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January 12, 2022

Ms. Connie Groven
Washington State Department of Ecology
Southwest Regional Office
300 Desmond Drive SE
Lacey, Washington 98503

SUBJECT: 2021 ANNUAL PROGRESS REPORT FOR THE K PLY SITE

Dear Ms. Groven:

This Annual Progress Report has been prepared by Floyd|Snider on behalf of the Port of Port Angeles (Port) to meet the reporting requirements of the 2015 Agreed Order No. DE 11302 with the Washington State Department of Ecology (Ecology) for the K Ply Site (Site). The Site is located at 439 Marine Drive in Port Angeles, Washington.

The objective of this report is to describe work performed from December 2020 to November 2021.

AGREED ORDER ACTIVITIES COMPLETED

Groundwater samples were collected in April 2021 and October 2021 from 14 wells in the long-term monitoring network in accordance with the Ecology-approved Confirmational Monitoring Plan (Engineering Design Report [EDR]; Floyd|Snider 2015a).

Soil samples were collected from 29 borings in April 2021 during the first post-remediation long-term soil monitoring event in accordance with the EDR (Floyd|Snider 2015a) and the Long-Term Soil Monitoring Plan (Floyd|Snider 2021).

GROUNDWATER COMPLIANCE MONITORING RESULTS

This section presents the groundwater monitoring results from the April 2021 and the October 2021 monitoring events. Except where deviations are noted, the field methods used were conducted in accordance with the Ecology-approved Sampling and Analysis Plan/ Quality Assurance Project Plan (SAP/QAPP; Appendix G of the EDR; Floyd|Snider 2015a). The groundwater data from these monitoring events were loaded to Ecology's Environmental Information Management (EIM) database in May 2021 and December 2021. Notification of acceptance of the data into the EIM database was received for the April data in June 2021 but has not yet been received for the October data.

Semiannual Groundwater Compliance Monitoring

The list of long-term monitoring wells includes 4 conditional point of compliance (CPOC) wells (PP-17, PP-18R2, PP-19, and PP-34) and 10 performance monitoring wells (PP-13R, PP-14R, PP-15R2, PP-27, PP-29, PP-30, PP-32, PP-33, PP-36, and PP-37R). Monitoring well locations are shown in Figure 1a. Groundwater samples were collected using standard low-flow sampling methods. Purge water was collected and placed in a 55-gallon drum stored on site for profiling and offsite disposal by Clean Harbors as industrial wastewater. All compliance monitoring samples were submitted to Fremont Analytical, Inc., of Seattle, Washington, under chain-of-custody procedures for analysis of gasoline-, diesel-, and oil-range organics (GRO, DRO, and ORO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and sulfate.

Field water quality parameters, including specific conductivity, pH, dissolved oxygen (DO), oxidation reduction potential (ORP), temperature, and turbidity, were field-monitored during sampling of all wells using a YSI Pro DSS water quality meter and LaMotte 2020we turbidimeter. Field parameters are presented in Table 1. In general, groundwater at the Site is reducing with low DO content and historically negative ORP measurements. The DO has been historically less than 1 milligram per liter (mg/L); the site-wide average DO was 0.77 mg/L in April and 1.3 mg/L in October. The ORP, which has previously been negative across the Site, is becoming more neutral. Based on previous observations and water level measurements collected from each location during sampling, groundwater flow is generally to the north, with some mounding in the backfilled portions of the Site.

Data Quality

As described in the SAP/QAPP (Appendix G of the EDR; Floyd|Snider 2015a), a Compliance Screening (Stages 1 & 2A) data quality review was performed on total petroleum hydrocarbons (TPHs), select volatile organic compounds, and sulfate data resulting from laboratory analysis. The analytical data were validated in accordance with the *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA 2020).

A total of 15 groundwater samples and 1 trip blank were submitted in one sample delivery group (SDG) for each event, including delivery groups 2104297 (April 2021) and 2110197 (October 2021), to Fremont Analytical of Seattle, Washington, for chemical analysis by NWTPH-Dx, NWTPH-Gx, USEPA Method 8260D, and USEPA Method 300.0. For all sample delivery groups, the analytical holding times were met, and the method blanks had no detections. The matrix spike (MS), matrix spike duplicate (MSD), laboratory control sample (LCS), and laboratory control sample duplicate (LCSD) recoveries and sample/sample duplicate, LCS/LCSD, and MS/MSD relative percent differences all met U.S. Environmental Protection Agency (USEPA) and QAPP requirements.

No notations were made by Fremont Analytical regarding the chromatograms. A review of the chromatograms showed an adequate match to standards, and results will be reported without qualifiers or chromatogram notes.

Based on the data quality review, data are determined to be of acceptable quality for use as reported by the laboratory unless specifically qualified.

Quantification of NWTPH-Dx Results in Groundwater

For consideration of potential contingency action to address ongoing ORO exceedances in groundwater at the CPOC (refer to Table 1 in Attachment 1), additional coordination was conducted with the laboratory following the October 2021 event to perform a more detailed quantification of DRO and ORO in groundwater. The data review involved coordination with the laboratory to review sample preparation methodology, chromatograms, and laboratory-specific judgments regarding TPH quantification allowed within the NWTPH-Dx method.

Comparison of the chromatograms from groundwater across the Site showed that the chromatograms generally exhibit a single peak within the C12 to C24 range, which overlaps the typical carbon ranges of commercial diesel fuel and hydraulic or heavy oil. It is allowable under the NWTPH-Dx method to either quantify this peak as a single petroleum product that it most closely resembles according to the professional judgment of the analytical chemist, or to quantify both DRO and ORO within the peak according to pre-defined carbon ranges established by the analytical laboratory. It is Fremont Analytical's protocol to quantify peaks as a single petroleum product according to the professional judgment of the analytical chemist. Historically at the Site, the laboratory has interpreted and quantified NWTPH-Dx results as ORO.

Further detailed review of the NWTPH-Dx chromatograms with the laboratory concluded that the post-remediation groundwater results collected across the K Ply excavation area are generally consistent with a weathered diesel product rather than hydraulic oil. Groundwater samples previously analyzed with silica gel cleanup have also resulted in a decrease in DRO and ORO concentrations of up to 60%, which is expected for groundwater samples with highly weathered petroleum. These results are consistent with the conceptual site model (CSM) of the presence of residual contamination in soil of weathered diesel that has heavier carbon chains that overlap with ORO. Therefore, post-remediation groundwater results from 2016 through April 2021, which were reported by the laboratory as ORO, are more likely to represent weathered diesel product and will be discussed as DRO. NWTPH-Dx results collected in October 2021 were quantified by the laboratory as DRO. These reported DRO results account for the total DRO and ORO carbon ranges present in the groundwater samples, as ORO was reported as non-detect for all October 2021 samples. The reported DRO results are appropriate for comparison to the established Site CUL for DRO, as the DRO and ORO carbon ranges represented are presumed to result from the same weathered diesel source of residual groundwater contamination.

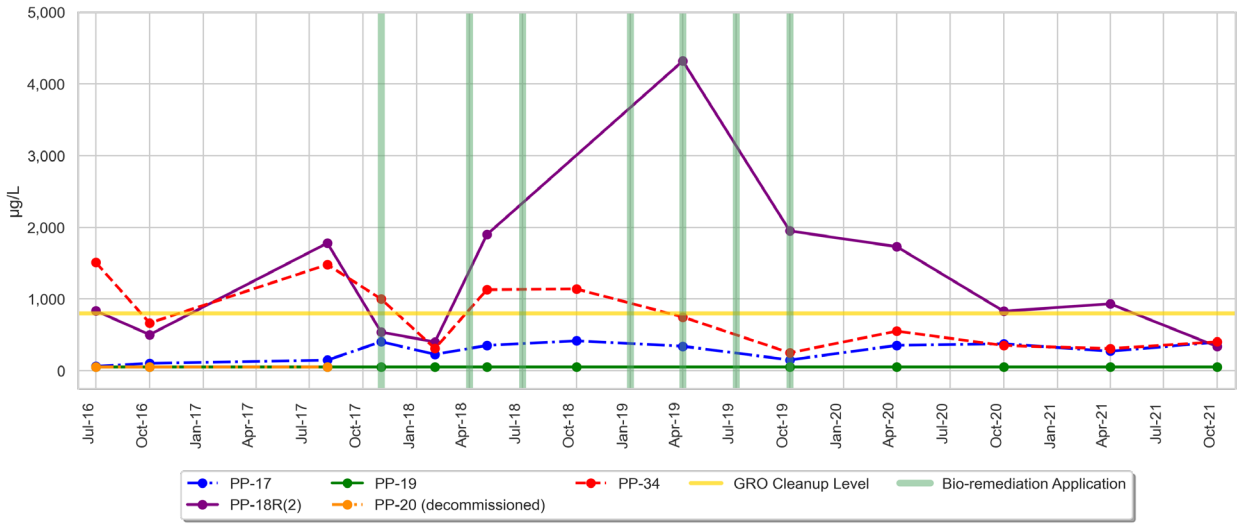
Groundwater Analytical Results

Analytical results for the 2021 post-remediation groundwater monitoring are presented in Table 2 and on Figures 1a through 7. The 2021 groundwater results are discussed separately by contaminant group: GRO, DRO, ORO, and benzene, followed by a discussion of sulfate. For reference, the cumulative post-remediation groundwater monitoring results from 2016 to 2021 are presented in Tables 1 and 2 of Attachment 1.

Gasoline-Range Organics: GRO concentrations in groundwater at the CPOC have generally decreased or remained stable since the previous sampling events, and the results from the most recent October monitoring event resulted in GRO concentrations less than the cleanup level (CUL) of 800 micrograms per liter (µg/L) at all four CPOC wells (PP-17, PP-18R2, PP-19, and PP-34) and PP-37R immediately upgradient of the CPOC. The replacement well PP-18R2, a CPOC well, had concentrations of GRO at 933 µg/L in April 2021 and 337 µg/L in October 2021, which is following a steady decrease of GRO concentrations at this location from 4,320 µg/L since the monitoring well was reinstalled in March 2019. This well was reinstalled within a seam of residually contaminated soil along the bulkhead, with known concentrations of GRO exceeding the soil CUL; however, the most recent GRO concentration observed in groundwater at PP-18R2 resulted in GRO concentrations less than the CUL for the first time since replacement, indicating that the residually contaminated seam is attenuating.

The most recent GRO concentrations in groundwater from April and October 2021 are presented in Figures 1a and 1b, respectively. All post-remediation GRO concentrations in CPOC wells are shown in Figure 2.

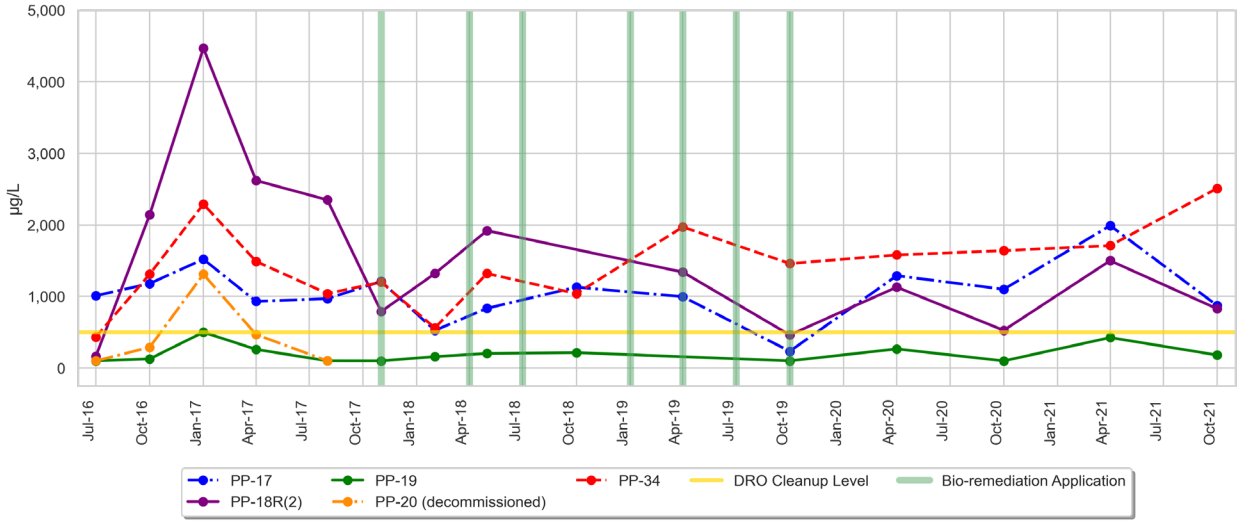
Figure 2
Post-Remediation CPOC GRO Concentrations in Groundwater



Diesel-Range Organics: As discussed previously, the quantification of petroleum concentrations by analytical method NWTPH-Dx are more consistent with DRO (as weathered diesel), rather than ORO. Therefore, it is presumed that ORO concentrations reported in 2016 through April 2021 (Table 1 of Attachment 1) are more consistent with a weathered diesel product and should be quantified as DRO. These results are discussed as DRO below.

DRO concentrations in groundwater have remained relatively stable with seasonal variability since remediation was completed in 2016. DRO concentrations measured in groundwater from CPOC well PP-19 on the northwestern extent of the CPOC have consistently been non-detect or less than the Site CUL of 500 µg/L. Groundwater samples from the other three CPOC wells (PP-17, PP-18R2, and PP-34) consistently demonstrate exceedances of DRO at concentrations ranging from 1.1 to 5 times the Site CUL of 500 µg/L. Although silica gel cleanup was not performed on samples collected in 2021, previous silica gel cleanup analyses have resulted in decreased concentrations of approximately 20% to 30% and up to 60% in some samples. This indicates that sustained DRO concentrations detected in groundwater may be partially attributed to naturally occurring organics in the aquifer and fuel metabolites as well as TPH. The most recent DRO concentrations in groundwater are illustrated on Figure 3a (ORO as weathered diesel) from April 2021 and Figure 3b (DRO as weathered diesel) from October 2021. The post-remediation DRO concentrations in CPOC wells are shown in Figure 4.

Figure 4
Post-Remediation CPOC DRO Concentrations in Groundwater



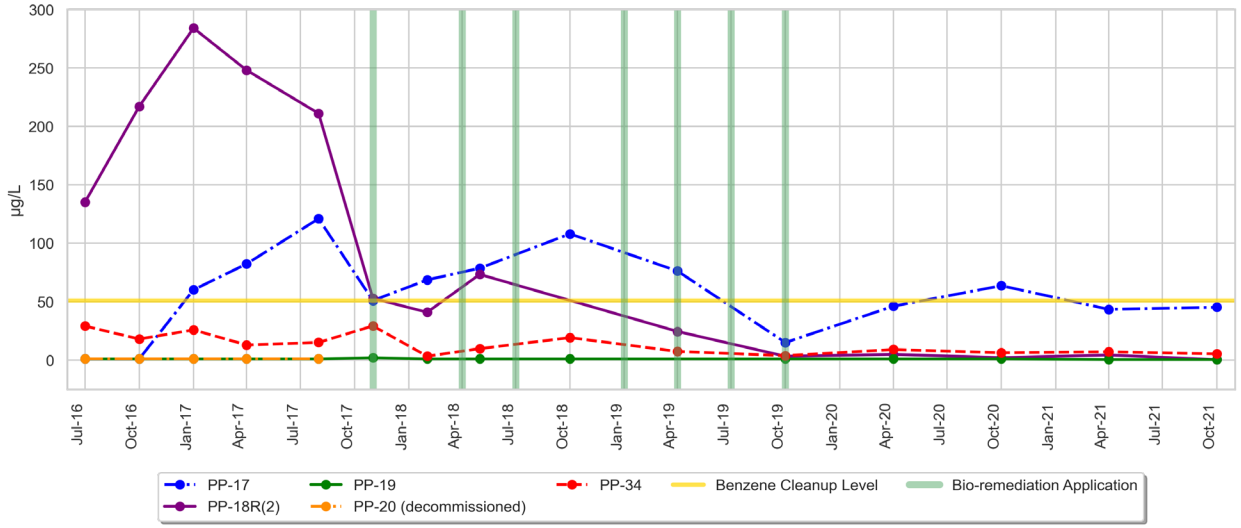
Note: The results displayed in Figure 4 depict groundwater concentrations of ORO quantified as weathered diesel between July 2016 and April 2021, and DRO quantified as weathered diesel in October 2021.

Oil-Range Organics: ORO concentrations resulting from hydraulic oil in groundwater comply with the Site CUL of 500 µg/L at the CPOC based on the October 2021 monitoring results. ORO in aqueous phase was not historically present in groundwater at elevated concentrations, which is consistent with 2021 analytical results and the revised TPH quantification of ORO as described

above. In October 2021, ORO was not detected in any monitoring well. This is consistent with the Remedial Investigation (RI) findings that ORO was not detected in most groundwater samples from the southern portion of the former mill building (Area 5) or in the northern portion of the former Mill Building and bulkhead (Area 6) (Floyd|Snider 2015b). Because ORO was not detected in any monitoring wells in October 2021, there is no figure depicting ORO results in groundwater for October 2021. In accordance with the explanation in the *Quantification of NWTPH-Dx Results in Groundwater* section, Figure 3a presents ORO concentrations interpreted as weathered diesel from April 2021, which is discussed in the DRO section.

Benzene: Benzene concentrations in groundwater across the Site continue to decrease but also continue to fluctuate with seasonal variations. The 2021 benzene concentrations measured in the CPOC well network are all less than the remediation level of 51 µg/L. Benzene concentrations in three of the four CPOC wells (PP-19, PP-18R2, and PP-34) are consistently less than the Site CUL of 51 µg/L during the last 2 years of monitoring. The benzene concentration in groundwater from CPOC well PP-17 located downgradient of the upland benzene groundwater plume has ranged from less than the Site CUL to greater than 2 times the CUL since compliance monitoring began in 2016. Both 2021 samples collected from PP-17 resulted in benzene concentrations less than the Site CUL at 43.4 µg/L in April 2021 and 45.2 µg/L in October 2021. These concentrations are expected to continue fluctuating due to residual source mass in soil near PP-15R2 that is contributing to elevated groundwater concentrations; however, the latest benzene concentrations show that groundwater concentrations are successfully attenuating before reaching the CPOC. The most recent benzene concentrations in groundwater are presented on Figures 5a and 5b. Figure 6 graphically presents all post-remediation benzene concentrations in CPOC wells.

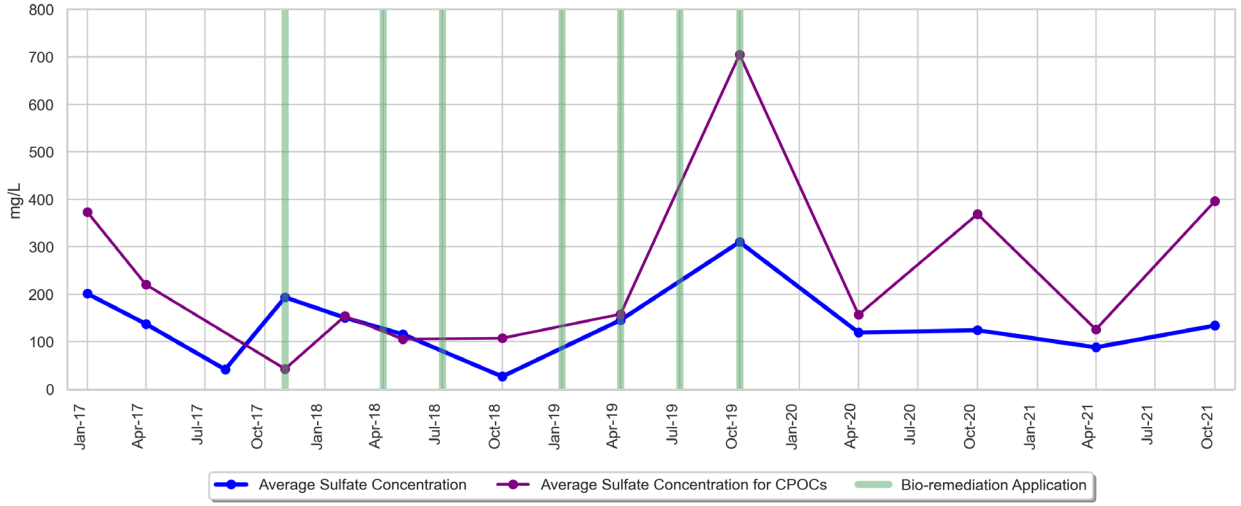
Figure 6
Post-Remediation CPOC Benzene Concentrations in Groundwater



No other Agreed Order activities were completed during this reporting period; however, sulfate concentrations were analyzed during both monitoring events to continue assessing the residual effects of the sulfate-rich bio-amendment applications and injections completed between 2017 to promote anerobic degradation of benzene.

Sulfate: Sulfate was analyzed in groundwater samples from all 14 wells in the long-term monitoring network to track post-amendment concentrations and evaluate residual sulfate concentrations after pausing seawater injections in 2020 and 2021. The last bio-amendment application of seawater occurred in October 2019, and sulfate concentrations have been analyzed every 6 months since then. From the last 2 years of monitoring without sulfate applications, the site-wide average concentration has stabilized around 100 mg/L. The sulfate concentrations at the CPOC are regularly greater than site-wide concentrations due to tidal mixing with groundwater so sulfate concentrations are biased high relative to the rest of the aquifer. The site-wide sulfate concentrations have not been depleted even without sulfate-loading through seawater injections. Additionally, the slight apparent increase in DO and ORP suggests that the aquifer may be trending away from methanogenesis (observed in early post-remediation conditions) and sulfate-reducing conditions toward a more oxidizing state. Continued monitoring is necessary to verify these observations. Figure 7 shows the average sulfate concentrations for each post-amendment groundwater sampling event (at the CPOC and site-wide). The 2021 laboratory results for sulfate are included in Table 2. The cumulative post-remediation results of sulfate and all other conventional parameters analyzed since the 2016 remediation are listed in Table 2 of Attachment 1.

Figure 7
Average Site-Wide and CPOC Sulfate Concentrations in Groundwater



Assessment of In Situ Treatment of Groundwater with Bio-Amendments

Following the completion of excavation and the initial injection of oxygen-rich bioremediation amendments at the Site in 2016, groundwater was assessed to have low to high concentrations of contaminants and low DO. Per Table 3.2 in the EDR, additional bio-amendments with sulfate (as electron acceptors) to Site groundwater were injected to support degradation of contaminants. In November 2017, two targeted areas around PP-14R and PP-37R were injected with activated carbon amended with magnesium sulfate to control plume migration per recommendations in the September 28, 2017, memorandum (Floyd|Snider 2017). In conjunction with these carbon injections, bio-amendment applications consisting of magnesium sulfate and seawater injections into upland infiltration galleries (IGs) began in 2017 and reoccurred every 3 to 6 months until October 2019 to promote anaerobic degradation of benzene under sulfate-reducing conditions. A summary of the bio-amendment applications to date is included in Table 3.

No bio-amendment applications were made to the Site during the 2020 or 2021 monitoring years to allow the aquifer to recover to a state of equilibrium and to gauge the effectiveness of the bio-amendment process on groundwater conditions. The groundwater analytical results from 2021 presented in this report were used to assess if sulfate-loading via seawater injections is benefitting the overall recovery of the Site, and if ongoing bio-amendment is recommended.

In general, the groundwater concentrations of COCs have decreased and/or stabilized since active remediation was completed in 2016. The spike in GRO at the CPOC (refer to Figure 2) was due to reinstallation of monitoring well PP-18R2 within a seam of residually contaminated soil in March 2019, however, the GRO concentrations at PP-18R2 have declined to less than the GRO concentrations measured in groundwater in 2017 and 2018 from PP-18R, which was the former well location originally installed in backfill south of the residually contaminated bulkhead soils where PP-18R2 is currently located. This location is within the CPOC where tidal mixing with groundwater is likely promoting natural attenuation of GRO and benzene. Aside from PP-18R2, the past 2 years of monitoring without seawater injections has not shown any significant change in COC concentrations at any other location across the Site. Slight variations in groundwater concentrations during the bio-amendment applications may be attributed to temporary dissolution from groundwater treatment, or from seasonal variation between spring and fall.

The bench-scale test of injecting activated carbon at PP-14R seems to have had the most significant improvement of any of the bio-amendment applications. GRO and benzene concentrations at PP-14R have declined by over 90% to less than CULs demonstrating the effectiveness of the activated carbon-magnesium sulfate injections. However, there is no conclusive evidence that the injections had any effect on DRO concentrations as they do not appear to be declining at this location. Further evaluation is recommended to assess alternative remedial options for DRO exceedances in groundwater.

Table 3
Summary of Bio-Amendments

Date	Bio-Amendment	Location Applied (Figure 1a)
November 2017	$MgSO_4$ injection, 3,500 pounds (17 percent solution) with 2,000 gallons chase water per IG	Area 6: IGs 3, 4, and 5
	$MgSO_4$ (400 pounds total) and activated carbon (1,200 pounds total) slurry direct injected via Geoprobe	Vicinity of PP-37R and PP-14R
	Land spread $CaSO_4$, 8,000 pounds	Area 5
April 2018	Land spread $CaSO_4$, 8,000 pounds	Excavation footprint
July 2018	Injected 30,000 gallons of seawater followed by 2,000 gallons chase water per IG	IGs 4 and 5
January 2019	Injected 20,000 gallons of seawater followed by 1,000 gallons chase water per IG	IGs 2, 3, 4, and 5
April 2019		
July 2019		
October 2019		

Abbreviations:
$CaSO_4$ Calcium sulfate
IG Infiltration gallery
$MgSO_4$ Magnesium sulfate

GROUNDWATER MONITORING CONCLUSIONS AND RECOMMENDATIONS

- Post-remediation groundwater conditions are gradually declining or stabilized across the Site with seasonal variability accounting for minor increased concentrations. Data indicate that GRO and benzene concentrations in groundwater continue to decline, with recent concentrations less than the Site cleanup standards at the CPOC.
- The 2021 sampling events show reduced benzene concentrations compared to the concentrations detected before and during bio-amendment application (conducted from 2017 to 2019); however, the 2020 and 2021 COC concentrations measured following a hiatus of the bio-amendment applications do not provide any conclusive trends to demonstrate the effectiveness of seawater injections.
    - It is recommended that sulfate analyses be eliminated during future monitoring events and that DO and ORP field parameters be used to track oxidizing or reducing conditions of the aquifer.

- A laboratory re-review of chromatograms with the CSM indicate that groundwater concentrations resulting from NWTPH-Dx analyses are indicative of a weathered diesel product with carbon chains overlapping both DRO and ORO. October 2021 groundwater results indicate that hydraulic oil as ORO is non-detect and remains in compliance with cleanup standards at the CPOC and weathered diesel as DRO concentrations in groundwater have remained stable generally with exceedances of 1.1 to 5 times the CUL.
- It is recommended that groundwater samples be analyzed with and without silica gel cleanup during the 2022 monitoring events. These results will be used to further assess the composition of measured DRO, including contributions from polar metabolites and natural organic matter and will provide information that may help to inform potential contingency actions.

The Agreed Order prescribes a restoration time frame for groundwater at the CPOC of 10 years. The current data, representing 5 years since completion of remedial actions, is in alignment with this time frame expectation for the majority of COCs. DRO concentrations since completion of remedial actions have remained relatively stable, with exceedances ranging generally between 1 and 5 times the CUL at the CPOC. The addition of silica gel cleanup of groundwater samples analyzed in 2022 may support the evaluation of degradation of DRO and inform whether contingency treatment is necessary to meet CULs for DRO at the CPOC by 2026.

SOIL COMPLIANCE MONITORING RESULTS

This section presents the April 2021 soil monitoring results from the first post-remediation monitoring event (conducted every 5 years). This event is intended to track progress of the long-term natural attenuation of residually contaminated soil left in place in Areas 5 and 6 during the 2015/2016 remedial excavation. Residually contaminated soil impacted with GRO and DRO at concentrations greater than CULs but less than remediation levels was left in place below the water table in Area 5. Soil in Area 6 was excavated until all confirmation samples were below CULs, however a small area near the bulkhead at the north end of Area 6 with GRO impacts was left in place where excavation had the potential to damage the bulkhead (refer to Figures 8a through 8c). Except where deviations are noted, the field methods used were conducted in accordance with the SAP/QAPP (Appendix G of the EDR; Floyd|Snider 2015). The soil data from this monitoring event were loaded to Ecology's EIM database in May 2021. Notification of acceptance of the data into the EIM database was received in June 2021.

Five-Year Soil Compliance Monitoring

The first post-remediation long-term soil monitoring event took place between April 20 and 21, 2021. Soil samples were collected from 29 locations, 1 sited in each cell of a 40-foot by 40-foot grid, extending laterally from the limits of the excavation in areas where residual contamination was established during the RI and Feasibility Study (FS), using an extension of the same sampling grid established for excavation confirmational sampling. Soil was collected by direct-push probe,

and samples were analyzed for DRO; ORO; GRO; and BTEX. Analytical results and soil boring locations are presented on Figures 8a, 8b, and 8c for GRO, DRO, and benzene (respectively).

Proposed boring locations were marked out for drilling with a handheld global positioning device (GPS) with sub-meter accuracy. The proposed location adjacent to Cedar Street (A14) and the locations in the alley (B16, C16, D16, C17, and D17) were adjusted in the field to avoid drilling near underground utilities. These locations were adjusted to within 10 feet of the proposed location and within the respective grid cells. These new locations were recorded with the GPS and will be retained for subsequent monitoring events. All other locations were drilled at the proposed locations.

One soil sample was collected from each boring at the depth interval with the strongest field indications of contamination (i.e., sheen, odor, elevated photoionization detector [PID] readings). If no contamination was observed, a soil sample was collected from a similar interval of the nearest historical boring with contamination or within the smear zone where contamination was consistently encountered during previous site investigations. PID measurements collected in the field from the interval sampled at each boring are summarized in Table 4. 2021 soil boring and historical soil boring locations and the exceedance status for the respective COCs are presented on Figures 8a, 8b, and 8c for reference.

One boring, A14, exhibited two distinct intervals of contamination, so two soil samples were collected from this location, one within each interval, and both samples were analyzed for the suite of COCs.

Cultural Resource Monitoring

Because the Site is considered sensitive for cultural resources, an archaeologist (Jennifer Ferris, HDR) was present to monitor all subsurface soil-disturbing activities. Additionally, an archaeologist (Bill White) for the Lower Elwha Klallam Tribe observed soil-disturbing activities on April 20, 2021. No precontact or historic cultural materials or anthropogenic sediments were observed within any of the soil cores. As subsequent long-term monitoring will occur within the same boring locations, the archaeologist recommends that archaeological monitoring is not necessary for future sampling under the long-term soil monitoring program; however, all long-term soil sampling should follow the inadvertent discovery protocols that are outlined in the Archaeological Monitoring and Inadvertent Discovery Plan for the K Ply Site (Attachment 3 in the Long-Term Soil Monitoring Plan [Floyd|Snider 2021]) if any cultural materials or anthropogenic sediments are identified. The archaeologist's field observations and recommendations are presented in the cultural resources monitoring report (Attachment 2). This report has been submitted on WISAARD under Department of Archaeological and Historic Preservation (DAHP) Project No. 2021-04-02418 but is pending Ecology review and consultation with DAHP.

Data Quality

A total of 32 samples were submitted in one SDG, 2104296, to Fremont Analytical for chemical analysis by NWTPH-Dx, NWTPH-Gx, and USEPA Method 8260D. The analytical holding times were met, and the method blanks had no detections. The MS, MSD, LCS, and LCSD recoveries, and LCS/LCSD, sample/sample duplicate, and MS/MSD relative percent differences all met USEPA and QAPP requirements.

The laboratory noted that for sample 2021-H13-9.5-10 the 1-bromo-4-fluorobenzene surrogate was 110% and outside laboratory control limits (87.9 to 109%) high. It was attributed to TPH interference. As the sample was also diluted due to matrix interference, only one surrogate was outside control limits by 1%, four of the five reported analytes were non-detect, and all other samples had no issues with recovery of this particular surrogate, it is with professional judgment that no results be qualified based on this surrogate recovery information alone.

The laboratory noted that the chromatogram for sample 2021-A14-6-8 indicates the presence of unresolved compounds eluting from the dodecane through tetracosane (~C12 to C24), and that this pattern resembles a continuation of the gasoline detection not quantified under NWTPH-Gx method. This will be retained as a chromatogram note.

Based on the data quality review, data are determined to be of acceptable quality for use as reported by the laboratory unless specifically qualified above.

Soil Analytical Results

Soil analytical results for the 2021 monitoring are presented in Table 4 with exceedance status illustrated on Figures 8a, 8b, and 8c. The results from this monitoring event will be used as a baseline for COC concentrations at the 29 monitoring locations for comparison with subsequent soil monitoring events (to occur every 5 years). These monitoring locations were established within the areas of residual contamination summarized in the Construction Completion Report (CCR; Floyd|Snider 2016).

These 2021 post-remediation baseline results collected around Area 5 are generally consistent with the presumed extent of residually contaminated soil documented by in situ confirmational results collected during the remedial investigation and remedial excavation, which are documented in the CCR (Floyd|Snider 2016).

The 2021 soil samples collected at the bulkhead (D1, E1, F1) show an improvement of GRO and DRO concentrations in this area. Theses samples did not replicate the DRO or GRO exceedances previously observed along the bulkhead at K-89 or SB-210 (refer to Figures 8a and 8b), which suggests that the TPH is attenuating in this area. Groundwater results from PP-18R2 also support this observation of improvements in soil concentrations because GRO in groundwater has steadily declined over the past few years.

SOIL LONG-TERM MONITORING CONCLUSIONS AND RECOMMENDATIONS

- The 2021 soil results are consistent with post-remediation confirmational monitoring results with improvements of GRO concentrations observed at the bulkhead. This suggests that the source of soil contamination has been effectively controlled by the remedial excavation; however, little attenuation has been observed in Area 5.
- Long-term soil monitoring will continue every 5 years per the compliance monitoring plan until soil concentrations have been demonstrated to be in compliance with CULs (Floyd|Snider 2015). No modifications to the compliance monitoring plan are recommended at this time.

DEVIATIONS FROM COMPLIANCE MONITORING PLAN

As described above, six of the long-term soil monitoring locations were adjusted in the field to provide a safe buffer between the drilling location and underground utilities. These adjusted locations were recorded with a handheld GPS and will be retained for the next 5-year soil monitoring event.

There were no deviations from the Compliance Monitoring Plan for groundwater monitoring in 2021.

SUMMARY OF PROGRESS UNDER THE 2015 AGREED ORDER NO. DE 11302

The following progress has been made on the Site:

- The 14th and 15th rounds of post-remediation groundwater monitoring were conducted, representing 5 years of post-remediation monitoring data.
- The first post-remediation soil monitoring was conducted.

CHANGE IN KEY PERSONNEL

Kristin Anderson, LHG, has assumed the role of Project Manager, supervising work performed at the Site starting in March 2021. All other project staff remains the same, providing continuity to the project during this transition.

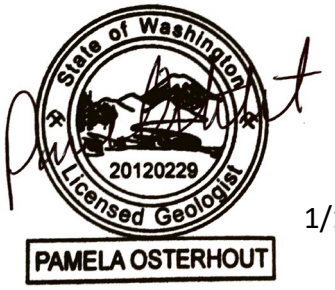
UPCOMING WORK

Work activities that may occur during the next work period, ending in November 2022, include:

- Groundwater monitoring, which will continue on a semiannual schedule in April and October 2022.
- Collection of additional groundwater volume for silica gel cleanup at all wells.
- Coordination with Ecology to support the first 5-year review anticipated to occur in 2022.

Please feel free to reach out directly to me at Pamela.Osterhout@floydsnider.com with any comments or questions on the information provided in this Annual Progress Report.

Sincerely,
FLOYD | SNIDER



1/12/2022

Pamela Osterhout, LG

Encl:	Table 1	2021 Groundwater Field Parameters
	Table 2	2021 Groundwater Analytical Results
	Table 3	Summary of Bio-Amendments (embedded)
	Table 4	2021 Soil Analytical Results
	Figure 1a	April 2021 GRO Concentrations in Groundwater
	Figure 1b	October 2021 GRO Concentrations in Groundwater
	Figure 2	Post-Remediation CPOC GRO Concentrations in Groundwater (embedded)
	Figure 3a	April 2021 ORO as Weathered Diesel Concentrations in Groundwater
	Figure 3b	October 2021 DRO Concentrations in Groundwater
	Figure 4	Post-Remediation CPOC DRO Concentrations in Groundwater (embedded)
	Figure 5a	April 2021 Benzene Concentrations in Groundwater
	Figure 5b	October 2021 Benzene Concentrations in Groundwater
	Figure 6	Post-Remediation CPOC Benzene Concentrations in Groundwater (embedded)
	Figure 7	Average Site-Wide and CPOC Sulfate Concentrations in Groundwater (embedded)
	Figure 8a	GRO in Soil
	Figure 8b	DRO in Soil
	Figure 8c	Benzene in Soil
	Attachment 1	Cumulative Post-Remediation Groundwater Analytical Results (2016 to 2021)
	Attachment 2	Cultural Resources Report: K Ply Mill Cleanup Archaeological Monitoring Technical Memorandum

Copies: Tod Gold, Joyce Ziker Parkinson, PLLC
Jesse Waknitz, Port of Port Angeles

LIST OF REFERENCES

Floyd|Snider. 2021. *K Ply Remediation Site Long-Term Soil Monitoring Plan*. Memorandum to Connie Groven, Washington State Department of Ecology, from Pamela Osterhout and Allison Geiselbrecht, Floyd|Snider. 5 April.

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Tables

Table 1
2021 Groundwater Field Parameters

Field Parameter [1]			Depth to Water	Groundwater Elevation	Specific Conductivity	pH	Dissolved Oxygen	ORP	Temperature	Turbidity
Units			Feet bTOC	Feet NAVD 88	mS/cm	--	mg/L	mV	°C	NTU
Location	Measured Date	Screened Interval (feet bgs)								
PP-13R	4/21/2021	5–15	10.45	4.29	2.23	9.73	0.52	48.9	11.2	1.32
	10/13/2021		9.79	4.95	1.94	8.56	1.53	-213.2	15.0	1.02
PP-14R	4/20/2021	5–15	10.48	5.09	0.992	8.73	0.61	56.4	10.6	1.16
	10/13/2021		10.49	5.08	0.658	8.36	0.77	20.6	14.9	0.90
PP-15R2	4/20/2021	5–15	10.83	4.58	1.19	7.88	0.41	-129.3	11.6	2.94
	10/13/2021		9.43	5.98	0.966	7.73	0.60	-21.8	14.9	0.98
PP-17	4/21/2021	5–15	11.52	4.80	1.08	10.65	0.50	0.00	11.5	2.57
	10/13/2021		11.55	4.77	0.722	10.11	1.15	108	15.2	2.08
PP-18R2	4/21/2021	10-20	11.98	4.66	1.23	8.41	0.63	24.7	11.1	2.04
	10/13/2021		11.58	5.06	2.72	7.23	1.07	74.7	14.2	0.65
PP-19	4/20/2021	5–15	11.61	4.03	3.51	7.48	1.26	102.1	11.9	0.63
	10/13/2021		11.00	4.64	16.23	6.95	3.16	154.5	15.9	0.49
PP-27	4/20/2021	5–15	10.02	5.44	1.20	11.64	0.5	110.8	10.5	4.64
	10/13/2021		9.13	6.33	0.45	9.52	1.44	-364.4	15.1	3.50
PP-29	4/20/2021	5–15	11.42	4.54	0.844	7.69	2.93	60.1	11.5	5.24
	10/13/2021		9.66	6.30	2.43	7.25	1.39	-104.5	15.7	0.76
PP-30	4/21/2021	5–15	10.49	5.01	1.05	11.59	0.5	-3.60	11.0	2.56
	10/13/2021		10.51	4.99	0.94	9.20	0.71	20.5	15.7	1.42
PP-32	4/20/2021	8–18	11.75	3.30	1.70	7.57	0.68	77.2	12.9	2.73
	10/13/2021		9.96	5.09	1.20	7.84	1.46	-199.6	15.7	1.45
PP-33	4/20/2021	5–15	10.90	4.72	2.13	7.41	0.53	77.8	11.8	2.01
	10/13/2021		9.48	6.14	0.79	7.52	0.72	-5.9	13.1	0.53
PP-34	4/21/2021	5–15	12.39	4.47	2.11	11.94	0.57	-6.80	10.9	1.46
	10/13/2021		11.90	4.96	1.45	12.06	0.74	17.3	15.3	0.94
PP-36	4/21/2021	5–15	11.35	4.74	0.289	9.44	0.53	15.2	11.4	1.38
	10/13/2021		9.94	6.15	0.38	7.80	1.49	-185.3	13.6	0.96
PP-37R	4/21/2021	10–20	10.99	4.67	1.68	7.64	0.62	15.2	12.1	1.83
	10/13/2021		10.80	4.86	1.27	7.77	1.87	-196.8	15.3	1.39

Notes:

-- Not applicable.

1 Field parameters collected with YSI Pro DSS water quality meter and LaMotte 2020we turbidity meter.

Abbreviations:

bgs Below ground surface
bTOC Below top of casing
°C Degrees Celsius
mg/L Milligrams per liter
mS/cm Millisiemens per centimeter
mV Millivolts
NAVD 88 North American Vertical Datum of 1988
NTU Nephelometric turbidity units
ORP Oxidation-reduction potential

Table 2
2021 Groundwater Analytical Results

Analyte		Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics	Weathered-Diesel TPH [1]	Benzene	Ethylbenzene	Toluene	Xylene (total)	Sulfate
Analytical Method		NWTPH-Gx	NWTPH-Dx			USEPA 8260D				USEPA 300.0
Criteria		800	500	500	500	51	--	--	--	--
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
Sample Location	Sample Date									
Conditional Point of Compliance Monitoring Wells										
PP-17	4/21/2021	272	99.5 U	**1,990**	**1,990**	43.4	1.68	0.75 U	2.75	89.5
	10/13/2021	397	**873**	98.1 U	**873**	45.2	1.77	0.75 U	2.98	92.5
PP-18R2	4/21/2021	**933**	394 [2]	**1,500**	**1,500**	4.34	4.2	0.75 U	1.31	163
	10/13/2021	337	**828**	98.9 U	**828**	0.44 U	0.4 U	0.75 U	1.0 U	286
PP-19	4/20/2021	425	98.5 U	425	425	0.44 U	0.4 U	0.75 U	1 U	210
	10/13/2021	50 U	181	98.8 U	181	0.44 U	0.4 U	0.75 U	1.0 U	1,170
PP-34	4/21/2021 [3]	307	99.3 U	**1,710**	**1,710**	7.09	13.8	0.75 U	8.54	40.4
	10/13/2021	403	**2,510**	98.2 U	**2,510**	5.28	16.9	0.75 U	10.1	35.4
Other Site Monitoring Wells										
PP-13R	4/21/2021	71.4	99.3 U	**909**	**909**	20.8	0.4 U	0.75 U	1 U	108
	10/13/2021	93.8	**501**	99.4 U	**501**	26.7	0.4 U	0.75 U	1.0 U	64.2
PP-14R	4/20/2021	78.0	99.2 U	477	477	25.9	0.4 U	0.75 U	1.0 U	201
	10/13/2021 [3]	156	**1,570 J**	98.5 U	**1,570 J**	24.4	0.4 U	0.75 U	1.0 U	178
PP-15R2	4/20/2021	**6,800**	335 [2]	**3,210**	**3,210**	**456**	388	23.7	91.2	0.864
	10/13/2021	**7,660**	**2,240**	99 U	**2,240**	**1,550**	70.2	7.15	33.3	6 U
PP-27	4/20/2021	**1,740**	**1,360** [2]	**906**	**906**	**73.6**	61.5	5.68	38.1	6.69
	10/13/2021	**1,100**	**841**	98.5 U	**841**	31.3	31.8	1.6	11.2	2.21
PP-29	4/20/2021	50.0 U	99.7 U	**1,400**	**1,400**	4.23	0.4 U	0.75 U	1 U	35.8
	10/13/2021	65.6	**1,180 J**	98.8 U	**1,180 J**	0.44 U	0.4 U	0.75 U	1.0 U	3.8 JQ
PP-30	4/21/2021	522	99.5 U	**2,420**	**2,420**	37.2	9.68	0.961	8.07 U	66.2
	10/13/2021	**863**	**1,580**	99.3 U	**1,580**	31.5	3.96	0.75 U	1.0 U	15.6
PP-32	4/20/2021	50 U	98.6 U	414	414	0.44 U	0.4 U	0.75 U	1 U	140
	10/13/2021	57.1	347	98.6 U	347	8.86	0.4 U	0.75 U	1.0 U	1.25
PP-33	4/20/2021	50 U	98.7 U	**1,460**	**1,460**	0.44 U	0.4 U	0.75 U	1 U	108
	10/13/2021	50 U	**663**	99.6 U	**663**	0.44 U	0.4 U	0.75 U	1.0 U	14.2
PP-36	4/21/2021	**1,520**	152 J [2]	466 J	466 J	37.6	26.5	0.762	2.78	12
	10/13/2021	**898**	458	98.1 U	458	5.09	0.928	0.75 U	1.0 U	0.6 U
PP-37R	4/21/2021	177	98.2 U	**958**	**958**	**89.7**	0.4 U	0.75 U	1 U	50
	10/13/2021	235	**548**	98.1 U	**548**	**100**	0.4 U	0.75 U	1.0 U	4.43 JQ

Notes:

-- Not available.

RED/BOLD Detected concentration that exceeds criteria.

1 Coordination with laboratory on quantification of DRO versus ORO was conducted between the April and October 2021 monitoring events. The laboratory concluded that overlap of DRO and ORO carbon ranges in a single peak is more indicative of a weathered diesel rather than heavy oil. ORO results collected prior to October 2021 interpreted as a weathered-diesel product based on labortory coordination and conceptual site model of residual diesel contamination in soil acting as source to groundwater.

2 Laboratory notes that DRO results indicate the presence of unresolved compounds eluting from dodecane through tetracosane (C12 to C24).

3 A field duplicate was collected. The greatest value is reported.

Abbreviations:

DRO Diesel-range organics
µg/L Micrograms per liter
mg/L Milligrams per liter
ORO Oil-range organics
TPH Total petroleum hydrocarbons

Qualifiers:

J Concentration is estimated but acceptable for most uses.
JQ Concentration is reported between the method detection limit and reporting limit and is considered an estimate.
U Analyte is not detected at the associated reporting limit.

Table 4
2021 Soil Analytical Results

			Analyte	PID (field measurement)	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics	Benzene	Ethylbenzene	Toluene	Xylene (total)
			CUL	--	30	2,000	2,000	0.3	6	7	9
			Units	ppm	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample Name	Date	Depth Range								
A14	2021-A14-6-8	4/20/2021	6–8 ft	930	**1,170**	105 (1)	418	***0.410 U***	5.3	2.91 U	8.94
A14	2021-A14-15-16	4/20/2021	15–16 ft	633	**283**	58.5 U	347	0.121 U	0.943	0.393 U	0.302 U
B12	2021-B12-11.5-12.5	4/21/2021	11.5–12.5 ft	5.5	2.07 U	52.3 U	105 U	0.0194	0.0104 U	0.0269 U	0.0207 U
B16	2021-B16-12-13	4/20/2021	12–13 ft	9.9	2.65 U	57.9 U	352	0.0145	0.0133 U	0.0345 U	0.0265 U
C10	2021-C10-6-7	4/21/2021	6–7 ft	20.4	4.12	53 U	106 U	0.0101 U	0.117	0.0329 U	0.0253 U
C11	2021-C11-6-7.5	4/21/2021	6–7.5 ft	10.2	3.73	58.6 U	117 U	0.0233	0.148	0.0203 U	0.0156 U
C16	2021-C16-11-12	4/20/2021	11–12 ft	308	**961**	**8,720**	1,210	**0.422**	0.555	0.628 U	0.483 U
C17	2021-C17-12-14	4/20/2021	12–14 ft	501	22.1 U	**8,070**	1,150	0.222 U	0.277 U	0.72 U	0.554 U
D1	2021-D1-16-17	4/21/2021	16–17 ft	0.5	2.11 U	52.6 U	105 U	0.0085 U	0.0106 U	0.0275 U	0.0211 U
D9	2021-D9-14-15	4/21/2021	14–15 ft	25.9	7.91	67.5 U	135 U	**1.8**	0.0158 U	0.0412 U	0.0366
D10	2021-D10-5.5-7 (2)	4/21/2021	5.5–7 ft	450	**143**	61.8 U	124 U	0.103 U	1.5	0.334 U	2.95
D16	2021-D16-9.5-11	4/20/2021	9.5–11 ft	550	**1,710**	**3,140**	718	0.197 U	1.29	0.641 U	0.493 U
D17	2021-D17-11-12	4/20/2021	11–12 ft	86	19.7 U	**4,800**	879	0.198 U	0.247 U	0.642 U	0.494 U
E1	2021-E1-14-15	4/21/2021	14–15 ft	3.7	4.59	53.6 U	107 U	0.0108 U	0.0136 U	0.0352 U	0.0271 U
F1	2021-F1-16-17	4/21/2021	16–17 ft	0.8	2.04 U	61.7 U	123 U	0.0082 U	0.0102 U	0.0265 U	0.0204 U
F15	2021-F15-8.75-9.25	4/20/2021	8.75–9.25 ft	1024	**180**	75.4	372	0.115 U	0.736	0.375 U	0.288 U
G8	2021-G8-7-8	4/21/2021	7–8 ft	824	**1,880**	177	104 U	0.162 U	**9.11**	0.526 U	7.41
G10	2021-G10-7-8	4/20/2021	7–8 ft	341	**124**	61.4 U	123 U	0.0132 U	0.144	0.0429 U	0.189
G11	2021-G11-7.5-8.5	4/20/2021	7.5–8.5 ft	508	**635**	184	325	0.087 U	1.08	0.283 U	0.218 U
G12	2021-G12-7.5-8.5	4/20/2021	7.5–8.5 ft	566	**781**	539	359	0.226 U	**10.7**	1.6 U	1.23 U
G15	2021-G15-10-11 (2)	4/20/2021	10–11 ft	307	**449**	398	358	0.079 U	4.74	0.257 U	3.77
GH9	2021-GH9-5.5-6.5	4/21/2021	5.5–6.5 ft	27.4	**54.1**	62.8 U	126 U	0.0112 U	0.023	0.0364 U	0.028 U
H7	2021-H7-8.5-9.5	4/21/2021	8.5–9.5 ft	2.3	6.82	52 U	104 U	0.0086 U	0.0108 U	0.028 U	0.0215 U
H8	2021-H8-5.5-6.5	4/21/2021	5.5–6.5 ft	5.8	3.72	58.2 U	116 U	0.0057 U	0.00717 U	0.0186 U	0.0143 U
H12	2021-H12-9.5-10	4/20/2021	9.5–10 ft	795	**707**	200	364	0.12 U	2.2	0.39 U	0.30 U
H13	2021-H13-9.5-10	4/20/2021	9.5–10 ft	786	**2,930**	349	425	0.146 U	**30.3**	1.04 U	0.797 U
H14	2021-H14-10.5-11.5	4/20/2021	10.5–11.5 ft	754	**1,700**	122	352	0.285 U	**16.6**	2.02 U	1.55 U
H15	2021-H15-9-10	4/20/2021	9–10 ft	0	2.06 U	47.3 U	279	0.0083 U	0.0103 U	0.0268 U	0.0206 U
I13	2021-I13-12-13	4/20/2021	12–13 ft	276	**59.5**	58.5 U	394	0.0067 U	0.00843 U	0.0219 U	0.0169 U
I14	2021-I14-7.5-8.5	4/20/2021	7.5–8.5 ft	0.5	2.93 U	67.1 U	410	0.0117 U	0.0146 U	0.0381 U	0.0293 U

Notes:

Italics Non-detected concentration exceeds CUL at the given reporting limit.

RED/BOLD Detected concentration exceeds CUL.

1 Per laboratory, chromatogram indicates the presence of unresolved compounds eluting from the dodecane through tetracosane (~C12 to C24); pattern resembles a continuation of the gasoline detection not quantified under NWTPH-Gx method.

2 A field duplicate was collected for this sample; the maximum result between the two is displayed.

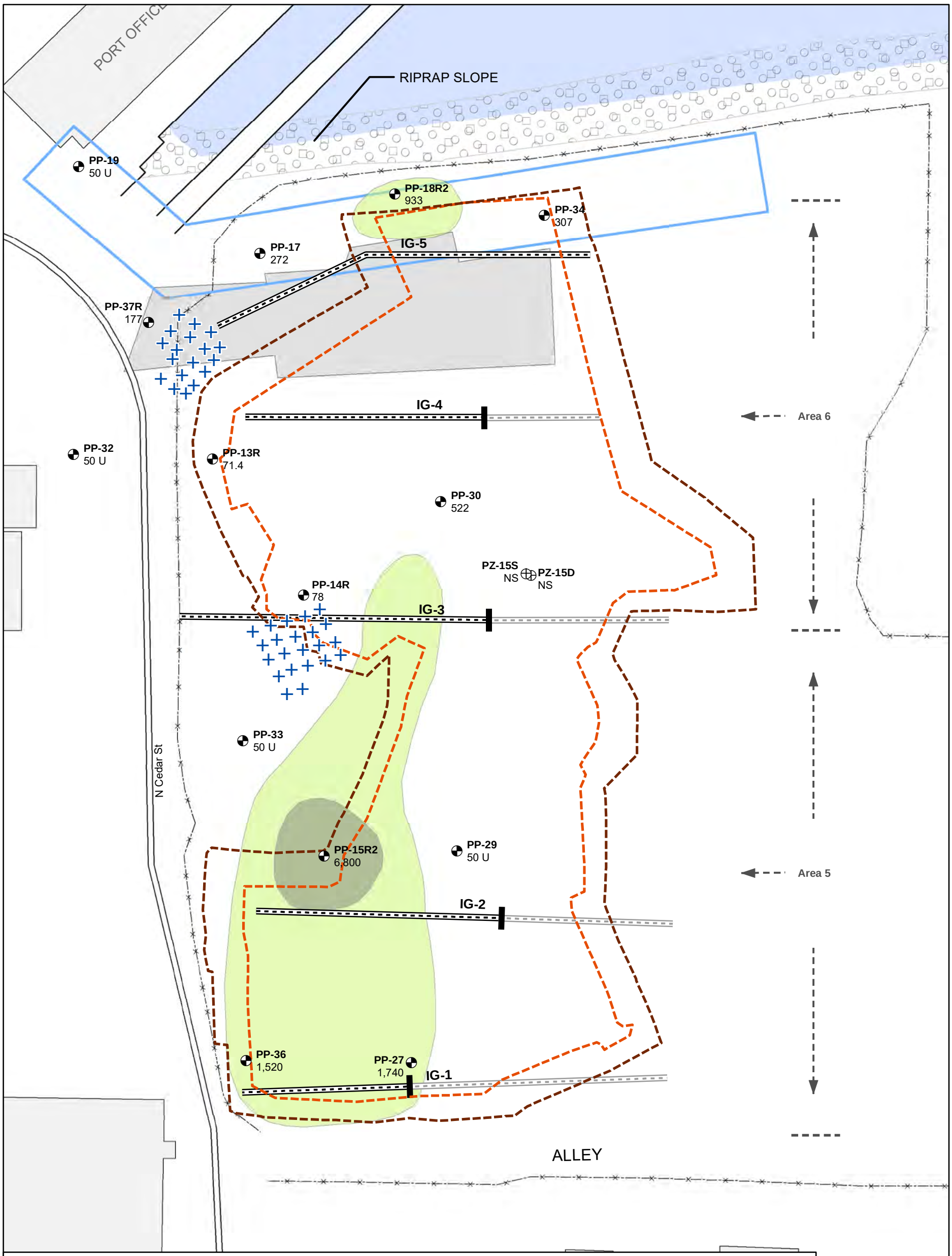
Abbreviations:

CUL Cleanup level
mg/kg Milligrams per kilogram
ppm Parts per million
ft Feet
PID Photoionization detection

Qualifier:

U Analyte is not detected at the associated reporting limit.

Figures



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Port Angeles, Washington

Figure 1a
April 2021 GRO
Concentrations in Groundwater

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12/29/2021

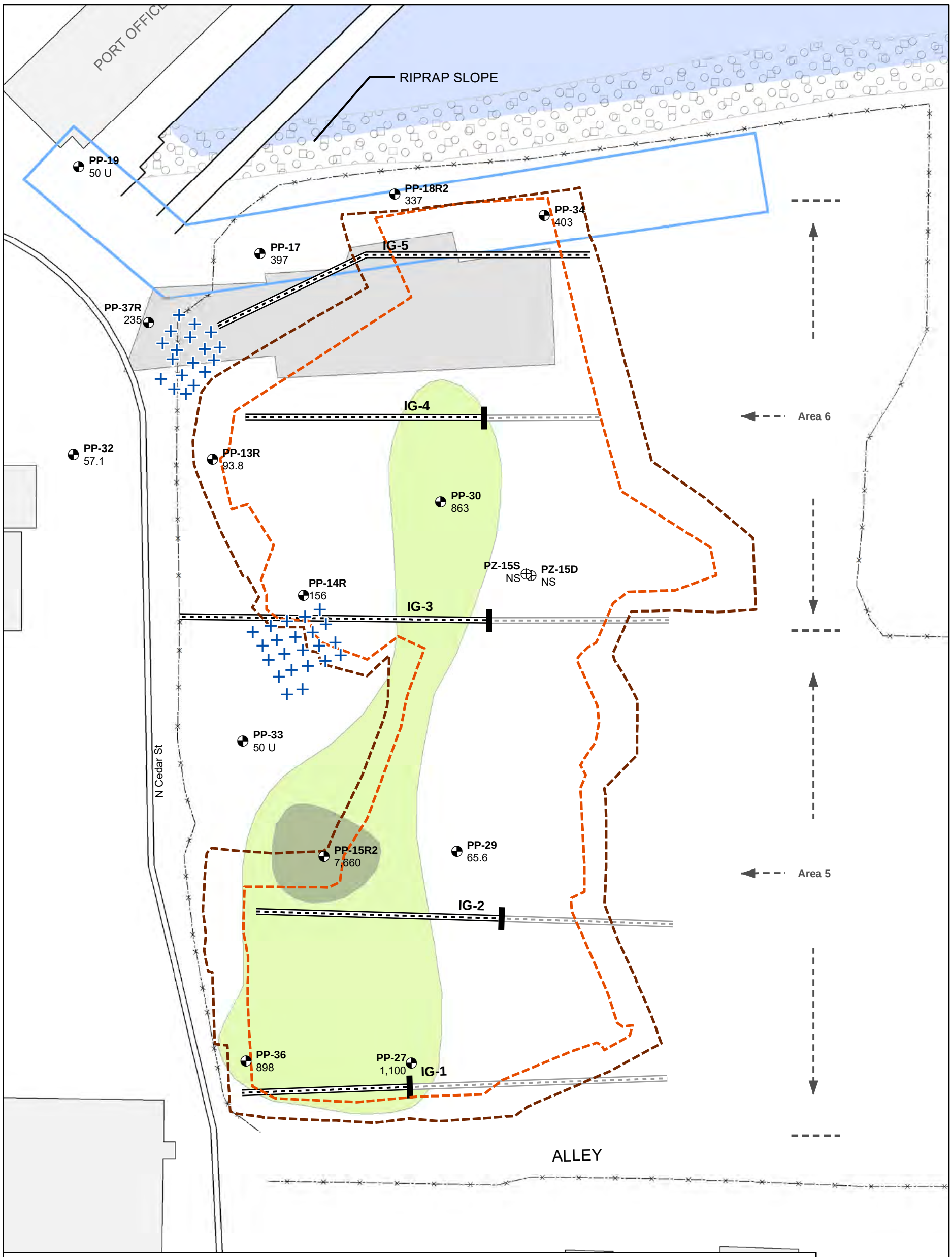

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Figure 1b
October 2021 GRO
Concentrations in Groundwater

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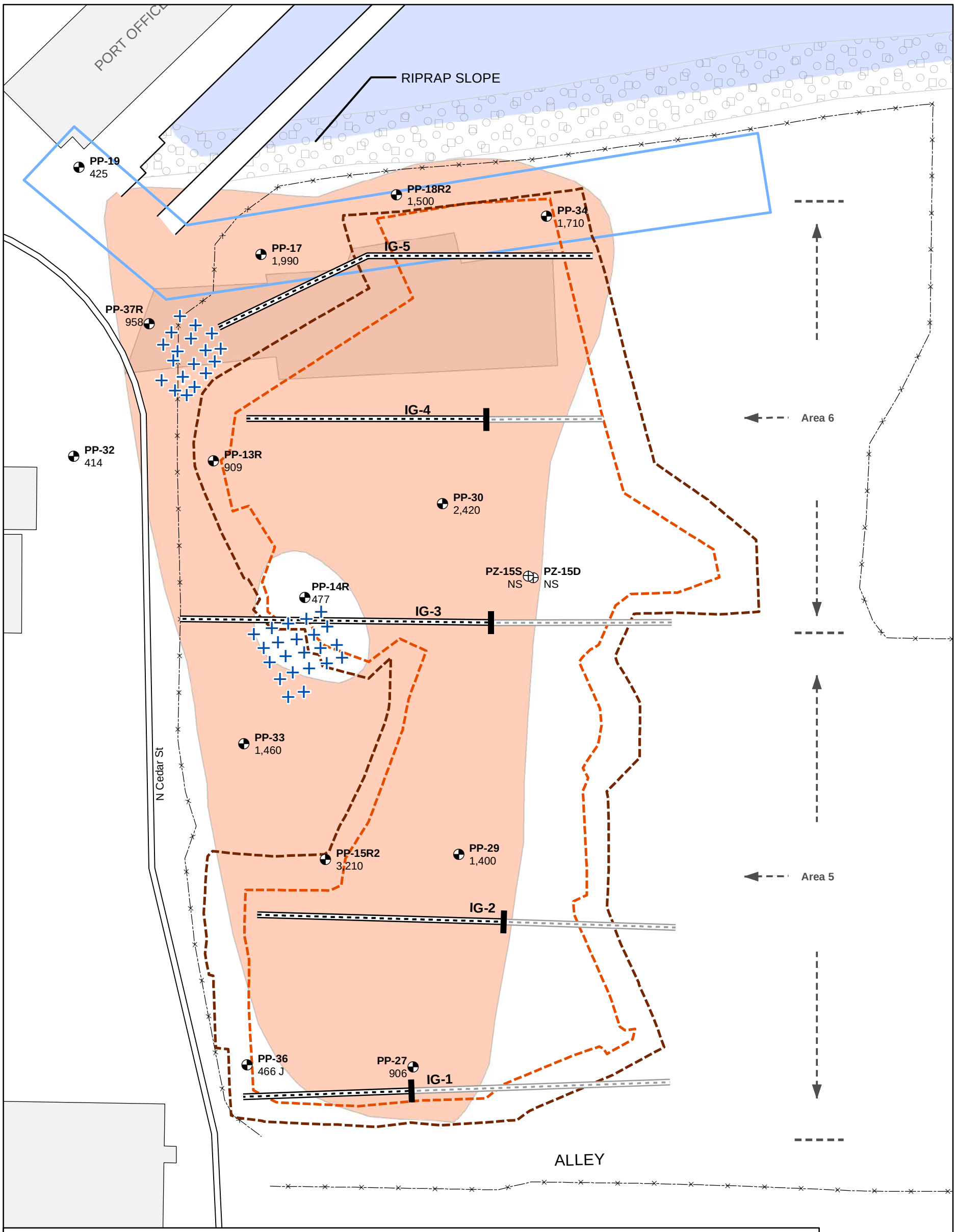
12/29/2021



Legend

- Piezometer
- Well
- Carbon-Injection Location
- Infiltration Gallery and ID Number
- 2" PVC Capped Below Grade

Extent of ORO in Groundwater (µg/L)

- >500
- 2015 Excavation Area Toe of Slope
- 2015 Excavation Area Top of Slope
- Conditional Point of Compliance Monitoring Wells
- Temporary Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
- Laboratory quantification review completed after the April 2021 monitoring event suggests that the ORO concentrations are indicative of a weathered-diesel product.
- All results reported in µg/L. No silica gel treatment.
- Cleanup level is 500 µg/L.
- If duplicate collected, greater concentration reported.
- Results rounded to three significant figures.

Abbreviations:
µg/L = Micrograms per liter
NS = Not sampled
ORO = Oil-range organics

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 30 60 120
Scale in Feet

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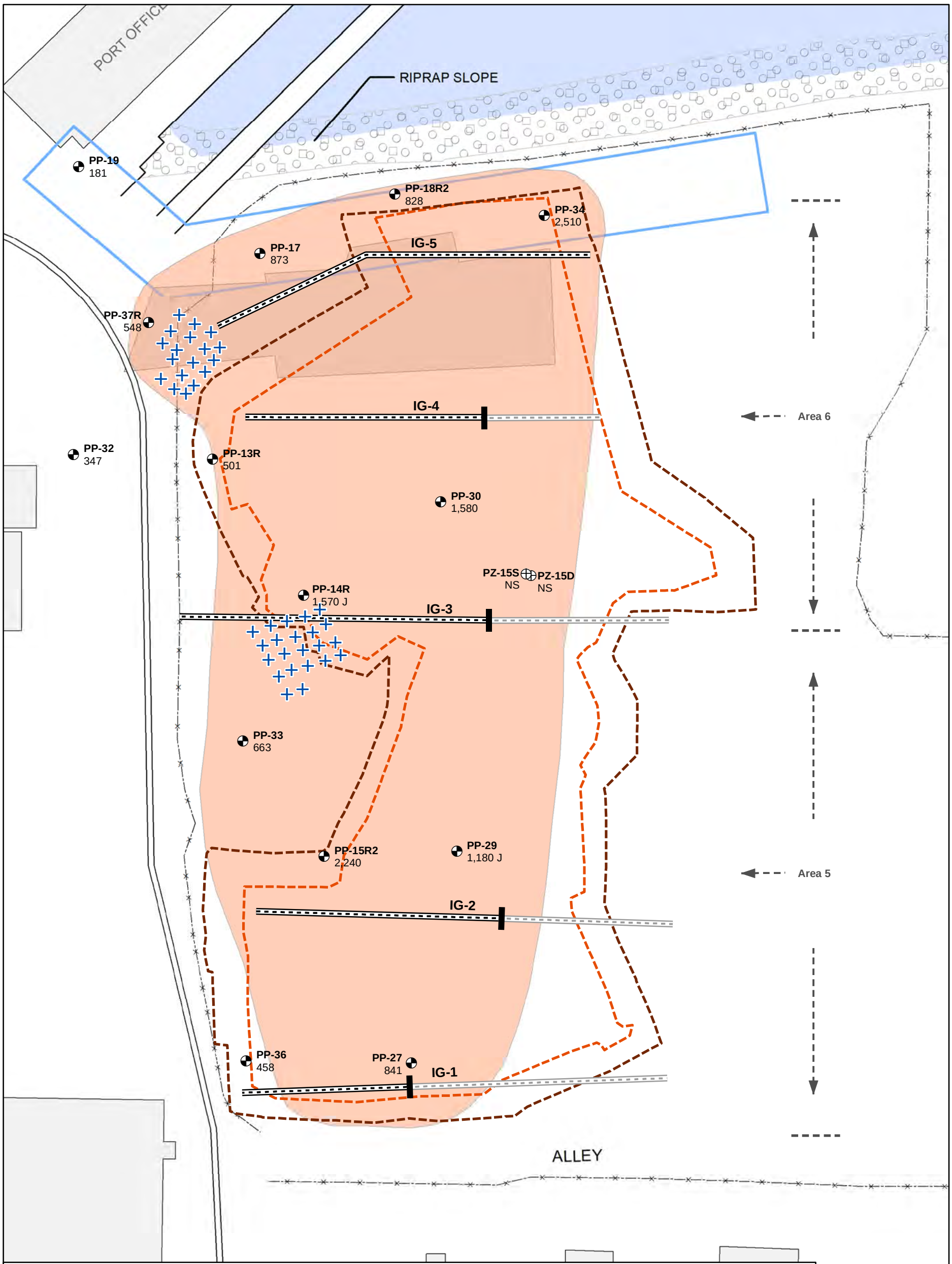
Figure 3a
April 2021 ORO as Weathered Diesel Concentrations in Groundwater

I:\GIS\Projects\PPA_KPLY\MXD\Annual Report\2021\Figure 3a April 2021 ORO as Weathered Diesel Concentrations in Groundwater.mxd
12/29/2021



Legend

- Piezometer
- Well
- Carbon-Injection Location
- Infiltration Gallery and ID Number
- 2" PVC Capped Below Grade

Extent of DRO in Groundwater (µg/L)

- >500
- 2015 Excavation Area Toe of Slope
- 2015 Excavation Area Top of Slope
- Conditional Point of Compliance Monitoring Wells
- Temporary Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
- All results reported in µg/L. No silica gel treatment.
- Cleanup level is 500 µg/L.
- If duplicate collected, greater concentration reported.
- Results rounded to three significant figures.

Abbreviations:
DRO = Diesel-range organics
µg/L = Micrograms per liter
NS = Not sampled

Qualifiers:
J = Concentration is estimated but acceptable for most uses.
U = Analyte is not detected at the associated reporting limit.

0 30 60 120
Scale in Feet

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Figure 3b
October 2021 DRO
Concentrations in Groundwater

I:\GIS\Projects\PPA_KPLY\MXD\Annual Report\2021\Figure 3b October 2021 DRO in Groundwater.mxd
12/29/2021

PORT OFFICE

RIPRAP SLOPE

PP-19
0.44 U

PP-18R2
4.34

PP-34
7.09

PP-17
43.4

IG-5

PP-37R
89.7

IG-4

Area 6

PP-32
0.44 U

PP-13R
20.8

PP-30
37.2

PZ-15S
NS

PZ-15D
NS

PP-14R
25.9

IG-3

PP-33
0.44 U

N Cedar St

PP-29
4.23

PP-15R2
456

IG-2

Area 5

PP-36
37.6

PP-27
73.6

IG-1

ALLEY

Legend

- Piezometer
- Well
- Carbon-Injection Location
- Infiltration Gallery and ID Number
- 2" PVC Capped Below Grade

Extent of Benzene in Groundwater (µg/L)

- 51-500
- 2015 Excavation Area Toe of Slope
- 2015 Excavation Area Top of Slope
- Conditional Point of Compliance Monitoring Wells
- Temporary Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
· All results reported in µg/L.
· Cleanup level is 51 µg/L.
· If duplicate collected, greater concentration reported.
· Results rounded to three significant figures.

Abbreviations:
µg/L = Micrograms per liter
NS = Not sampled

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 30 60 120
Scale in Feet

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Figure 5a
April 2021 Benzene
Concentrations in Groundwater

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12/29/2021

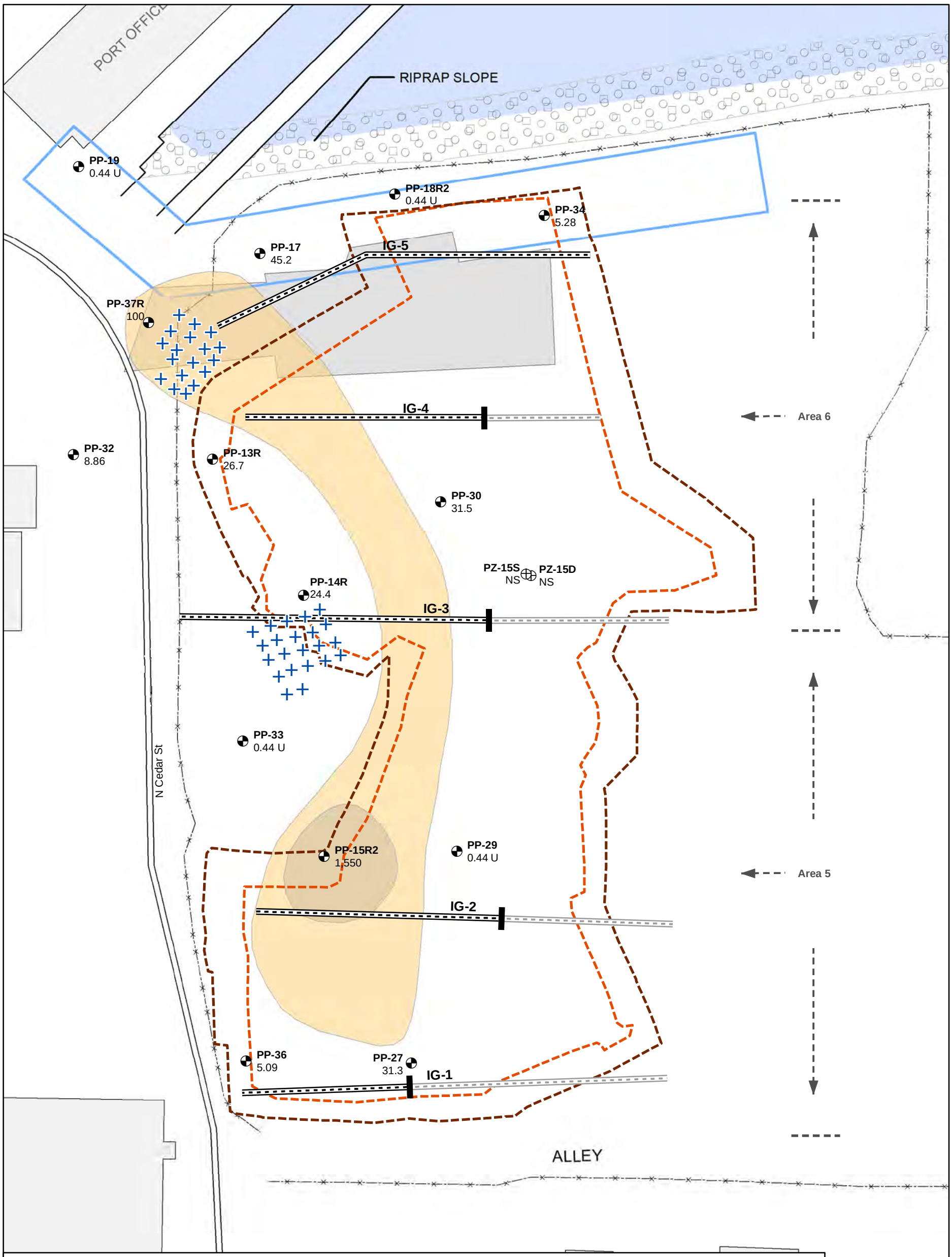

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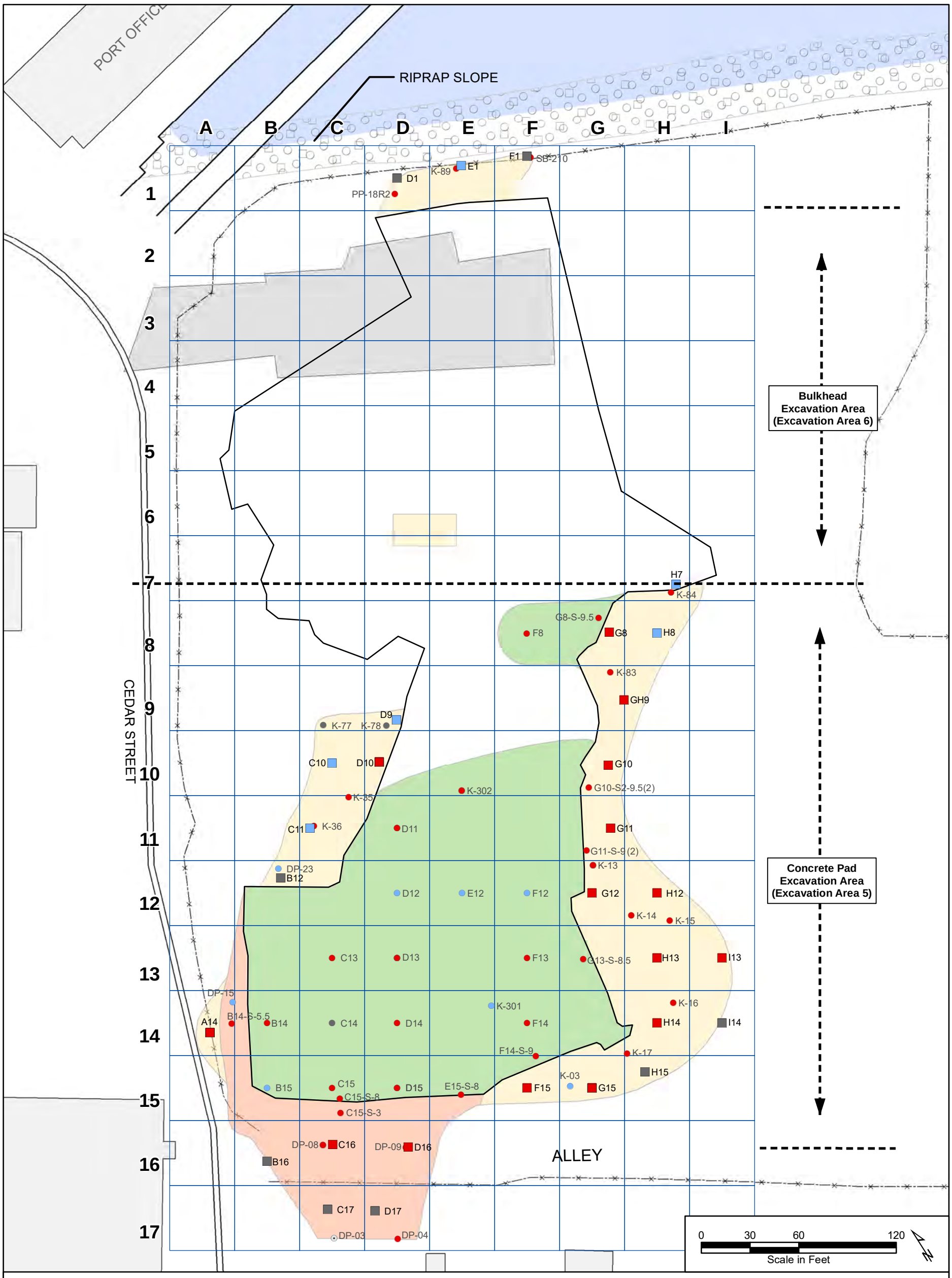
Figure 5b
October 2021 Benzene
Concentrations in Groundwater

I:\GIS\Projects\PPA_KPLY\MXD\Annual Report\2021\Figure 5b October 2021 Benzene in Groundwater.mxd
12/29/2021



Legend

Sample Type

- ☐ Recent Soil Sample
- ○ Historical Soil Sample

Sample Result

- ■/● Concentration Greater Than CUL(1)
- ■/● Concentration Less Than CUL
- ■/● Non-Detect
- ⊡/⊙ Non-Detect Exceedance

Shallowest Depth Residual Contamination Detected

- Shallow: <4 ft bgs
- Medium: 4–8 ft bgs
- Deep: >8 ft bgs

Other Features

- Excavation Toe of Slope
- Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
1.The MTCA Method A CUL for GRO in soil is 30 mg/kg.
· If multiple results are available at a location, the greatest sample result is presented.
· All depths are approximate.
· Site survey provided by Northwestern Territories Inc.
· Black and white reproduction of this color original may affect interpretation of content.

Abbreviations:
bgs = Below ground surface relative to Cedar Street
CUL = Cleanup level
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
MTCA = Model Toxics Control Act

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Figure 8a
GRO in Soil

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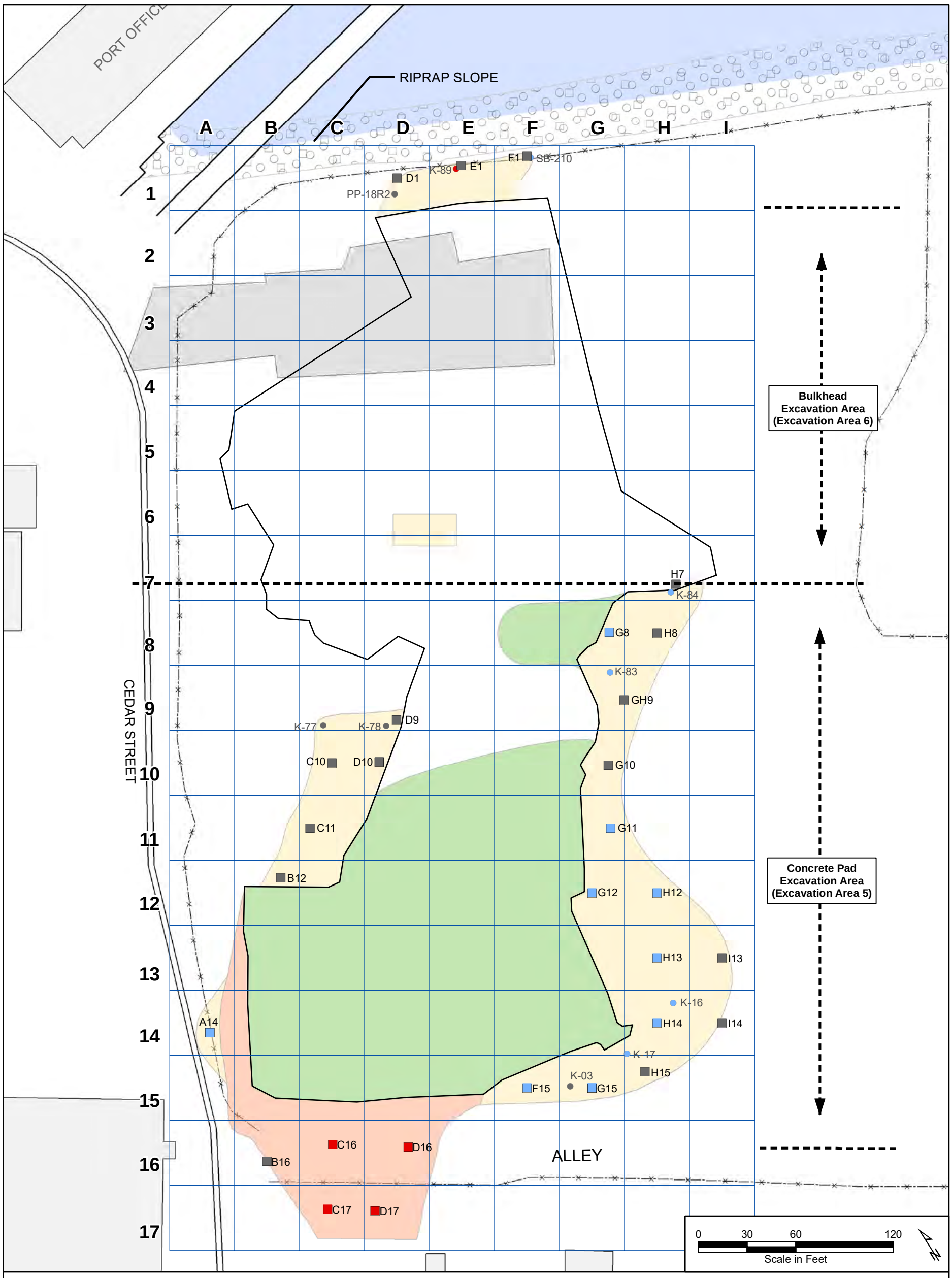
1/11/2022



Legend

Sample Type

- ☐ Recent Soil Sample
- ○ Historical Soil Sample

Sample Result

- ■/● Concentration Greater Than CUL(1)
- ■/● Concentration Less Than CUL
- ■/● Non-Detect

Shallowest Depth Residual Contamination Detected

- Shallow: <4 ft bgs
- Medium: 4–8 ft bgs
- Deep: >8 ft bgs

Other Features

- Excavation Toe of Slope
- Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
1.The MTCA Method A CUL for DRO in soil is 2,000 mg/kg.
· If multiple results are available at a location, the greatest sample result is presented.
· All depths are approximate.
· Site survey provided by Northwestern Territories Inc.
· Black and white reproduction of this color original may affect interpretation of content.

Abbreviations:
bgs = Below ground surface relative to Cedar Street
CUL = Cleanup level
DRO = Diesel-range organics
ft = Feet
mg/kg = Milligrams per kilogram
MTCA = Model Toxics Control Act

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Figure 8b
DRO in Soil

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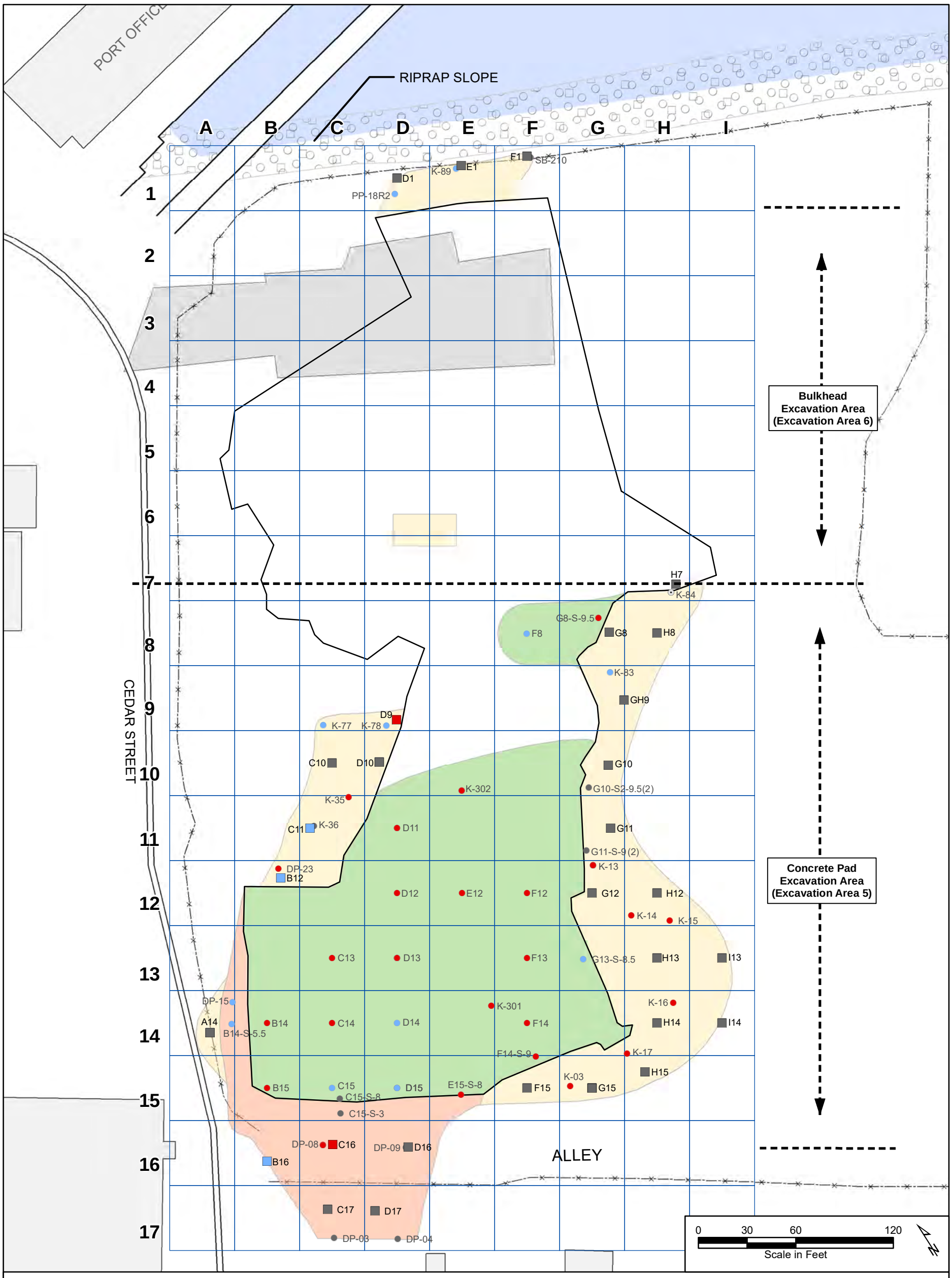
1/11/2022



Legend

Sample Type

- ☐ Recent Soil Sample
- ○ Historical Soil Sample

Sample Result

- ■/● Concentration Greater Than CUL(1)
- ■/● Concentration Less Than CUL
- ■/● Non-Detect
- ⊡/⊙ Non-Detect Exceedance

Shallowest Depth Residual Contamination Detected

- Shallow: <4 ft bgs
- Medium: 4–8 ft bgs
- Deep: >8 ft bgs

Other Features

- Excavation Toe of Slope
- Fence
- Existing Structure
- Intertidal Area
- Concrete Wash Pad

Notes:
1.The site-specific CUL for benzene in soil is 0.3 mg/kg.
· If multiple results are available at a location, the greatest sample result is presented.
· All depths are approximate.
· Site survey provided by Northwestern Territories Inc.
· Black and white reproduction of this color original may affect interpretation of content.

Abbreviations:
bgs = Below ground surface relative to Cedar Street
CUL = Cleanup level
ft = Feet
mg/kg = Milligrams per kilogram

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Figure 8c
Benzene in Soil

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1/11/2022

Attachment 1
Cumulative Post-Remediation
Groundwater Analytical Results
(2016 to 2021)

Table 1
Groundwater Analytical Results: Contaminants of Concern

Analyte	Total Petroleum Hydrocarbons (TPH)			Benzene, Toluene, Ethylbenzene, and Xylenes			
	Gasoline-Range Organics	Diesel-Range Organics [1]	Oil-Range Organics [1,8]	Benzene	Ethylbenzene	Toluene	Xylene (total)
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Criteria	800	500	500	51	--	--	--
Sample Location and Date							
Conditional Point of Compliance Monitoring Wells							
PP-17 (Screened Interval 5–15 ft)							
7/27/2016	59.5	417 JM	**1,010**	1.0 U	1.0 U	1.0 U	1.0 U
10/27/2016	102	257 (153)	**1,180 (543)**	1.0 U	1.0 U	1.0 U	1.0 U
1/26/2017	195	160 (49.8 U)	**1,520 (633)**	**60.1**	1.0 U	1.0 U	1.0 U
4/26/2017	287	167	**931**	**82.3**	1.1	1.09	2.01
8/2/2017	147	135 [2]	**969**	**121**	1.32	1.31	2.33
11/07/1027	404	471 [2]	**1,210**	50.9	1.0 U	1.0 U	1.23
2/8/2018	228	91.1 [2]	**525**	**68.6**	1.06	1.0 U	1.39
05/2/2018 [4]	352	218 [2]	**834**	**78.6**	1.76	1.07	2.52
10/25/2018	417	354	**1,130**	**108**	2.7	1.04	2.76
4/8/2019	341	49.6 U	**996**	**76.2**	1.0 U	1.8	2.62
10/22/2019	150	49.8 UJ (49.8 UJ)	234 J (178 J)	15	1.0 U	1.0 U	1.0 U
04/27/2020 [4]	353	158 [3]	**1,290**	46.1	1.53	1.0 U	2.70
10/21/2020	375	49.3 U	**1,100**	**63.6**	1.9	1.0 U	3.34
4/21/2021	272	99.5 U	**1,990**	43.4	1.68	0.75 U	2.75
10/13/2021	397	**873**	98.1 U	45.2	1.77	0.75 U	2.98
PP-18R2 [5] (Screened Interval 10–20 ft)							
7/28/2016	**835**	151 JM	163	**135**	2.10	2.82	6.69
10/27/2016	503	**1,090** (406)	**2,140 (1,200)**	**217**	1.31	1.0 U	2.05
1/26/2017	**921**	494 (279)	**4,470 (1,760)**	**284**	11.2	4.32	19.4
4/26/2017	**1,130**	**643**	**2,620**	**248**	12.9	4.46	22.6
8/2/2017	**1,780**	**572 J** [2]	**2,350**	**211**	15.5	3.93	19.8
11/7/2017	538	425 [2]	**789**	**52.8**	7.06	1.20	9.74
2/8/2018	401	**596** [2]	**1,320**	40.9	14.4	1.65	15.7
5/2/2018	**1,900**	**781** [2]	**1,920**	**73.3**	17.8	1.94	20.2
10/25/2018	--	--	--	--	--	--	--
04/8/2019 [4]	**4,320**	50.4 U	**1,340 (1,120)**	24.5	1.0 U	19.8	6.09
10/22/2019	**1,950**	84.6 J [2] (129 J [2])	462 J (375 J)	3.28	13.4	1.0 U	1.23 U
4/27/2020	**1,730**	271 [3]	**1,130**	4.87	9.84	1.0 U	1.61
10/21/2020	**829**	242 [3]	**526**	2.09	7.14	1.0 U	1.0 U
4/21/2021	**933**	394 [2]	**1,500**	4.34	4.2	0.75 U	1.31
10/13/2021	337	**828**	98.9 U	0.44 U	0.4 U	0.75 U	1.0 U
PP-19 (Screened Interval 5–15 ft)							
7/27/2016	50 U	49.9 U	99.7 U	1.0 U	1.0 U	1.0 U	1.0 U
10/27/2016	50 U	50 U	127	1.0 U	1.0 U	1.0 U	1.0 U
1/26/2017	50 U	49.8 U (49.8 U)	500 (248)	1.0 U	1.0 U	1.0 U	1.0 U
4/26/2017	50 U	49.8 U	260	1.0 U	1.0 U	1.0 U	1.0 U
8/2/2017	50 U	50 U	100 U	1.0 U	1.0 U	1.0 U	1.0 U
11/7/2017	50 U	49.7 U	99.4 U	1.96	1.0 U	1.0 U	1.0 U
2/8/2018	50 U	50 U	159	1.0 U	1.0 U	1.0 U	1.0 U
5/2/2018	50 U	50.2 U	203	1.0 U	1.0 U	1.0 U	1.0 U
10/25/2018	50 U	50 U	215	1.0 U	1.0 U	1.0 U	1.0 U
10/22/2019	50 U	49.9 UJ	99.9 UJ	1.0 U	1.0 U	1.0 U	1.0 U
4/27/2020	50 U	49.9 U	266	1.0 U	1.0 U	1.0 U	1.0 U
10/21/2020	50 U	49.5 U	99 U	1.0 U	1.0 U	1.0 U	1.0 U
4/20/2021	50 U	98.5 U	425	0.44 U	0.4 U	0.75 U	1.0 U
10/13/2021	50 U	181	98.8 U	0.44 U	0.4 U	0.75 U	1.0 U
PP-20 (Decommissioned)							
7/26/2016	50 U	50.1 U	100 U	1.0 U	1.0 U	1.0 U	1.0 U
10/27/2016	50 U	50 U (92.7)	289 (177)	1.0 U	1.0 U	1.0 U	1.0 U
1/26/2017	50 U	49.9 U (49.9 U)	**1,310** (454)	1.0 U	1.0 U	1.0 U	1.0 U
4/26/2017	50 U	49.8 U	468	1.0 U	1.0 U	1.0 U	1.0 U
8/2/2017	50 U	50 U	100 U	1.0 U	1.0 U	1.0 U	1.0 U
PP-34 (Screened Interval 8–18 ft)							
7/28/2016	**1,510**	328 JM	433	29.1	76.3	7.19	132
10/27/2016	665	**603** (493)	**1,310 (772)**	18	35.1	3.77	62.6
1/26/2017	**1,220**	**503** (348)	**2,290 (688)**	25.8	61.8	4.1	88.7
4/26/2017	**1,420**	357	**1,490**	12.9	70.4	3.81	83.9
8/2/2017	**1,480**	238 [2]	**1,040**	15.1	117	5.26	122
11/7/2017 [4]	**1,000**	**695** [2]	**1,200**	29.2	82.6	3.92	86.1
2/8/2018	309	212 [2]	**560**	3.31	15.2	1.0 U	15.0
5/2/2018	**1,130**	458 [2]	**1,320**	9.78	44.6	1.81	45.0
10/25/2018	**1,140**	417 [2]	**1,040**	19.2	60.8	2.3	51.9
4/8/2019	749	50 U	**1,970**	7.39	1.38	29.4	23.9
10/22/2019	249	90.7 J [2] (105 J [2])	**1,460 J (1,030 J)**	3.79	9.81	1.0 U	6.53
4/27/2020	552	376 [3]	**1,580**	9.01	17.4	1.0 U	10.6
10/21/2020	351	114 [3]	**1,640**	6.28	20.9	1.0 U	11.6
4/21/2021 [4]	307	99.3 U	**1,710**	7.09	13.8	0.75 U	8.54
10/13/2021	403	**2,510**	98.2 U	5.28	16.9	0.75 U	10.1
Other Site Monitoring Wells							
PP-13R (Screened Interval 5–15 ft)							
7/28/2016	**4,560**	124 JM	377	1.0 U	5.44	24.3	43.2
10/27/2016	340	157	**611**	**106**	1.0 U	1.96	2.55
1/25/2017	66.5	49.8	**1,030**	7.43	1.0 U	1.0 U	1.0 U
4/25/2017	**1,460**	80.7 J	**1,060**	**518**	1.31	6.61	4.96
8/2/2017	**6,700**	156 [2]	**518**	**1,730**	3.94	26.6	32.9
11/7/2017	**7,630**	289 [2]	**481**	**2,150**	4.49	28.0	32.9
2/8/2018	159	106 [2]	**565**	39.8	1.0 U	1.0 U	1.43
5/2/2018	**1,110**	302 [2]	**1,150**	**358**	1.68	6.00	7.48
10/25/2018 [4]	546	94.9 [2]	398	**123**	1.0 U	1.54	2.17
4/8/2019	433	50 U	**684**	**163**	1.52	1.0 U	2.07
10/21/2019	**1,100**	49.7 UJ	**646 J**	**606**	1.0 U	2.5	3.99
4/27/2020	446	122 [3]	**975**	**209**	1.0 U	1.0 U	1.0 U

Table 1
Groundwater Analytical Results: Contaminants of Concern

Analyte	Total Petroleum Hydrocarbons (TPH)			Benzene, Toluene, Ethylbenzene, and Xylenes			
	Gasoline-Range Organics	Diesel-Range Organics [1]	Oil-Range Organics [1,8]	Benzene	Ethylbenzene	Toluene	Xylene (total)
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Criteria	800	500	500	51	--	--	--
Sample Location and Date							
Other Site Monitoring Wells (cont.)							
PP-13R (Screened Interval 5–15 ft) (cont.)							
10/21/2020	250	49.2 U	201	**80.1**	1.0 U	1.0 U	1.0 U
4/21/2021	71.4	99.3 U	**909**	20.8	0.4 U	0.75 U	1.0 U
10/13/2021	93.8	**501**	99.4 U	26.7	0.4 U	0.75 U	1.0 U
PP-14R (Screened Interval 5–15 ft)							
7/28/2016	**4,350**	105 JM	99.4 U	**1,550**	35.7	42.6	51.2
10/27/2016	**5,640**	90	193	**2,120**	20.9	35.1	51.7
1/25/2017	**4,140**	266	**1,440**	**1,180**	12.7	20.8	20.7
4/25/2017	**7,290**	60.3	**552**	**1,870**	15.6	27.7	27.5
8/2/2017	**6,480**	168 [2]	480	**1,960**	6.51	19.1	19.1
11/7/2017	**7,430**	185 [2]	299	**2,100**	7.67	18.7	20.6
2/8/2018	**1,320**	249 [2]	**710**	**415**	2.78	3.60	3.20
5/2/2018	**6,690**	156 [2]	475	**1,290**	3.42	4.93	4.21
10/25/2018	**1,490**	282 [2]	**674**	**362**	1.76	3.07	3.3
4/8/2019	**830**	49.6 U	141	**356**	2.67	1.58	2.0
10/21/2019	209	49.3 UJ	296 J	38.4	1.0 U	1.0 U	1.0 U
4/27/2020	375	80.6 [3]	290	**83.8**	1.0 U	1.0 U	1.0 U
10/21/2020	420	56.5 [3]	472	**105**	1.0 U	1.0 U	1.0 U
4/20/2021	78.0	99.2 U	477	25.9	0.4 U	0.75 U	1.0 U
10/13/2021 [4]	156.0	**1,570 J**	98.5 U	24.4	0.4 U	0.75 U	1.0 U
PP-15R2 (Screened Interval 5–15 ft)							
7/27/2016	**9,940**	**574 JM**	**526**	1 U	215	29.7	41.8
10/26/2016	**1,040**	217	289	**542 J**	106	13.7	33.1
01/25/2017 [4]	**15,200**	**1,110**	**3,640**	**622**	704	42.9	351
4/25/2017	**18,500**	**501**	**2,810**	**490**	912	31.9	520
8/2/2017	**7,260**	277 [2]	**1,520**	**1,190**	171	11.2	68.6
11/8/2017	**4,480**	**649** [2]	**1,470**	**1,200**	48.5	11.6	71.3
2/8/2018	**11,600**	**990** [2]	**2,010**	**265**	887	52.6	234
5/2/2018	**10,600**	**843** [2]	**2,190**	**1,440**	324	18.4	78.9
10/25/2018	**3,560**	405 [2]	**959**	**828**	21.2	10 U	27.6
4/8/2019	**7,540**	**574** (499)	**1,990 (1,380)**	**367**	10.1	117	79.8
10/21/2019	**6,950**	411 [2]	**871 J**	**1,680**	44.6	8.1	40.2
4/27/2020	**7,480**	447 [3]	**2,120**	**404**	232	15.7	79.9
10/21/2020	**5,070**	189 [3]	**1,530**	**809**	62	5.82	42
4/20/2021	**6,800**	335 [2]	**3,210**	**456**	388	23.7	91.2
10/13/2021	**7,660**	**2,240**	99 U [8]	**1,550**	70.2	7.15	33.3
PP-27 (Screened Interval 5–15 ft)							
7/27/2016	507	90.4 JM	257	**64.0**	28.0	5.51	27.5
10/26/2016	298	72.4	421	19.0	3.97	1.0 U	4.24
1/25/2017	**3,810**	**1,060**	**2,960**	**455**	75.1	16.3	80.7
4/25/2017	**4,460**	**744**	**1,360**	**464**	130	15.1	86.5
8/2/2017	**1,230**	120 [2]	323	**101**	31.6	2.80	17.4
11/8/2017	323 J	249 [2]	434	**73.8**	17.4	2.02	10.2
2/8/2018	**2,060**	**1,390** [2]	**1,330**	**240**	99.7	11.3	66.2
5/3/2018	**1,700**	**585** [2]	**1,090**	**136**	51.7	4.50	26.0
10/25/2018	428	198 [2]	235	27.6	11.2	1.0 U	6.47
4/8/2019	**1,710**	**1,050**	405	**95.7**	5.85	58.8	38.7
10/21/2019	**960**	150 J [2]	158 J	43.2	31.4	1.83	12.1
4/27/2020	**1,940**	**681** [3]	**992**	**85.1**	67.3	6.15	34.9
10/21/2020	**1,220**	179 [3]	**525**	**69.4**	46.3	3.42	19.5
4/20/2021	**1,740**	**1,360** [2]	**906**	**73.6**	61.5	5.68	38.1
10/13/2021	**1,100**	**841**	98.5 U	31.3	31.8	1.6	11.2
PP-29 (Screened Interval 5–15 ft)							
7/28/2016	**4,170**	**531 JM**	**985**	**1,480**	40.8	14.6	83.9
10/26/2016	160	268 J	402	35.3	1.0 U	1.0 U	1.0 U
1/25/2017	**1,550**	174	**1,650**	**448**	13.2	4.97	24.4
04/25/2017 [4]	**3,180**	**586**	**1,750**	**878**	19.7	6.40	30.6
8/2/2017	752	183 [2]	**1,190**	**202**	4.67	1.53	6.81
11/8/2017	**997**	**646** [2]	**1,560**	**326**	5.29	1.85	7.33
2/8/2018	288	387 [2]	**664**	**55.7**	6.12	3.93	15.8
5/3/2018	324	179 [2]	**921**	38.9	3.10	1.0 U	5.78
10/25/2018	170	487 [2]	**952**	10.9	1.0 U	1.0 U	1.0 U
4/8/2019	145	49.9 U	**1,660**	17.9	1.0 U	1.28	1.41
10/21/2019	252	49.2 UJ	**836 J**	26.4	1.0 U	1.0 U	1.0 U
4/27/2020	322	112 [3]	**1,420**	20.3	4.14	1.0 U	1.0 U
10/21/2020 [4]	55.8	93.8 [3]	**863**	1.0 U	1.0 U	1.0 U	1.0 U
4/20/2021	50.0 U	99.7 U	**1,400**	4.23	0.4 U	0.75 U	1.0 U
10/13/2021	65.6	**1,180 J**	98.8 U	0.44 U	0.4 U	0.75 U	1.0 U
PP-30 (Screened Interval 5–15 ft)							
7/28/2016	**2,310**	**1,210**	**1,430**	**450**	61.2	8.89	86.9
10/27/2016	**2,980**	164	353	**539**	10.1	4.42	39.5
1/25/2017	**1,570**	**1,510**	**4,330**	**139**	25.9	4.55	43.6
4/25/2017	**1,920**	**1,040**	**3,090**	**132**	37.9	5.92	81.3
8/2/2017	**1,460**	453 [2]	**1,890**	**184**	26.5	4.15	56.3
11/7/2017	**1,280**	**987** [2]	**1,640**	**229**	32.1	4.12	56.3
2/8/2018	**862**	**910** [2]	**3,560**	26.7	11	1.40	14.2
5/2/2018	**2,800**	**865** [2]	**2,530**	**99.5**	125	4.47	108
10/25/2018	**1,640**	**547** [2]	**1,200**	**294**	22.1	1.52	31.3
4/8/2019	**1,180**	49.9 U	**3,060 (1,760)**	26.7	2.74	44.4	42.9
10/22/2019	**963**	167 J [2] (138 J [2])	**2,690 J (1,610 J)**	**119**	12.6	1.54	15
4/27/2020	**1,220**	**668** [3]	**2,530**	**60.7**	19.2	1.44	18.6
10/21/2020	**853**	394 [3]	**2,680**	**118**	13.6	1.74	16.5
4/21/2021	522	99.5 U	**2,420**	37.2	9.68	0.961	8.07 U
10/13/2021	**863**	**1,580**	99.3 U	31.5	3.96	0.75 U	1.0 U

Table 1
Groundwater Analytical Results: Contaminants of Concern

Analyte	Total Petroleum Hydrocarbons (TPH)			Benzene, Toluene, Ethylbenzene, and Xylenes			
	Gasoline-Range Organics	Diesel-Range Organics [1]	Oil-Range Organics [1,8]	Benzene	Ethylbenzene	Toluene	Xylene (total)
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Criteria	800	500	500	51	--	--	--
Sample Location and Date							
Other Site Monitoring Wells (cont.)							
PP-32 (Screened Interval 8–18 ft)							
7/28/2016	296	50 U	142	**113**	1.0 U	1.0 U	1.0 U
10/27/2016	50 U	50.3 U	152	2.74	1.0 U	1.0 U	1.0 U
1/26/2017	373	50 U	**542**	**160**	1.0 U	1.0 U	1.0 U
4/26/2017	289	49.8 U	114	**97**	1.0 U	1.0 U	1.0 U
8/2/2017	114	49.8 U	99.6 U	**80.4**	1.0 U	1.0 U	1.0 U
11/8/2017	50 U	50 U	159	40.3	1.0 U	1.0 U	1.0 U
2/8/2018	50 U	49.7 U	99.4 U	26.1	1.0 U	1.0 U	1.0 U
5/2/2018	221	49.9 U	175 J	**88.4**	1.0 U	1.0 U	1.0 U
10/25/2018	85.1	50.1 U	100 U	30.1	1.0 U	1.0 U	1.0 U
4/8/2019	50 U	49.9 U	271	2.37	1.0 U	1.0 U	1.0 U
10/22/2019	95	49.4 UJ	146 J	34.1	1.0 U	1.0 U	1.0 U
4/27/2020	50 U	49.6 U	231	1.0 U	1.0 U	1.0 U	1.0 U
10/21/2020	50 U	49.3 U	332	16.2	1.0 U	1.0 U	1.0 U
4/20/2021	50 U	98.6 U	414	0.44 U	0.4 U	0.75 U	1.0 U
10/13/2021	57.1	347	98.6 U	8.86	0.4 U	0.75 U	1.0 U
PP-33 (Screened Interval 5–15 ft)							
7/28/2016	**1,560**	55 JM	99.5 U	**670**	3.90	6.30	4.38
10/26/2016 [4]	50 U	94.8	140	1.0 U	1.0 U	1.0 U	1.0 U
1/25/2017	316	109	**520**	49.6	1.0 U	1.0 U	1.0 U
4/25/2017	442	170	**685**	**80.6**	1.0 U	1.0 U	1.11
8/2/2017	457	49.8 U	99.6 U	**207**	1.0 U	1.24	1.03
11/7/2017	50 U	146 [2]	264	20.1	1.0 U	1.0 U	1.12
02/8/2018 [4]	**1,160**	218 [2]	**614**	**128**	2.09	1.57	1.93
5/3/2018	647	205 [2]	**690**	**164**	1.0 U	1.10	1.0 U
10/25/2018	81.4	142	302	1.0 U	1.0 U	1.10	1.0 U
4/8/2019	128	49.9 U	416	1.04	1.0 U	1.0 U	1.0 U
10/21/2019	50 U	49.4 UJ	254 J	1.0 U	1.0 U	1.0 U	1.0 U
4/27/2020	50 U	68.6 [6]	**831**	1.0 U	1.0 U	1.0 U	1.0 U
10/21/2020	50 U	50 U	366	1.0 U	1.0 U	1.0 U	1.0 U
4/20/2021	50 U	98.7 U	**1,460**	0.44 U	0.4 U	0.75 U	1.0 U
10/13/2021	50 U	**663**	99.6 U	0.44 U	0.4 U	0.75 U	1.0 U
PP-36 (Screened Interval 5–15 ft)							
7/27/2016	297	49.8 U	99.7 U	**90.6**	4.72	1.0 U	3.50
10/26/2016	**2,900**	49.8 U	**622**	**321**	246	4.28	9.83
1/25/2017	**6,000**	255	**1,240**	**323**	355	4.01	15.2
4/25/2017	**6,170**	282	**693**	**530**	301	6.95	27.7
08/2/2017 [4]	**1,320**	63.3 [2]	374	**153**	39.6	1.64	6.77
11/8/2017	515	229 [2]	435	**153**	22.2	1.04	4.38
2/8/2018	**5,310**	408 [2]	497	**272**	348	5.09	17.5
5/3/2018	**5,350**	274 [2]	337 J	**290**	346	5.04	19.1
10/25/2018	513	58.9 [2]	149	23.6	4.13	1.0 U	1.0 U
4/8/2019	**4,200**	49.5 U	327	**160**	3.02	194	8.51
10/22/2019	**1,610**	110 J [2]	624 J	37.5	37.9	1.0 U	34.1
4/27/2020	**2,910**	219 [3]	424	39.5	72.2	1.13	3.86
10/21/2020	**1,970**	103 [3]	379	47.7	42.1	1.42	1.85
4/21/2021	**1,520**	152 J [2]	466 J	37.6	26.5	0.762	2.78
10/13/2021	**898**	458	98.1 U	5.09	0.928	0.75 U	1.0 U
PP-37R [7] (Screened Interval 10–20 ft)							
8/4/2017	**3,640**	56.9 [2]	99.7 U	**1,420**	1.0 U	3.97	1.22
11/8/2017	50 U	131 [2]	339	20.1	1.0 U	1.0 U	1.0 U
2/8/2018	50 U	50 U	123	1.0 U	1.0 U	1.0 U	1.0 U
5/2/2018	50 U	49.8 U	131	15.7	1.0 U	1.0 U	1.0 U
4/8/2019	135	50.1 U	324	**72.1**	1.0 U	1.0 U	1.0 U
10/21/2019 [4]	219	49.1 UJ	49.1 UJ	**135 J**	80.6	1.0 U	1.0 U
4/27/2020	50 U	49.7 U	401	5.5	1.0 U	1.0 U	1.0 U
10/21/2020	221	49.2 U	251	**100**	1.0 U	1.0 U	1.0 U
4/21/2021	177	98.2 U	**958**	**89.7**	0.4 U	0.75 U	1.0 U
10/13/2021	235	**548**	98.1 U	**100**	0.4 U	0.75 U	1.0 U

Notes:

-- Not analyzed or not available.

RED/BOLD Detected concentration that exceeds criteria.

1 Results without and (with) silica gel cleanup.

2 Laboratory notes that DRO results indicate the presence of unresolved compounds eluting from dodecane through tetracosane (C12 to C24).

3 Laboratory notes that DRO results indicate the presence of unresolved compounds eluting from dodecane through tetracosane (C12 to C24), and resembles a continuation of the gasoline detection not quantified under the NWTPH-Gx method.

4 A field duplicate was collected. The greatest value is reported.

5 PP-18R was replaced by PP-18R2 in March 2019, approximately 25 feet north.

6 Laboratory notes that DRO results indicate unresolved compounds in the diesel range inconsistent with a known petroleum standard.

7 PP-37 was screened 5–15 feet bgs, but was replaced by PP-37R in March 2019, which is screened 10–20 ft bgs.

8 Coordination with laboratory on quantification of DRO versus ORO was conducted between the April and October 2021 monitoring events. Laboratory concluded that overlap of DRO and ORO carbon ranges in a single peak is more indicative of a weathered diesel rather than heavy oil. ORO results collected prior to October 2021 interpreted as a weathered-diesel product based on labortory coordination and conceptual site model of residual diesel contamination in soil acting as source to groundwater.

Abbreviations:

bgs Below ground surface

DRO Deisel-range organics

ft Feet

µg/L Micrograms per liter

ORO Oil-range organics

Qualifiers:

J Concentration is estimated but acceptable for most uses.

JM Analyte is detected; concentration is considered to be an estimate due to poor match to chromatographic standard used for quantitation.

U Analyte is not detected at the associated reporting limit.

UJ Analyte is not detected at the associated reporting limit, which is considered to be an estimate.

Table 2
Groundwater Analytical Results: Geochemical Parameters

Analyte	Conventionals					Metals		Field Parameters	
	Biochemical Oxygen Demand	Chemical Oxygen Demand	Bromide	Methane	Sulfate	Iron, Dissolved	Iron, Total	Dissolved Oxygen	Oxidation-Reduction Potential
Units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mV
Sample Location and Date [1]									
Conditional Point of Compliance Monitoring Wells									
PP-17 (Screened Interval 5–15 ft)									
7/27/2016	5.64	57.7	--	0.005 U	--	617	835	NM	NM
10/27/2016	11.2	--	--	0.193	--	592	1,020	0	-75
1/26/2017	6.57	--	--	0.229	570	213	444	0.72	-94
4/26/2017	--	--	--	--	110	--	--	0.78	-165
11/7/2017	--	--	--	--	39.7	--	--	0	57
2/8/2018	--	--	--	0.279	257	--	--	0	-147
05/2/2018 [2]	--	--	2.18	--	191	--	--	0	-143
10/25/2018	--	--	3.84 JQ	--	161	--	--	0	-134
4/8/2019	--	--	--	--	243	--	--	3.36	-108.7
10/22/2019	--	--	77 J	--	1,410 J	--	--	0.23	-207
04/27/2020 [2]	--	--	--	--	144	--	--	0	-180.9
10/21/2020	--	--	--	--	114	--	--	0.75	-98.7
4/21/2021	--	--	--	--	89.5	--	--	0.50	0.0
10/13/2021	--	--	--	--	92.5	--	--	1.15	108
PP-18R2 [3] (Screened Interval 10–20 ft)									
7/28/2016	15.2	38.5	--	5.48 J	--	100 U	676	NM	NM
10/27/2016	20.3	--	--	0.117	--	100 U	100 U	0	-244
1/26/2017	11.6	--	--	0.259	41.0	100 U	101	0.66	-192
4/26/2017	--	--	--	--	44.2	--	--	0.96	-180
11/7/2017	--	--	--	--	45.9	--	--	0	2
2/8/2018	--	--	--	0.381	97.8	--	--	0	-184
5/2/2018	--	--	0.361	--	62.0	--	--	0	-226
04/8/2019 [2]	--	--	--	--	130	--	--	0.63	-83
10/22/2019	--	--	16.4 J	--	266 J	--	--	0.53	-61
4/27/2020	--	--	2.98	--	148	--	--	0.11	-93
10/21/2020	--	--	--	--	300	--	--	0.76	-66.6
4/21/2021	--	--	--	--	163	--	--	0.63	24.7
10/13/2021	--	--	--	--	286	--	--	1.07	74.7
PP-19 (Screened Interval 5–15 ft)									
7/27/2016	2 U	80.9	--	0.007	--	100 U	100 U	NM	NM
10/27/2016	2 U	--	--	0.005 U	--	500 U	500 U	3.01	49
1/26/2017	2 U	--	--	0.0051	610	100 U	291	4.50	105
4/26/2017	--	--	--	--	518	--	--	4.00	154
10/22/2019	--	--	--	--	740 J	--	--	2.39	0.5
4/27/2020	--	--	--	--	274	--	--	1.38	58.5
10/21/2020	--	--	--	--	1,010	--	--	1.64	176.5
4/20/2021	--	--	--	--	210	--	--	1.26	102.1
10/13/2021	--	--	--	--	1,170	--	--	3.16	154.5
PP-34 (Screened Interval 8–18 ft)									
7/28/2016	10.8	53.1	--	1.03	--	100 U	422	NM	NM
10/27/2016	8.26	--	--	0.0795	--	100 U	771	0	-178
1/26/2017	7.16	--	--	0.838	38.6	100 U	134	0.78	-244
4/26/2017	--	--	--	--	47.8	--	--	0.76	-143
11/07/2017 [2]	--	--	--	--	41.8	--	--	0	-3
2/8/2018	--	--	--	0.197	106	--	--	0	-186
5/2/2018	--	--	0.410	--	63.0	--	--	1.24	103
10/25/2018	--	--	1.490 JQ	--	53.5	--	--	0	-211
4/8/2019	--	--	--	--	101	--	--	0.44	-94
10/22/2019	--	--	24.9 J	--	403 J	--	--	0.21	-232
4/27/2020	--	--	3.31	--	60.6	--	--	0.03	-104
10/21/2020	--	--	--	--	51.0	--	--	0.70	-264
4/21/2021 [2]	--	--	--	--	40.4	--	--	0.57	-6.80
10/13/2021	--	--	--	--	35.4	--	--	0.74	17.3
Other Site Monitoring Wells									
PP-13R (Screened Interval 5–15 ft)									
7/28/2016	32.9	51.7	--	12.1 J	--	152	1,470	NM	NM
10/27/2016	30.7	--	--	1.74	--	259	427	0	-110
1/25/2017	2 U	--	--	0.0915	164	100 U	100 U	0	-208
4/25/2017	--	--	--	--	54.9	--	--	0.61	-207
11/7/2017	--	--	--	--	5.07	--	--	0	-68
2/8/2018	--	--	--	0.308	148	--	--	0	-226
5/2/2018	--	--	--	--	208	--	--	0	-192
10/25/2018 [2]	--	--	1.88	--	14.7	--	--	0.17	-159
4/8/2019	--	--	--	--	129	--	--	0.38	-191
10/21/2019	--	--	6.36 J	--	74 J	--	--	0.42	-135
4/27/2020	--	--	--	--	91.4	--	--	0.29	-176.6
10/21/2020	--	--	--	--	49.9	--	--	0.80	28.8
4/21/2021	--	--	--	--	108	--	--	0.52	48.9
10/13/2021	--	--	--	--	64.2	--	--	1.53	-213.2

Table 2
Groundwater Analytical Results: Geochemical Parameters

Analyte	Conventionals					Metals		Field Parameters	
	Biochemical Oxygen Demand	Chemical Oxygen Demand	Bromide	Methane	Sulfate	Iron, Dissolved	Iron, Total	Dissolved Oxygen	Oxidation-Reduction Potential
Units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mV
Sample Location and Date [1]									
Other Site Monitoring Wells (cont.)									
PP-14R (Screened Interval 5–15 ft)									
7/28/2016	25.5	35.9	--	8.28 J	--	100 U	287	NM	NM
10/27/2016	35.5	--	--	2.23	--	100 U	206	0	-110
1/25/2017	12.0	--	--	6.80 J	221	100 U	100 U	0.54	-208
4/25/2017	--	--	--	--	231	--	--	0.60	-151
11/7/2017	--	--	--	--	11.0	--	--	0	-78
2/8/2018	--	--	--	0.911	337	--	--	0	-157
5/2/2018	--	--	--	--	155	--	--	0	-87
10/25/2018	--	--	1.32	--	30.4	--	--	0.22	-155
4/8/2019	--	--	--	--	334	--	--	0.41	-140
10/21/2019	--	--	--	--	1,060 J	--	--	0.18	-247
4/27/2020	--	--	--	--	264	--	--	0.33	-151.4
10/21/2020	--	--	--	--	58.4	--	--	0.21	-203.1
4/20/2021	--	--	--	--	201	--	--	0.61	56.4
10/13/2021 [2]	--	--	--	--	178	--	--	0.77	20.6
PP-15R2 (Screened Interval 5–15 ft)									
7/27/2016	30.9	70.9	--	7.4 J	--	212	1,670	NM	NM
10/26/2016	39.6	--	--	1.05	--	1,950	2,210	0.81	-130
01/25/2017 [2]	21.6	--	--	5.34	225	535	1,100	0.60	-166
4/25/2017	--	--	--	--	181	--	--	0.62	-152
11/8/2017	--	--	--	--	7.70	--	--	0	-56
2/8/2018	--	--	--	1.54	68.8	--	--	0.16	-199.6
5/2/2018	--	--	--	--	11.8	--	--	0	-165
10/25/2018	--	--	1.13	--	0.78	--	--	0.22	-127
4/8/2019	--	--	--	--	14.9	--	--	0.45	-146
10/21/2019	--	--	--	--	4.78 J	--	--	0.18	-240
4/27/2020	--	--	3.34	--	45	--	--	0.22	-282.5
10/21/2020	--	--	--	--	3 U	--	--	0.29	-110.8
4/20/2021	--	--	--	--	0.864	--	--	0.41	-129.3
10/13/2021	--	--	--	--	6 U	--	--	0.60	-21.8
PP-27 (Screened Interval 5–15 ft)									
7/27/2016	10.4	54.4	--	3.51	--	199	20,100	NM	NM
10/26/2016	8.23	--	--	0.111	--	100 U	4,090	0	-192
1/25/2017	17.7	--	--	1.11	18.8	100 U	1,520	0.7	-139
4/25/2017	--	--	--	--	31.0	--	--	0.77	-210
11/8/2017	--	--	--	--	16.4	--	--	0.15	-193
2/8/2018	--	--	--	1.14	52.6	--	--	0.60	-177
5/3/2018	--	--	--	--	124	--	--	1.25	74
10/25/2018	--	--	0.838	--	0.714	--	--	0.23	-158
4/8/2019	--	--	--	--	118	--	--	3.80	27.4
10/21/2019	--	--	--	--	42.5 J	--	--	0.14	-385
4/27/2020	--	--	--	--	16.4	--	--	0	-143.2
10/21/2020	--	--	--	--	6.74	--	--	0.64	-156
4/20/2021	--	--	--	--	6.69	--	--	0.5	110.8
10/13/2021	--	--	--	--	2.21	--	--	1.44	-364.4
PP-29 (Screened Interval 5–15 ft)									
7/28/2016	20.3	69.6	--	3.34	--	100 U	1,750	NM	NM
10/26/2016	37.9	--	--	1.70	--	100 U	811	0	-101
1/25/2017	15.6	--	--	2.45	152	100 U	100 U	1.11	-104
04/25/2017 [2]	--	--	--	--	123	--	--	0.60	-173
11/8/2017	--	--	--	--	6.90	--	--	0	-47
2/8/2018	--	--	--	0.227	279	--	--	2.75	-16.7
5/3/2018	--	--	--	--	163	--	--	0.07	-49
10/25/2018	--	--	0.79	--	2.21	--	--	0	-77
4/8/2019	--	--	--	--	264	--	--	3.56	14.7
10/21/2019	--	--	--	--	27.4 J	--	--	0.36	-106
4/27/2020	--	--	4.12	--	126	--	--	1.80	-106
10/21/2020 [2]	--	--	--	--	26.0	--	--	0.74	-67.1
4/20/2021	--	--	--	--	35.8	--	--	2.93	60.1
10/13/2021	--	--	--	--	3.8 JQ	--	--	1.39	-104.5
PP-30 (Screened Interval 5–15 ft)									
7/28/2016	13.0	91.5	--	3.34	--	100 U	287	NM	NM
10/27/2016	11.3	--	--	2.14	--	163	267	0	-171
1/25/2017	21.0	--	--	2.1	43.2	100 U	339	0.55	-278
4/25/2017	--	--	--	--	59.8	--	--	0.60	-272
11/7/2017	--	--	--	--	25.1	--	--	0	-155
2/8/2018	--	--	--	0.21	60.0	--	--	0	-277
5/2/2018	--	--	--	--	108	--	--	0	-221
10/25/2018	--	--	0.702	--	15.3	--	--	0	-221
4/8/2019	--	--	--	--	130	--	--	4.16	-90.4
10/22/2019	--	--	--	--	199 J	--	--	0.42	-205
4/27/2020	--	--	2.56	--	90.0	--	--	0.01	-126.3
10/21/2020	--	--	--	--	54.8	--	--	0.29	-21
4/21/2021	--	--	--	--	66.2	--	--	0.5	-3.60
10/13/2021	--	--	--	--	15.6	--	--	0.71	20.5

Table 2
Groundwater Analytical Results: Geochemical Parameters

Analyte	Conventionals					Metals		Field Parameters	
	Biochemical Oxygen Demand	Chemical Oxygen Demand	Bromide	Methane	Sulfate	Iron, Dissolved	Iron, Total	Dissolved Oxygen	Oxidation-Reduction Potential
Units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mV
Sample Location and Date [1]									
Other Site Monitoring Wells (cont.)									
PP-32 (Screened Interval 8–18 ft)									
7/28/2016	22.4	54.4	--	7.63 J	--	503	2,290	NM	NM
10/27/2016	33.2	--	--	2.14	--	466	672	0	-107
1/26/2017	34.6	--	--	10 J	16.6	1,390	1,820	0.55	-173
4/26/2017	--	--	--	--	67.6	--	--	0.65	-148
4/8/2019	--	--	--	--	81.3	--	--	0.40	-156
10/22/2019	--	--	--	--	3.45 J	--	--	0.15	-248
4/27/2020	--	--	--	--	161	--	--	0.45	-160.6
10/21/2020	--	--	--	--	4.21	--	--	0.27	25.2
4/20/2021	--	--	--	--	140	--	--	0.68	77.2
10/13/2021	--	--	--	--	1.25	--	--	1.46	-199.6
PP-33 (Screened Interval 5–15 ft)									
7/28/2016	21.0	48.4	--	5.67 J	--	609	2,530	NM	NM
10/26/2016 [2]	26.0	--	--	1.07	--	1,820	2,030	0.07	-127
1/25/2017	11.8	--	--	2.71	135	588	1,710	0.55	-135
4/25/2017	--	--	--	--	109	--	--	0.66	-138
11/7/2017	--	--	--	--	5.64	--	--	0	-86
02/08/2018 [2]	--	--	--	0.798	192	--	--	0.24	-167
5/3/2018	--	--	--	--	49.1	--	--	1.05	52
10/25/2018	--	--	0.936	--	11.6	--	--	0.19	-143
4/8/2019	--	--	--	--	265	--	--	0.39	-136
10/21/2019	--	--	--	--	26.4 J	--	--	0.39	-130
4/27/2020	--	--	--	--	138	--	--	0.69	-146.7
10/21/2020	--	--	--	--	16.2	--	--	0.27	-104.5
4/20/2021	--	--	--	--	108	--	--	0.53	77.8
10/13/2021	--	--	--	--	14.2	--	--	0.72	-5.9
PP-36 (Screened Interval 5–15 ft)									
7/27/2016	11.0	30.6	--	2.80	--	100 U	10,600	NM	NM
10/26/2016	10.1	--	--	0.128	--	100 U	12,100	0	-112
1/25/2017	14.2	--	--	1.41	113	507	1,560	0.60	-173
4/25/2017	--	--	--	--	49	--	--	0.63	-207
11/8/2017	--	--	--	--	33.8	--	--	0	-94
2/8/2018	--	--	--	0.211	148	--	--	0.16	-236.5
5/3/2018	--	--	--	--	131	--	--	1.49	32
10/25/2018	--	--	0.403	--	2.5	--	--	0.22	-130
4/8/2019	--	--	--	--	68.5	--	--	3.82	-72.6
10/22/2019	--	--	--	--	40.1 J	--	--	0.2	-199
4/27/2020	--	--	2 U	--	30.1	--	--	0.29	-186.5
10/21/2020	--	--	--	--	10.1	--	--	0.27	-108.1
4/21/2021	--	--	--	--	12	--	--	0.53	15.2
101/3/2021	--	--	--	--	0.6 U	--	--	1.49	-185.3
PP-37R [4] (Screened Interval 10–20 ft)									
11/8/2017	--	--	--	--	7.02	--	--	0.13	-4
2/8/2018	--	--	--	0.0218	148	--	--	1.8	9.2
5/2/2018	--	--	--	--	131	--	--	1.2	66
4/8/2019	--	--	--	--	12.8	--	--	3.4	-12.7
10/21/2019 [2]	--	--	1.92 J	--	42 J	--	--	0.18	-242
4/27/2020	--	--	--	--	80.2	--	--	0.06	-67.3
10/21/2020	--	--	--	--	31.7	--	--	0.71	-68.1
4/21/2021	--	--	--	--	50	--	--	0.62	15.2
10/13/2021	--	--	--	--	4.43 JQ	--	--	1.87	-196.8

Notes:

-- Not analyzed or not available.

1 No geochemical parameters were analyzed during the August 2017 sampling event.

2 A field duplicate was collected. The greatest value is reported.

3 PP-18R was replaced by PP-18R2 in March 2019, approximately 25 feet north.

4 PP-37 was screened 5–15 ft bgs, but was replaced by PP-37R in March 2019, which is screened 10–20 ft bgs.

Abbreviations:

bgs Below ground surface

ft Feet

µg/L Micrograms per liter

mg/L Milligrams per liter

mV Millivolt

NM Not measured

Qualifiers:

J Concentration is estimated but acceptable for most uses.

JQ Concentration is reported between the method detection limit and reporting limit and is considered an estimate.

U Analyte is not detected at the associated reporting limit.

Attachment 2
Cultural Resources Report:
K Ply Mill Cleanup Archaeological Monitoring
Technical Memorandum

CULTURAL RESOURCES REPORT COVER SHEET

DAHP Project No.: 2021-04-02418

Author: Ferris, Jennifer M.

Title of Report: KPly Mill Cleanup Archaeological Monitoring Technical Memorandum

Date of Report: May 20, 2021

County: Clallam Section: 3 Township: 30 N Range: 06 W

Quad: Ediz Hook Acres: 18

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Technical Memorandum

Date:	Thursday, May 20, 2021
Project:	KPly Mill Cleanup
To:	Pamela Osterhout, LG Floyd|Snider 601 Union Street, Suite 600 Seattle, WA 98101
From:	Jennifer Ferris, MA, RPA
Subject:	KPly Mill Cleanup Archaeological Monitoring DAHP Project No. 2021-04-02418

Introduction

This memorandum describes the results of the archaeological monitoring completed on April 20 and 21, 2021, for the Port of Port Angeles (Port) KPly Mill Cleanup sampling undertaken by Floyd|Snider. The project is within the former KPly Mill site, located at 439 W. Marine Drive, Port Angeles, Washington, which is owned by the Port (Figure 1 and Figure 2 in Appendix A). The project area is located in Section 3 of Township 30 North, Range 6 West of the Willamette Meridian.

The project area was considered sensitive for cultural resources and, as a result, HDR Engineering, Inc. (HDR) was retained to provide monitoring services for the sampling. These services included a focused review of existing cultural resources records within 1.0 mile (mi; 1.6 kilometer [km]) of the project area, monitoring of the soil sampling, and preparation of a technical memorandum documenting the results of the review and monitoring.

Project Background

The Port is implementing a long-term soil monitoring program at the KPly Mill site, which was a former plywood mill. The site is being remediated in accordance with Agreed Order (AO) No. DE 11302 between the Washington State Department of Ecology (Ecology) and the Port, effective May 2015.

Beginning in 1941, Peninsula Plywood Corporation (PenPly) operated a mill on the property, manufacturing plywood and lumber that largely supported the war effort during World War II and the post-war boom (Tingwall and Rust 2009). After a lull in demand during the 1960s, the PenPly facility was acquired by ITT Rayonier, who maintained operation of the mill from 1971 to 1989. During the Rayonier operations, a hydraulic oil leak contaminated part of the site (Ecology 2021). In 1989, the property was sold to Klukwan, Inc., an Alaska Native venture that took over production as KPly, Inc. (Tingwall and Rust 2009). Various operations since 1941 included log storage, hog fuel burning, and log debarking and peeling (Pickrell and Gilpin 2015). By 2011,

mill operations discontinued; the associated structures within the property were subsequently abandoned and demolished, and the property is now being remediated (Floyd|Snider 2015).

In 2015 and 2016, 53,765 tons of contaminated soil was removed from the KPly Mill site (Osterhout and Geiselbrecht 2021). The site was then backfilled with a combination of crushed concrete, quarry spalls, and clean, common borrow fill material in accordance with the requirements of the Cleanup Action Plan (CAP; Ecology 2015; Osterhout and Geiselbrecht 2021). This area is shown on Figure 3 as the "2015 mass excavation area."

The long-term soil monitoring program, which is a component of the selected remedial action for the site, is to be conducted once every 5 years following completion of active remediation (Osterhout and Geiselbrecht 2021). The soil monitoring is being implemented to confirm that monitored natural attenuation (MNA) of soil is occurring in areas of residually contaminated soil outside of the excavation areas and to define the current limits of soil greater than cleanup levels (CULs) and average concentrations of contaminants of concern (COCs) within these areas, which are expected to diminish over time (Ecology 2015; Osterhout and Geiselbrecht 2021). The CAP identifies an expected 30-year time frame for all site soil to achieve CULs via MNA (Osterhout and Geiselbrecht 2021).

Floyd|Snider implemented the first soil monitoring event, which occurred in April 2021. This sampling served to establish baseline COC concentrations at established monitoring locations within the areas of residual contamination where the CAP identifies MNA as the selected remedial action (Osterhout and Geiselbrecht 2021). Soil samples were collected from a total of 29 locations across a 40-foot (ft) by 40-ft grid. Soil was collected by direct-push probe, to be later analyzed for diesel-range organics (DRO), oil-range organics (ORO); gasoline-range organics (GRO); and benzene, toluene, ethylbenzene, and xylenes (BTEX) as described in the EDR (Floyd|Snider 2015; Osterhout and Geiselbrecht 2021). A handheld global positioning device with sub-meter accuracy was used during drilling to record the sampling locations, which are shown on Figure 3.

Cultural Resources Regulations

The Washington State Environmental Policy Act (SEPA) (Revised Code of Washington [RCW] 43.21C) and implementing rules contained in Washington Administrative Code 197-11 require the identification of historic, archaeological, and cultural resources listed in or eligible for the national, state, or local registers. Measures must be considered to reduce or control impacts on identified significant cultural resources affected by a proposed project.

In the state of Washington, archaeological sites are protected from known disturbance on both public and private lands. RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the Department of Archaeology and Historic Preservation (DAHP) before excavating, removing, or altering Native American human remains or archaeological resources in Washington. Failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090.

Under RCW 27.53.095, the DAHP is allowed to issue civil penalties for the violation of this statute of up to $5,000, in addition to site restoration costs and investigative costs. Remedies do

not prevent concerned tribes from undertaking civil action in state or federal court, or law enforcement agencies from undertaking criminal investigation or prosecution. RCW 27.44.050 allows an affected Indian tribe to undertake civil action apart from any criminal prosecution if burials are disturbed.

In the event that a project is using capital funds for construction or acquisitions, Washington Governor's Executive Order (EO) 21-02 applies. EO 21-02 requires agencies to consult with DAHP and affected Indian tribes on the potential effects of state-funded projects on cultural resources that are not undergoing Section 106, including grant or pass-through funding that culminates in construction or land acquisitions, to determine potential effects to cultural resources. The agency should initiate consultation with DAHP and affected tribes early in the project planning process and consultation must be completed prior to the expenditure of any state funds for construction, demolition, or acquisition. Consultation under EO 21-02 may be delegated to non-state recipients of state funds but the state agency shall retain the responsibility to ensure an adequate consultation process and will be responsible for holding all records related to the tribal consultation process. The agency must provide the records to DAHP to demonstrate completion of the tribal consultation process.

The 2006 Settlement Agreement between the Lower Elwha Klallam Tribe (LEKT), State of Washington, City of Port Angeles, and Port stipulates that the parties to the agreement will institute and maintain active communication with each other for the purposes of ensuring cooperation, coordination, and collaboration with regard to issues of archaeological, cultural, and historic significance. It also requires the Port, City of Port Angeles, and State of Washington to consult with the LEKT with regard to a proposed mitigation plan if ground-disturbing work will occur within culturally sensitive areas of interest to the Tribe. The mitigation plan may dictate that an on-site archaeologist and/or LEKT members or staff persons may monitor the work and that the City of Port Angeles, Port, or State of Washington will take all reasonable means to ensure that the LEKT representatives have access to the site.

Cultural Resources Review

HDR Senior Cultural Resources Specialist Jennifer Ferris, MA, RPA, completed a focused desktop review using the Washington Information System for Architectural and Archaeological Records Data (WISAARD) database managed by the DAHP, as well as the Port's and HDR's office files. The archival research focused on previously conducted cultural resources surveys and recorded archaeological resources (i.e., sites and isolates) within 1.0 mi (1.6 km) of the project area in April 2021. Previous archaeological monitoring reports (Meoli 2008; Pickrell and Gilpin 2015; Raff-Tierney and Gilpin 2014; Tingwall and Rust 2009) provide detailed archival and background research associated with the KPly Mill Cleanup project.

The modern-day city of Port Angeles is in the ethnohistoric territory of the Klallam (Clallam, S'Klallam), a Central Coast Salish people whose villages ranged along the north shore of the Olympic Peninsula from the Hoko River to Port Discovery Bay, with some territory extending into the San Juan Islands and Hood Canal (Gunther 1927; Suttles and Lane 1990) and inland to the crest of the Olympic Mountains. The project area is sensitive for cultural resources due to its location between Valley and Tumwater creeks and proximity to a documented ethnographic

Klallam village along the shoreline of Port Angeles Harbor. Ethnographic reports and oral tradition place three Klallam villages facing north toward Ediz Hook along the shore of modern-day Port Angeles, including Čĺxwicən (Tze-whit-zen or 45CA523) and I'ēnis (45CA468) at the mouth of Ennis Creek, both of which were documented by Gunther (1927). The third village, shown on an 1853 Coast and Geodetic Survey map near the paired mouths of Tumwater and Valley creeks, was recalled in childhood memories by LEKT elders (Beery 2010:35).

There have been 36 cultural resources studies previously completed within 1.0 mi (1.6 km) of the project area that are reported in WISAARD, and an additional two surveys completed recently that are not yet in WISAARD (Table 1). Seven previous surveys overlap with the project area (Dellert et al. 2016; Scott et al. 2019; Raff-Tierney and Gilpin 2014; Tingwall and Rust 2009; Trost 2015; Uldall and Ferris 2021; White 2017).

Table 1. Previously Completed Cultural Resources Surveys

Year	Author(s)	Report Title	NADB #	Report Type	Proximity to Project Area
2021	Uldall and Ferris	Archaeological Resources Survey for the Marine Trades Industrial Area, Port Angeles, Washington	TBD	Survey	Adjacent
2021	Uldall and Ferris	Results for the 914/916 Marine Drive Cultural Resources Investigation, Port Angeles, Washington	TBD	Survey	0.3 mi W
2021	Colón et al.	Archaeological Resources Survey and Testing at the Port of Port Angeles Log Yard, Port Angeles, Washington	TBD	Survey and testing	0.9 mi NW
2019	Scott and Ferris	Results of Archaeological Support Service for the William Shore Memorial Pool Project, Port Angeles, Washington	1694699	Monitoring	0.4 mi S
2019	Hannum and Ferris	Results of the Archaeological Monitoring for the Port of Port Angeles Boat Yard Fabric Structure Project, Port Angeles, Washington	1693054	Monitoring	0.4 mi W
2019	Hannum and Ferris	Results of the Archaeological Monitoring for the Port of Port Angeles Maintenance and Repair Program at Terminal 1, Port Angeles, Washington	1692957	Monitoring	540 ft NW
2019	Ferris	Results of the Archaeological Monitoring for the Port of Port Angeles Coffer Dam Dock Facility Improvements Geotechnical Borings, Port Angeles, Washington	1692469	Survey	750 ft NW
2019	Ferris and Scott	Results of Archaeological Survey for the Terminal 7 Site Redevelopment and Stormwater Conveyance Improvements Projects, Port Angeles, Washington	1692305	Survey	0.9 mi WNW
2019	Scott et al.	Results for Archaeological Monitoring for the Boat Wash Down Facility – Marine Trades Industrial Park Project, Clallam County, Washington	TBD	Monitoring	Within
2018	Hannum and Ferris	Results of Archaeological Monitoring for the Marine Terminal and Cargo Surge Area Stormwater Conveyance and Treatment Improvements Project, Port of Port Angeles	1692063	Monitoring	760 ft NW
2018	Mathews	Archaeological Monitoring for Geotechnical Testing for the Platypus Marine New Building, 523 Marine Dr. Port Angeles, Clallam County, Washington	1692161	Monitoring	750 ft SW
2018	Metz and Ferris	Archaeological Survey for the Marine Terminal and Cargo Surge Area Stormwater Conveyance and Treatment Improvements Project, Port of Port Angeles	1690262	Survey	760 ft NW
2018	Wessen	A Report of Archaeological Monitoring in the Old Pettitt & Shell Oil Bulk Plant Project Area, Port Angeles, Clallam County, Washington	1691525	Monitoring	0.3 mi W
2017	White	KPly Environmental Geo-Test Cultural Resources Monitoring	n/a	Monitoring	Within

Year	Author(s)	Report Title	NADB #	Report Type	Proximity to Project Area
2016	Boersema	Archaeological Monitoring for Excavation of Terminal 7 - Stormwater Infiltration Pond, Port of Port Angeles, Clallam County	1687963	Monitoring	0.9 mi WNW
2016	Dellert et al.	Archaeological Monitoring Report for the 2015 KPly Remediation Project, City of Port Angeles, Clallam County, Washington	1691128	Monitoring	Within
2015	Trost	Evaluation of the KPly Rail Road Spur Site (45CA458) Historic Register Eligibility, KPly Site Remedial Investigation, Port Angeles, Washington	1687801	Testing and NRHP evaluation	Within
2014	Raff-Tierney and Gilpin	Archaeological Monitoring for the KPly Remediation Project, City of Port Angeles, Washington	n/a	Monitoring	Within
2014	Sullivan	Port of Port Angeles Terminals 1, 3, 4, 7, Fuel Pier and Transit Shed Cultural Resource Survey	1686276	Survey	5 ft NW
2013	Pinyerd	Elks Lodge #SE33XC102, 131 E 1st St., Port Angeles	1683933	Historic structures survey	0.3 mi SE
2012	Gall and Holschuh	Archaeological Monitoring of the Tumwater Creek Bridge Replacement Project, Port Angeles	1681854	Monitoring	0.2 mile W
2011	Beery	Lower Elwha River Restoration Project: Archaeological Monitoring for Stormwater Separation to Mitigate Lower Elwha Flows to City of Port Angeles	1680863	Monitoring	450 ft SE
2010	Kiers	Section 106 Compliance State Route 117, Tumwater Truck Route- Major Electrical	1354363	Survey	800 ft SW
2010	Wessen	A Report of Archaeological Monitoring of Construction Excavations at the East Boat Haven Sheet Pile Retaining Wall Repair Project Area, Port Angeles	1354857	Monitoring	0.42 mi W
2009	Tingwall & Rust	Results of Cultural Resources Monitoring, MTA/K-Ply Cedar Street Benzene Investigation, Clallam County, Washington	1352816	Monitoring	Within
2009	White	Dry Screening Recovery Report and Human Remains Reburial for 45CA523 Tse-Whit-Zen Village and Cemetery Phase 1	1354822	Data Recovery Report	1 mi WNW
2008	Beery	Cultural Resources Inventory for 323 E. 6th Street, Port Angeles	1351950	Survey Report	0.7 mi SE
2008	Meoli	Letter to Derek Beery Regarding the City of Port Angeles Marine Trades Area - Cultural Resource Monitoring Project Number: SJZ-MTA Task 6	1351311	Monitoring Report	0.2 mi W
2007	Fichter et al.	Port Angeles Graving Dock Remediation Project Archaeological Monitoring Report	1350463	Monitoring	1 mi WNW
2007	Gillis and Hodges	Technical Memorandum: Cultural Resources Assessment during Geotechnical Drilling for the 8th Street Bridges Redesign Project	1349172	Survey	0.5 mi SW
2007	Trost	Letter to Jim Ulvenes RE: Cultural Significance of Deposits Observed During Monitoring at the Gateway Project Site, Port Angeles	1349897	Monitoring	0.5 mi E
2007	Wessen	An Archaeological Survey and Evaluation of the Proposed Tumwater Creek Bridge Replacement Project Area, Port Angeles	1350660	Survey	0.2 mi W
2005	Lewarch et al.	Fieldwork Status Report, Data Recovery Excavation and Archaeological Construction Monitoring at the TSE-WHIT-ZEN Site (45CA523)	1346904	Data Recovery	1 mi WNW
2004	ENTRIX, Inc.	Port Angeles 8th Street Bridge Replacements	1344237	Survey	0.5 mi SW
2004	Lewarch and Larson	FINAL - WSDOT Port Angeles Graving Dock Facility Treatment and Monitoring Plans for the Tse-whit-zen Site (45CA523) and Shotwell Recycling Property Recovery, Port Angeles	1343696	Survey	1 mi WNW

Year	Author(s)	Report Title	NADB #	Report Type	Proximity to Project Area
2003	Burns and Rooke	Cultural Resources Survey for the Washington State Department of Transportation's Port Angeles Graving Dock Facility for the Hood Canal Bridge Retrofit and East Half Replacement	1341846	Survey	1 mi WNW
2002	Rooke	Letter Report: Procedures and Results of a Cultural Resources Survey of Cingular Wireless tower Site WA-718 (Shane Park) in Clallam County, Washington	1341199	Survey	0.9 mi W
1998	Robbins and Larson	Letter to Gary Kentworthy Regarding Cultural Resource Monitoring for Construction Excavation of the Peabody Street Storm Outfall Pond Project	1343894	Survey	0.6 mi ESE

NADB = National Archaeological Database

There are 15 previously recorded archaeological resources within 1.0 mi (1.6 km) of the project area documented in WISAARD: one historic district, one historic Indian village, five historic structures, one historic dwelling, one historic cemetery, one historic railroad grade, one precontact village site, one precontact isolate, two historic logging properties, and one historic scatter/concentration (Table 2). In addition, there are three newly identified sites that are not yet reported in WISAARD: a precontact shell midden site, historic industrial features, and historic structural lumber.

A segment of the historic railroad was once present within the project area, previously documented as the KPly Rail Road Spur Site as part of the Chicago, Milwaukee, St. Paul and Pacific Railroad (45CA458) (Trost 2015). The KPly Rail Road Spur was constructed to support former PenPly mill operations, and the main line ran along the artificial shoreline to the north. Site 45CA458 was previously determined not eligible for listing in the National Register of Historic Places (NRHP) (Beery 2010; Trost 2015).

Table 2. Previously Recorded Archaeological Resources Surveys

Site Number	Site Name	Site Type	NRHP Eligibility (SHPO)	Recorded By	Proximity to Project Area
TBD	N/A	Precontact Shell Midden	Unevaluated	Uldall and Ferris 2021a	100 ft E
TBD	N/A	Historic Industrial	Unevaluated	Uldall and Ferris 2021a	100 ft E
TBD	N/A	Historic Structures Unspecified (lumber)	Unevaluated	Uldall and Ferris 2021b	0.3 mi W
45DT235	Port Angeles Civic Historic District	Historic District	Listed	Kidd 2011	0.5 mi SE
45CA235	I'e'nis Clallam Indian Village	Historic Indian Village	Listed	No author 1972	0.6 mi ESE
45CA237	Clallam County Courthouse	Historic Structure	Listed	Edmonson 1987	0.6 mi SE
45CA243	St. Andrews Episcopal Church	Historic Structure	Listed	Garfield 1987	0.7 mi SE
45CA254	US Post Office—Port Angeles Main	Historic Structure	Listed	Bak 1983	0.3 mi ESE
45CA404	Masonic Temple, Port Angeles	Historic Structure	Listed	Garfield 1989	0.6 mi S
45CA405	Joseph Paris House	Historic Dwelling	Listed	Garfield 1987	0.5 mi SE
45CA406	Naval Lodge Elks Building	Historic Structure	Listed	Walls and Fish 1986	0.4 mi ESE

Site Number	Site Name	Site Type	NRHP Eligibility (SHPO)	Recorded By	Proximity to Project Area
45CA458	Chicago, Milwaukee, St. Paul and Pacific Railroad grade	Historic Railroad Property	Not Eligible	Spuelda et al. 1994; Beery 2010; Ferland 2010; Taylor 2018; Uldall and Ferris 2021	Within, N and S
45CA523	*Tse-whit-zen*	Precontact Shell Midden, Cemetery, Village	Listed	Schumacher 2003; Hartmann 2003; Schumacher and Gill 2005; Gill 2005; Fichter et al. 2007; White 2013	0.9 mi WNW
45CA610	Port Angeles Pioneer Cemetery	Historic Cemetery	Listed	Washington DAHP (no date)	0.5 mi S
45CA689	N/A	Precontact Isolate Lithic	Unevaluated	Berry 2011b	150 ft S
45CA773	Port of Port Angeles Rail Spur	Historic Railroad Properties	Unevaluated	Metz 2017	0.9 mi WNW
45CA796	N/A	Historic Logging Properties	Unevaluated	Metz 2017	0.9 mi WNW
45CA797	N/A	Historic Debris Scatter/ Concentration	Unevaluated	Metz 2017	0.9 mi WNW

SHPO = State Historic Preservation Officer

Monitoring

The Port requested archaeological monitoring during all soil sampling in accordance with the AO and the 2006 Settlement Agreement. Floyd|Snider contracted with HDR to conduct the monitoring consistent with the existing Monitoring and Inadvertent Discovery Plan (MIDP) that was previously prepared for the project (Pickrell and Gilpin 2015). Ms. Ferris completed the archaeological monitoring for the sampling. She meets the Secretary of the Interior's Professional Qualifications Standards for Archeology and is a Registered Professional Archaeologist (RPA).

Ms. Ferris monitored the soil sampling on April 20 and 21, 2021. The weather was clear and sunny with temperatures in the low to mid 60 degrees Fahrenheit. Ms. Ferris recorded all field observations in a field notebook and took photographs of each soil core and an overview of the project area. Mr. Bill White, LEKT archaeologist, observed the monitoring activities on April 20, 2021.

A total of 29 soil cores were collected within the project area (Figure 3 through Figure 9). Once collected, the cores were brought to a processing area (Figure 10). Samples were collected from each core by Floyd|Snider personnel (Figure 11 through Figure 16). During sampling, Ms. Ferris inspected all cores for evidence of cultural resources including artifacts, fragmentary shell, charcoal pieces and flecking, fragmentary faunal bone, and anthropogenic sediments such as shell midden and burned soil.

For each core, descriptions of the soil were noted and photographs were taken. The cores extended to 10, 15, or 20 ft (3, 4.5, or 6.1 meters) below ground surface (bgs).

In general, the soil within the 2015 mass excavation area consisted of Type 17 imported fill (brown coarse sand with gravel) to 0.5–1.0 ft (15–30 cm) bgs underlain by brown silty sand to

approximately 2–3 ft (60–90 cm) bgs, which was usually followed by grey, silty, fine to very fine sand with occasional lenses of dark grey medium sand with crushed shell or medium sand with few gravels to about 14 ft (4.3 meters) bgs. These interbedded lenses are characteristic of the tidal flat that once comprised the project area (Floyd|Snider 2015). Cores within the 2015 mass excavation area that extended to 15 ft bgs included B12, C10, D9, F15, and G12. Cores that extended to 10 ft bgs within the 2015 mass excavation area included C11, D10, G8, GH9, G10, G11, H7, and H8.

The cores along the northern portion of the project area (D1, E1, and F1) are located outside the 2015 mass excavation area. These three cores extended to 20 ft bgs and contained similar sediment. Imported road base gravel with grey coarse sand was present in the upper 2 to 3.5 ft (0.6 to 1.1 meters) bgs and was underlain by brown silty fine sand with gravel to about 4 ft (1.2 meters) bgs. Light grey gravelly coarse to fine sand extended to 14 ft (4.3 meters) bgs, below which was wet, gray, fine to very fine sand with alternating layers of coarse sand/gravel and medium sand/crushed shell.

The cores to the south and southeast of the 2015 mass excavation area that extended to 15 ft bgs included B16, C16, C17, D16, D17, G15, H14, and I13. The cores in this area that extended to 10 ft bgs included H12, H13, H15, and I14. Sediments characteristic of these cores generally included brown gravelly sand to 2–2.5 ft (60–76 cm) bgs underlain by grey, silty sand with bands of brown, silty medium sand to about 8 ft (2.4 meters) bgs followed by brown coarse sand with few gravels and fragmented shell to about 10.5 ft (3.2 meters) bgs. At approximately 10.5 ft bgs, there were alternating bands of dark grey medium sand to silt to about 14 ft (4.3 meters) bgs, underneath which was grey coarse gravelly sand. No charcoal, faunal bone, shell midden, burned soil, or fragmentary shell of cultural origin were identified within the soil cores. No evidence of 45CA458 were observed during monitoring.

Natural crushed and fragmentary shell was observed in many cores; see Figure 15 for an example of crushed shell in core G15. Two non-diagnostic wire staples were observed in core I14 at approximately 4 ft (1.2 meters) bgs (Figure 13). Various pieces of woody debris were observed in several of the cores throughout the project area, typically between 2 and 15 ft (0.6 and 4.6 meters) bgs.

Summary and Recommendations

HDR monitored the soil sampling conducted for the KPly Mill Cleanup. No precontact or historic cultural materials or anthropogenic sediments were observed within the soil cores.

The 29 soil cores were taken throughout the project area and are assumed to be representative of site conditions. Therefore, it is reasonable to conclude that precontact or historic cultural materials or anthropogenic sediments are not located within the KPly Mill Cleanup project area. HDR recommends that archaeological monitoring is not necessary for future sampling under the long-term soil monitoring program; however, sampling should follow the inadvertent discovery protocols that are outlined in the MIDP in the event that any cultural materials or anthropogenic sediments are identified during soil sampling.

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Floyd|Snider

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Attachment A

Figures

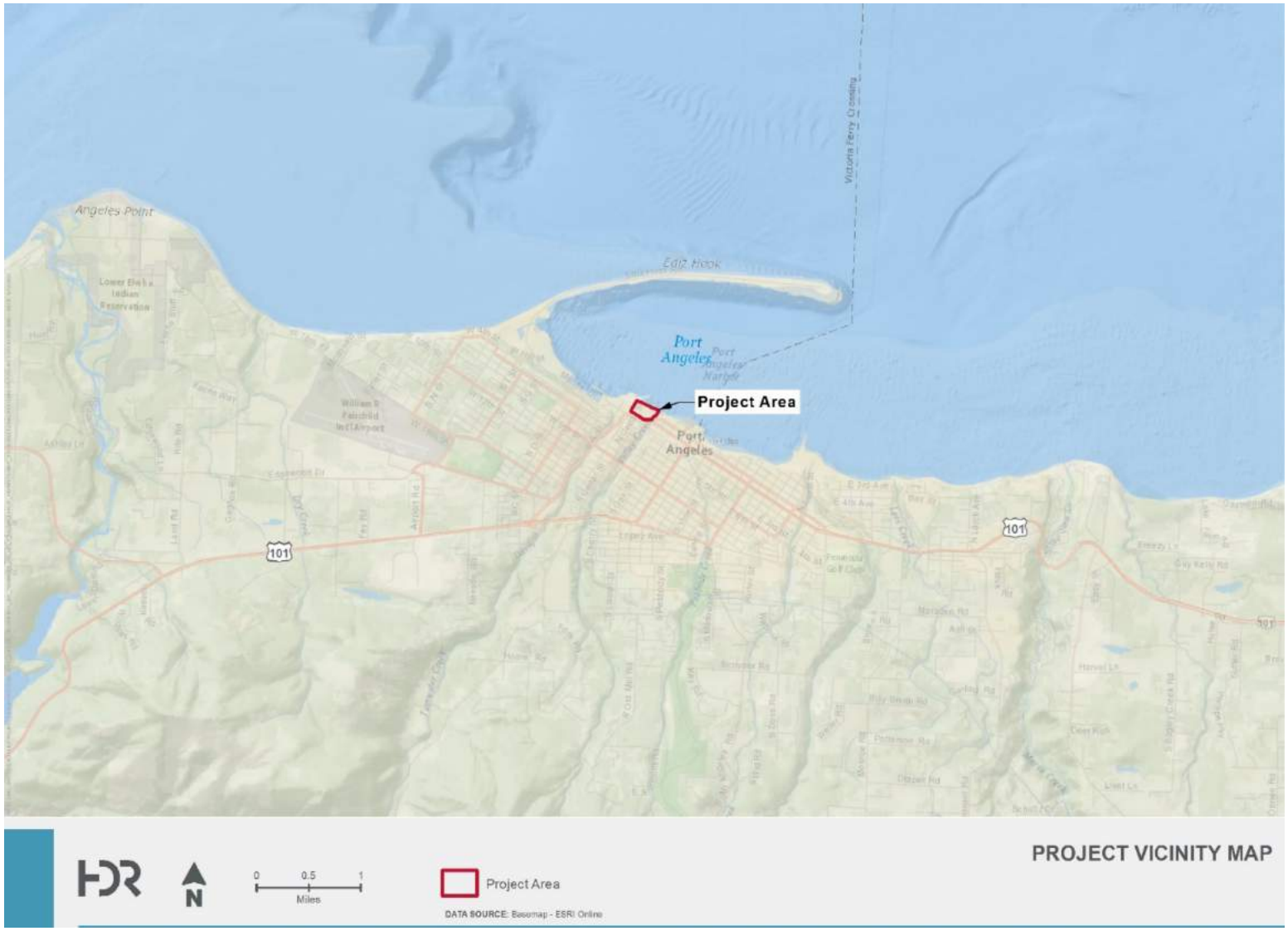

Figure 1. Project vicinity map.

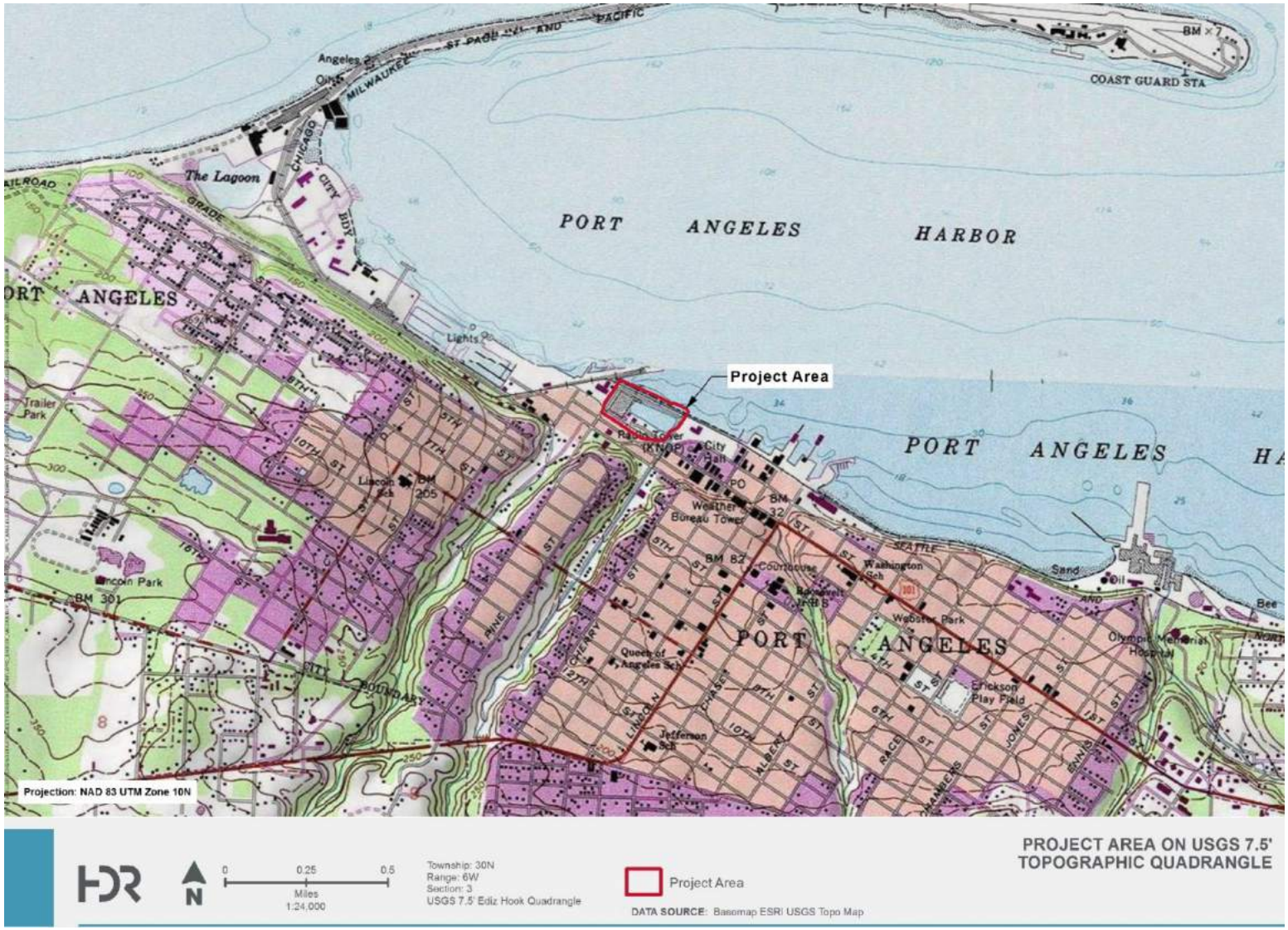

Figure 2. Project area plotted on USGS 7.5' topographic quadrangle.

Figure 3. Location of borings. Note extent of 2015 mass excavation area.

Figure 4. Overview of southern half of KPly Mill Cleanup project area, looking northwest.

Figure 5. Overview of KPly Mill Cleanup project area from southwest portion of project area, looking northwest.

Figure 6. Overview of KPly Mill Cleanup project area from wash down, looking south.

Figure 7. Overview of northern portion of KPly Mill Cleanup project area, looking east.

Figure 8. View of boring I13, looking northwest.

Figure 9. View of boring G8, looking south. Note boring within 2015 mass excavation area.

Figure 10. View of processing set up, looking northwest.

Figure 11. View of processing core D16.

Figure 12. View of processing core I14.

Figure 13. Close up of wire nails in core I14.

Figure 14. Processing core C11.

Figure 15. Close up of natural shell in core G15.

Figure 16. Close up of sediments in core D1.