geopump		Status P	ass
Serial Number/ Lot	n/a		Temp °C 2	3
Number				
Location	544004		Humidity % 4	6
Department				
	Calibrati	on Specifications		
Group) # 1			
Group Nar	ne PERISTALSIS AND			
	FUNCTIONAL TEST			
Test Performed: Yes	As Found Result: Pass	Α	s Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

		and the second	
Instrument ID	32690		
Description	Solinst Interface		
Calibrated	10/11/2022 5:40:48PM		
Manufacturer	Solinst	State Certified	
Model Number		State	Pass
Serial Number/ Lot		Temp °C	
Number		Temp C	23
Location		Humidity %	43
Department			
•			
	Calibrat	tion Specifications	
Group		•	
Group Nar			
Test Performed: Yes	As Found Result: Pass	As Left Result:	Pass
Test Instruments Used D	uring the Calibration		(As Of Cal Entry Date)
		Serial Number	
Test Standard ID Descrip	tion <u>Manufacturer</u>	Model Number Lot Number	Last Cal Date/ Expiration Date
			Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Real and the second	and the second se			
Instrument ID	7481			
Description	Solinst Interface			
Calibrated	10/11/2022 5:40:10PM			
Manufacturer	Solinst		State Certified	
Model Number	IP 200'		Status P	ass
Serial Number/ Lot	286714		Temp °C 24	4
Number				
Location	Seattle		Humidity % 4	3
Department				
	Calibrat	ion Specifications	\$	
Group	y # 1			
Group Nar	ne			
Test Performed: Yes	As Found Result: Pass		As Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

	46376 Pro DSS Displa 10/6/2022 12:4					
Manufacturer Model Number Serial Number/ Lot Number Location Department	YSI Pro DSS 19D104639	7:34PM		State Certified Status Temp °C Humidity %	21	
Group Group Nar Stated Ac	ne	Calibra	tion Specification F	IS Range Acc % Reading Acc % Plus/Minus		
<u>Nom In Val / In Val</u> <u>Test Instruments Used Du Test Standard ID</u> <u>Descrip</u>		<u>Out Val</u> ration <u>Manufacturer</u>	Out Type Model Number	<u>Fnd As</u> <u>L1</u> <u>Serial Number</u> <u>Lot Number</u>		

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

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Pine Environmental Services LLC

(As Of Cal Entry Date)

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873 Description YSI Pro DSS Calibrated 10/6/2022 12:43:56PM

Group	oup # 5 Name Disolved Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	105.10	100.00	0.00%	Pass

Test Instruments Used During the Calibration

Test Standard ID	<u>Description</u>	Manufacturer	Model Number	<u>Serial Number /</u> Lot Number	Last Cal Date Opened Date	<u>Next Cal Date /</u> Expiration Date
SEA AUTOCAL 22140172	SEA AUTOCAL AMCO Clear	GFS	8483	22140172	<u>Opened Dute</u>	4/30/2023
SEA COND 1.413 µS/CM 2GE259	Conductivity solution 1.413 µS/cm	AquaPhoenix Scientific	Conductivity 1.413 mS/cm	2GE259		5/31/2023
SEA NTU 126 22C2205179	SEA 126 NTU turbidity for YSI	YSI	607300	22C2205179		3/31/2023
SEA ORP 240 2GB110	240 mV ORP Solution	AquaPhoenix Scientific	32001	2GB110		11/30/2022
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018		7/24/2024
SEA PH 7 2GB314	pH 7 Buffer Solution	AquaPhoenix Scientific	32025	2GB314		2/29/2024
SEA PH4 2GG184	pH 4 Buffer Solution	AquaPhoenix Scientific	32017	2GG184		7/31/2024

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

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Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

•	ID 46873 on YSI Pro DS red 10/6/2022 1						
Manufactur Model Numb Serial Number/ L Numb	rer YSI Der Pro DSS Lot 19K104044			State Certific Statu Temp °	is Pass		
	on Seattle			Humidity %	6 56		
		Calib	ration Specific	ations			
Group N	oup#l NamePH AccyPctofRe	ading		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.12	7.02	0.29%	Pass
4.00 / 4.00	PH	4.00	PH	3.89	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.37	10.05	0.50%	Pass
Gro	oup#2			Range Acc %	0.0000		
Group I	Name Turbidity	/		Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	NTU	0.00	NTU	1.20	0.00	0.00%	Pass
124.00 / 124.00	NTU	124.00	NTU	127.51	124.02	0.02%	Pass
Gro	oup#3			Range Acc %	0.0000		
	Name Conduct	ivity		Reading Acc %			
Stated	Accy Pct of Re	eading		Plus/Minus	0.000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.174	1.413	0.00%	Pass
	oup # 4 Name Redox (0)RP)		Range Acc % Reading Acc %			
•	Accy Pct of Re	-		Plus/Minus			
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	238.90	240.00	0.00%	Pass
	oup # 5			Range Acc %	0.0000		
	Name Disolved	Oxygen Span		Reading Acc %			
	Accy Pct of Re			Plus/Minus			



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	33239		
Description	Geo Pump		
Calibrated	10/11/2022 1:07:19PM		
Manufacturer	Geotech	State Certified	J
Model Number	23672	Statu	s Pass
Serial Number/ Lot	n/a	Temp °C	2 23
Number			
Location	Seattle	Humidity %	46
Department			
	Calibrati	on Specifications	
Group	# 1		
	ne Functional Test		
Test Performed: Yes	As Found Result: Pass	As Left Result	: Pass
Test Instruments Used D		<u>Serial Numb</u> Model Number <u>Lot Number</u>	(As Of Cal Entry Date) er / <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

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AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30
Project Number	60681370
Project Manager	Paul Kalina
Project Manager Phone #	2063105097
Muster Point location	Clubhouse
Meeting date	10/13/2022
Business Line	Environment
SH&E Manager	Tim Gilles
SH&E Manager Phone #	3128335991
First Aid Kit Location	Conex
Prepared by	Corley, Antonio

Meeting Summary

Attendees	
Location	SODO
Tasks to be performed	Bi-weekly system O&M
Hazards to be considered today	pressure, noise, motion, electrical
Will there be Lone Workers?	Yes
Hierarchy of controls	administrativecontrols, ppe
Personal Protective Equipment	Task Specific: gloves, earprotection, sunscreen Mandatory: hardhat, safetyglasses, longpants, reflectivevest, workboots
High Risk Events	 Impact by vehicle or mobile equipment Contact with moving parts of machinery Uncontrolled release of stored energy
Tonic of the week	<u>Is your car parked properly - turn off, curbs, windows closed, reverse</u>

торіс от тле week	parking
Other topics discussed	
Hazards	 Motion Noise Pressure Electrical

DAILY FIELD LOG

Proj	ect Information			Page of			
Proje	et Name:	T-30	Location:	Sentile			
Proje	ct/Task No.:		Weather:	55, Smoky Kunng			
Date:		10/19/22	Personnel:	GFCB			
Observations							
	Time	Observation Description					
1	0710	· Arrive ansite, CB already Lere.					
2		· Scape: Giv sample The 3 remaining tidal wells					
3		Troubleshost the AS VFD					
4		. Safety toilight: Traffic horards are the most significant					
5		astre port is approximal taday.					
6		SVE System ON on arriver! but AS 5, stem uses down					
7		due to another VFD high temp fault. As in neter					
8		at 8030.					
9		SVE System left ON for sampling					
10	0730						
11		Today's low - low file . Today's low - low tide was UGKO,					
12		50 Sample vindow was 0750-0850.					
13		>MW-58A-1022 Sampled at 0823.					
14		· Some small rest-colored flecks were observed					
15		in the VOA Samples that were not previous!					
16		anserved in 1	re ewaen	rater.			
17	04050			2 CB on MW-89.			
18		Both nave target a					
19		after low-low tide translating to 0850-0950.					
20		-> MW-86B-1022 Sompled at 0940 20					
21		2.00	Sampled a	+ "1200"			
22		-> MW-89-1072	sandled	at 0949. PH and			
23		lover than att other cells on site (3.75 vs ~7)					
24		and temp way	s hister	(22.5°C V5 ~19°C)			
25	1030	· VFD traildeshootine	v				
Com	Comments / Site Activities / Personnel Tracking						

DAILY FIELD LOG

Projec	t Information			P	$2 \operatorname{age} 2 \operatorname{of} 4$
Project	t Name:	T-20	Location:	Senttle	
Project	/Task No.:		Weather:	60	
Date:		10/19/22	Personnel:	GF, CB	
Obser	vations				
Т	ìme		Observation Descriptio	n	
		·VED Frond not	restart when we we	legted it on arrive	al but
2		inned; steh did	when it pressed	the "Stort" but	tan
3		at 1050. Not			
4		· with heat exchange	meer OFF, temp	Switch is shuth	n the
5	<u></u>	agten davn	in the 100-00.	France, TAH.	foult.
6		. The aremand the			
7		of the beat en	-changer bet	20n -150 - 650	fpm
8				it is beld. Lo	
9				highest is the	
10		night (surt	17 S S S S S S S S S S S S S S S S S S S	0	
11			2.3 F1 × 0.83 Ft	= 1.94 sf	
12			nge = 290-1150		
13		-> Sporge cabi	et is ns'x 6'x	4.25' = 76.5 0	f. That
14		preans pe's	e getting 3.75 -	15 air exchange	s per
15		minute.	0		
16		NOTE: ven	der said the hea	+ exchange should	1 20
17				it has the me	
18		he	thought it wou	W. Knumit confir	med.
19	1155	· with the As a	abilet fully open	pe heat excha	meer
20		was keeping ten	nps ~ 62 F. Am	bient temptis no	5895
21	1157	· Cabinet Jours C	losed to see of	fect on temps	
22	1224	=> 72° on the ther	maneter. An AZ	old all appea	ed_
23		on the AS VE	D, which is to	e legger high te	mp
24		alarm. UFD St	mys on al it au	tive. There does "	t appear
25		to be any scal	sin to doubt the	Mermoneter's au	curacy.
Comm	ents / Site Acti	vities / Personnel Tracking			5

DAILY FIELD LOG

Project Informatio	Page <u>3</u> of <u>4</u>
Project Name:	1-20 Location:
Project/Task No.:	Weather:
Date:	10/19/22 Personnel: GF, CB
Observations	
Time	Observation Description
1	The AS motor is warm but not not to he touch. The
2	SUE motor is significantly hotter. It's discharge air
3	55 MOGF.
4	> ADO10 code Grantaneously Stapped Plashing, despile
5	no marked share in apartion ~12:50.
6 12:25	GF installed simblers on all vertical SVE Lell Leaders
7	(SUE-4-10). They work great stabilizing previously very
8	unstable readings. Prior to install one gauge was
9	OSTIMATE to be at 48 in 420, with a range of 42-54.
10	with the psouldber installed, it was stable at 47 in Hop
11	I the horizontal SVE wells do not have the game value
12	fluctuation and shubbers are not related.
13	· GF installed a sputcher & the new O-15 in the gauge
14	at the GUE discharge part in place of the 0-100 mt
15	gauge that always read O. The new gauge reads
16	astendy 10.9 in H.D.
17	-> When the gauge was grand in its readle rotated
18	counter clockware to 10.9 passing the bottom of
19	the gauge seemed and but was reproducible with
20	and without the snupper.
21	> place are 4 Snubbers left as gares.
22 13:00	
23	ore 1/4" NPT and reed to be 18".
24	· CB is troubleshooting the VFD. Eventually calls ABB
25	(the mometacturer) & determines that the motor is house
Comments / Site Ac	ctivities / Personnel Tracking

DAILY FIELD LOG

Project Inf	formation		Page 4 of 4
Project Nar	nc: <u>7.30</u>	Location:	
Project/Tas		Weather:	
Date:	10/19/22	Personnel:	GFCB
Observatio	DNS		
Time		Observation Descri	The Constant of the Constant o
1	to work too he	rd with the b	eld value at its corrent
2	position. Ful-	load Amps or	9.6 but it was princing
3	at 10.5 and his	Ler. ABB recon	mends using a corrent
4	Joup to determine	Weller it is a	actually sending that
5	more mills to	ne motor. I	fit is the motor has an
6			is an ichel. I can
7	typhis during	Oth on nex	t weds.
8			I the bleed value more
9		A Contract Contract of Contrac	10 ar so, Mapefully
10	this avoids		1
11	> we also a	nfimed there	is no actual temp services
12	in the mote	N it is Comm	mirating with
13	-7 Cary has de	failed notes a	an all of this
14 14	120 . The temp sense	c has an adju	istable dig (that has
15	been set to 12	DOF. Halver,	he asserved TAH Shutdow
16			PS were 100-100F. We
17	increased the d	iat to 130°F	to compensate.
18 15	15 . CB trok a cal	I for another pr	oject, but will stick around
19	to cleck on the	System when I	reisdone. It was in Levid, and everything
20	1e Zare 2/201	es gerlap	served and everything
21	was running	smoothly.	. 0.5
22	GFOFEGIR)	
23	1 2		
24			
25)4	F
Comments	/ Site Activities / Personnel Tracking	5	

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name		T-30				Well ID:	MW-58A				
Project Numb		60681370				Sample ID:	MW-58A- 4	222	[WellID-MMYY]	1	
Date:		10/191	27		-	Well Condition:	Far		Traditin-tanari 1	1	
Weather:			(lordy		7.5 	Sampled by:	GF, C	5	-		
PRE-PURGE		DN	J								
	to Water* (ft b		10.9	3 0.	7:36	Purge/Sample Me	thod:	Low-Flow		Pine Equi	Owent
	duct* (ft btoc)			- 6-		Purge/Sample Equ		Peristaltic Pi	ump		
Product Thick			0		-	Total Well Depth*	•	25		755:51 Robe:41	292
Water Colum	n (ft):		~12	5.77	-	Screened Interval	* (ft bgs):	5-25		Rober 4	1202
Water Volum	e in Well (gal):		~2:	26		Tubing Inlet Dept	n* (ft):	18		Noge - It	
Inner Casing	Diameter (Inch	ı):	2		_	Sampling Tube Ma	iterial:	LPDE			
Inner Casing	Material:		PVC		_						
PURGING IN										06:40	
Start Purge T	ime: 7 :	42	-			****Tidal w	vell, sample 70	-130 min afte	r the low-low tic	ie E	
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (°C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments	
0752	200	10.98		19.2	1173	0.29	676	-16.1	55.7		
6802	ч	10.99		19.2	1164	0.20	6.77	-122	14.7		
0807	~	- 11		19.2	1161	0.17	6.77	-123.3	16.1		
081 Dk		11.00		19.2	1159	6.14	6.77	-123.9	18.7		
0817	U.	11.02	-	19.1	1157	0.13	6-77	-124.0	17.7		
0621	щ			19.2	1157	6.12	6.76	-124.2	17.5		
	SAM	PLED	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	23 -							
					\square						
						6-					
						CIP					
		L			/		1	1			

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	COC	Method	Container	No. of bottles	Preservative
Mar 1 5511 4422		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
MW-584-1022	Ma	Dx	NWTPH-Dx	500 mL Amber	1	
	0003	PAHs & 2-	SVOCs	1 L Ambler	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10% USEFUL INFORMATION * = Measured from top of inner casing

Gras also present rust-colored flecks visible in VOAs that were not asserved at and of purzing.

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

									LD			
Project Name	e:	T-30			→	Well ID:	MW-86B		T U	up2		
Project Num	ber:	60681370			=	Sample ID:	MW-868-		[Well ID-MMY	Y]		
Date:		10/10	9/22			Well Condition:	fair		_			
Weather:		21 21	۴F		- 2	Sampled by:	GF	,	-			
PRE-PURGE		ON								D. Er	0. 1. 6	
Initial Depth	to Water* (ft b	otoc):	12.	63	-	Purge/Sample Me	thod:	Low-Flow		rine uga	11-011	
Depth to Pro	duct* (ft btoc)	:		-	-	Purge/Sample Equ	ipment	Peristaltic P	Pump VCT : 51297			
Product Thick	kness (ft):		C	>	_	Total Well Depth*	(ft bgs):	20	1000 Fine Equipmen 1000 YGZ : 51292 Ridde: 40206			
Water Colum	ın (ft):		٨٦.		_	Screened Interval	* (ft bgs):	5-20		Ridge: 402	06	
Water Volum	ie in Well (gal)	:	1.10	1	40	Tubing Inlet Depth	1* (ft):	16	bas			
Inner Casing	Diameter (Incl	ו):	2		_	Sampling Tube Ma	aterial:	LPDE	V			
Inner Casing	Material:		PVC		_							
PURGING IN	FORMATION									,0640		
Start Purge Time: 0907						****Tidal w	ell, sample 13	0-190 min afte	er the low-low	tide		
[Purge Depth Rate Wate Time (mL/min) (ft)					Dissolved		T				
Time		Water (ft)	Purged (gal)	Temp (°C)	Conductivity (mS/m)	Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments		
0917	200	12.02		18.8	2022	0.29	7.16	-90.4	527			
0927	41	12,54		18.8	1946	0.20	7.14	-109.1	3.34			
0932	h	12.51		198.8	1931	0.17	714	-114-0	2.41			
0935	n	12.49		18.4	1921	0.16	7,14	-114,9	1.44			
0938	6	12.48		146	1917	015	7.13	-116.8	1.07			
	- <	Ann	EC	940								
						-						
					$\left \right\rangle$		+					
					\rightarrow							
r					$\vdash \leq$	6-		<u> </u>	├ ──┼			
						Gr						

SAMPLING INFORMATION	v		/				For Dup 2
Sample ID(s)	Sample time(s)	сос	Method	Container	No. o bottle		Preservative
1012 50 7 1122		Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	3	HCL
MW -563-1072	ogue	Dx	NWTPH-Dx	500 mL Amber	1	1	
Dup 2-1022	1200	PAHs & 2- methylnaphthalene	SVOCs	1 L Ambler	1	1	87

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10% Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

NA

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: Project Number:

Date:

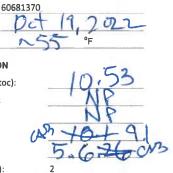
Weather:

PRE-PURGE INFORMATION

T-30

Initial Depth to Water* (ft btoc): Depth to Product* (ft btoc) : Product Thickness (ft): Water Column (ft): Water Volume in Well (gal): Inner Casing Diameter (Inch): Inner Casing Material:

PURGING INFORMATION



PVC

Well ID: Sample ID: Well Condition:

Sampled by:

MW-89- 1022 [Well ID-MMYY] GOOD Broan

Purge/Sample Method: Purge/Sample Equipment Total Well Depth* (ft bgs): Screened Interval* (ft bgs): Tubing Inlet Depth* (ft bgs): Sampling Tube Material:

MW-89

Low-Flow **Peristaltic Pump** 7.0 20 (filming won it go deepe 5-20 LPDE

Start Purge Ti	me: <u>70</u>	1				****Tidal wel	l, sample 130-	190 min afte	r the low-low	tide
Time	Purge Rate (mL/min)	Depth to Water (ft)	Volume Purged (gal)	Temp (˘C)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)	pH (SI Units)	ORP mV	Turbidity (NTU)	Comments
914	280	10,91		23.2	2201	3,99	3.95	226	8.5	
925	230	10.83		22,3	2757	4.64	3.Ho	292	8.6	
933	250	031		22.5	2719	496	3.76	311	7,1	
936	200	1020)	22.1	2700	5,07	3.74	319	8.8	
940	200	1070		22.2	-2692	5.11	3.76	324	7.4	
943	200	10.20		22.1	2688	5.14	3.76	327-	4.5	
Su	itch.	e 2	nd Y	51 -	to ce	ntim	enp	\$ pt	(Re	advers
948	200	10.3		22.4	29417	- 5.26	348	227	1.2	

SAMPLING INFORMATION

Sample ID(s)	Sample time(s)	Analysis	Method	Container	No. of bottles	Preservative
Mw-89-1022	219	Gx/BTEX	NWTPH-G/BTEX	40 mL VOA	3	HCL
	-41	Dx	NWTPH-Dx	500 mL Amber	1	-

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

STABILIZATION RANGES

Dissolved Oxygen: +/- 10% Conductivity: +/- 10% Temperature: +/- 10 % pH: +/- 0.1 unit Redox Potential: +/- 10%

Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

NB

2" casing: 1 ft = 0.164 gal = 0.62 L 4" casing: 1 ft = 0.656 gal = 2.48 L 1 gal = 3785.4 mL

las remared from Well MW-89

Pire Equipment VGI: 46376 Prose: 7481

SAMPLE CHAIN OF CUSTODY

Report To Paul Val	inc	~		SAMPL	ERS (signo	ature)	G	of.	2		SAMPLERS (signature)							Page # of TURNAROUND TIME			
Company AE(ON				PROJEC	CT NAME	4-		-0			P	0#	77				ndaro	d turnaround			
Address 1111 3rd A				T-3	T-30											harges authorized by:					
		LIA ag	101	REMAR	REMARKS IN				INVOICE TO					SAMPLE DISPOSAL rchive samples							
Phone 206 - 310 - 5097Er	nail_	Paul. Kalin	allottom	REMARKS (m Project specific RLs? - Yes / No								E	Other Default: Dispose after 30 days								
		Jus. fr. Pa	munear	(Orh. (On	2						ANAI	LYSI	ES RI	EQU						-'	
Sample ID	Time Sampled	Sample Type	# of Jars		NWTPH-Gx	BTEX EPA 8021									No	tes	-				
MW-89-1022			10/19/22	0949	gw	4	×	×						×							
MW-546A-1022			10/19/22	04673	gw	5	×	×				×		×				PAHS	include	,	
MW-463-102	2		10/14/22	0940	gw	5	×	×				×		×				2-me	leve	in.	
Dup2-1022			10/19/22	1200	gw	5	×	×				X		×) - 100	(eve		
							4													1	
	-																	e Dx both with	n and	1	
										_								SGC	<u>un</u>		
								-	_												
F			GNATURE																		
Friedman & Bruya, Inc.		6	PRIN	- 1							OMF		Y ,		DATE	TIME]				
			1	Gus	Frit	dr	na	n AE(ON				n			19/19/22	1640	-				
	Received by: WPS by Early Relinquished by:			el	Wes	eyl	ef		731				10/19/1	1646	-						
	Relinquished by:										_										



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID	51292									
Description	Pro DSS Displa	ay								
Calibrated	10/10/2022 4:	54:48PM								
Manufacturer	YSI	<u></u>		State Certified						
Model Number	Pro DSS			Status	Pass					
Serial Number/ Lot	21D221618			Temp °C	25					
Number										
	Colorado			Humidity %	16					
Department										
Calibration Specifications										
Group	#			Range Acc %						
Group Nar	ne		F	Reading Acc %						
Stated Ac	cy			Plus/Minus						
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	<u>Fnd As</u>	ft As 1	Dev%	Pass/Fail			
	est Instruments Used During the Calibratio			<u>Serial Number</u> Lot Number		<u>Ne</u> Date/ Ex	y Date) xt Cal Date / piration Date			

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Des	ment ID 51293 cription YSI Pro DSS S librated 10/10/2022 4:5			under an		0 namp atar 20	
	Group # 5 roup Name Dissolved O tated Accy Pct of Reading			Range Acc % Reading Acc % Plus/Minus	3.0000	in the Bridge print of the Bridge MCI Layour d	la def Nered
<u>Nom In Val / In V</u> 100.00 / 100.00	/al <u>In Type</u> %	<u>Out Val</u> 100.00	<u>Out Type</u> %	<u>Fnd As</u> 102.30	<u>Lft As</u> 100.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Test Instruments	Used During the Calib	ration			(As	Of Cal Enti	ry Date)
<u>Test Standard ID</u>	Description	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u> Lot Number	Last		ext Cal Date / opiration Date
CO 126/124 NTU	CO 126/124 YSI NTU 21L21440187	YSI	607300	22A214601			30/2023
(22A214) CO AUTO CAL 0NTU/PH4 18262406	CO AUTO CAL 0NTU/PH4 18262406	AMCOCLEAR		18262406			
CO COND 1.413(2GG653)	1413 COND STND LOT	AquaPhoenix Scientific	31986	2GG653		7/:	30/2023
CO ORP 240MV(2GI207)	ORP SOLUTION 240 mV	Pine Environmental Services, Inc.	32001	2GI207		6/	1/2023
CO PH 4 1GF009	CO PH 7	AquaPhoenix Scientific		1GF009		6/	1/2023
CO PH10 1GD492	CO PH10	AquaPhoenix Scientific		1GD492		4/	1/2023
CO PH7 1GF460	CO PH 7	AquaPhoenix Scientific	BU5007-T			6/	1/2023
CO ZERO DO	CO Zero Dissolved Oxygen Solution	Hanna	HI7040L	S0021/18		3/	1/2023

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Kevin Morin



Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E. Centennial, CO 80112 Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

•	ID 51293 on YSI Pro DS ed 10/10/2022						
Manufactur Model Numb Serial Number/ L Numb	er Pro DSS ot 21E100011			State Certifie Statu Temp %	s Pass		
Locatio Departme	on Colorado nt			Humidity %	6 16		
		<u>Calib</u>	ration Specific:	ations			
Group N	oup#1 Name PH Accy Pct of Re	ading		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 7.00 / 7.00 4.00 / 4.00 10.00 / 10.00	<mark>In Type</mark> PH PH PH PH	<u>Out Val</u> 7.00 4.00 10.00	<u>Out Type</u> PH PH PH	Fnd As 6.94 4.23 9.83	<u>Lft As</u> 7.00 4.00 10.00	<u>Dev%</u> 0.00% 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass Pass
Group N	oup # 2 Name Turbidity Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 0.00 / 0.00 124.00 / 124.00	<u>In Type</u> NTU NTU	<u>Out Val</u> 0.00 124.00	<u>Out Type</u> NTU NTU	<u>Fnd As</u> 0.00 126.00	<u>Lft As</u> 0.00 124.00	<u>Dev%</u> 0.00% 0.00%	<u>Pass/Fail</u> Pass Pass
Group N	oup # 3 Name Conducti Accy Pct of Re	•		Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 1.413 / 1.413	<u>In Түре</u> ms/cm	<u>Out Val</u> 1.413	Out Type ms/cm	<u>Fnd As</u> 1.430	<u>Lft As</u> 1.413	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Group N	oup#4 Name Redox (C Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u> 240.00 / 240.00	<u>In Түре</u> mv	<u>Out Val</u> 240.00	<u>Out Түре</u> mv	<u>Fnd As</u> 243.50	<u>Lft As</u> 240.00	<u>Dev%</u> 0.00%	<u>Pass/Fail</u> Pass
Group N	oup # 5 Name Dissolved Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u>	In Type	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Instrument ID 40206 Description Solinst IP (200 ft) Calibrated 10/11/2022 5:41:18PM Manufacturer Solinst **State Certified** Model Number N/A Status Pass Serial Number/ Lot 312227 Temp °C 23 Number Humidity % 43 Location Seattle Department **Calibration Specifications** Group # Range Acc % **Group Name Reading Acc % Stated Accy Plus/Minus** Nom In Val / In Val In Type Out Val Out Type Fnd As Lft As Dev% Pass/Fail **Test Instruments Used During the Calibration** (As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Serial Number / Test Standard ID Description Manufacturer **Model Number** Lot Number **Opened Date**

Pine Environmental Services, Inc.

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	51630			
Description	Pine Environmental Peristaltic Pu	mp		
Calibrated	10/11/2022 1:03:56PM			
Manufacturer	Pine Environmental Services, Inc	•	State Certified	
Model Number			Status H	Pass
Serial Number/ Lot	n/a		Temp °C 2	23
Number				
Location	Seattle		Humidity % 4	16
Department				
Group Group Nar Test Performed: Yes)# 1	on Specification	s As Left Result: P	ass
Test Instruments Used D Test Standard ID Descrip		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	<u>(As Of Cal Entry Date)</u> <u>Next Cal Date /</u> <u>Last Cal Date/ Expiration Date</u> <u>Opened Date</u>

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID	46801			
Description	Geotech Peristaltic Pump			
Calibrated	10/11/2022 1:06:32PM			
Manufacturer	Pine Environmental Services, Inc	. S	tate Certified	
Model Number	Geopump		Status P	ass
Serial Number/ Lot	n/a		Temp °C 2	3
Number				
Location			Humidity % 4	6
Department				
Calibration Specifications				
Group) # 1			
Group Nar	ne PERISTALSIS AND			
	FUNCTIONAL TEST			
Test Performed: Yes	As Found Result: Pass	Α	s Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Real and the second	and the second se			
Instrument ID	7481			
Description	Solinst Interface			
Calibrated	10/11/2022 5:40:10PM			
Manufacturer	Solinst		State Certified	
Model Number	IP 200'		Status P	ass
Serial Number/ Lot	286714		Temp °C 24	4
Number				
Location	Seattle		Humidity % 4	3
Department				
	Calibrat	ion Specifications	\$	
Group	y # 1			
Group Nar	ne			
Test Performed: Yes	As Found Result: Pass		As Left Result: Pa	ISS
<u>Test Instruments Used D</u> <u>Test Standard ID</u> <u>Descrip</u>		<u>Model Number</u>	<u>Serial Number /</u> Lot Number	(As Of Cal Entry Date) <u>Next Cal Date /</u> Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

	46376 Pro DSS Displa 10/6/2022 12:4					
Manufacturer Model Number Serial Number/ Lot Number Location Department	YSI Pro DSS 19D104639	7:34PM		State Certified Status Temp °C Humidity %	21	
Group Group Nar Stated Ac	ne	Calibra	tion Specification F	IS Range Acc % Reading Acc % Plus/Minus		
<u>Nom In Val / In Val</u> <u>Test Instruments Used Du Test Standard ID</u> <u>Descrip</u>		<u>Out Val</u> ration <u>Manufacturer</u>	Out Type Model Number	<u>Fnd As</u> <u>L1</u> <u>Serial Number</u> <u>Lot Number</u>		

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



Pine Environmental Services LLC

(As Of Cal Entry Date)

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873 Description YSI Pro DSS Calibrated 10/6/2022 12:43:56PM

Group	oup # 5 Name Disolved Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	105.10	100.00	0.00%	Pass

Test Instruments Used During the Calibration

Test Standard ID	<u>Description</u>	Manufacturer	Model Number	<u>Serial Number /</u> Lot Number	Last Cal Date Opened Date	<u>Next Cal Date /</u> Expiration Date
SEA AUTOCAL 22140172	SEA AUTOCAL AMCO Clear	GFS	8483	22140172	<u>Opened Dute</u>	4/30/2023
SEA COND 1.413 µS/CM 2GE259	Conductivity solution 1.413 µS/cm	AquaPhoenix Scientific	Conductivity 1.413 mS/cm	2GE259		5/31/2023
SEA NTU 126 22C2205179	SEA 126 NTU turbidity for YSI	YSI	607300	22C2205179		3/31/2023
SEA ORP 240 2GB110	240 mV ORP Solution	AquaPhoenix Scientific	32001	2GB110		11/30/2022
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018		7/24/2024
SEA PH 7 2GB314	pH 7 Buffer Solution	AquaPhoenix Scientific	32025	2GB314		2/29/2024
SEA PH4 2GG184	pH 4 Buffer Solution	AquaPhoenix Scientific	32017	2GG184		7/31/2024

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance





Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

Pine Environmental Services, Inc.

•	ID 46873 on YSI Pro DS red 10/6/2022 1						
Manufactur Model Numb Serial Number/ L Numb	rer YSI Der Pro DSS Lot 19K104044			State Certific Statu Temp °	is Pass		
	on Seattle			Humidity %	6 56		
		Calib	ration Specific	ations			
Group N	oup#l NamePH AccyPctofRe	ading		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.12	7.02	0.29%	Pass
4.00 / 4.00	PH	4.00	PH	3.89	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.37	10.05	0.50%	Pass
Gro	oup#2			Range Acc %	0.0000		
Group I	Name Turbidity	/		Reading Acc %	3.0000		
Stated	Accy Pct of Re	eading		Plus/Minus	0.00		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	NTU	0.00	NTU	1.20	0.00	0.00%	Pass
124.00 / 124.00	NTU	124.00	NTU	127.51	124.02	0.02%	Pass
Gro	oup#3			Range Acc %	0.0000		
	Name Conduct	ivity		Reading Acc %			
Stated	Accy Pct of Re	eading		Plus/Minus	0.000		
<u>Nom In Val / In Val</u>	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.174	1.413	0.00%	Pass
	oup # 4 Name Redox (0)RP)		Range Acc % Reading Acc %			
•	Accy Pct of Re	-		Plus/Minus			
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	238.90	240.00	0.00%	Pass
	oup # 5			Range Acc %	0.0000		
	Name Disolved	Oxygen Span		Reading Acc %			
	Accy Pct of Re			Plus/Minus			

AECOM Daily Tailgate Meeting Summary

Project information

Project Name	T-30		
Project Number	60681370		
Project Manager	Paul Kalina		
Project Manager Phone #	2063105097		
Muster Point location	Clubhouse		
Meeting date	10/19/2022		
Business Line	Environment		
SH&E Manager	Tim Gilles		
SH&E Manager Phone #	3128335991		
First Aid Kit Location	Conex		
Prepared by	Friedman, Gus		

Shift Summary

Location	SODO
Attendees (Workers)	Brown, Cary;Friedman, Gus;
Attendees (Visitors)	
Tasks to be performed	Tidal well gw sampling AS VFD troubleshooting
Hazards to be considered today	noise, motion, mechanical, electrical
Will there be Lone Workers?	No
Hierarchy of controls	engineering, ppe
Personal Protective Equipment	Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots
High Risk Events	

Topic of the week	Hearing Conservation
Other topics discussed	Traffic hazards Crane operation awareness
Mid day reviews	
End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here	All wells sampled within the required time periods. Progress made troubleshooting VFD
Hazards	Mechanical Motion Noise Electrical

<u>Appendix G</u> Groundwater Sampling Laboratory Analytical Reports

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

April 25, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on April 15, 2022 from the T-30, F&BI 204253 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures AEC0425R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 15, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 204253 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
204253 -01	RW-11A-0422
204253 -02	RW-11A-0422-MS
204253 -03	RW-11A-0422-MSD
204253 -04	MW-100-0422
204253 -05	MW-89-0422

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253 Date Extracted: 04/20/22 Date Analyzed: 04/20/22 and 04/22/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
RW-11A-0422 204253-01	<1	<1	<1	<3	<100	80
RW-11A-0422-MS 204253-02	<1	<1	<1	<3	<100	70
RW-11A-0422-MSD 204253-03	<1	<1	<1	<3	<100	70
MW-100-0422 204253-04	<1	6.8	1.4	7.7	170	92
MW-89-0422 204253-05	<1	<1	<1	<3	<100	87
Method Blank 02-880 MB	<1	<1	<1	<3	<100	85

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253 Date Extracted: 04/21/22 Date Analyzed: 04/21/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx Sample Extracts Passed Through a Silica Gel Column Prior to Analysis Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
RW-11A-0422 204253-01	<50	<250	71
RW-11A-0422-MS 204253-02	71	<250	131
RW-11A-0422-MSD 204253-03	<50	<250	91
MW-100-0422 204253-04	<50	<250	109
MW-89-0422 204253-05	54	<250	110
Method Blank 02-962 MB	<50	<250	115

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253 Date Extracted: 04/19/22 Date Analyzed: 04/19/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
RW-11A-0422 204253-01	1,700 x	440 x	79
RW-11A-0422-MS 204253-02	2,600 x	700 x	133
RW-11A-0422-MSD 204253-03	2,400 x	650 x	107
MW-100-0422 204253-04	910 x	480 x	118
MW-89-0422 204253-05	780 x	440 x	125
Method Blank 02-962 MB	<50	<250	118

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 204285-01 (Duplicate)										
	Reporting	Sample	Duplicate	RPD						
Analyte	Units	Result	Result	(Limit 20)						
Benzene	ug/L (ppb)	<1	<1	nm						
Toluene	ug/L (ppb)	<1	<1	nm						
Ethylbenzene	ug/L (ppb)	<1	<1	nm						
Xylenes	ug/L (ppb)	<3	<3	nm						
Gasoline	ug/L (ppb)	<100	<100	nm						

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	82	65-118
Toluene	ug/L (ppb)	50	81	72 - 122
Ethylbenzene	ug/L (ppb)	50	86	73-126
Xylenes	ug/L (ppb)	150	85	74-118
Gasoline	ug/L (ppb)	1,000	86	69-134

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample Silica Gel									
			Percent	Percent					
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD			
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)			
Diesel Extended	ug/L (ppb)	2,500	92	108	63-142	16			

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22 Date Received: 04/15/22 Project: T-30, F&BI 204253

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	100	104	63-142	4

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

		Friedman & Bruya, Inc. Ph. (206) 285-8282					÷ (1)	MW-89-0422	MW-100-0422	Rw-11 A-0422-msp 03	Rw-11 A-0422-ms	RW-11A-0422	Sample ID		Phone 206-438-2702 mail	City, State, ZIP	Address	Company A	Report To
Reveived by:		i, Inc.	7 7						•	0422-msp	<u> </u>					Seattle,	312	AECOM	Paul Kalisa
	Relinquished by:	Relinquished by:	SIG					20	04		8	OIA-D	Lab ID		Pavi-Katin	WA	Ave, Suite		
		P.	SIGNATURE					4/15/22	4/15/22	4/14/22	4/14/22	4/14/22	Date Sampled		Pavi-Kelinh @ Heren.Com	10186	+ 1600		10 - A - A - A - A - A - A - A - A - A -
								1330	1230	0181	0181	0181	Time Sampled		Project	- REMARKS	-	PROJE	- SAMPL
	Ye/cna	, Gus						65	66	30	GW	Gw	Sample Type		Project specific RLs? - Yes	IKS		PROJECT NAME T_2O	SAMPLERS (signature)
	I'VA	э Л	PRIN					F	1	I	٦	1	# of Jars		s? - Ye				ture)
	Ar	5.00	PRINT NAME					X	X	X	X	X	NWTPH-Dx	*	No / No				have
	Araukiz	riedman	ME				-	X	× ×	X	× ×	× ×	NWTPH-Gx		, 6 , , , , , , , , , , , , , , , , , ,				19
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													*		er lt: Di	SAMF uve sa	harge	ndard }H	Page #
	15/	4/15/32	DATE									t tuo Salas	443 N		□ Other Default: Dispose after 30 days	SAMPLE DISPOSAL	Rush charges authorized by:	Standard turnaround	Page # / of /
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	171	1710	TIME									Clentp	otes d wither		30 d	AL	by:		MB

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

October 21, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on October 14, 2022 from the T-30, F&BI 210207 project. There are 25 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Gus Friedman, Lucy Panteleeff AEC1021R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 14, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210207 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
210207 -01	RW-11A-1022
210207 -02	MW-36A-1022
210207 -03	MW-39A-1022
210207 -04	MW-42-1022
210207 -05	RW-9-1022
210207 -06	MW-93-1022
210207 -07	RW-5A-1022
210207 -08	MW-45A-1022
210207 -09	MW-46B-1022
210207 -10	MW-92-1022
210207 -11	Dup1-1022

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207 Date Extracted: 10/18/22 Date Analyzed: 10/18/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	Surrogate (<u>% Recovery)</u> (Limit 51-134)
RW-11A-1022 210207-01	<100	94
MW-36A-1022 210207-02	<100	91
MW-39A-1022 210207-03	<100	93
MW-42-1022 210207-04	260	103
RW-9-1022 210207-05	<100	94
MW-93-1022 210207-06	<100	87
RW-5A-1022 210207-07	110	101
MW-45A-1022 210207-08	<100	92
MW-46B-1022 210207-09	<100	92
MW-92-1022 210207-10	<100	90

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207 Date Extracted: 10/18/22 Date Analyzed: 10/18/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	Surrogate (<u>% Recovery)</u> (Limit 51-134)
Dup1-1022 210207-11	<100	91
Method Blank ^{02-2512 mb}	<100	92

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207 Date Extracted: 10/17/22 Date Analyzed: 10/17/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
RW-11A-1022 210207-01	4,800	410 x	133
MW-36A-1022 210207-02	4,900	460 x	138
MW-39A-1022 210207-03	6,800 x	1,200 x	140
MW-42-1022 210207-04	5,600 x	1,400 x	135
RW-9-1022 210207-05	9,500 x	2,000 x	ip
MW-93-1022 210207-06	2,300 x	590 x	122
RW-5A-1022 210207-07	1,400 x	310 x	112
MW-45A-1022 210207-08 1/1.2	1,100 x	<300	127
MW-46B-1022 210207-09	890 x	<250	123
MW-92-1022 210207-10	2,400 x	410 x	122
Dup1-1022 210207-11	4,900	510 x	122
Method Blank 02-2529 MB	<50	<250	110

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	RW-11A-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-01 101710.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 101	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-36A-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	022	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-02 101711.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 112 101 99	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-39A-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb))22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-03 101712.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 107 96 102	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-42-102 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-04 101713.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 117 96 99	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) 0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	RW-9-1022 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-05 101714.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 90 102	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene		Concentration ug/L (ppb) <0.35		
Toluene Ethylbenzene m,p-Xylene o-Xylene		<1 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-93-102 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-06 101715.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 107 97 95	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds:		Concentration ug/L (ppb)		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		<0.35 <1 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	RW-5A-102 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	2	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-07 101716.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 107	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-45A-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	022	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-08 101720.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 103 102 105	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-46B-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	022	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-09 101717.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 106 102 103	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-92-102 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-10 101718.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 107 107 108	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <2 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Dup1-1022 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-11 101719.D GCMS11 JCM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 107 101 99	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <2 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 10/17/22 10/17/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 02-2484 mb 101707.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 112 102 100	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-45A-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	922	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-08 101719.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 69 76 114 91	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe	ene	<pre><0.2 <0.2 <0.2 <0.2 <0.02 3.7 0.039 <0.02 <</pre>		
Benzo(k)fluoranthe Indeno(1,2,3-cd)py Dibenz(a,h)anthrac Benzo(g,h,i)peryler	rene cene	<0.02 <0.02 <0.02 <0.04		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-46B-10 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	922	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-09 101720.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 68 77 113 87	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe	ene	<pre><0.2 <0.2 <0.2 <0.02 0.29 <0.02 <0.02</pre>		
Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrac Benzo(g,h,i)peryler	rene cene	<0.02 <0.02 <0.02 <0.04		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-92-102 10/14/22 10/17/22 10/17/22 Water ug/L (ppb)	2	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 210207-10 101721.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 65 61 101 90	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrace	ene ene rene	$< 0.2 \\ < 0.2 \\ < 0.2 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.$		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 10/17/22 10/17/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210207 02-2530 mb 101716.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 97 92 111 97	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr	ene ene rene	$< 0.2 \\< 0.2 \\< 0.2 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \end{aligned}$		

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 210	0207-08 (Matrix	x Spike)					
Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	1,200	118	107	53-117	10
Laboratory Code: Lab	ooratory Contr	ol Sample	e Percent				
Analyte	Reporting Units	Spike Level	Recovery LCS	Acceptance Criteria	e		
Gasoline	ug/L (ppb)	1,000	106	69-134			

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ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code:	210207-08 (Matri	ix Spike)					
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	1,200	104	104	50 - 150	0
Laboratory Code:	Laboratory Contr	rol Sampl	e				
			Percent	,			
	Reporting	Spike	Recover	y Accept	ance		
Analyte	Units	Level	LCS	Crite	ria		
Diesel Extended	ug/L (ppb)	2,500	80	63-1	10		

Laboratory Code: 210207-08 (Matrix Spike)

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 210207-08 (Matrix Spike)

Laboratory coue. 210207 00	(interim opino)			Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Benzene	ug/L (ppb)	10	< 0.35	102	104	50 - 150	2
Toluene	ug/L (ppb)	10	<1	99	105	50 - 150	6
Ethylbenzene	ug/L (ppb)	10	<1	96	102	50 - 150	6
m,p-Xylene	ug/L (ppb)	20	<2	96	101	50 - 150	5
o-Xylene	ug/L (ppb)	10	<1	92	99	50 - 150	7

Laboratory Code: Laboratory Control Sample

	,		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Benzene	ug/L (ppb)	10	103	106	70-130	3
Toluene	ug/L (ppb)	10	102	103	70-130	1
Ethylbenzene	ug/L (ppb)	10	104	107	70-130	3
m,p-Xylene	ug/L (ppb)	20	103	106	70-130	3
o-Xylene	ug/L (ppb)	10	105	107	70-130	2

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22 Date Received: 10/14/22 Project: T-30, F&BI 210207

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 210207-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	<0.2	70	74	50-150	6
2-Methylnaphthalene	ug/L (ppb)	5	<0.2	70	82	50-150	6
1-Methylnaphthalene	ug/L (ppb)	5	<0.2	76	83	50-150	9
Acenaphthylene	ug/L (ppb)	5	< 0.02	76	80	50-150	5
Acenaphthene	ug/L (ppb)	5	3.7	42 b	63 b	50-150	40 b
Fluorene	ug/L (ppb)	5	0.039	80	83	50 - 150	4
Phenanthrene	ug/L (ppb)	5	< 0.02	80	86	50 - 150	7
Anthracene	ug/L (ppb)	5	< 0.02	82	84	50 - 150	2
Fluoranthene	ug/L (ppb)	5	< 0.02	83	88	50 - 150	6
Pyrene	ug/L (ppb)	5	< 0.02	78	82	50 - 150	5
Benz(a)anthracene	ug/L (ppb)	5	< 0.02	80	87	50 - 150	8
Chrysene	ug/L (ppb)	5	< 0.02	80	85	50 - 150	6
Benzo(a)pyrene	ug/L (ppb)	5	< 0.02	82	88	50 - 150	7
Benzo(b)fluoranthene	ug/L (ppb)	5	< 0.02	83	90	50 - 150	8
Benzo(k)fluoranthene	ug/L (ppb)	5	< 0.02	80	87	50 - 150	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	< 0.02	84	84	50 - 150	0
Dibenz(a,h)anthracene	ug/L (ppb)	5	< 0.02	83	82	50 - 150	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	< 0.04	80	78	50 - 150	3

Laboratory Code: Laboratory Control Sample

C C	v 1		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Ūnits	Level	LCS	Criteria
Naphthalene	ug/L (ppb)	5	81	62-97
2-Methylnaphthalene	ug/L (ppb)	5	85	64-101
1-Methylnaphthalene	ug/L (ppb)	5	86	64-93
Acenaphthylene	ug/L (ppb)	5	88	70-130
Acenaphthene	ug/L (ppb)	5	86	70-130
Fluorene	ug/L (ppb)	5	91	70-130
Phenanthrene	ug/L (ppb)	5	89	70-130
Anthracene	ug/L (ppb)	5	92	70-130
Fluoranthene	ug/L (ppb)	5	95	70-130
Pyrene	ug/L (ppb)	5	88	70-130
Benz(a)anthracene	ug/L (ppb)	5	92	70-130
Chrysene	ug/L (ppb)	5	93	70-130
Benzo(a)pyrene	ug/L (ppb)	5	91	70-130
Benzo(b)fluoranthene	ug/L (ppb)	5	91	70-130
Benzo(k)fluoranthene	ug/L (ppb)	5	92	70-130
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	93	70-130
Dibenz(a,h)anthracene	ug/L (ppb)	5	93	70-130
Benzo(g,h,i)perylene	ug/L (ppb)	5	92	70-130

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

October 26, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the additional results from the testing of material submitted on October 14, 2022 from the T-30, F&BI 210207 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Gus Friedman, Lucy Panteleeff AEC1026R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 14, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210207 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
210207 -01	RW-11A-1022
210207 -02	MW-36A-1022
210207 -03	MW-39A-1022
210207 -04	MW-42-1022
210207 -05	RW-9-1022
210207 -06	MW-93-1022
210207 -07	RW-5A-1022
210207 -08	MW-45A-1022
210207 -09	MW-46B-1022
210207 -10	MW-92-1022
210207 -11	Dup1-1022

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/14/22 Project: T-30, F&BI 210207 Date Extracted: 10/17/22 Date Analyzed: 10/24/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx Sample Extracts Passed Through a Silica Gel Column Prior to Analysis Results Reported as ug/L (ppb)

Surrogate

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	<u>(% Recovery)</u> (Limit 41-152)
RW-11A-1022 210207-01	<50	<250	113
MW-36A-1022 210207-02	180	<250	123
MW-39A-1022 210207-03	110	<250	112
MW-42-1022 210207-04	120	<250	120
RW-9-1022 210207-05	200	<250	125
MW-93-1022 210207-06	<50	<250	109
RW-5A-1022 210207-07	84	<250	111
MW-45A-1022 210207-08 1/1.2	72	<300	129
MW-46B-1022 210207-09	73	<250	122
MW-92-1022 210207-10	81	<250	125
$\begin{array}{c} \text{Dup1-1022} \\ _{210207\text{-}11} \end{array}$	<50	<250	116
Method Blank 02-2529 MB	<50	<250	115

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/14/22 Project: T-30, F&BI 210207

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 2	210207-08 (Matri	x Spike)	Silica Gel				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<50	103	128	50-150	22 vo
Laboratory Code: I	Laboratory Conti	rol Sampl	e Silica Ge	el			
			Percent	;			
	Reporting	Spike	Recover	y Accept	ance		
Analyte	Units	Level	LCS	Crite	ria		
Diesel Extended	ug/L (ppb)	2,500	80	63-1	42		

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Sample	F8B	AECOM	COM						2	 	X	PAHs EPA 8270 PCBs EPA 8082	ANALYSES REQ	faut Valina:	INVOICE TO		P0#		10/14
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

October 26, 2022

Paul Kalina, Project Manager AECOM 1111 3rd Ave, Suite 1600 Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on October 19, 2022 from the T-30, F&BI 210273 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Gus Friedman, Lucy Pantaleef AEC1026R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 19, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210273 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	AECOM
210273 -01	MW-89-1022
210273 -02	MW-58A-1022
210273 -03	MW-86B-1022
210273 -04	Dup 2-1022

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273 Date Extracted: 10/20/22 Date Analyzed: 10/21/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	Surrogate (<u>% Recovery)</u> (Limit 51-134)
MW-89-1022 210273-01	<100	91
MW-58A-1022 210273-02	130	99
MW-86B-1022 210273-03	<100	92
Dup 2-1022 210273-04	<100	93
Method Blank 02-2516 MB	<100	90

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273 Date Extracted: 10/20/22 Date Analyzed: 10/24/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx Sample Extracts Passed Through a Silica Gel Column Prior to Analysis Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
MW-89-1022 210273-01	61	<250	114
MW-58A-1022 210273-02	240	<250	124
MW-86B-1022 210273-03	63	<250	113
Dup 2-1022 210273-04	89	<250	117
Method Blank 02-2551 MB	<50	<250	104

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273 Date Extracted: 10/20/22 Date Analyzed: 10/20/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
MW-89-1022 210273-01	550 x	<250	114
MW-58A-1022 210273-02	6,300 x	900 x	ip
MW-86B-1022 210273-03	1,600 x	400 x	128
Dup 2-1022 210273-04	1,600 x	420 x	127
Method Blank 02-2551 MB	<50	<250	114

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-89-102 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)	2	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-01 102021.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 97	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds:		Concentration ug/L (ppb)		
Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		<0.35 <1 <1 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-58A-10 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)	022	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-02 102022.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 103 101 109	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <1 <2		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-86B-10 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)	022	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-03 102023.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 104 99	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene		Concentration ug/L (ppb) <0.35 <1 <1 <1		
m,p-Xylene o-Xylene		<2 <1		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Dup 2-1022 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-04 102024.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 101	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <2 <2 <1		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 10/20/22 10/20/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 02-2490 mb 102007.D GCMS11 LM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 104 106 98	Lower Limit: 78 84 72	Upper Limit: 126 115 130
Compounds: Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene		Concentration ug/L (ppb) <0.35 <1 <1 <2 <2 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-58A-10 10/19/22 10/20/22 10/20/22 Water ug/L (ppb))22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-02 102020.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 69 66 86 87	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrac Benzo(g,h,i)peryler	ene ene rene cene	$< 0.2 < 0.2 < 0.2 < 0.02 \\ < 0.02 \\ 2.8 < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.04 $		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-86B-10 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)	22	Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-03 102021.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery: 70 82 105 90	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe	ene	$<\!\!0.2 \\ <\!\!0.2 \\ <\!\!0.2 \\ <\!\!0.02 \\ 0.96 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.084 \\ 0.060 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <\!\!0.02 \\ <$		
Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrad Benzo(g,h,i)peryler	rene cene	<0.02 <0.02 <0.04		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Dup 2-1022 10/19/22 10/20/22 10/20/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 210273-04 102022.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromophe: Terphenyl-d14	nol	% Recovery: 66 82 109 92	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe	ene	$< 0.2 \\ < 0.2 \\ < 0.2 \\ < 0.02 \\ 2.6 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \\ < 0.02 \end{aligned}$		
Benzo(k)fluorantho Indeno(1,2,3-cd)py Dibenz(a,h)anthrae Benzo(g,h,i)peryler	rene cene	<0.02 <0.02 <0.02 <0.04		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 10/20/22 10/20/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	AECOM T-30, F&BI 210273 02-2550 mb2 102017.D GCMS12 JCM
Surrogates: Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	nol	% Recovery:	Lower Limit: 11 44 10 50	Upper Limit: 173 108 140 150
Compounds:		Concentration ug/L (ppb)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrace	ene ene ene cene	$< 0.2 \\< 0.2 \\< 0.2 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 \\< 0.02 $		
Benzo(g,h,i)peryler		<0.02 <0.04		

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 210263-07 (Duplicate)								
Reporting	Sampl	le Dup	olicate	RPD				
Units	Resul	t Re	esult	(Limit 20)				
ug/L (ppb)	250	2	270	8				
Laboratory Code: Laboratory Control Sample								
Roporting	Sniko		Accontanco					
Units	Level	LCS	Criteria	_				
ug/L (ppb)	1,000	115	69-134	-				
	Reporting Units ug/L (ppb) oratory Contro Reporting Units	ReportingSampleUnitsResulug/L (ppb)250oratory Control SampleReportingSpikeUnitsLevel	Reporting UnitsSample ResultDup Unitsug/L (ppb)2502oratory Control Sample ReportingPercentReportingSpikeRecovery LCS	Reporting UnitsSample ResultDuplicate Resultug/L (ppb)250270oratory Control SamplePercentReportingSpikeRecoveryAcceptance UnitsLevelLCSCriteria				

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample Silica Gel								
			Percent	Percent				
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD		
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)		
Diesel Extended	ug/L (ppb)	2,500	72	76	63-142	5		

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	79	63-142	6

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 210275-01 (Matrix Spike)

<i>.</i>	1 /			Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	\mathbf{MS}	Criteria
Benzene	ug/L (ppb)	10	< 0.35	99	50-150
Toluene	ug/L (ppb)	10	<1	101	50 - 150
Ethylbenzene	ug/L (ppb)	10	<1	101	50 - 150
m,p-Xylene	ug/L (ppb)	20	<2	101	50 - 150
o-Xylene	ug/L (ppb)	10	<1	100	50 - 150

Laboratory Code: Laboratory Control Sample

	,		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Benzene	ug/L (ppb)	10	102	98	70-130	4
Toluene	ug/L (ppb)	10	104	99	70-130	5
Ethylbenzene	ug/L (ppb)	10	105	100	70-130	5
m,p-Xylene	ug/L (ppb)	20	105	100	70-130	5
o-Xylene	ug/L (ppb)	10	104	98	70-130	6

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22 Date Received: 10/19/22 Project: T-30, F&BI 210273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample

Laboratory Code. Laboratory Co	1		Percent	Percent		
Amaluta	Reporting Units	Spike	Recovery LCS	Recovery LCSD	Acceptance	RPD
Analyte	Units	Level	LUS	LUSD	Criteria	(Limit 20)
Naphthalene	ug/L (ppb)	5	79	77	62-97	3
2-Methylnaphthalene	ug/L (ppb)	5	80	75	64-101	6
1-Methylnaphthalene	ug/L (ppb)	5	81	76	64-93	6
Acenaphthylene	ug/L (ppb)	5	87	84	70-130	4
Acenaphthene	ug/L (ppb)	5	85	83	70-130	2
Fluorene	ug/L (ppb)	5	87	83	70-130	5
Phenanthrene	ug/L (ppb)	5	90	89	70-130	1
Anthracene	ug/L (ppb)	5	88	86	70-130	2
Fluoranthene	ug/L (ppb)	5	92	90	70-130	2
Pyrene	ug/L (ppb)	5	89	85	70-130	5
Benz(a)anthracene	ug/L (ppb)	5	89	86	70-130	3
Chrysene	ug/L (ppb)	5	90	88	70-130	2
Benzo(a)pyrene	ug/L (ppb)	5	90	87	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	5	92	89	70-130	3
Benzo(k)fluoranthene	ug/L (ppb)	5	92	88	70-130	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	86	83	70-130	4
Dibenz(a,h)anthracene	ug/L (ppb)	5	86	87	70-130	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	85	85	70-130	0

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

 ${\rm J}$ - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Appendix H

Groundwater Sampling Summary

Data Quality Review Reports



Memorandum

AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 www.aecom.com 206 438 2700 tel 866 495 5288 fax

То	Paul Kalina, Project Manager	Info	FINAL
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	April 2022 Groundwater Sampling		
	Lucy Panteleeff, Chemist		
From	Jennifer B. Garner, Chemist		
Date	September 19, 2022		

The summary data quality review of three groundwater samples collected on April 14, 2022, has been completed. The samples were analyzed at Freidman and Bruya, Incorporated (F&BI) located in Seattle, Washington for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B and total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology Methods NWTPH-Gx (gasoline-range TPH) and NWTPH-Dx (diesel-range and motor oil-range TPH) with silica gel cleanup and NWTPH-Dx (diesel-range and motor oil-range TPH) without silica gel cleanup. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-0422). The following samples are associated with F&BI laboratory group 204253:

Sample ID	Laboratory ID	Requested Analyses
RW-11A-0422	204253-01	BTEX, NWTPH-Gx, NWTPH-Dx
MW-100-0422 (duplicate of MW-89-0422)	204253-04	BTEX, NWTPH-Gx, NWTPH-Dx
MW-89-0422	204253-05	BTEX, NWTPH-Gx, NWTPH-Dx

Data were evaluated based on laboratory QC criteria and validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.



Summary Data Quality Review Port of Seattle - T 30 April 2022 Groundwater Sampling Laboratory Group: 204253

• DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Sample Receipt

Upon receipt by the laboratory, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. The coolers were received at temperatures within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C. Sample volume intended for use as the matrix spike and matrix spike duplicate (MS/MSD) for sample RW-11A were listed individually on the COC. The laboratory logged the samples as primary samples (204253-2 and 204253-3), and an MS/MSD was not analyzed.

Organic Analyses

Samples were analyzed for BTEX and TPHs by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable
- 4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Acceptable
- 5. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>General</u> – MS/MSDs were not performed due to the login error described above. Precision and accuracy were assessed using LCS/LCSD results and/or field duplicate results

6. Laboratory Duplicate – Acceptable (applicable to BTEX and gasoline-range TPH only)

<u>BTEX by EPA 8021B</u> – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

<u>Gasoline-range TPH by NWTPH-Gx</u> – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

7. Field Duplicate – Acceptable

<u>General</u> – A field duplicate was submitted for MW-89 and identified as MW-100. Results were comparable with the following exception.

Toluene and total xylenes were not detected in MW-89 but were detected in MW-100 at concentrations greater than five times the reporting limits; therefore, the results for toluene and total xylenes in MW-89 and MW-100 were qualified as estimated and flagged 'J' or 'UJ' based on these field duplicate results.



Summary Data Quality Review Port of Seattle - T 30 April 2022 Groundwater Sampling Laboratory Group: 204253

- 8. Reporting Limits Acceptable
- 9. Other Items of Note:

<u>Diesel-range and Motor Oil-range TPH by NWTPH-Dx</u> – The laboratory noted that the diesel-range and motor oil-range hydrocarbon patterns in RW-11A, MW-100, and MW-89 did not resemble the fuel standards used for quantitation. No qualifiers were assigned based on these qualitative observations.

Overall Assessment of Data

The data reported in this laboratory group are considered to be usable for meeting project objectives. The completeness for F&BI laboratory group 204253 is 100%.

Sample ID	Lab ID	Analyte	Result	Units	Final Result
MW-100	204253-04	Toluene	6.8	ug/L	6.8 J
MW-100	204253-04	Total Xylenes	7.7	ug/L	7.7 J
MW-89	204253-05	Toluene	1 U	ug/L	1 UJ
MW-89	204253-05	Total Xylenes	3 U	ug/L	3 UJ

Table 1. Summary of Qualified Data



Memorandum

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То	Paul Kalina, Project Manager	Info	FINAL
	Summary Data Quality Review		
	Port of Seattle – T-30		
Subject	October 2022 Groundwater Sampling		
	Lucy Panteleeff, Chemist		
From	Jennifer B. Garner, Chemist		
Date	November 9, 2022		

The summary data quality review of fifteen groundwater samples collected on October 13 and October 19, 2022, has been completed. The samples were analyzed at Freidman and Bruya, Incorporated (F&BI) located in Seattle, Washington for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260D, total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology Methods NWTPH-Gx (gasoline-range TPH) and NWTPH-Dx (diesel-range and motor oil-range TPH) with silica gel cleanup (SGC) and NWTPH-Dx (diesel-range and motor oil-range TPH) with silica gel cleanup. Select samples got polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270E modified by selected ion monitoring (SIM). The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-1022). The following samples are associated with F&BI laboratory groups 210207 and 210273:

	Laboratory	Laboratory	
Sample ID	Group	ID	Requested Analyses
RW-11A-1022	210207	210207-01	BTEX, NWTPH-Gx, NWTPH-Dx
MW-36A-1022		210207-02	BTEX, NWTPH-Gx, NWTPH-Dx
MW-39A-1022		210207-03	BTEX, NWTPH-Gx, NWTPH-Dx
MW-42-1022		210207-04	BTEX, NWTPH-Gx, NWTPH-Dx
RW-9-1022		210207-05	BTEX, NWTPH-Gx, NWTPH-Dx
MW-93-1022		210207-06	BTEX, NWTPH-Gx, NWTPH-Dx
RW-5A-1022		210207-07	BTEX, NWTPH-Gx, NWTPH-Dx
MW-45A-1022		210207-08	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
MW-46B-1022		210207-09	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
MW-92-1022		210207-10	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
Dup 1-1022 (Field duplicate of RW-11A-1022)		210207-11	BTEX, NWTPH-Gx, NWTPH-Dx
MW-89-1022	210273	210273-01	BTEX, NWTPH-Gx, NWTPH-Dx
MW-58A-1022		210273-02	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
MW-86B-1022		210273-03	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
Dup 2-1022 (Field duplicate of MW-86B-1022)		210273-04	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs

Data were evaluated based on laboratory QC criteria and validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix



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spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR Do Not Report. Another result is available that is more reliable or appropriate.

Sample Receipt

Upon receipt by the laboratory, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. No discrepancies related to sample identification were noted and the coolers were received by the laboratory at temperatures within the EPA recommended limits of greater than 0°C and less than or equal to 6°C.

Organic Analyses

Samples were analyzed for BTEX, TPHs and PAHs by the methods identified in the introduction of this report.

- 1. Holding Times Acceptable
- 2. Blanks Acceptable
- 3. Surrogates Acceptable except as noted below:

<u>Diesel-range and Motor Oil-range TPH by NWTPH-Dx (No SGC)</u> – The percent recoveries for o-terphenyl in MW-58A (176%) and RW-9 (167%) exceeded the control limits of 41-152%. The results for diesel-range TPH and motor oil-range TPH in MW-58A and RW-9 were qualified as estimated and flagged 'J' based on these surrogate results.

- 4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Acceptable
- 5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Acceptable except as noted below:

<u>Gasoline-range TPH by NWTPH-Gx</u> – An MS/MSD was performed using MW-45A. The percent recovery for gasoline-range TPH in the MS (118%) exceeded the control limits of 53-



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117%. The percent recovery in the MSD and the relative percent difference (RPD) for the MS/MSD pair were acceptable; therefore, data were not qualified for gasoline-range TPH based on the elevated MS recovery.

<u>Diesel-range and Motor Oil-range TPH by NWTPH-Dx (SGC)</u> – An MS/MSD was performed using MW-45A. The RPD for diesel-range TPH (22%) exceeded the control limit of 20%. The percent recoveries for diesel-range TPH in the MS and the MSD were acceptable; therefore, data were not qualified based on the elevated RPD.

<u>PAHs by EPA 8270E-SIM</u> – An MS/MSD was performed using MW-45A. The percent recovery (42%) and the RPD (40%) for acenaphthene in MW-45A were outside the control limits of 50-150% and 20%, respectively. The result for acenaphthene in MW-45A was qualified as estimated and flagged 'J' based on the MS/MSD results.

6. Laboratory Duplicate – Acceptable (applicable to gasoline-range TPH only)

<u>Gasoline-range TPH by NWTPH-Gx</u> – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

7. Field Duplicate – Acceptable

<u>General</u> – Field duplicates were submitted for RW-11A and MW-86B and identified as Dup 1 and Dup 2, respectively. Results greater than five times the reporting limit were comparable with the following exception.

<u>PAHs by EPA 8270E-SIM</u> – The RPD for acenaphthene (92%) exceeded 45% in the MW-86B/Dup 2 field duplicate pair. The results for acenaphthene in MW-86B and Dup 2 were qualified as estimated and flagged 'J' based on this field duplicate result.

- 8. Reporting Limits Acceptable
- 9. Other Items of Note:

<u>Diesel-range and Motor Oil-range TPH by NWTPH-Dx (No SGC)</u> – The laboratory noted that the diesel-range and/or motor oil-range hydrocarbon patterns for all of the samples reported in laboratory groups 210207and 210273 did not resemble the fuel standards used for quantitation. No qualifiers were assigned based on these qualitative observations.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for F&BI laboratory groups 210207and 210273 is 100%.



Summary Data Quality Review Port of Seattle - T-30 October 2022 Groundwater Sampling Laboratory Groups: 210207 and 210273

Sample ID	Lab ID	Analyte	Result	Units	Final Result
RW-9	210207-05	Diesel-range TPH	9,500	ug/L	9,500 J
RW-9	210207-05	Motor Oil-range TPH	2,000	ug/L	2,000 J
MW-45A	210207-08	Acenaphthene	3.7	ug/L	3.7 J
MW-58A	210273-02	Diesel-range TPH	6,300	ug/L	6,300 J
MW-58A	210273-02	Motor Oil-range TPH	900	ug/L	900 J
MW-86B	210273-03	Acenaphthene	0.96	ug/L	0.96 J
Dup 2	210273-03	Acenaphthene	2.6	ug/L	2.6 J

Table 1. Summary of Qualified Data

<u>Appendix I</u> Select Figures from the Groundwater Compliance Monitoring Plan

