Periodic Review
Tidewater Fuel Line Leak

2900 Sacajawea Park Rd., Pasco, Franklin County
Facility Site ID: 2331, Cleanup Site ID: 39378684

Toxics Cleanup Program, Eastern Region

Washington State Department of Ecology
Spokane, Washington

December 2024

Document Information

This document is available on the Department of Ecology's Tidewater Fuel Line Leak cleanup site page.[1]

Related Information

- Facility Site ID: 2331
- Cleanup Site ID: 39378684

Contact Information

Toxics Cleanup Program

Eastern Regional Office
Christer Loftenius, Site Manager
4601 N Monroe St
Spokane, WA 99205
Email: christer.loftenius@ecy.wa.gov
Phone: 509-385-8380

Website: Washington Department of Ecology[2]

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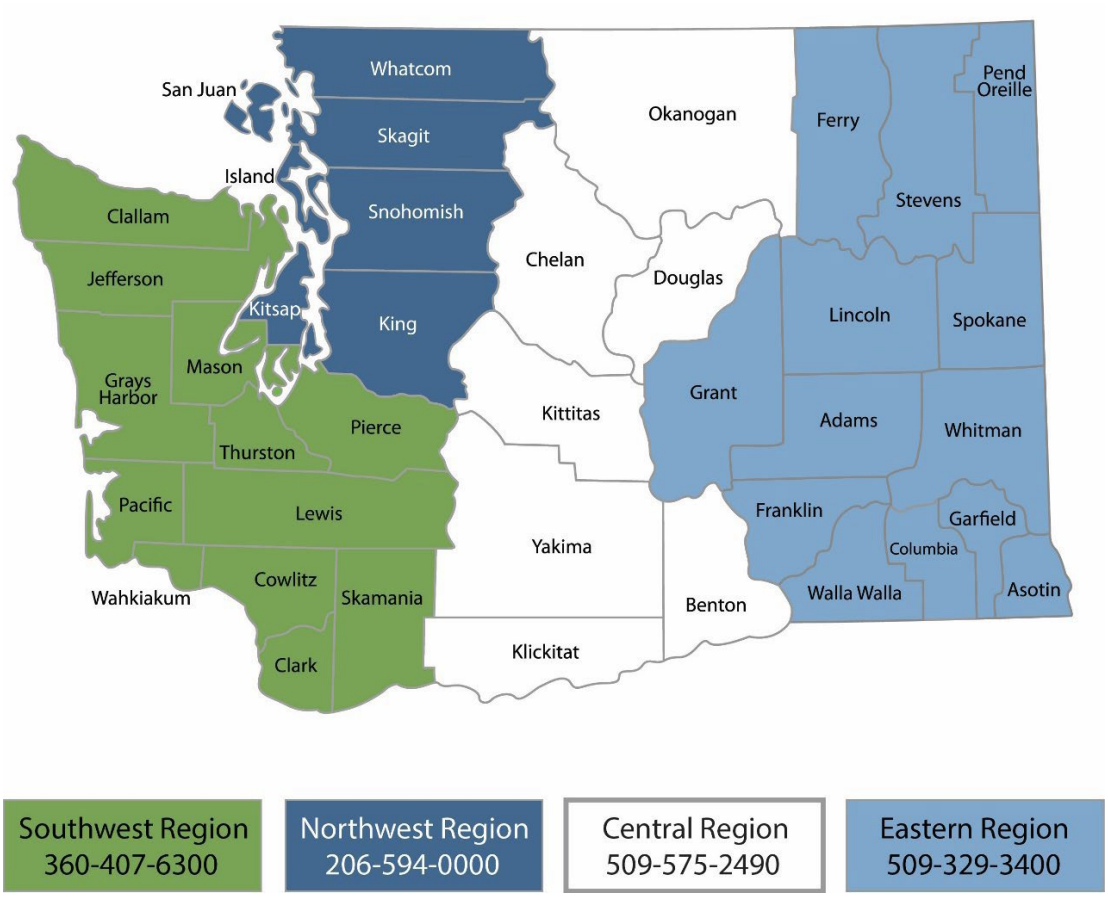
[1] https://apps.ecology.wa.gov/cleanupsearch/site/2331
[2] https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup
[3] https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 47600 Olympia, WA 98504	360-407-6000

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Introduction

The Washington Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health, and the environment are being protected at the Tidewater Fuel Line Leak cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the first periodic review conducted for this Site. Ecology completed the Cleanup Action Plan for the Site in November 2016.

Cleanup activities at this Site were completed by Tidewater Terminal Co. (Tidewater) under Consent Decree (CD) Docket No. 16 250951 11, filed with Washington State Superior Court for Benton-Franklin County on November 22, 2016 (Ecology, 2016a). Total petroleum hydrocarbons as gasoline (TPH-g) is the primary hazardous indicator substance that remains on the property. Other indicator hazardous substances found at the Site are described below. The MTCA cleanup levels for soil and groundwater are established under WAC 173-340- 740[4] and WAC 173-340-720,[5] respectively.

Ecology determined that institutional controls in the form of an Environmental Restrictive Covenant (ERC)would be required as part of the cleanup action for the Site. WAC 173-340-420(2)[6] requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because the department approved the cleanup actions under a CD.

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)):

a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site

b) New scientific information for individual hazardous substances or mixtures present at the site

c) New applicable state and federal laws for hazardous substances present at the site

d) Current and projected site and resource uses

e) The availability and practicability of more permanent remedies

f) The availability of improved analytical techniques to evaluate compliance with cleanup levels

Ecology publishes a notice of all periodic reviews in the *Site Register* and provides an opportunity for public comment.

[4] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740
[5] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720
[6] https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420

Summary of Site Conditions

Site description and history

The Site is located on an easement that crosses the former Chevron Pipeline Company (CPL) Pasco Bulk Terminal (Pasco Terminal) Site located in Pasco, Washington. Tesoro Logistics Operations LLC (Tesoro) purchased the CPL Pasco Terminal site from Chevron in 2015. The Pasco Terminal is located southwest of the intersection of U.S. Highway 12 and Sacajawea Park Road, east of the City of Pasco in Franklin County, Washington (Figure 1) and is situated on the north bank of the Snake River (Lake Wallula).

The Pasco Terminal is an active facility that has been in operation since September 1950. It is used for bulk storage of refined fuel products, which are delivered through pipelines and by barge. Pipelines transfer the product between the terminal and barge facility. Petroleum products (currently diesel, gasoline, and jet fuel) and ethanol are stored in 18 aboveground storage tanks.

Tidewater (and its predecessors) own and operate pipelines that transfer products between the Pasco Terminal and the adjacent Tidewater Terminal which is located approximately ¾-mile upstream of the Pasco Terminal along the Snake River. The Tidewater pipeline enters the Pasco Terminal on the northwest side of the Pasco Terminal where Tidewater has a small easement. The Pasco Terminal Site and Tidewater site is shown on Figure 1. It is Ecology's understanding that Tidewater is leasing the property on which the Site is situated from Tesoro.

Historical releases of petroleum products at the Pasco Terminal tanks, pipelines, and other facilities have occurred within the formerly owned CPL Pasco Terminal. In July 2000, a leak in a Tidewater pipeline at the site resulted in the release of an estimated 41,000 gallons of gasoline at the Site. The release occurred in the northwest portion of the Pasco Bulk Fuel Terminal where the Tidewater pipeline entered the Pasco Terminal. CPL and Tidewater conducted soil and groundwater investigations and performed remedial activities to address these historical releases, including at the Site. These activities are described in the Remedial Investigation/Feasibility (RI/FS) Report, dated September 29, 2011 (URS, 2011). Interim cleanup of this spill took place between 2000 and 2006 and is described below.

At the time of the RI/FS (URS 2011), Ecology's managed cleanup activities as one site that encompassed both the CPL Pasco Terminal and the Tidewater Pipeline Fuel Leak Site. In July 2015, Ecology made the decision to separate management of cleanup activities at the Pasco Terminal into two Sites: the area associated with the Tidewater Fuel Pipeline Leak Site and the Tesoro (former CPL) release site (Ecology, 2016b). Therefore, this periodic review only addresses activities related to the Tidewater Site located within the Tesoro Pasco Terminal that is hereafter referred to as the "Site".

Physical Setting

The Site is located in Section 35, Township 9 North, Range 30 East, Willamette Meridian. Topographic map coverage of the Site and vicinity is provided by the Pasco Quadrangle, U.S.

Geological Survey, 7.5-minute series dated 1992. The upland portion of the Site is about 420 feet above sea level using the National Geodetic Vertical Datum (NGVD) of 1929.

The 33-acre former CPL Pasco Bulk Fuel Terminal is situated along the north bank of the Snake River (Lake Wallula) and is bordered by unimproved land on three sides (Figure 1). Tidewater has a narrow easement for the pipeline at the Pasco Terminal which crosses on the Pasco Bulk Fuel Terminal. The Site extends beyond the easement and encompasses about three acres. (Figure 2) Land use in the vicinity is mostly undeveloped and limited with industrial development occurring to the northwest of the site (approximately 0.25 mile), and existing agricultural activities to the north across US Highway 12 (approximately 0.15 mile).. The general land slope is relatively flat with a sharp decline from the tank storage area to the Snake River located 1,100 feet south of the Site (Figure 1). Ground surface at the Site is mostly compacted sand and gravel.

Regional and Site Geology

The Site is situated within the Pasco Basin. The basin is underlain by three major stratigraphic units, which are in ascending order: the Columbia River Basalt Group; the Ringold Formation; and the Hanford Formation. The thick sequence of flood basalts was deposited during the Miocene Era resulting in a total thickness of over 15,000 feet (Drost, et. al, 1997). The basalt formations found in the area include the Saddle Mountains Basalt that overlies the Wanapum Basalt which in turn overlies the Grande Ronde. Overlaying the basalt is the Ringold Formation. The Ringold, deposited during the Pliocene, consists of four units recognized by textural class, and consist of the following soil types listed in ascending order:

- Basal units consisting of sand and gravel;
- Lower unit comprised of silt and clay;
- Middle unit composed of sand, gravel, and silt; and
- Upper unit consisting of sand and silt.

Pleistocene glacial flood deposits sit atop the Ringold Formation (Ecology 2016b). The Pleistocene age Hanford Formation is composed of two units: the lower Pasco Gravels; and the overlying Touchet Beds. The Pasco gravels are comprised of sand or sand and gravel while the Touchet Beds consist of silt and sand.

The upper Site soil profile consists of brown to gray, fine to coarse-grained sand with some gravel (Ecology 2016b). The gravel portion appears to increase with depth. The gravel is dense, mostly fine to coarse with some sand and trace amounts of silt. The gravel lithology is mostly basalt and is typically sub-angular to sub-rounded.

Regional Hydrogeology

The Pasco Basin is a subset of the regional Columbia Plateau aquifer system. The Columbia Plateau Regional Aquifer System (CPRAS) covers over 50,000 square miles of eastern Oregon and Washington and western Idaho (Kahle, et. al, 2011). The basalts may be as thick as 16,000 feet in the Site area (Drost , et al. 1990). The Columbia River Basalt Group (CRBG) are the

primary aquifers in the region. However, the alluvial aquifers are important in some areas of the Columbia Plateau, including in the Site area since they are readily accessible and are capable of high yields. The groundwater flow direction in the alluvial and basalt aquifers is typically toward the rivers.

The alluvial aquifers known collectively as the Pasco Gravels in the Site area range in thickness from 50 to 200 feet (Whitehead, 1994). In the Site area, yields as high as 3,500 gallons per minute (gpm) have been reported in wells completed in the Pasco Gravels.

Site Hydrogeology

Groundwater levels have been monitored at the Pasco Bulk Fuel Terminal since the first monitoring wells were installed in 1983. Based upon Site groundwater elevations, groundwater beneath the Site generally flows to the southeast toward the Snake River. The aquifer at the Site is unconfined and is usually encountered about 80 feet below ground surface (bgs). Groundwater levels can fluctuate between 2 to 5.5 feet over a season as observed during more than 37 years of monitoring.

Site investigations

Tidewater Emergency Site Interim Action 2000–2006

In July 2000, a leak in a Tidewater pipeline resulted in the release of an estimated 41,000 gallons of gasoline at the Site. The release occurred in the northwest portion of the Pasco Bulk Fuel Terminal within Tidewater's portion of Terminal (Site)as shown in Figure 2. An emergency response effort was undertaken to characterize the release and begin remedial efforts to minimize impacts of the release. During the emergency response phase, Ecology's Spill Response Program provided oversight to the efforts conducted to address the release. The efforts were directed at identifying the extent of contamination and beginning free product recovery. By September 2000, the emergency response phase of the project was concluded when Tidewater demonstrated the free product plume was contained.

Prior to September 2000, Tidewater installed twelve monitoring wells in the release area to characterize the extent of free product. Four vapor extraction wells were installed within the soil contaminant area to assist in defining the free product plume. Total fluids recovery pumps were placed in several monitoring wells. About 8,000 gallons of liquid phase free product were recovered and sent off-site for reprocessing and eventual re-use. Along with the monitoring wells, an SVE system was installed during the emergency phase to assist in product recovery. Vapor phase recovery removed between 25,000 to 27,000 gallons of petroleum hydrocarbons which were destroyed on-site with thermal or catalytic oxidation. In February and March 2001, additional investigation work was completed at the Site to support the design and installation of an air sparging system.

Eight additional monitoring wells along with seventeen sparge points were completed in and adjacent to the free product pool. The air sparging in combination with the SVE system was designed to reduce the free product pool and enhance biodegradation in the upper saturated zone. Bioventing was included as part of the interim cleanup action. Wells MW-2, MW-3, and

MW-4 wellheads were fitted with vent caps and filters to provide passive atmosphere into the subsurface. These were originally initiated under active vapor extraction operations to limit the lateral extent of the vapor extraction/negative pressure influence from extending outside the Tidewater release area and potentially pulling vapors from other release areas outside the Site.

By February 2003, the free product pool had diminished to the point where only sheen was visible in some monitoring wells. Tidewater monitoring wells were sampled from February 2003 through December 2003. The sampling results indicated the remedial actions successfully addressed the free product plume while stabilizing the dissolved phase plume. Supplemental sampling completed in March 2006 confirmed the results of the 2003 sampling events and indicated that the dissolved phase plume had decreased in size as well as in concentration.

CPL and Site-Wide Activities 2007-2016

Between 2007 and 2011 CPL and Tidewater conducted a joint remedial investigation (RI) and conducted a feasibility study (FS). The final RI/FS report combining the results from RI investigation and the FS work was finalized in 2012 (URS, 2011) As part of the RI/FS CPL completed two sampling events in 2007 and 2008 that included the sampling of CPL's wells and a limited number of Tidewater monitoring wells.

Free product was not observed in any of the CPL or Tidewater monitoring wells during these sampling events. Sheen was observed on purge water collected from five of the Tidewater wells sampled in 2007. In June 2010, a joint field investigation was conducted by URS (representing CPL) and CH2M HILL (representing Tidewater) and referred to in the Site Cleanup Action Plan (Ecology 2016b). The investigation included well maintenance and rehabilitation, a civil survey of monitoring wells, and groundwater sampling. Eleven Tidewater wells and nine CPL wells were sampled for this sampling event and was conducted on the same day. The civil survey placed site wells on the same vertical datum, which allowed for preparing groundwater elevation contour, flow direction, and gradient maps.

Another joint site-wide groundwater sampling event was performed in December 2010. The groundwater sampling results from both events indicated petroleum hydrocarbon concentrations had decreased or remained stable at the Site. After the completion of the RI/FS report in 2012, CPL sold the Pasco Terminal to Tesoro) in 2013.

Separation of the Site from the Pasco Terminal site in 2016

At the time when the RI/FS investigation and reporting took place, the Site encompassed the Pasco Terminal and the Tidewater Pipeline. To best facilitate cleanup, in July 2015 Ecology made the decision to separate the Site into two separate sites. The Site discussed in this First Periodic Review is the area associated with the Tidewater pipeline release and related groundwater plume with a cleanup site identification number 2331. The other site is that the area associated with the Tesoro (former CPL) releases and related groundwater plumes on the Tesoro property with a cleanup site identification number 4867 and is not included in this First Periodic Review.

Site cleanup action

In the November 2016 Cleanup Action Plan (CAP) (Ecology, 2016b) Ecology selected Alternative 1: Institutional Controls and Monitored Natural Attenuation (MNA) as the preferred cleanup action that would be protective of human health and the environment at the Site. While the groundwater is not currently used as such at the Site, the highest beneficial use of groundwater is as a drinking water source.

Site Cleanup Action Implementation, MNA Methodology

Recorded field parameters includes dissolved oxygen (DO), oxygen reduction potential (ORP), pH, temperature, and specific conductance. In addition to using the field parameters to determine when representative samples can be collected, DO and ORP is also recorded (Table 1) to confirm continued biodegradation of dissolved phase petroleum hydrocarbons. Groundwater samples are collected and analyzed annually for the Site indicator hazardous substances (IHS): benzene, toluene, ethylbenzene, total xylenes, gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons (Table 2).

Sampling and analysis of the key parameters of natural attenuation: alkalinity, ferrous iron, manganese, sulfate, nitrate, and dissolved methane are performed in the following wells: AR-1 (since 2021), AR-4 (until 2020), AR-8, MW-4, MW-6, and MW-8.

Tidewater prepared the Site compliance monitoring plan (CMP) in 2017 (CH2M, 2017) and the first annual groundwater monitoring event in accordance with the CAP took place in 2018.Groundwater monitoring events since the implementation of the CAP in 2017 show that contamination remains within the Site and does not extend beyond the areas of the cleanup action.

Reasonable Restoration Timeframe defined in the CAP
A ten-year restoration time frame was estimated in the CAP, based on the contamination attenuation observed at the time the CAP was prepared.

Cleanup standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site.

Cleanup levels

The CD identified MTCA Method A cleanup levels as applicable to the Site in accordance with WAC 173-340-704.[7] The cleanup levels for the Site IHS were developed considering the existing Site conditions, known exposure pathways, anticipated receptors for the current Site activities, nearby land uses, and current and potential future beneficial uses of groundwater. The primary beneficial use of the groundwater beneath the Site is as a drinking water source. Site indicator

[7] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704

substances and cleanup levels are provided in Table 2. The process used to develop the cleanup levels is described in the CAP (Ecology 2016b).

Points of compliance

The CD defines the Site as the area affected by the IHS above MTCA Method A cleanup levels. The point of compliance established for soil is based on protection of groundwater per WAC 173-340-900[8] and is defined as throughout the lateral extent of the Site from the surface extending vertically below the water table.

The groundwater point of compliance was established as throughout the Site from the uppermost level of the saturated zone to the lowest depth that could possibly be affected by the Site.

Restrictive Environmental Covenant

Ecology determined that institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup action, and protect human health and the environment. However, due to the industrial use of the Site and the planned long-term use of the Site, a formal ERC has not been recorded for the Site at the Franklin-Bent County court system. Ecology will prepare the ERC with the assistance from Tidewater. The ERC must be recorded with the Franklin County clerk or at a location designated by the clerk.

Operations and maintenance

There currently is no operating remediation systems at the Site. The current network of Site monitoring wells is inspected for potential damage or problems during the annual groundwater sampling events and repaired as needed. In 2020, during annual groundwater sampling, a submersible pump used for sampling got stuck in well AR-4. Multiple attempts to retrieve the pump were unsuccessful. On July 21, 2021representatives of GeoEngineers and Tidewater observed video camera deployment into wells AR-1 and AR-4 by Environmental West Exploration, a Washington State licensed driller based out of Spokane, Washington.

The results of the inspection and subsequent repairs are reported in the 2021 Annual Report (GeoEngineers, 2021). The 2001 study showed that the well AR-1 casing was intact and generally straight throughout. The screened interval inside AR-1 was redeveloped in accordance with the procedures described in GeoEngineers (2021).

The sampling pump lost in the base of AR-4 during the 2020 monitoring event could not be retrieved by Environmental West. At Tidewater's request, Ecology approved the use of AR-1 for compliance monitoring in place of the damaged AR-4. Steel monuments were installed over wells AR-4 and AR-8 during the July 2021 monitoring event; remaining protective well covers at the Site were considered to still be sufficiently protective of remaining wells at this time (GeoEngineers, 2021).

[8] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-900

Performance monitoring

Annual performance monitoring is currently conducted to demonstrate when the cleanup action has attained cleanup standards. In accordance with the final CMP (CH2M, 2017), performance monitoring comprises of groundwater monitoring, including monitoring of geochemical parameters that are indicators of natural attenuation of petroleum hydrocarbons and biological activity in particular. As discussed above, wells MW-2, MW-3, and MW-4 wellheads were fitted with vent caps and filters before 2006 as part of the historic Site interim action to provide passive atmosphere into the subsurface. These well heads have been maintained as part of a passive bioventing system and is proposed to continue under the compliance monitoring.

Groundwater monitoring

The six (6) on-Site groundwater monitoring wells (AR-1, AR-8, AR-11, MW-4, MW-6, and MW-8) that are currently part of the natural attenuation parameter monitoring program area are also part of the groundwater analytical monitoring program. AR-1 replaced damaged well AR-4 in 2021 as a compliance well, as discussed above. Additionally, groundwater elevations are measured annually in a total of eleven on-Site wells, including well AR-4, and includes the six analytical groundwater monitoring wells. Table 1 provides groundwater monitoring well information such as well head elevation, depth to groundwater, groundwater elevation and 2023 field monitoring results from these eleven wells. Figure 2 shows the current monitoring wells that are sampled and analyzed as well as the wells where groundwater levels are recorded during the annual sampling event. Groundwater compliance monitoring has been conducted annually since 2018 to ensure no off- Site migration of hazardous materials.

Free-phase petroleum product monitoring

A check for free product is performed as part of the annual monitoring in the eleven wells in the current monitoring program using an interface probe and visual observation

Site Maintenance Work during the Review Period

In 2021, well AR-4 was replaced with well AR-1 due to irreparable damage to well AR-4 as discussed above. Groundwater contaminant concentrations and key natural attenuation parameters from the last monitoring event in 2023 are presented in Table 3. Additionally in 2021, a flush monument well cover was installed to protect well AR-8 from potential on-Site vehicles and equipment.

Periodic Review

Effectiveness of completed cleanup actions

During the Site visit conducted on May 20, 2024, Ecology found no indications the integrity of the remedial action has been compromised. There were no indications of undocumented Site excavation or disturbance activities, and no visual indications of possible disturbance of the asphalt surface. However, several wells are unprotected from vehicles and power equipment. A number of wells with flush-mounted covers do not have gaskets or are missing bolts holding the cover in place. Two wells: MW-01 and AR-02 could not be found and are currently missing. Some of the wells that are part of the interim action remedial system such as MW-05, MW-07, and MW-08 are exposed to the environment without covers. Table 4 presents recommended actions for the well heads observed by Ecology during the site visit.
A photo log is in Appendix D.

Direct contact

Cleanup actions at the Site are intended to eliminate human exposure to groundwater at the Site. The exposure pathways to contaminated groundwater and free product (ingestion, direct contact) have been removed by limiting and controlling access to the Site, the interim emergency cleanup actions, and the restriction on groundwater use from the Site in the Cleanup Action Plan.

Institutional controls

An ERC for the Site as prescribed in the CD is not in place. This ERC would prohibit groundwater use from any well in the property, prohibit activities that would result in the release of contaminants contained as part of the cleanup without Ecology's approval, and prohibit other uses.

Monitoring results

Groundwater gradients and groundwater flow 2018-2023

Groundwater is found at the Site approximately 80 ft below the ground surface. Between 2018 and 2023, the groundwater elevation ranged between 243.00 and 244.61 feet above mean sea level (NVGD29). The groundwater gradient for the site is flat with less than 0.001 foot/feet (ft/ft) variation between upgradient and downgradient wells. These groundwater elevations are consistent with historical measurements. Groundwater elevations measured during the June 2023 monitoring event were approximately 0.065 feet higher than were measured in June2022.

Groundwater elevations from the last groundwater monitoring event in 2023 are presented in Figure 3. Since 2010 groundwater elevations have declined 0.7 feet on average. The groundwater flow direction to the south was inferred based on historical groundwater elevations and groundwater plume geometry. Historical groundwater elevations are presented in Appendix A.

Groundwater monitoring

Petroleum hydrocarbons were not detected in wells AR-11, MW-4, or MW-6 above laboratory reporting limits since the inception of the Site compliance monitoring program in 2018. Wells AR-1, AR-4, AR-8, and MW-8 have all contained concentrations of IHS above the Site clean-up levels (CULs) since the Site CMP was implemented in 2016. Gasoline-range TPH concentrations exceeding the Site CUL have been detected in wells AR-1, AR-4, AR-8, and MW-8 since the compliance monitoring program was implemented in 2018. Benzene, toluene, and total xylenes concentrations exceeding the Site CULs were detected in wells AR-1 and AR-4 since 2018 with one detection of ethylbenzene in 2021 exceeding the Site CUL in well AR-1.

Historical groundwater monitoring data is presented in Appendix B. Field parameter data presented in Table 1 from the last sampling event at the Site in 2023 show that wells with historic and existing petroleum hydrocarbon detections also have negative oxidation-reduction potential (ORP) values that indicate reducing conditions. Similarly, lower dissolved oxygen (DO) detections are also noted in these wells, also indicating anaerobic conditions. Well AR-1, sampled in place of AR-4 and located within the center of the petroleum hydrocarbon plume directly downgradient for the release area, has the highest contaminant level exceeding Site CULs. Figure 4 shows the latest groundwater analytical data from the last annual groundwater sampling event conducted in June 2023,

Time series plots for benzene and TPH-g are provided in Appendix C from wells AR-1, AR-4, AR-8, and MW-8. These plots show stable to increasing concentrations of TPH-g in wells AR-1 and AR-4. The TPH-g trends in wells AR-8 and MW-8 are showing a gradual decrease. Benzene concentration well above the Site CUL in wells AR-1 and AR-4 show a stable or a slightly decreasing trend. Well AR-1, located within the center of the petroleum hydrocarbon plume directly downgradient for the release area, had the highest TPH-g and BTEX concentrations at the site. TPH-g, benzene, toluene, and xylenes consistently exceed Site CULs. Hydrocarbons detected in the diesel range in well AR-1 and AR-4 during the last five years of groundwater monitoring were attributed to weathered gasoline, which is consistent with the 2000 release of unleaded gasoline.

Free-product monitoring results

No free product has been detected in any of these wells since 2010 (well AR-1). Last time sheen was observed in any of the wells was in 2014 in well AR-1.

Monitored Natural Attenuation and an Estimate of Site Restoration Timeframes

In 2023 GeoEngineers evaluated the natural attenuation rate of residual petroleum contamination at the site. GeoEngineers used BIOSCREEN Natural Attenuation software for quantitative estimates of restoration timeframes. Further description of the evaluation can be found in the 2023 annual groundwater monitoring report (GeoEngineers, 2023). Individual BTEX compounds were modeled in BIOSCREEN to evaluate predicted biodegradation at the site. BTEX constituent cleanup levels are predicted to be achieved between 14 to 50 years. Benzene is estimated to achieve cleanup levels within 35 years, while total xylenes are estimated to achieve cleanup leaves within 14 years. Toluene was found to be the slowest to achieve

cleanup levels in multiple modeling scenarios at 50 years. Table 5 shows the predicted years before cleanup levels are achieved for each BTEX constituent. A copy of the BIOSCREEN input and output for each BTEX compound is provided in GeoEngineers (2023).

Summary

The results of the latest annual groundwater monitoring event (GeoEngineers 2023) confirms the original conclusions presented in the September 2011 Remedial Investigation/Feasibility Study Report (URS, 2011) as follows:

- The hydraulic gradient at the site is relatively flat with limited fluctuations.
- The petroleum hydrocarbon source in the vadose zone has been addressed through the interim actions implemented between 2000-2006 .
- Residual dissolved-phase petroleum hydrocarbons remain on property and within the central portion of the former free product plume at the Site. These areas include monitoring wells AR-1, AR-4, AR-8, and MW-8.
- The lateral extent of the dissolved-phase plume has been stable since active remedial actions were discontinued.
- Measured concentrations of field parameters and analytical results of natural attenuation constituents suggest that biodegradation processes continue at the site. The presence of biodegradation processes at the Site may be supported by observed gradual decreases of TPH-g in wells AR-8 and MW-8 located at the periphery of the contaminant plume
- Restoration timeframe is limited by the flat hydraulic gradient and inability to replenish electron acceptors in the source area. However, the flat hydraulic gradient appears to keep the plume from expanding.
- Since implementation of the CMP in 2018, the extent of the plume has not changed notably.

New scientific information for individual hazardous substances or mixtures present at the Site

There is no new relevant scientific information for the hazardous substances remaining at the Site.

New applicable state and federal laws for hazardous substances present at the Site

This cleanup is governed by Chapter 173-340 WAC (1996 ed.) that was amended in 2001 and 2024. TPH cleanup levels have not changed since 2001 and are valid.

Current and projected Site and resource uses

The Site is used for industrial purposes. There have been no changes in current or projected future Site or resource uses. The current Site use is not likely to have a negative impact on the protectiveness of the cleanup action.

Availability and practicability of more permanent remedies

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. However more permanent remedies are available to be able to reduce the Site restoration timeframe if necessary.

Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the cleanup action were capable of detection below the selected MTCA cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

Conclusions

- The cleanup actions completed at the Site appear to be protective of human health and the off-Site environment.
- The interim cleanup actions conducted between 2001 and 2006 reduced contaminants from unsaturated soils.
- Groundwater cleanup levels have not been met at the Site; however, the cleanup action complies with cleanup standards under WAC 173-340-740(6)(f). The flat groundwater gradient, combined with natural degradation of contaminants, currently precludes off-property migration of contaminants.
- With the longer restoration timeframe as originally estimated, special attention must be placed on the wells at the Site perimeter to ensure that contamination does not migrate off-property when evaluating the annual groundwater monitoring results.
- An ERC for the property has not been put in place to fully protect human health and the environment from the release of the Site contaminants and protect the integrity of the cleanup action.
- The current estimate of the restoration timeframe is approximately 50 years for all BTEX contaminants. This restoration timeframe does not include TPH as gasoline. The new estimate of the restoration timeframe for BTEX is longer than the original ten-year estimate in the CAP.
- While 50 years is not a reasonable restoration timeframe, Ecology would like to see additional data before determining whether additional cleanup actions are necessary to reduce this timeframe

Recommendations

- To fully protect human health and the environment from the release of the Site contaminants and protect the integrity of the cleanup action, Ecology will prepare formal ERC for the Site with the assistance from Tidewater. Upon completion, Tidewater will record the ERC with the Franklin County court system.
- Beyond recording an ERC, the requirements of the proposed ERC in the CAP are being followed. No additional cleanup actions are required by the property owner at this time.
- The property owner is responsible for continuing to inspect the Site to ensure the integrity of the cleanup action is maintained. Tidewater should conduct well-head maintenance to ensure continued integrity of the monitoring network, including installing protective casings for unprotected wells, conducting repairs to flush-mount monuments, and replacement of wellhead vent caps for wells at the Site.
- The laboratory holding time for ferrous iron is exceptionally short and cannot be met, resulting consistently as non-representative non-detects in historically impacted wells. Whereas field measurements of ferrous iron are accurate and representative of actual ground water conditions as they are collected at the time of sample collection. Therefore, future measurements of ferrous iron shall be performed in field only at the time of sampling and recorded on each well's sample log.
- Historical analytical and groundwater data provide support that the plume is stable, decreasing, and not at risk of migration. Due to the abundance and recent consistency of analytical results over several years of monitoring at the site, and the conclusions of a very flat groundwater gradient that is inhibiting the spread of the plume, it is appropriate to reduce the frequency of groundwater quality monitoring to once every three years.

Next review

Ecology will schedule the next review for the Site five years from the date of this periodic review. If additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years after those activities are completed.

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Tables

Table 1, 2023 Site Groundwater Monitoring Well Information (GeoEngineers, 2023)

Well	Date Monitored [1]	Reference Point Elevation (ft)	Depth to Water (ft btc)	Groundwater Elevation (ft)	Temp (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Ferrous Iron (mg/L)	Conductivity (mS/cm)	Turbidity (NTU)	Comments
AR-1	6/29/2023	423.88 [3]	79.98	343.90	20.4	7.72	0.15	-589.7	1.74	1.191	14.0	--
AR-8	6/27/2023	423.02	79.13	343.89	21.2	7.80	0.38	-492.2	0.46	0.919	19.0	--
AR-11	6/27/2023	422.62	78.74	343.88	20.9	8.16	8.15	-252.6	0.10	0.932	8.6	--
MW-4	6/28/2023	422.29	78.42	343.87	18.3	7.94	7.53	-193.3	0.15	0.947	2.3	--
MW-6	6/28/2023	422.50	78.62	343.88	18.0	8.15	8.12	-229.4	0.00	0.917	3.1	Also collected MS/MSD Lab QC Sample
MW-8	6/28/2023	427.15	83.30	343.85	18.9	7.94	5.66	-321.8	0.09	0.840	2.7	Also collected Field Duplicate and Equipment Rinsate Samples
Water Levels Only												
AR-4	6/27/2023	426.51 [2]	82.62	343.89	--	--	--	--	--	--	--	--
AR-7	6/27/2023	425.44	81.55	343.89	--	--	--	--	--	--	--	--
AR-12	6/27/2023	425.50	Dry	--	--	--	--	--	--	--	--	--
MW-5	6/27/2023	425.02	81.17	343.85	--	--	--	--	--	--	--	--
MW-7	6/27/2023	427.25	83.40	343.85	--	--	--	--	--	--	--	--

Notes:
1 - All water level measurements were conducted on June 27, 2023. Groundwater samples were collected on June 27, 28, and 29, 2023.
2 - Reference point elevation was resurveyed on July 27, 2021.
3 - Reference point elevation was resurveyed on June 1, 2022.
" -- " = Not applicable, not available, and/or not measured.
Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).
Field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

ft = feet
ft btc = feet below top of casing
°C = degrees celsius
mg/L = milligrams per liter
mV = millivolts
mS/cm = millisiemens per centimeter
NTU = Nephelometric Turbidity Units

Table 2, Indicator Hazardous Substances (IHS) Site cleanup Levels, from CAP (Ecology 2016b)

Contaminant	Frequency of Detection	Maximum Concentration, ug/L	MTCA Cleanup Level, ug/L	Basis	Screening Results
Benzene	**40%**	**6,750**	**5**	**Method A**	**Indicator**
Diesel	**30%**	**1,165,000**	**500**	**Method A**	**Indicator**
Ethylbenzene	**43%**	**1,500**	**700**	**Method A**	**Indicator**
Gasoline	**54%**	**77,000,000**	**800**	**Method A**	**Indicator**
Heavy Oil	**18%**	**5,900**	**500**	**Method A**	**Indicator**
Toluene	**46%**	**17,000**	**1000**	**Method A**	**Indicator**
Xylene	**48%**	**12,590**	**1000**	**Method A**	**Indicator**
MTBE	0	0	20	Method A	<5% detection
Ethanol	NA	NA	NA	NA	NA

Table 3, 2023 Groundwater Monitoring Well Analytical Data (GeoEngineers, 2023

Well Sample ID Sample Date				AR-11 AR-11-2306 6/27/2023	MW-4 MW-4-2306 6/28/2023	MW-6 MW-6-2306 6/28/2023	MW-8 MW-8-2306 6/28/2023	FD (MW-8) MW-8-FD-2306 6/28/2023	AR-8 AR8-2306 6/27/2023	AR-1 AR1-2306 6/29/2023	Equipment Blank MW-8-ER-2306 6/28/2023
Field Parameters	**Method**	**Units**	**MTCA CUL [1]**								
pH	Field Probe	units	--	8.16	7.94	8.15	7.94	--	7.80	7.72	--
Temperature	Field Probe	°C	--	20.9	18.3	18.0	18.9	--	21.2	20.4	--
Conductivity	Field Probe	mS/cm	--	0.932	0.947	0.917	0.840	--	0.919	1.191	--
Dissolved Oxygen	Field Probe	mg/L	--	8.15	7.53	8.12	5.66	--	0.38	0.15	--
Oxygen Reduction Potential	Field Probe	mV	--	-252.6	-193.3	-229.4	-321.8	--	-492.2	-589.7	--
Turbidity	Field Probe	NTU	--	8.6	2.3	3.1	2.7	--	19.01	14.0	--
Ferrous Iron	Field Screen	mg/L	--	0.10	0.15	0.00	0.09	--	0.46	1.74	--
Petroleum Hydrocarbons											
Benzene	EPA 624.1	µg/L	5	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	**723**	<0.500
Toluene	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**1.53**	**1.76**	<0.500	**3,800**	<0.500
Ethylbenzene	EPA 624.1	µg/L	700	<0.500	<0.500	<0.500	**45.5**	**65.0**	**48.0**	**434**	<0.500
Total Xylenes	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**607**	**855**	**55.6**	**6,740**	<0.500
TPH-Gasoline Range	NWTPH-Gx	µg/L	800	<200	<200	<200	**8,900**	**7,800**	**3,360**	**85,000**	<200
TPH-Diesel Range	NWTPH-Dx	µg/L	500	<160	<160	<160	<160	<160	<160	**6,010 [2]**	<160
TPH-Heavy Range	NWTPH-Dx	µg/L	500	<400	<400	<400	<400	<400	<400	<400	<400
MNA Parameters											
Manganese	EPA 200.8	mg/L	--	0.00487	<0.00100	<0.00100	0.283	0.272	1.05	2.21	--
Sulfate	EPA 300.0	mg/L	--	8.56	173	147	113.0	113.0	53.4	54.1	--
Nitrate	EPA 300.0	mg/L	--	0.550	30.8	29.8	22.4	22.6	2.29	1.29	--
Methane	RSK-175 MOD	µg/L	--	<0.65	<0.65	<0.65	<0.65	<0.65	6.69	67.9	--
Ferrous Iron	SM-3500	mg/L	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--

Notes:

[1] From the November 2016 Cleanup Action Plan Table 1.

[2] Diesel range detection does not appear to be target compound. Analyst indicates detection appears to be weathered gasoline.

MNA field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

BOLD = Detection

Grey shading = Exceeds MTCA Cleanup Level

Non-detect values reported as "<" laboratory method detection limit.

" -- " = Not applicable, not available, and/or not measured.

MTCA CUL = Model Toxics Control Act Cleanup Level

°C = degrees celsius

µg/L = micrograms per liter

mg/L = milligrams per liter

mV = millivolts

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Units

Table 4, Wellhead Conditions and Recommended Repair and Maintenance Work

Well ID	Well Head Type	Well Head Condition	Recommended Action	Comments
AR-01	Flush with ground	No bolts	Add bolts or replace with new cover	
AR-01	Biovent	No protection	Add vented protective cover	Paint yellow
AR-02	N/A	Well missing		Abandon* well if found
AR-03	PVC stickup	No protection	Add protective cover	Add bollards‡, paint yellow
AR-04	Steel monument cover	Good		Add bollards‡, paint yellow
AR-05	Biovent	No protection	Add vented protective cover	Add bollards‡, paint yellow
AR-06	PVC stickup	No protection	Add protective cover	Add bollards‡, paint yellow
AR-07	PVC stickup	No protection	Add protective cover	Add bollards‡, paint yellow
AR-08	Flush with ground	OK		Keep an eye on bolt conditions
AR-09	Biovent, flush with ground	No bioventing action, sealed cover	Replace with vented protective cover	Add bollards‡, paint yellow if above ground
AR-10	Flush with ground	No gasket	Add new gasket	
AR-11	Flush with ground	No bolts	add bolts or replace with new cover	
AR-12	PVC stickup	No protection, well is dry	Convert into biovent well or abandon* well	Paint any aboveground cover yellow
MW-01	N/A	Well missing	Locate well	Abandon* well if damaged beyond repair
MW-02	Flush with ground	No gasket	Add new gasket	
MW-03	Flush with ground	Water in wellhead, no gasket	Clean out well, add new gasket	
MW-04	Flush with ground	Old worn gasket	Replace gasket	
MW-05	Steel stickup 2" steel pipe	Open top, hornet nest inside pipe	Cover top to keep out critters	Add bollards‡, paint yellow
	inside 4" steel pipe		and debris	
MW-06	Flush with ground	No gasket	Add new gasket	
MW-07	Steel stickup 2" steel pipe	Open top	Cover top to keep out critters	Add bollards‡, paint yellow
	inside 4" steel pipe		and debris	
MW-08	Steel stickup 2" steel pipe	Open top	Cover top to keep out critters	Add bollards‡, paint yellow
	inside 4" steel pipe		and debris	

General comment: Keep an eye on well-head bolts
*Abandon wells in accordance with applicable State and local regulations
Ecology recommends ‡Installing bollards if vehicular traffic is allowed or could physically enter onto the Site.

Table 5, Predicted Time Until Cleanup Level Achievement Using BIOSCREEN Instantaneous Reaction Model (from GeoEngineers, 2023)

Compound	Cleanup Level	Units	Predicted Years Until Cleanup Level Achieved
Benzene	0.005	milligrams per liter	35
Toluene	1		50
Ethylbenzene	0.700		Ethylbenzene is currently under CUL
Total Xylenes	1		14

Figures

Figure 1, Site Location (GeoEngineers, 2023)

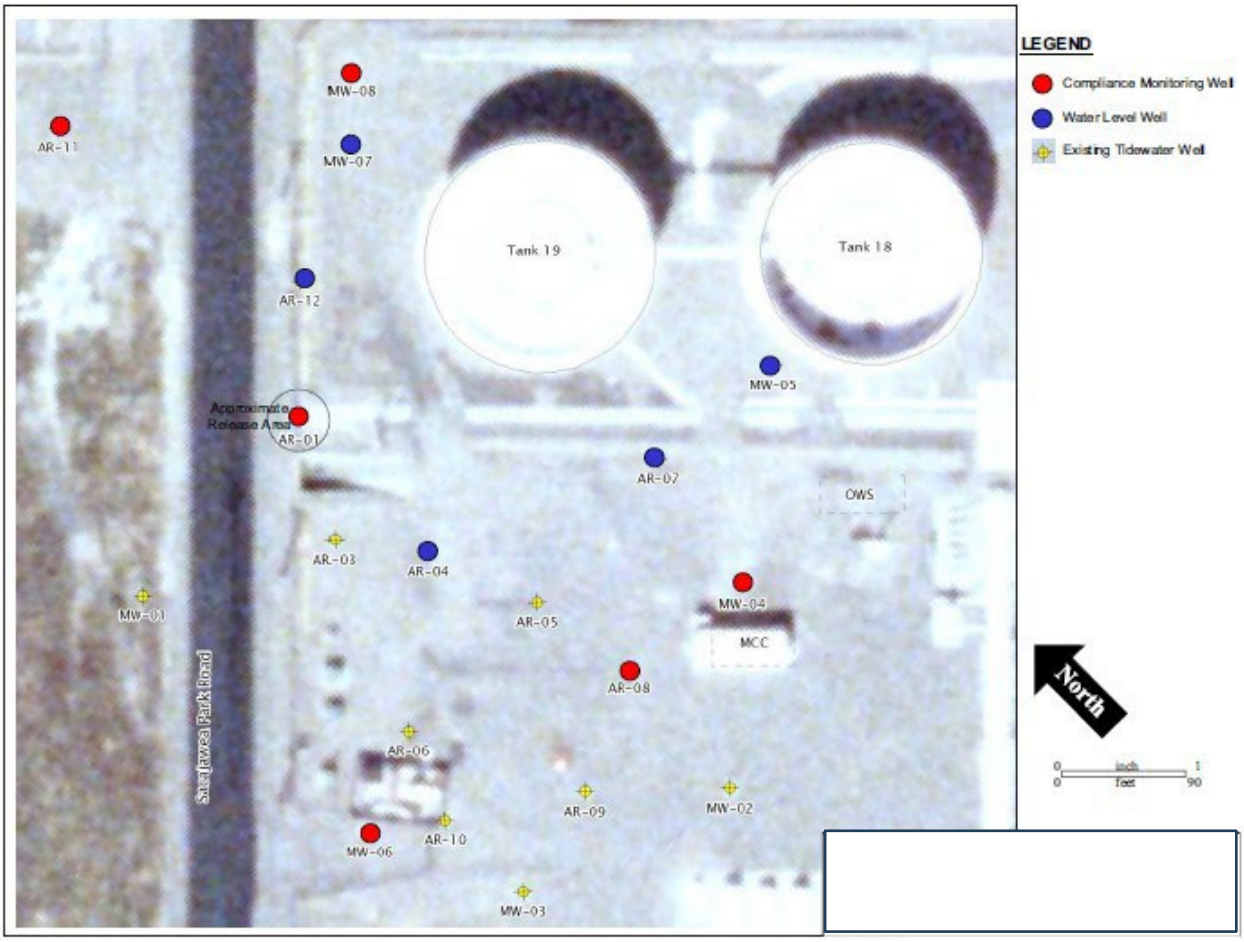


Figure 2, Site Layout (GeoEngineers, 2023)

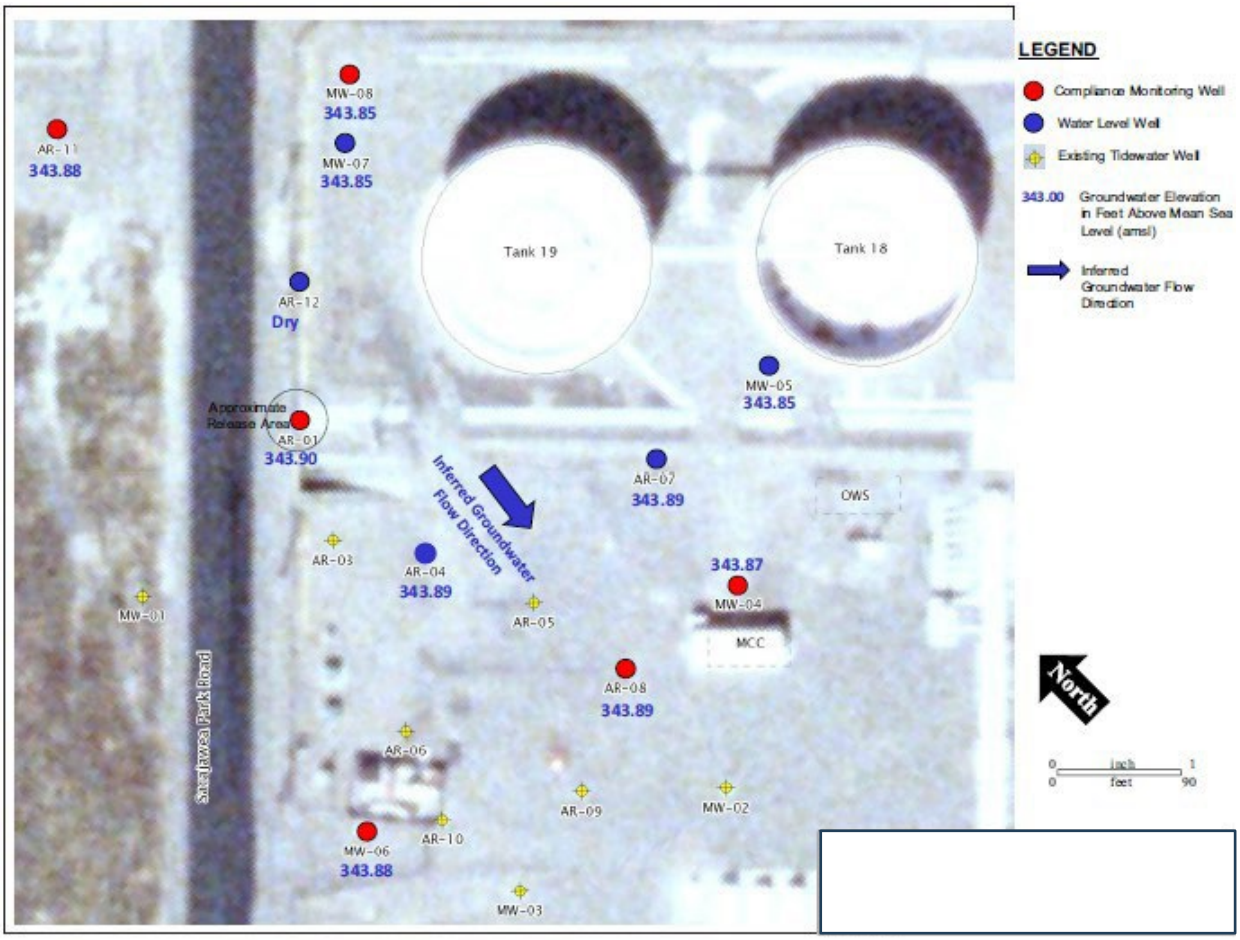


Figure 3, June 2023 Groundwater Elevations, and Inferred Groundwater Flow Direction. (GeoEngineers, 2023)

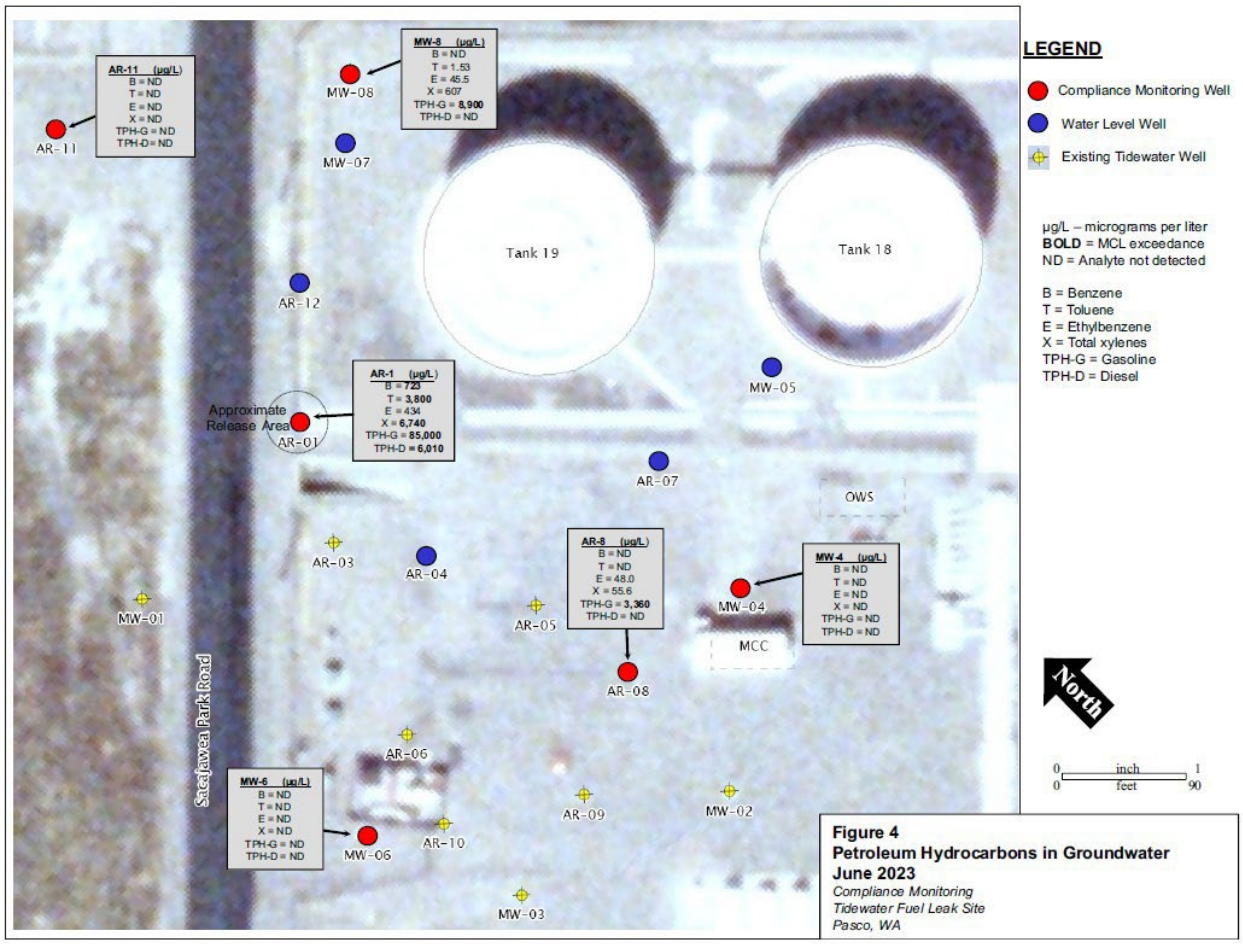


Figure 4, June 2023 Groundwater Analytical Data (GeoEngineers, 2023)

Appendix A,
Historical Groundwater Elevations and Product Thickness

Appendix A- Historical Groundwater Elevation Measurements *Tidewater Fuel Leak Site Compliance Monitoring Program*

Well	Date Measured	Reference Point Elevation (feet NGVD)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet NGVD)	Groundwater Elevation Change from Previous Event (feet)
AR-1	6/29/2010	425.80	81.28	0.01	344.52	--
	12/16/2010		81.70	sheen	344.10	0.42
	5/28/2014		79.56	sheen	346.24	2.14
	5/1/2018[2]	423.99	79.38	0	344.61	1.63
	6/25/2019		80.13	0	343.86	0.75
	6/24/2020		79.83	0	344.16	0.3
	7/27/2021		80.83	0	343.16	1
	6/1/2022[4]	423.88	80.05	0	343.83	0.67
	6/27/2023		79.98	0	343.90	0.07
AR-2[1]	6/29/2010	--	--	--	--	--
	12/16/2010	--	--	--	--	--
	5/28/2014	--	--	--	--	--
AR-3[1]	6/29/2010	428.01	--	--	--	--
	12/15/2010		--	--	--	--
	5/28/2014		--	--	--	--
AR-4	6/29/2010	426.47	81.90	0	344.57	--
	12/15/2010		82.38	0	344.09	0.48
	5/28/2014		81.99	0	344.48	0.39
	5/1/2018		81.93	0	344.54	0.06
	6/25/2019		82.76	0	343.71	0.83
	6/24/2020		82.52	0	343.95	0.24
	7/27/2021[3]		83.47	0	343.00	0.95
	6/1/2022		82.69	0	343.78	0.78
	6/27/2023		82.62	0	343.85	0.07
AR-5	6/29/2010	423.08	78.52	0	344.56	--
	12/15/2010		79.00	0	344.08	0.48
	5/28/2014		78.62	0	344.46	0.38
AR-6	6/29/2010	425.17	80.61	0	344.56	--
	12/15/2010		81.11	0	344.06	0.5
	5/28/2014		80.72	0	344.45	0.39
AR-7	6/29/2010	425.44	80.82	sheen	344.62	--
	12/16/2010		81.33	sheen	344.11	0.51
	5/28/2014		80.96	0	344.48	0.37
	5/1/2018		80.92	0	344.52	0.04
	6/25/2019		81.68	0	343.76	0.76
	6/24/2020		81.41	0	344.03	0.27
	7/27/2021		82.39	0	343.05	0.98
	6/1/2022		81.63	0	343.81	0.76
	6/27/2023		81.55	0	343.89	0.08
AR-8	6/29/2010	423.02	78.43	0	344.59	--
	12/15/2010		78.94	0	344.08	0.51
	5/28/2014		78.50	0	344.52	0.44
	5/1/2018		78.43	0	344.59	0.07
	6/25/2019		79.29	0	343.73	0.86
	6/24/2020		78.99	0	344.03	0.3
	7/27/2021		80.01	0	343.01	1.02
	6/1/2022		79.19	0	343.83	0.82
	6/27/2023		79.13	0	343.89	0.06
AR-9	6/29/2010	423.05	78.46	0	344.59	--
	12/15/2010		78.95	0	344.10	0.49
	5/28/2014		78.60	0	344.45	0.35
AR-10	6/29/2010	422.59	78.01	0	344.58	--
	12/14/2010		78.50	0	344.09	0.49
	5/28/2014		78.13	0	344.46	0.37
AR-11	6/29/2010	422.62	78.00	0	344.62	--
	12/15/2010		78.49	0	344.13	0.49
	5/28/2014		78.15	0	344.47	0.34
	5/1/2018		78.09	0	344.53	0.06
	6/25/2019		78.83	0	343.79	0.74
	6/24/2020		78.54	0	344.08	0.29
	7/27/2021		79.59	0	343.03	1.05
	6/1/2022		78.79	0	343.83	0.8
	6/27/2023		78.74	0	343.88	0.05
AR-12	6/29/2010	425.50	80.96	sheen	344.54	--
	12/16/2010		dry	--	--	--
	5/28/2014		dry	--	--	--
	5/1/2018		81.02	0	344.48	0.06
	6/25/2019		dry	--	--	--
	6/24/2020		81.50	0	344.00	0.48
	7/27/2021		dry	--	--	--
	6/1/2022		dry	--	--	--
	6/27/2023		dry	--	--	--
MW-4	6/29/2010	422.29	77.72	0	344.57	--
	12/15/2010		78.22	0	344.07	-0.5
	5/29/2014		77.82	0	344.47	0.4
	5/1/2018		77.80	0	344.49	0.02
	6/25/2019		78.52	0	343.77	-0.72
	6/24/2020		78.24	0	344.05	0.28
	7/27/2021		79.28	0	343.01	-1.04
	6/1/2022		78.48	0	343.81	0.8
	6/27/2023		78.42	0	343.87	0.06
MW-5	6/29/2010	425.02	80.48	0	344.54	--
	12/15/2010		80.95	0	344.07	-0.47
	5/29/2014		80.59	0	344.43	0.36
	5/1/2018		80.51	0	344.51	0.08
	6/25/2019		81.29	0	343.73	-0.78
	6/24/2020		80.97	0	344.05	0.32
	7/27/2021		82.02	0	343.00	-1.05
	6/1/2022		81.24	0	343.78	0.78
	6/27/2023		81.17	0	343.85	0.07
MW-6	6/28/2010	422.50	77.92	0	344.58	--
	12/14/2010		78.41	0	344.09	-0.49
	5/28/2014		77.99	0	344.51	0.42
	5/1/2018		77.98	0	344.52	0.01
	6/25/2019		78.72	0	343.78	-0.74
	6/24/2020		78.44	0	344.06	0.28
	7/27/2021		79.47	0	343.03	-1.03
	6/1/2022		78.68	0	343.82	0.79
	6/27/2023		78.62	0	343.88	0.06
MW-7	6/29/2010	427.25	82.74	sheen	344.51	--
	12/16/2010		83.19	0	344.06	-0.45
	5/29/2014		82.79	0	344.46	0.4
	5/1/2018		82.78	0	344.47	0.01
	6/25/2019		83.55	0	343.70	-0.77
	6/24/2020		83.26	0	343.99	0.29
	7/27/2021		84.23	0	343.02	-0.97
	6/1/2022		83.47	0	343.78	0.76
	6/27/2023		83.40	0	343.85	0.07
MW-8	6/29/2010	427.15	82.62	sheen	344.53	--
	12/16/2010		83.09	0	344.06	-0.47
	5/29/2014		82.69	0	344.46	0.4
	5/1/2018		82.61	0	344.54	0.08
	6/25/2019		83.44	0	343.71	-0.83
	6/24/2020		83.16	0	343.99	0.28
	7/27/2021		84.13	0	343.02	-0.97
	6/1/2022		83.36	0	343.79	0.74
	6/27/2023		83.30	0	343.85	0.06

Notes:

1 - Well not part of CMP program

2 - Well was re-surveyed in December 2018

3 - Reference point elevation was resurveyed on July 27, 2021.

4 - Reference point elevation was resurveyed on June 1, 2022.

" -- " = Not applicable, not available, and/or not measured.

Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).

Appendix B,
Historical Groundwater Analytical Data

Appendix B
Tidewater Fuel Leak Site Historical Groundwater Monitoring Results
Pasco, Washington

Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
AR-1	Feb-03	**191**	**2,130**	153	**4,570**	**31,700**	NA	NA
	Jun-03	**77**	**1,340**	179	**3,590**	**20,000**	NA	NA
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS
	Jun-20	NS	NS	NS	NS	NS	NS	NS
	Jul-21	**1,530**	**3,550**	**730**	**4,850**	**45,200**	**2,700**	**1,200**
	Jun-22	**1,080**	**1,080**	376	**4,750**	**43,600**	*160 U*	*400 U*
	Jun-23	**723**	**3,800**	434	**6,740**	**85,000**	**6,010**	*400 U*
AR-3	Feb-03	**754**	**3,870**	148	**6,350**	**38,900**	NA	NA
	Jun-03	**6,750**	**6,270**	649	**7,170**	**37,400**	NA	NA
	Mar-06	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS
AR-4	Apr-02	**52**	337	13.9	**1,989**	**10,500**	NA	NA
	Jul-02	**90**	816	10.7	705	**6,400**	NA	NA
	Nov-02	**10.3**	118	5.5	345	**3,080**	NA	NA
	Feb-03	*1.0 U*	*1.0 U*	*1.0 U*	4.8	195	NA	NA
	Jun-03	**10.1**	66	10	326	**5,090**	NA	NA
	Sep-03	**797**	70	27	321	**3,430**	NA	NA
	Mar-06	**2,210**	**3,430**	481	**5,600**	**26,600**	**4,400**	NA
	Nov-07	**640**	**2,800**	220	**4,400**	**28,000**	**4,500**	**1,400**
	Oct-08	**340**	**2,100**	170	**2,700**	**17,000**	**2,500**	**5,900**
	Jun-10	**380**	**1,900**	270	**4,400**	**21,000**	**5,300**	**650**
FD (AR-4 Dup)	Jun-10	**370**	**1,800**	250	**4,000**	**20,000**	**3,700**	440
	Dec-10	**350**	**1,400**	230	**3,600**	**17,000**	**3,700**	*260 U*
	May-14	**535**	789	385	**10,290**	**45,900**	*20 U*	*50 U*
	May-18	**141**	15.4	280	**5,450**	**28,100**	*50 U*	*250 U*
	Jun-19	**123**	10.5	305	**4,870**	**22,000**	*100 U*	*500 U*
	Jun-20	**132**	*50 U*	276	**3,780**	**20,100**	*160 U*	*400 U*
AR-5	Jul-02	**379**	**1,010**	17.5	**3,850**	**39,000**	NA	NA
	Nov-02	0.7	10.6	*ND*	124	**2,900**	NA	NA
	Feb-03	4.3	12.2	1	90	**830**	NA	NA
	Jun-03	**15.2**	8.8	3.4	136	**1,740**	NA	NA
	Sep-03	**8.5**	4.6	1.3	33	557	NA	NA
	Dec-03	*1 U*	26.1	14.1	739	**6,010**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	0.57	250	NA	NA
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	*0.9 U*	*0.9 U*	*0.5 U*	10	65	120	*95 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	260	730	*270 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	2.09	*100 U*	*20 U*	*50 U*
AR-6	Nov-01	**29.8**	**402**	82	**2,800**	**2,390**	NA	NA
	Apr-02	**713**	559	27	**2,060**	**17,700**	NA	NA
	Jul-02	**1,820**	**3,100**	85	**4,780**	**24,700**	NA	NA
	Nov-02	**104**	289	67	**2,886**	**11,900**	NA	NA
	Feb-03	**531**	**1,280**	93	**2,900**	**23,700**	NA	NA
	Jun-03	**475**	**2,340**	110	**3,750**	**23,500**	NA	NA
	Sep-03	**221**	**3,140**	241	**4,610**	**25,000**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	6.7	330	260	NA
	Nov-07	0.6	2.5	0.7	73	670	**1,500**	**990**
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	2.4	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	8.6	81	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	21.2	331	**4,640**	*20 U*	*50 U*
AR-7	Mar-06	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
AR-7	May-14	*1.0 U*	1.4	21	86	1,280	*20 U*	*50 U*
FD (AR-7 Dup)	May-14	*1.0 U*	*1.0 U*	16	65	883	*20 U*	*50 U*

Appendix B
Tidewater Fuel Leak Site Historical Groundwater Monitoring Results
Pasco, Washington

Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
AR-8	Jul-02	**47.3**	229	32	918	**5,330**	NA	NA
	Nov-02	**19.2**	**1,070**	384	**4,170**	**57,400**	NA	NA
	Feb-03	**43.8**	577	276	**3,410**	**59,600**	NA	NA
	Jun-03	**1470**	**2,050**	651	**2,760**	**22,700**	NA	NA
	Sep-03	**3,350**	**1,740**	**1,480**	**2,520**	**16,000**	NA	NA
	Nov-07	**8.0**	46	35	610	**7,400**	**23,000**	**<4,700**
	Jun-10	2.0	15	99	420	**3,300**	**2,000**	250
	Dec-10	1.7	26	100	460	**3,700**	**1,500**	*260 U*
FD (AR-8 Dup)	Dec-10	1.7	36	100	590	**3,500**	**1,500**	*280 U*
	May-14	*1.0 U*	11	280	755	**9,570**	*20 U*	*50 U*
FD (AR-8 Dup)	May-14	*1.0 U*	12	312	812	**9,880**	*20 U*	*50 U*
	May-18	*0.5 U*	0.90	145	200	**4,970**	*50 U*	*250 U*
FD (AR-8 Dup)	May-18	*0.5 U*	0.94	150	223	**4,980**	*50 U*	*250 U*
	Jun-19	*0.5 U*	0.53	88.0	157.2	**4,830**	*100 U*	*500 U*
FD (AR-8 Dup)	Jun-19	*0.5 U*	0.53	82.7	147.0	**4,610**	*100 U*	*500 U*
	Jun-20	*1.25 U*	*1.25 U*	61.7	109.7	**3,520**	*160 U*	*400 U*
FD (AR-8 Dup)	Jun-20	*1.25 U*	*1.25 U*	62.6	103.8	**3,220**	*160 U*	*400 U*
	Jul-21	*2.50 U*	*2.50 U*	119	121.5	**4,500**	*160 U*	*400 U*
FD (AR-8 Dup)	Jul-21	*2.50 U*	*2.50 U*	112	129.6	**4,720**	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	25.8	27.8	**1,660**	*160 U*	*400 U*
FD (AR-8 Dup)	Jun-22	*0.5 U*	*0.5 U*	25.6	27.6	**1,650**	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	48.0	55.6	**3,360**	*160 U*	*400 U*
AR-9	Nov-01	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
FD (AR-9 dup)	Nov-01	*1 U*	*1 U*	*1.1*	*2 U*	*50 U*	NA	NA
	Nov-02	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Dec-03	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*270 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
AR-10	Nov-01	**54**	13.7	*ND*	221	311	NA	NA
	Apr-02	3.1	*1.0 U*	3.5	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	78	NA	NA
	Feb-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Jun-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Sep-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
AR-11	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*230 U*	*560 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Dec-03	*1.0 U*	1.9	*1.0 U*	1.1	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
AR-12	Feb-03	**3,860**	**10,400**	**1,000**	**13,560**	**84,700**	NA	NA
	Jun-03	**3,810**	**8,060**	**731**	**9,190**	**55,100**	NA	NA
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS

Appendix B
Tidewater Fuel Leak Site Historical Groundwater Monitoring Results
Pasco, Washington

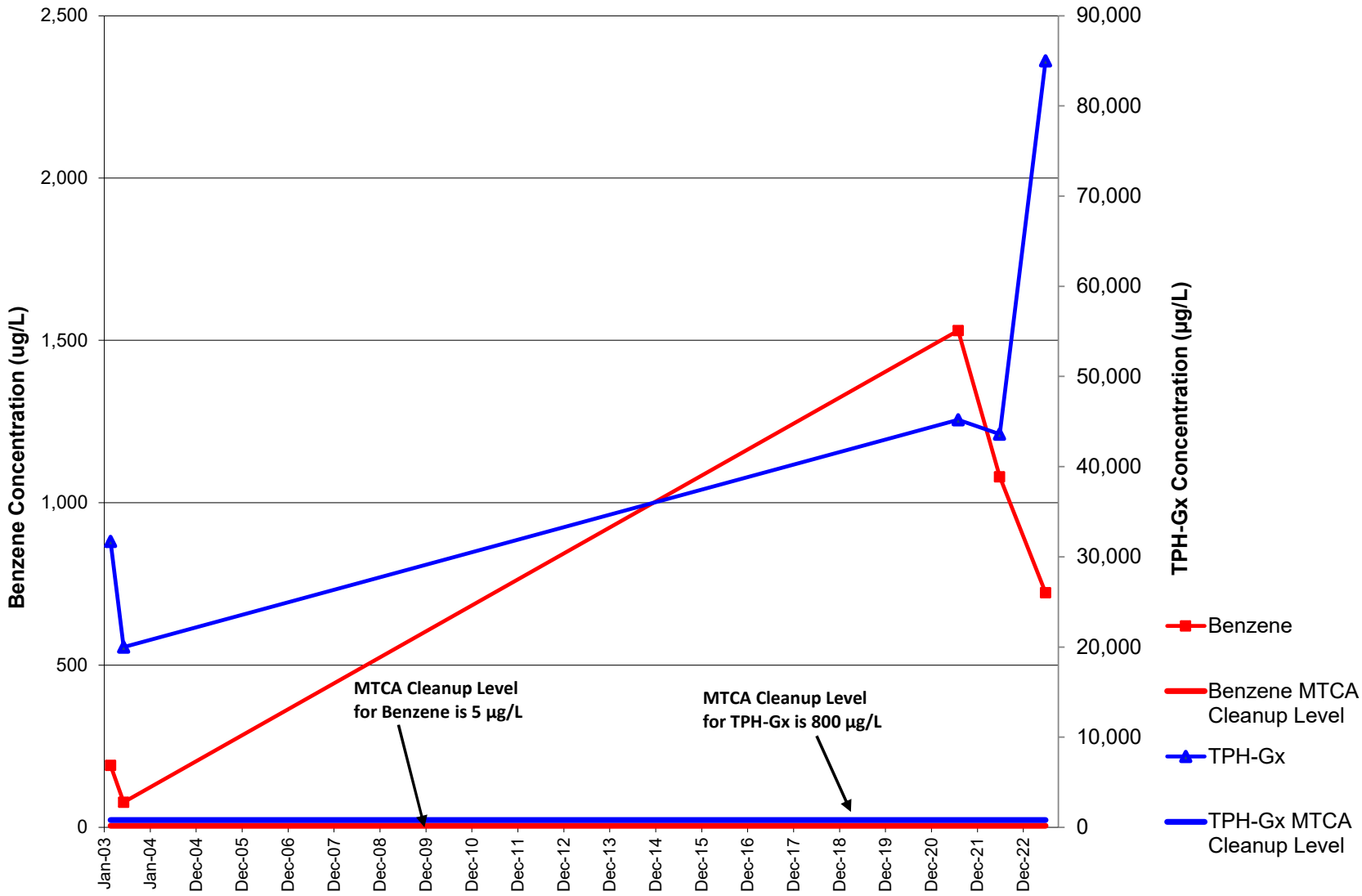
Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
MW-1	Mar-01	**20**	21	*1.0 U*	*2 U*	110	*230 U*	*580 U*
	Aug-01	**1,890**	**1,900**	9.5	**1,109**	**5,980**	NA	NA
	Nov-01	**336**	**88**	1 U	**211**	321	NA	NA
	Apr-02	**880**	33	5.3	43	667	NA	NA
	Jul-02	**1,040**	22	41	40	**1,600**	NA	NA
	Nov-02	**434**	36	57	131	**1,040**	NA	NA
	Nov-02	**385**	31	38	95	712	NA	NA
FD (MW-1 dup)	Feb-03	**453**	19.7	43	43.8	263	NA	NA
	Feb-03	**369**	15	32	33.8	240	NA	NA
FD (MW-1 dup)	Jun-03	**240**	131	78	257	**841**	NA	NA
	Jun-03	**131**	68	35	128	**1,420**	NA	NA
FD (MW-1 dup)	Sep-03	**149**	77	38	145	589	NA	NA
	Sep-03	**112**	69	26	NR	431	NA	NA
FD (MW-1 dup)	Dec-03	**20.2**	58	3.1	26	102	NA	NA
	Dec-03	**8.0**	22	1.2	9.3	143	NA	NA
	Mar-06	*0.5 U*	0.71	8.4	8.7	250	*250 U*	NA
FD (MW-1 dup)	Mar-06	*0.5 U*	0.69	6.8	6.1	250	*250 U*	NA
	Nov-07	*0.2 U*	0.20	0.5	*0.6 U*	*50 U*	*190*	**670**
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-2	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*220 U*	*540 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	82	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	78	*96 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*260 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-3	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	270	NA
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	117	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	*80 U*	*100 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*140*	*270 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-4	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*200 U*	*680 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	55	NA	NA
	Dec-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	*77 U*	*97 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*140 U*	*280 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
MW-5	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*200 U*	NA
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	**954**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	**4,300**	NA
	Nov-07	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	**1,300**	**1,100**
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	91	*98 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*260 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*100 U*	*500 U*

Appendix B
Tidewater Fuel Leak Site Historical Groundwater Monitoring Results
Pasco, Washington

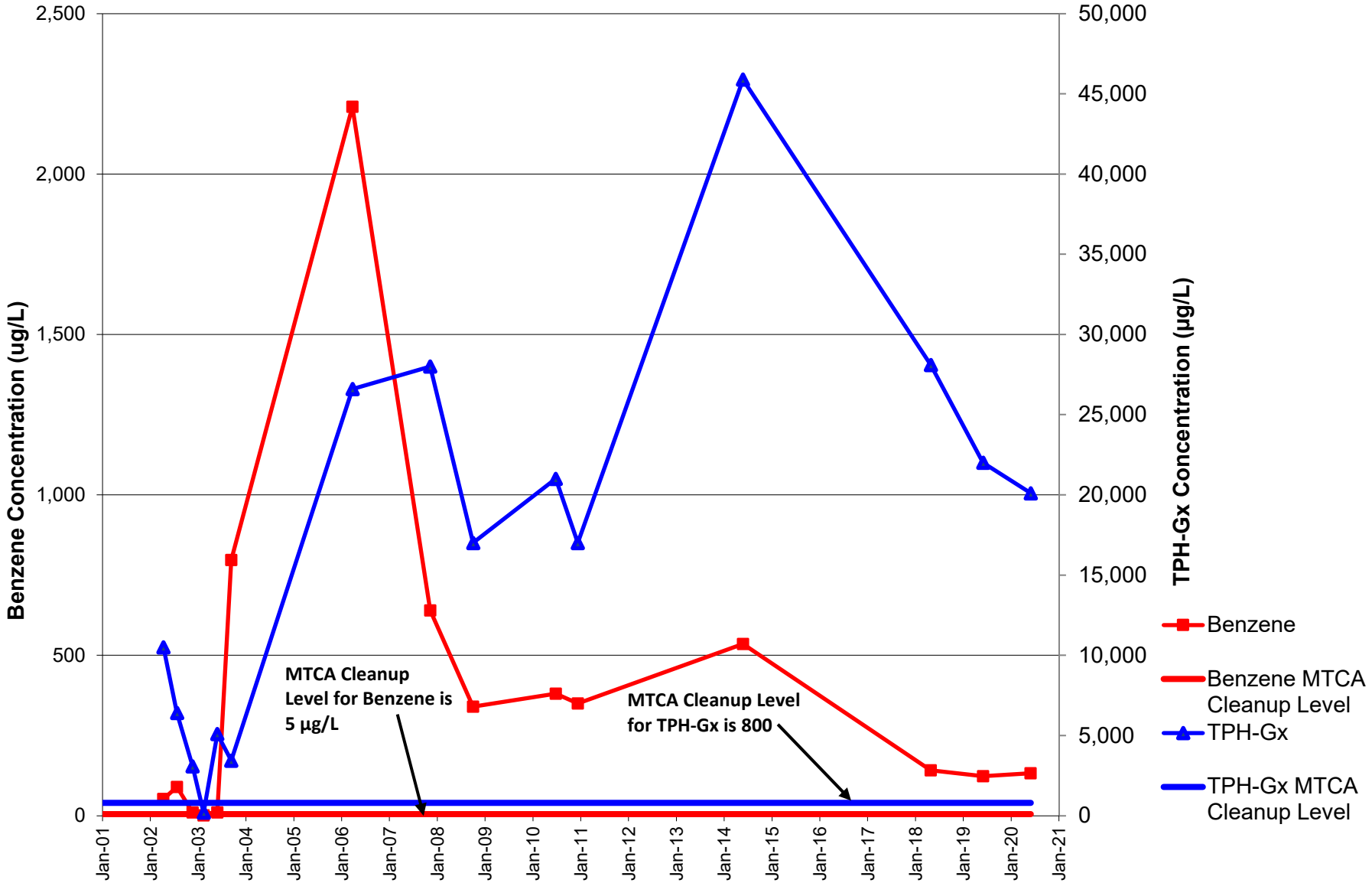
Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
MW-6	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*190 U*	*480 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	62	NA	NA
	Sep-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Dec-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*145*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
MW-7	Mar-01	**990**	**3,000**	130	**1,260**	**11,000,000**	**1,240**	**510**
	Nov-07	**70**	530	53	930	**7,000**	**2,000**	300
	Dec-10	*1.0 U*	4.1	*1.0 U*	27	350	*120 U*	*240 U*
	May-14	**88**	**1,910**	133	**2,702**	**19,200**	*20 U*	*50 U*
MW-8	Mar-01	**5,300**	**17,000**	**1,500**	**10,800**	**77,000,000**	**72,400**	**1,210**
	Feb-03	**3,630**	**8,540**	**931**	**8,450**	**51,500**	NA	NA
	Jun-03	**6,490**	**14,500**	**1,320**	**12,590**	**80,900**	NA	NA
	Mar-06	**183**	**5,440**	452	**5,140**	**25,700**	**8,400**	NA
	Nov-07	**29**	**2,200**	**410**	**5,500**	**36,000**	**6,500**	**1,900 U**
	Dec-10	2.4	500	210	**2,000**	**9,900**	**2,500**	*260 U*
	May-14	*1.0 U*	286	462	**4,920**	**27,000**	*20 U*	*50 U*
	May-18	*0.5 U*	3.8	*0.5 U*	*0.5 U*	**3,540**	*50 U*	*250 U*
	Jun-19	*0.5 U*	8.10	61.8	810	**5,190**	*100 U*	*500 U*
	Jun-20	*10.0 U*	*25 U*	106	**1,241**	**8,130**	*160 U*	*400 U*
	Jul-21	*12.5 U*	15.5	120	**1,357**	**11,300**	*160 U*	*400 U*
	Jun-22	*0.5 U*	2.6	40	**502**	**3,980**	*160 U*	*400 U*
	Jun-23	*0.5 U*	1.53	45.5	**607**	**8,900**	*160 U*	*400 U*
FD (MW-8 dup)	Jun-23	*0.5 U*	1.76	65.0	**855**	**7,800**	*160 U*	*400 U*

Notes:
MCL - Maximum Contaminant Level. Based on Washington Department of Ecology Method A cleanup levels in Table 720-1 of the Model Toxics Control Act, Oct 2007.
µg/L - Micrograms per liter
BOLD - Exceeds MCL
U = Analyte not detected above method reporting limit
J = Analyte value is estimated
NS = Not Sampled for one of the following reasons: insufficient water in well, presence of liquid hydrocarbons, inaccessibility, date was between sampling events, or well no longer in sampling program.
N/A = Not applicable or not available
FD = Field duplicate

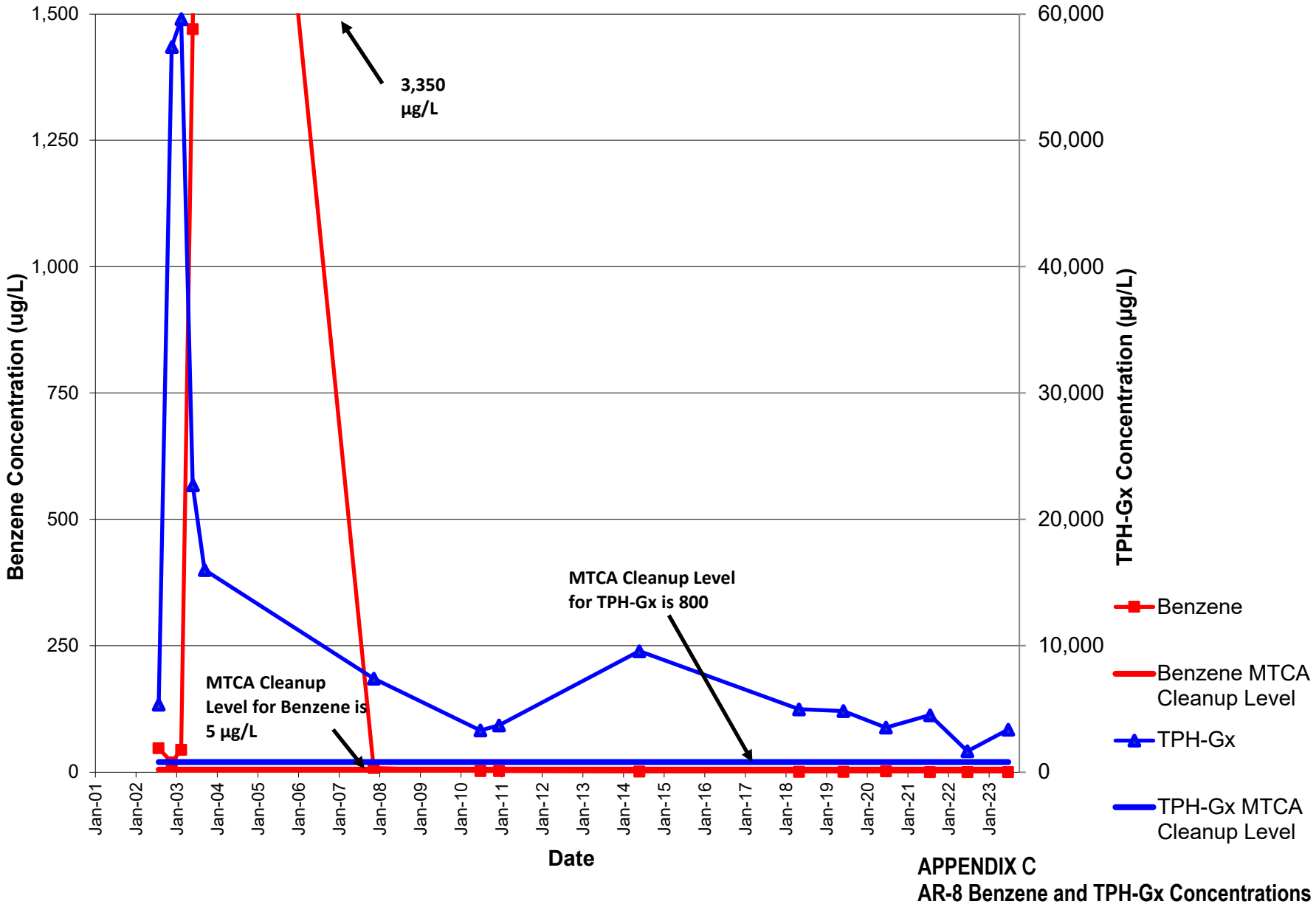
Appendix C, Historical Groundwater Analytical Data Time Series Plots



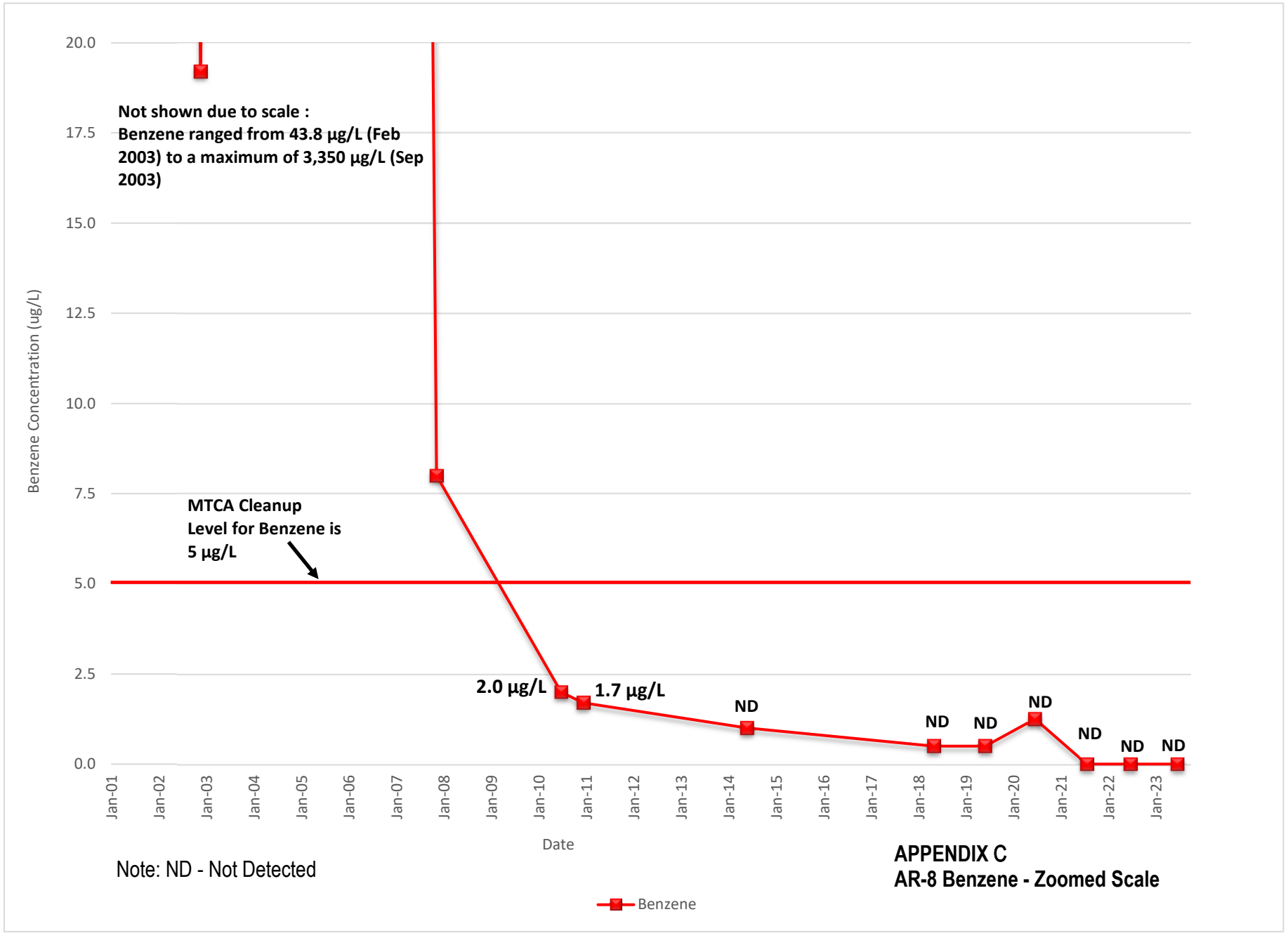
APPENDIX C
AR-1 Benzene and TPH-Gx Concentrations
Tidewater Fuel Leak Site



APPENDIX C
AR-4 Benzene and TPH-Gx Concentrations

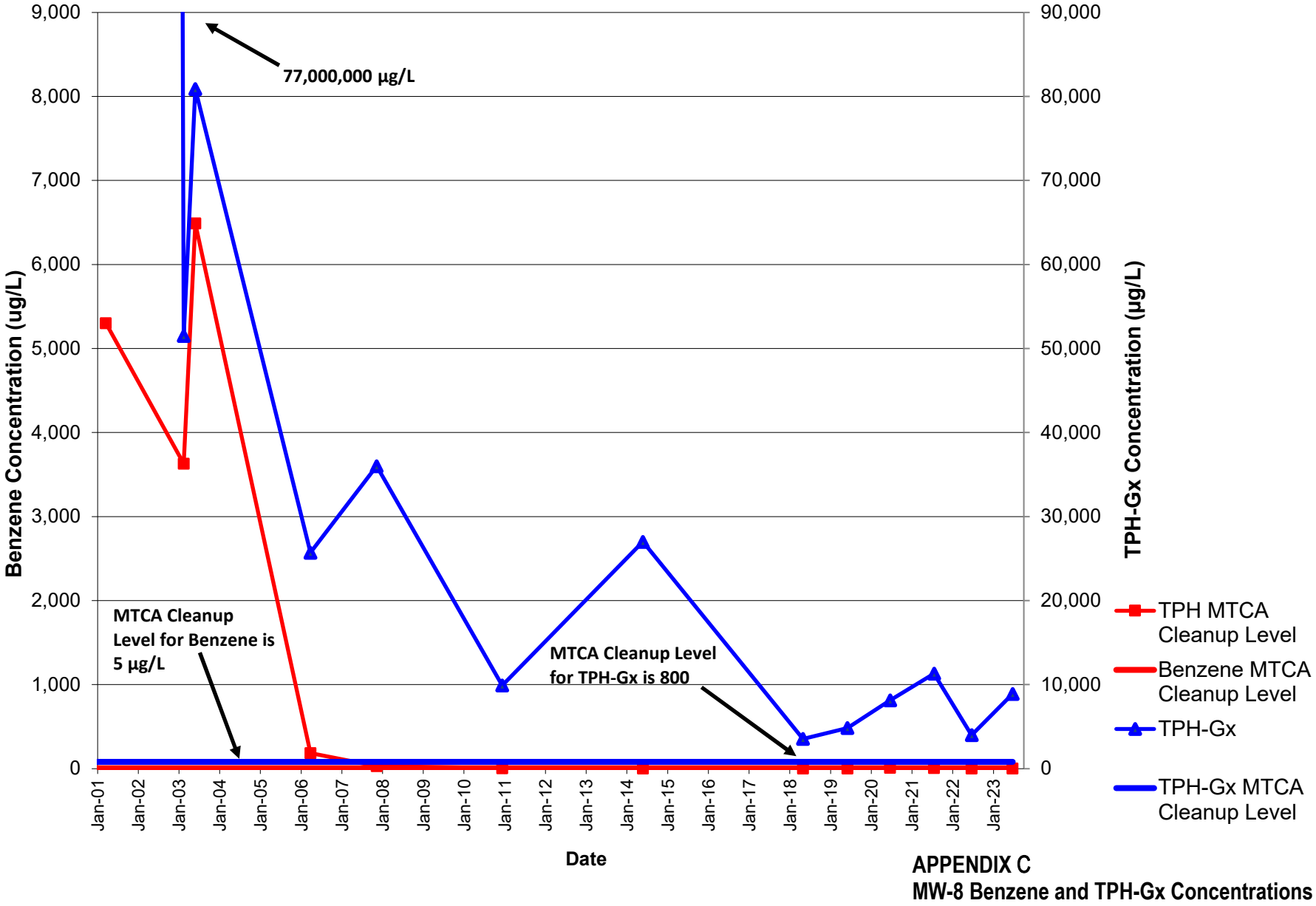


APPENDIX C
AR-8 Benzene and TPH-Gx Concentrations

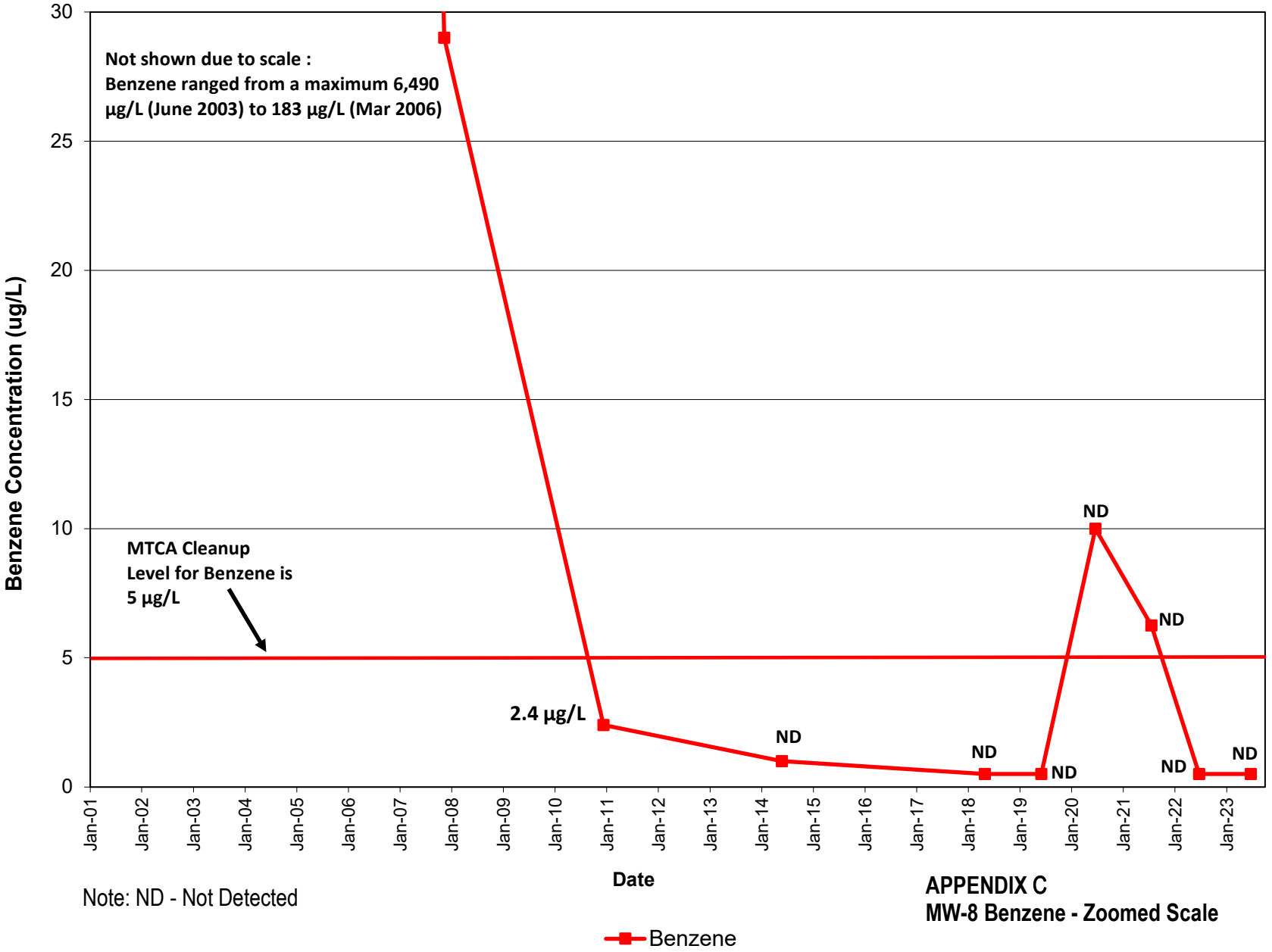


Note: ND - Not Detected

APPENDIX C
AR-8 Benzene - Zoomed Scale



APPENDIX C
MW-8 Benzene and TPH-Gx Concentrations



Note: ND - Not Detected

APPENDIX C
MW-8 Benzene - Zoomed Scale

Appendix D,
Site Visit Photos

AR-01 Biovent. No protection around the PVC pipe.

AR-01 Well cover. Missing bolts in well cover

Well AR-03. No protective cover or bollards.

Well AR-04

Well AR-04, with stuck pump

Well AR-04, well cover, no bollards

Biovent well AR-05. No protective cover or bollards.

Well AR-06. No protection

Well AR-07. No protection

AR-09 Bioventing well, old gasket

Well AR-10. No gasket

Well AR-11. No bolts

Dry well AR-12. No protection

Well MW-02

Well MW-02, No gasket

Well MW-03. No gasket

Well MW-04. Old gasket

Well MW-5, No bollards, low visibility, open top

Well MW-06. No gasket

Well MW-07. Open top, no bollards, low visibility

Well MW-08, open top, low visibility

Well MW-11

Western portion of the Site facing south