FINAL - Data Summary Report for Annual Groundwater Monitoring for the Tidewater Fuel Leak Site, Pasco, Washington

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Prepared for

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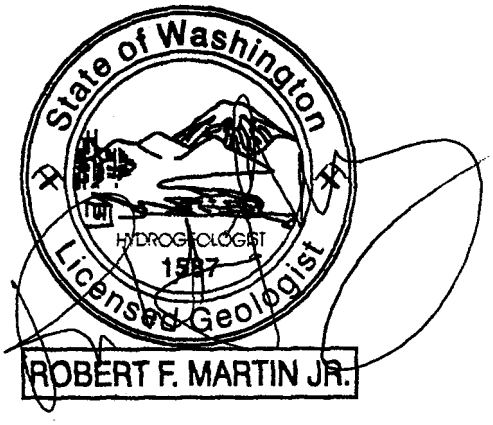

12/19/2021

This report was prepared under the supervision of
a licensed geologist, employed by Jacobs.

Jacobs Project No. D3383500

Contents

1.0 Introduction

This data summary report presents results from groundwater monitoring conducted at the Tidewater Terminal Company (Tidewater) Fuel Leak Site (Site) in Pasco, Washington on June 24 and 26, 2020 (Figure 1). The field sampling was performed in accordance with the Compliance Monitoring Plan (CMP) dated November 30, 2017 (CH2M, 2017) and approved by the Washington Department of Ecology (Ecology) on December 8, 2017.

1.1 Purpose

This data summary report has been prepared by Jacobs to document field observations and analytical results from the June 2020 monitoring event conducted at the Site. As described in the CMP, the purpose of annual groundwater monitoring at the Site is to monitor indicator substances and secondary indicator parameters for the effectiveness of natural attenuation (NA) as the selected cleanup action for the Site (CH2M, 2017). Indicator substances from the CMP include Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX), and Gasoline, Diesel, and Heavy Oil-range Total Petroleum Hydrocarbons (TPH). Secondary indicator parameters include ferrous iron, manganese, methane, and sulfate, and will be used in conjugation with field parameters dissolved oxygen, oxidation reduction potential, and pH to evaluate effectiveness of NA at the Site. The CMP provides the cleanup levels for indicator substances for the Site (Table 1). The Sampling and Analysis Plan (Appendix A of the CMP, Table A-2) provides a full list of analytical parameters.

1.2 Objectives

This data summary report was prepared to summarize the sampling approach and methods, laboratory analytical methods, and results. The sampling approach is described in the Sampling and Analysis Plan (Appendix A) of the CMP (CH2M, 2017) and was designed to collect samples from compliance wells located within the Site monitoring network (Figure 2).

This data summary report includes the following:

- Summary of field activities, sampling methods and details, and field observations
- Summary of analytical results

All fieldwork and laboratory analyses were performed in general accordance with the Sampling and Analysis Plan as included in the 2017 CMP.

2.0 Field Summary

This section provides a summary of the sampling activities and field observations during groundwater monitoring activities. Groundwater monitoring was performed on June 24 and 26, 2020 and conducted in general accordance with the CMP.

2.1 Groundwater Measurements and Elevations

Groundwater levels were measured prior to pumping and sampling wells so as not to influence the flat groundwater gradient at the Site. Groundwater measurements were collected from 11 wells as listed in Table 1 of the CMP. Wells that have had historic measurable sheen, or historic high concentrations of indicator substances, were measured for the presence of sheen using an oil-water interface probe. No sheen was detected in the wells monitored as part of the June 2020 monitoring event.

Groundwater levels were measured from the top of casing of each well. Groundwater measurements, including measurements for sheen (if observed), are provided in Table 1. Groundwater measurements were recorded on the groundwater field forms in Appendix A. Depths to water for all measured wells at the site ranged from 78.24 feet below ground surface (bgs) in MW-4 to 83.26 feet bgs in MW-7.

Based on depth to water measurements, groundwater elevations were calculated and are shown in Table 1. Groundwater elevations at the site ranged from 343.95 feet above mean seal level (AMSL) in AR-4 to 344.16 feet AMSL in AR-1.

The groundwater gradient for the site is flat with only a 0.2-foot variation between all measured wells. These groundwater elevations are consistent with historical measurements. Groundwater elevations measured in the 2020 monitoring were 0.24 to 0.32 ft higher than were measured in May 2019. The groundwater flow direction to the south was inferred based on the 2020 measurements and historical groundwater elevations and groundwater plume geometry. Historical groundwater elevations are included in Appendix B.

Note that groundwater elevations are calculated from field depth to water measurements and surveyed top of well casing data. In 2010, a survey was performed for the wells at the site. Based on the 2010 survey, it was determined the survey data for AR-1 was incorrect. Well AR-1 was re-surveyed by Andeavor Logistics' (Andeavor) consultant CEECON on December 21, 2018. Groundwater elevation data for AR-1 has been included in the CMP Reports since 2019.

2.2 Groundwater Monitoring

Groundwater samples were collected from the six CMP network wells (Table 2 of the CMP) after groundwater levels were measured. Groundwater samples were collected using a nominal 2-inch diameter portable submersible pump powered by a direct current (DC) power car battery with disposable polyethylene tubing. Prior to use in each well, the submersible pump was decontaminated using a phosphate-free detergent and rinsed with de-ionized water.

Wells were sampled in order based on historical concentrations of petroleum hydrocarbons and starting with the lowest historical concentrations of petroleum hydrocarbons and moving to the highest. Wells sampled during the June 2020 monitoring event are listed in Table 2 of the CMP and include AR-4, AR-8, AR-11, MW-4, MW-6, and MW-8.

Well sampling was performed in accordance with the SAP using low-flow sampling techniques. Field parameters recorded on field forms for each well and are summarized in Table 1. Well Sampling Forms are provided in Appendix A of this report. Sampling occurred when stabilization of field parameters was indicated over three consecutive 5-minute intervals. Groundwater samples were collected in laboratory-provided sample containers. Ferrous iron field measurements were collected during groundwater collection activities and recorded on the Well Sampling Forms (Appendix A) and are summarized in Table 2.

As per the Quality Assurance Project Plan (QAPP) (Appendix B of the CMP), field duplicates (FDs), matrix spike/matrix spike duplicate (MS/MSDs), and equipment blank (EBs) were collected for quality control and verification of field and laboratory procedures. A FD and a MS/MSD sample were collected from AR-8.

Purge water was collected during sampling activities, contained in a labeled 55-gallon drum, and stored at the Site within a secured area pending characterization by groundwater results and disposal.

2.3 Well AR-4 Damage

After collecting groundwater samples from well AR-4, the PVC stickup of the well disengaged from a joint near the ground surface during retrieval of the submersible pump, causing the pump to drop into the well and allowed for the sloughing of sand and gravel into the well. The PVC casing was quickly placed back on the well, but not before sloughing of sand and gravel into the well.

After replacing the PVC stickup back on the coupler of the well, field staff attempted to retrieve the submersible pump. Several unsuccessful attempts to retrieve the submersible pump were performed using various strategies and methods. The pump was unable to be recovered, hitting a hard ‘dislocation’ in the well screen, a few feet from the bottom of the well.

Attempts were made to surge the well above and below the in-well obstruction, flush the well with water pumped from the submersible pump, and other methods with no success. Eventually, the cable attached to the pump broke near the surface of the well. The remaining excess cable from the pump was securely wrapped around the well, taped, and the well cap replaced on the well.

3.0 Results

Groundwater samples were submitted to Anatek Laboratories in Spokane (Anatek), Washington on June 27, 2020 for analysis and analyzed for the parameters listed in Table 2 of the CMP.

3.1 Analytical Results

Groundwater results for indicator substances for the June 2020 monitoring event are listed for each well below. Analytical results are provided in Table 2. Analytical reports are provided in Appendix C.

- AR-11 – Petroleum hydrocarbons were not detected above laboratory method detection limits (MDL). AR-11 is considered the upgradient well for the site.
- MW-4 – Petroleum hydrocarbons were not detected above laboratory MDLs. MW-4 is considered the down-gradient perimeter well for the site.
- MW-6 – Petroleum hydrocarbons were not detected above laboratory MDLs.
- AR-4 – TPH-G and BTEX constituents were detected in AR-4. TPH-G was detected at 20,100 µg/L, exceeding the Model Toxics Control Act (MTCA) cleanup level of 800 µg/L. Benzene was detected at 132 µg/L and exceeded the MTCA cleanup level of 5 µg/L. Total xylenes were detected at 3,780 ug/L exceeding the MTCA cleanup level of 1,600 ug/L. Ethylbenzene was detected in AR-4 at 276 µg/L, but did not exceed the MTCA Cleanup level. No other petroleum hydrocarbon constituents were detected in AR-4. AR-4 is located within the center of the petroleum hydrocarbon plume directly downgradient from the release.
- AR-8 –Petroleum hydrocarbons ethylbenzene, total xylenes, and TPH-G were detected, but only TPH-G (3,520 ug/L) exceeded the MTCA Cleanup level.
- MW-8 – TPH-G exceeded the MTCA Cleanup level at 8,130 µg/L. Ethylbenzene and total xylenes were detected, but below their respective MDLs. No other petroleum hydrocarbon constituents were detected in MW-8 for the June 2020 event.

Additionally, manganese, sulfate, nitrate, methane and ferrous iron were analyzed to determine if NA processes are still occurring at the site. Natural attenuation analytes are provided in Table 2. A short summary of NA parameters is below:

- Manganese – Manganese was detected in upgradient well AR-11 and wells MW-8, AR-4, and AR-8. Manganese concentrations were highest in wells AR-4 and AR-8 at 2.00 mg/L and 0.997 mg/L, respectively. Manganese concentrations were detected in wells with higher groundwater petroleum hydrocarbon concentrations.
- Sulfate – Sulfate concentrations ranged from highs of 134 mg/L (MW-4), 133 mg/L (AR-11), and 115 mg/L (MW-6) to lows of 51.5 mg/L (AR-4), and 57.7 mg/L (AR-8). Sulfate concentrations are lower within wells containing hydrocarbon concentrations.
- Nitrate – Concentrations of nitrate ranged from 34.3 mg/L to 29.5 mg/L in wells AR-11, MW-4, and MW-6. Concentrations of nitrate were detected at 25.3 mg/L, 8.17 mg/L, and 0.288 mg/L in wells MW-8, AR-4, and AR-8, respectively, and are lower in wells with higher groundwater petroleum hydrocarbon concentrations.

- Methane – Methane was detected in wells AR-4 and AR-8 at concentrations of 742 µg/L and 6.57 µg/L, respectively, elevated in the in wells with the highest groundwater petroleum hydrocarbon concentrations.

3.2 Quality Assurance Summary

Quality assurance samples were collected by Jacobs in the field (field duplicates, equipment blank, and trip blanks). Additionally, the analytical laboratory performed quality assurance on samples during analysis.

Field Quality Assurance Samples

A field duplicate was collected from AR-8 for the June 2020 event. The relative percent difference (RPD) for the field duplicate sample collected at AR-8 was within acceptable limits for all analytes. An equipment blank sample (EB-1) was also collected by Jacobs field staff from the submersible pump during the sampling event as a quality check of the effectiveness of field decontamination procedures. No analytes were detected for the equipment blank, indicating decontamination procedures were generally effective and no cross contamination is suspected.

No analytes were detected in two trip blanks.

Laboratory Quality Assurance Results

Laboratory performance criteria for calibration, precision (as measured by laboratory duplicate samples), and accuracy (as measured by spike and surrogate recovery and laboratory control sample analysis) were reviewed. Laboratory quality assurance results indicate laboratory quality control requirements were generally met for the analyses performed with the following exceptions:

- Hold time exceedance: The hold time for Nitrate exceeded the recommended hold time for samples MW-8 and AR-4
- Low matrix recovery: Matrix recovery for manganese did not meet the established criteria in laboratory in the matrix spike duplicate.
- Lab control RPD exceeded: The RPD of the lab control spike duplicate exceeded established criteria for NWTPH-Gx (Gasoline).

Assessment

1. No data were rejected
2. MS/MSD recovery for manganese (Method EPA 200.8) was below quality criteria. Four (4) results were qualified as estimated (J-flag). Three (3) results that were non-detect were flagged as non-detect, but approximated (UJ-flag)
3. Primary/FD RPD exceedance was observed for Method NWTPH-Gx; Four (4) results were qualified as estimated (J-flag). Three (3) results that were non-detect were flagged as non-detect, but approximated (UJ-flag)
4. The hold time for nitrate (Method EPA 300.0) was exceeded for two (2) samples (MW-8 and AR-4) and are qualified as estimated (J-flag).

3.3 Water Quality and Field Parameters

During groundwater sampling, field parameters were recorded to provide additional details of water quality.

Dissolved oxygen (DO), pH, and oxidation-reduction potential (ORP) were recorded and provide additional data as to if biodegradation processes are occurring. Negative ORP field values, which indicate the potential of reducing conditions were recorded in AR-4, AR-8, and MW-8. Low DO readings, which indicate increasing anaerobic conditions, were recorded in AR-4 and AR-8. Field pH readings ranged from 6.91 (AR-4) to 7.30 (AR-11). Field parameters are recorded on the well sampling field sheets in Appendix A and are provided in Table 1.

4.0 Conclusions

No petroleum hydrocarbons were detected in wells AR-11, MW-4 and MW-6 for the June 2020 monitoring event. These data support the conclusion that the petroleum hydrocarbon plume continues to be contained within the monitoring network.

Well AR-4, located within the center of the petroleum hydrocarbon plume directly downgradient for the release area, has the most MTCA Cleanup Level exceedances for the site with benzene, total xylenes, and TPH-G exceeding cleanup levels. However, benzene has decreased to some of the lowest concentrations in AR-4 since June 2003. Historical groundwater monitoring results are provided in Appendix D. BTEX constituents did not exceed cleanup levels in the other compliance wells monitored in 2020. Time-series plots for benzene and TPH-G are provided in Appendix E.

Total xylenes and TPH-G concentrations were lower for the June 2020 monitoring event than the previous monitoring event conducted in May 2019.

Field parameter data indicate that wells with historic and existing petroleum hydrocarbon detections showed negative ORP values (indicating potential for reducing conditions), lower DO readings (indicating presence of anaerobic conditions), and lower pH.

Natural attenuation constituents indicate that biodegradation of petroleum indicator substances is occurring in groundwater at the Site. Manganese concentrations were much higher in wells with petroleum hydrocarbons as opposed to wells that have not had petroleum hydrocarbon detections. Conversely, sulfate concentrations were noticeably lower in wells AR-4, AR-8, and MW-8, than wells where petroleum hydrocarbons were historically not detected.

Biodegradation processes associated with natural attenuation have been shown to reduce nitrates as well as petroleum hydrocarbons and is illustrated by the low nitrate values detected in AR-4 and AR-8 when compared to other wells at the Site. Methane is indicative of biodegradation processes and was detected in wells AR-4 and AR-8 which are located in the area of highest elevated groundwater concentrations of indicator parameters.

The results of the June 2020 monitoring event continue to support the conclusions presented in the September 2011 Remedial Investigation/Feasibility Study Report (CH2M/URS, 2011) as follows:

- The hydraulic gradient at the site is relatively flat with limited fluctuations.
- The petroleum hydrocarbons source has been addressed through remedial activities.
- Residual dissolved-phase petroleum hydrocarbons remain on site and within localized areas of the former free product plume. These areas include AR-1, AR-4, and AR-8.
- The lateral extent of the dissolved-phase plume has generally continued to maintain or decrease in area since active remedial actions were discontinued.
- Measured concentrations of field parameters and analytical results of natural attenuation constituents, as well as the decreased lateral extent and concentration of petroleum hydrocarbons in sampled wells, suggest biodegradation processes continue at the Site. Biodegradation and associated natural attenuation processes have contributed to the observed reduction in petroleum concentrations. These processes are expected to continue, resulting in continued decreases in petroleum hydrocarbons in groundwater.

4.1 2021 Recommendations

Recommendations to Include AR-1 in the CMP

CMP Support for Including AR-1

The CMP allows for modification of the well network based on changing conditions and other factors. It is recommended, regardless of the condition and repair of AR-4 (described below), that AR-1 be included as a replacement groundwater monitoring well of AR-4. Well AR-1 is a suitable replacement for well AR-4 based on the objective stated in Section 2.1 of the CMP for protection to human health and the environment.

Additional support for replacing AR-4 with AR-1 as provided in the CMP:

AR-1 Meets Point of Compliance definitions (CMP Section 2.2.2): Points of Compliance (POCs) are designated at on-site locations where cleanup levels are to be met. For the Site, the standard POC is the unconfined groundwater located in the sand and gravel deposits beneath the facility. Well AR-1 is located in this area and screened in the zone of degraded groundwater and provides an adequate assessment of the groundwater and indicator substances at the POC. Incorporating well AR-1 for monitoring would be required as part of cleanup demonstration and meeting the cleanup levels at the point of compliance.

Meets CMP monitoring Objectives (CMP Section 3.1): The goal of compliance monitoring is to monitor the effectiveness of natural attenuation as the selected cleanup action for the Site. Specific objectives of the CMP are to:

- Document groundwater flow patterns, including changes that might adversely impact
- effectiveness of the natural attenuation remedy;
- Identify the wells to be sampled and analyses to be performed to demonstrate compliance with the cleanup standards;
- Establish a monitoring frequency that ensures that human health and the environment continue to be protected during performance and confirmational monitoring periods; and
- Provide periodic reports to demonstrate progress toward achieving Site cleanup standards.

Well AR-1 meets all the above objectives of the CMP monitoring network.

Maintains Integrity of CMP Monitoring Well Network (CMP Section 3.2): The Tidewater compliance monitoring network includes one upgradient monitoring location (AR-11), three sentinel wells (MW-4, MW-6, and MW-8), and two interior plume source area well (AR-4 and AR-8) (Section 3.2 of the CMP). Well AR-1 meets the definition of an interior plume source area well as it is located at the source of the historic release and subsequent plume. Interior plume source area well AR-8 is located hydraulically downgradient of both AR-4 and AR-1 and provides data on the farthest extent of the plume.

The CMP allows for modifications to the site monitoring network or monitoring frequency, without changes or re-negotiations to the 2016 Consent Decree (Ecology, 2016). Any proposed modifications to the CMP will be submitted to Ecology for review and approval prior to implementation.

Recommendations for AR-1 Inspection

Well AR-1 PVC casing and screen may be weakened by the prolonged exposure to fuel hydrocarbons as its located near the source of the original release. Before AR-1 is formally incorporated into the network as a replacement monitoring point for AR-4, the following will be performed:

1. Confirm well AR-1 continues to be free of floating product or sheen. AR-1 is currently monitored as a water level well in the CMP. Recent water level measurements in well AR-1 have not indicated the presence of free product or sheen.

2. If well AR-1 is free of floating product, A camera inspection will be conducted to check the integrity of the well casing and screen.
3. If no damage is observed based on the camera inspection, and AR-1 is free from floating product or sheen, it will be developed to reduce the presence of silt and fines in the well in accordance with well installation industry standards.
4. A caliper survey should be performed on AR-1 after the well development to confirm well screen integrity after well development.
5. If well AR-1 is determined to be damaged or unusable for groundwater sampling purposes now or in the future, it will not be included as a monitoring well replacement of AR-4. If well AR-4 is inspected and repaired (pump removed) and observed to be undamaged, well AR-4 will remain as the interior monitoring well for the network with AR-1 remaining as a water level well.
6. Replacement wells for both AR-1 and AR-4 will be installed if both existing AR-1 and AR-4 (see below) are observed as unusable as monitoring wells based on camera inspections. This requirement is accordance with monitoring and sampling requirements set forth in Table 2 in the November 2017, Compliance Groundwater Monitoring Report.

The above well inspection activities will occur in 2021, prior to performing the annual CMP monitoring event.

Recommendations for AR-4 Inspection and Repair

It is recommended that well AR-1 replace AR-4 at the site. Well AR-4 should still be inspected and repaired, if possible, as it is no longer functional as a monitoring well for the CMP Program due to a pump that was not retrievable within the well screen from the 2020 CMP monitoring event. Water levels may still be collected from AR-4, but groundwater samples cannot be collected presently as the presence of the pump prevents collecting representative groundwater samples from the target screen zone. The condition of AR-4 well screen is also unknown and requires inspection.

A camera investigation is recommended to observe the submersible pump and well conditions and determine if the pump can be recovered. If the pump can be retrieved, a camera inspection of the well screen will be performed to inspect if any damage to well screen is observed.

If the pump is removed successfully from AR-4, and the subsequent camera inspection indicates no damage has occurred to the well, AR-4 will be used as a groundwater elevation well and an alternate groundwater monitoring well in the event of free product observed in AR-1 which would preclude collection of samples. If the pump in AR-4 is not retrievable, or the camera inspection indicates damage to the integrity of the well that prevents use as a monitoring well, it is recommended that AR-4 be used as a water level only well, assuming the well is not damaged or blocked to make it inappropriate for such use.

If AR-4 is damaged and cannot be used for groundwater monitoring or groundwater level measurements, AR-4 will be abandoned in accordance with all applicable Washington State regulations governing groundwater well abandonment.

Installation of Protective Casing to Site Wells

Wells AR-4, AR-7, AR-8, and AR-12 are all PVC cased wells that lack protective casing. Years of exposure to the elements has weakened the PVC and PVC connections, and is a probable direct cause of the damage that occurred to well AR-4.

AR-8 is an unprotected PVC stickup with the top of the well just below surface level. The well is capped with a slotted plastic bio-vent cap and protected by a traffic cone. Care is needed during sampling events to

prevent gravel and sand sloughing into the well when accessing for measurements and sampling. Many of the AR wells are vulnerable to damage from typical site activities that could cause irreparable damage to the wells.

Jacobs recommends protecting exposed PVC monitoring and water level wells with flush-mount monuments or above ground steel protective casings to prevent further damage due to weathering and inadvertent physical damage. This work would be performed by a licensed driller and would be performed by the same drilling contractor performing the well camera inspections required by Ecology described in the section above.

5.0 References

CH2M/URS 2011. *Remedial Investigation/Feasibility Study Report for the NWTC Pasco Terminal, Pasco, Washington.* September 29.

CH2M 2017. *Compliance Monitoring Plan for The Tidewater Fuel Leak Site, Pasco*. October 3.

Washington Department of Ecology 2016. *State of Washington, Department of Ecology v. Tidewater Terminal Company, Inc., Consent Decree No. 16-250951-11.* November 22.

Tables

Table 1. Groundwater Elevations and Field Parameter Readings

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Measured [1]	Reference Point Elevation (ft)	Depth to Water (ft btc)	Groundwater Elevation (ft)	Temp (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (mS/cm)	Turbidity (NTU)	Comments
AR-4	6/24/2020	426.47	82.52	343.95	21.7	6.91	0.19	-175	0.995	2.0	--
AR-8	6/26/2020	423.02	78.99	344.03	20.3	7.13	0.04	-179	0.815	2.7	Also collected Field Duplicate and MS/MSD Lab QC Sample
AR-11	6/26/2020	422.62	78.54	344.08	20.1	7.30	5.34	125	1.04	11.5	--
MW-4	6/26/2020	422.29	78.24	344.05	20.4	7.20	4.58	159	1.03	1.9	--
MW-6	6/26/2020	422.50	78.44	344.06	20.5	7.16	5.61	151	0.972	2.7	--
MW-8	6/24/2020	427.15	83.16	343.99	20.7	7.02	4.22	-76	0.943	6.0	--
Water Levels Only											
AR-1	6/24/2020	423.99	79.83	344.16	--	--	--	--	--	--	--
AR-7	6/24/2020	425.44	81.41	344.03	--	--	--	--	--	--	--
AR-12	6/24/2020	425.50	81.50	344.00	--	--	--	--	--	--	--
MW-5	6/24/2020	425.02	80.97	344.05	--	--	--	--	--	--	--
MW-7	6/24/2020	427.25	83.26	343.99	--	--	--	--	--	--	--

Notes:

1 - Water level measurements were collected on June 24, 2020. Groundwater samples were collected on June 24 and June 26, 2020.

" -- " = 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 celcius

mg/L = milligrams per liter

mV = millivolts

uS/cm = microsiemens per centimeter

NTU = Nephelometric Turbidity Units

Table 2. Groundwater Quality Data

Tidewater Fuel Leak Site Compliance Monitoring Program

Well				**AR-11**	**MW-4**	**MW-6**	**MW-8**	**AR-8**	**FD (AR-8)**	**AR-4**	**Equipment Blank**
Sample ID				AR11-2006	MW4-2006	MW6-2006	MW8-2006	AR8-2006	FD-2006	AR4-2006	EB-2006
Sample Date				6/26/2020	6/26/2020	6/26/2020	6/24/2020	6/26/2020	6/26/2020	6/24/2020	6/26/2020
Field Parameters	**Method**	**Units**	**MTCA Cleanup Level**								
pH	Field Probe	units	-	7.30	7.20	7.16	7.02	7.13	--	6.91	--
Temperature	Field Probe	°C	-	20.1	20.4	20.5	20.7	20.3	--	21.7	--
Spec. Conductance	Field Probe	mS/cm	-	1.04	1.03	0.972	0.943	0.815	--	0.995	--
Dissolved Oxygen	Field Probe	mg/L	-	5.34	4.58	5.61	4.22	0.04	--	0.19	--
Oxygen Red. Potential	Field Probe	mV	-	125	159	151	-76	-179	--	-175	--
Turbidity	Field Probe	NTU	-	11.5	1.9	2.7	6.0	2.7	--	2.0	--
Ferrous Iron	Field Screen	mg/L	-	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons											
Benzene	EPA 8260D	ug/L	5	<0.500	<0.500	<0.500	<25	<1.25	<1.25	**132**	<0.500
Toluene	EPA 8260D	ug/L	320	<0.500	<0.500	<0.500	<25	<1.25	<1.25	<50	<0.500
Ethylbenzene	EPA 8260D	ug/L	400	<0.500	<0.500	<0.500	106	61.7	62.6	276	<0.500
Total Xylenes	EPA 8260D	ug/L	1,600	<0.500	<0.500	<0.500	1,241	109.7	103.8	**3,780**	<0.500
TPH-Gasoline Range	NWTPH-Gx	ug/L	800	<100 UJ	<100 UJ	<100 UJ	**8,130 J**	**3,520 J**	**3,220 J**	**20,100 J**	<100 UJ
TPH-Diesel Range	NWTPH-Dx	ug/L	500	<160	<160	<160	<160	<160	<160	<160	<160
TPH-Heavy Range	NWTPH-Dx	ug/L	500	<400	<400	<400	<400	<400	<400	<400	<400
MNA Parameters											
Manganese	EPA 200.8	mg/l	-	0.00364 J	<0.00100 UJ	<0.00100 UJ	0.268 J	0.997 J	1.05 J	2.00 J	--
Sulfate	EPA 300.0	mg/l	-	133	134	115	100	57.7	55.7	51.5	--
Nitrate	EPA 300.0	mg/l	-	34.2	34.3	29.5	25.3 J	0.288	0.240	8.17 J	--
Methane	RSK-175 MOD	ug/L	-	<0.65	<0.65	<0.65	<0.65	6.57	6.38	742	--
Ferrous Iron	SM-3500	mg/l	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--

Notes:

Field parameters represent final stabilized readings obtained during sampling immediately prior to sample collection.

BOLD - Exceeds MTCA Cleanup Level

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

-- = not measured

J = Analyte was positively identified, the quantitation is an estimate.

UJ = the analyte was not detected above the detection limit. However, the detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

°C = degrees celcius

mg/L = milligrams per liter

mV = millivolts

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Units

Figures

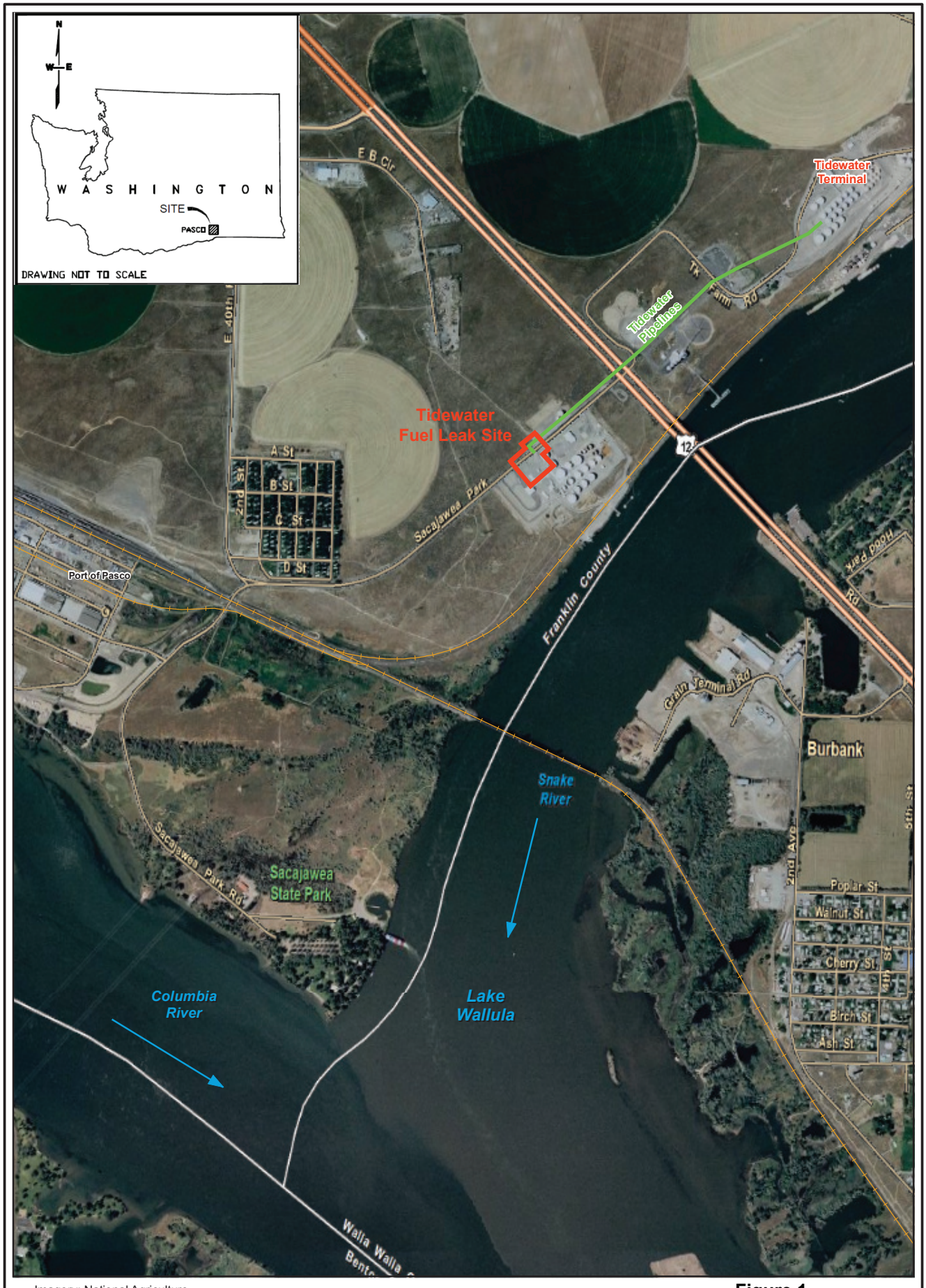

Figure 1
Site Location
Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

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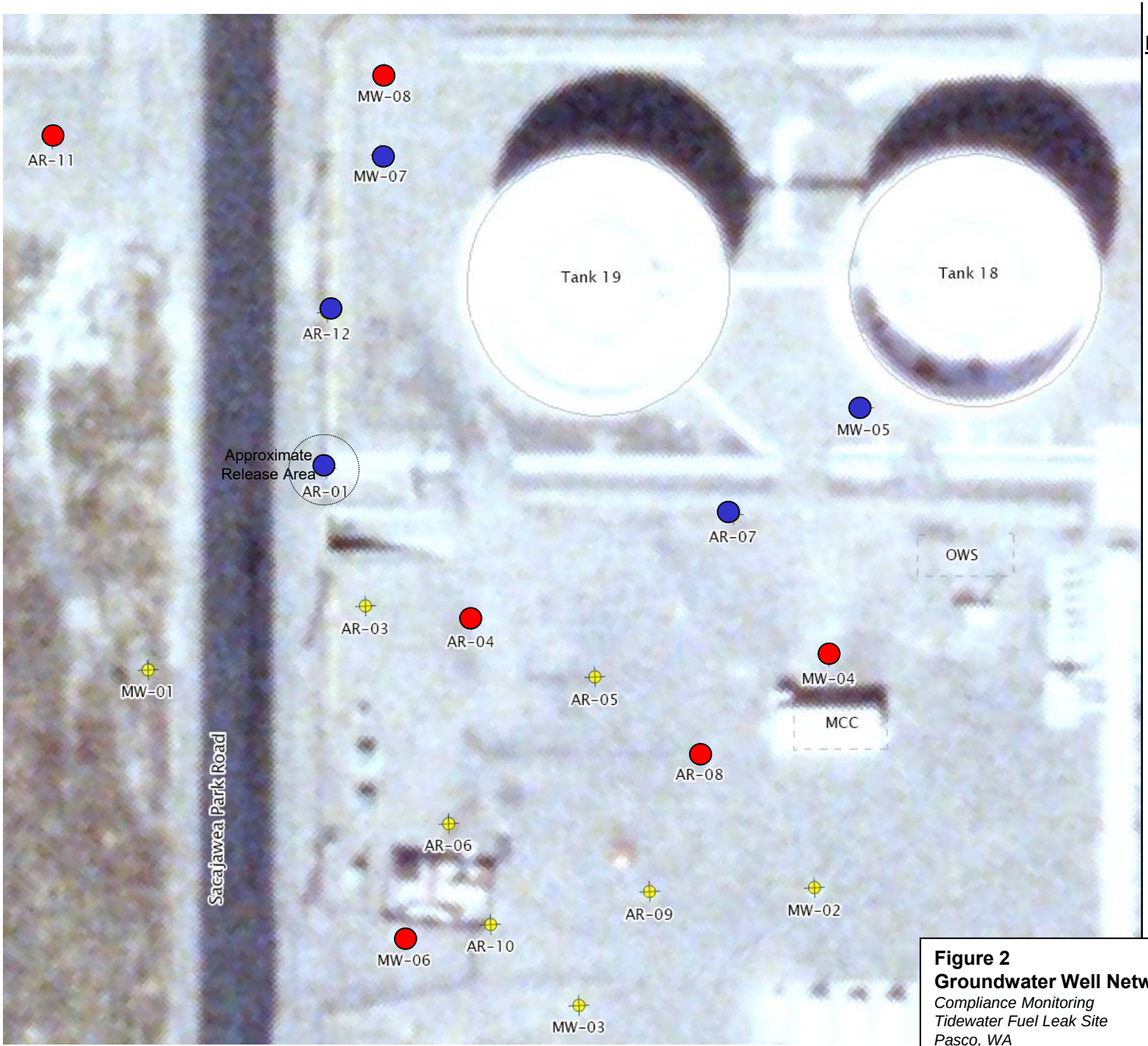


LEGEND

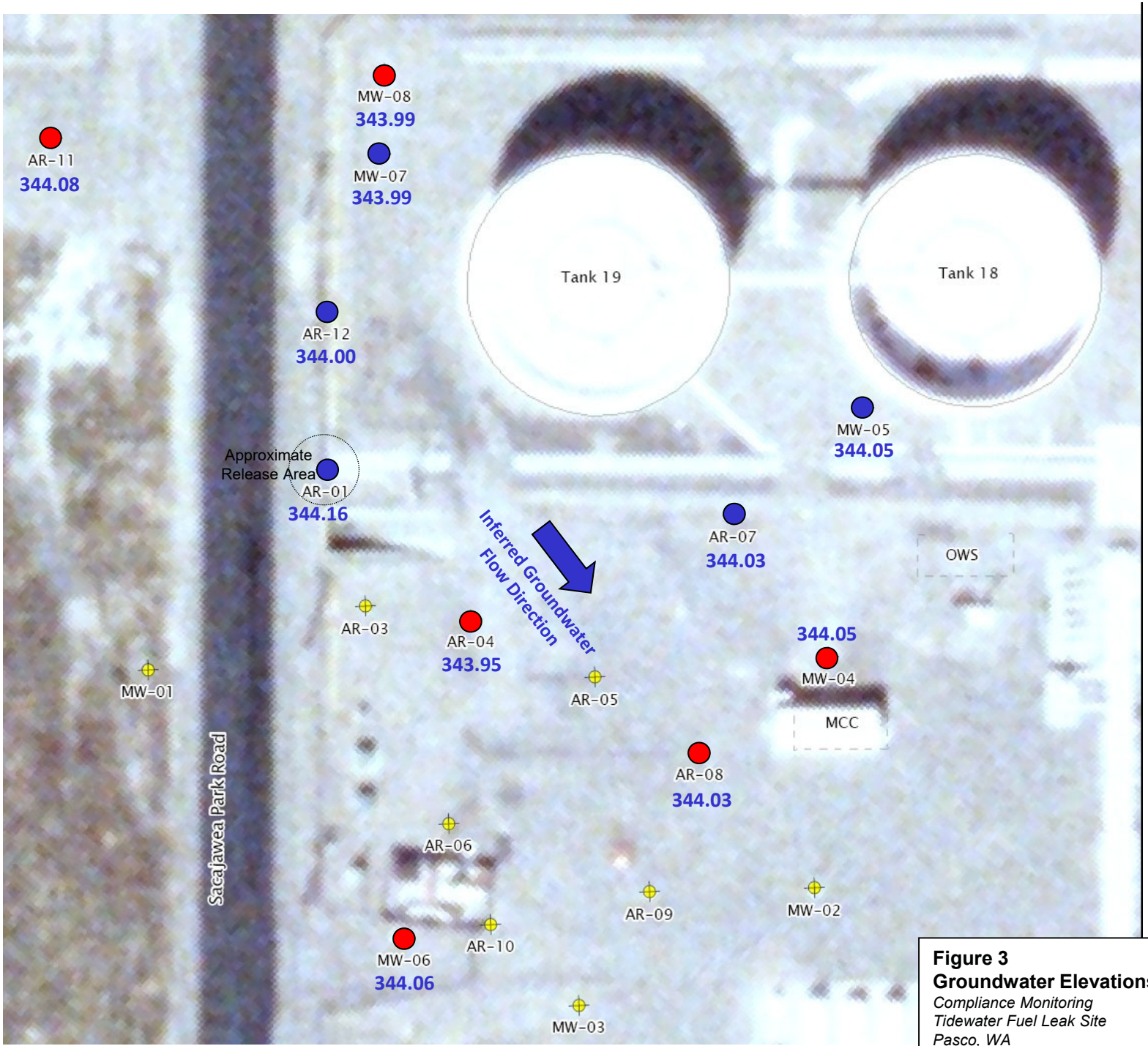
- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well

North

0 inch 1
0 feet 90

Figure 2
Groundwater Well Network
Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

JACOBS



LEGEND

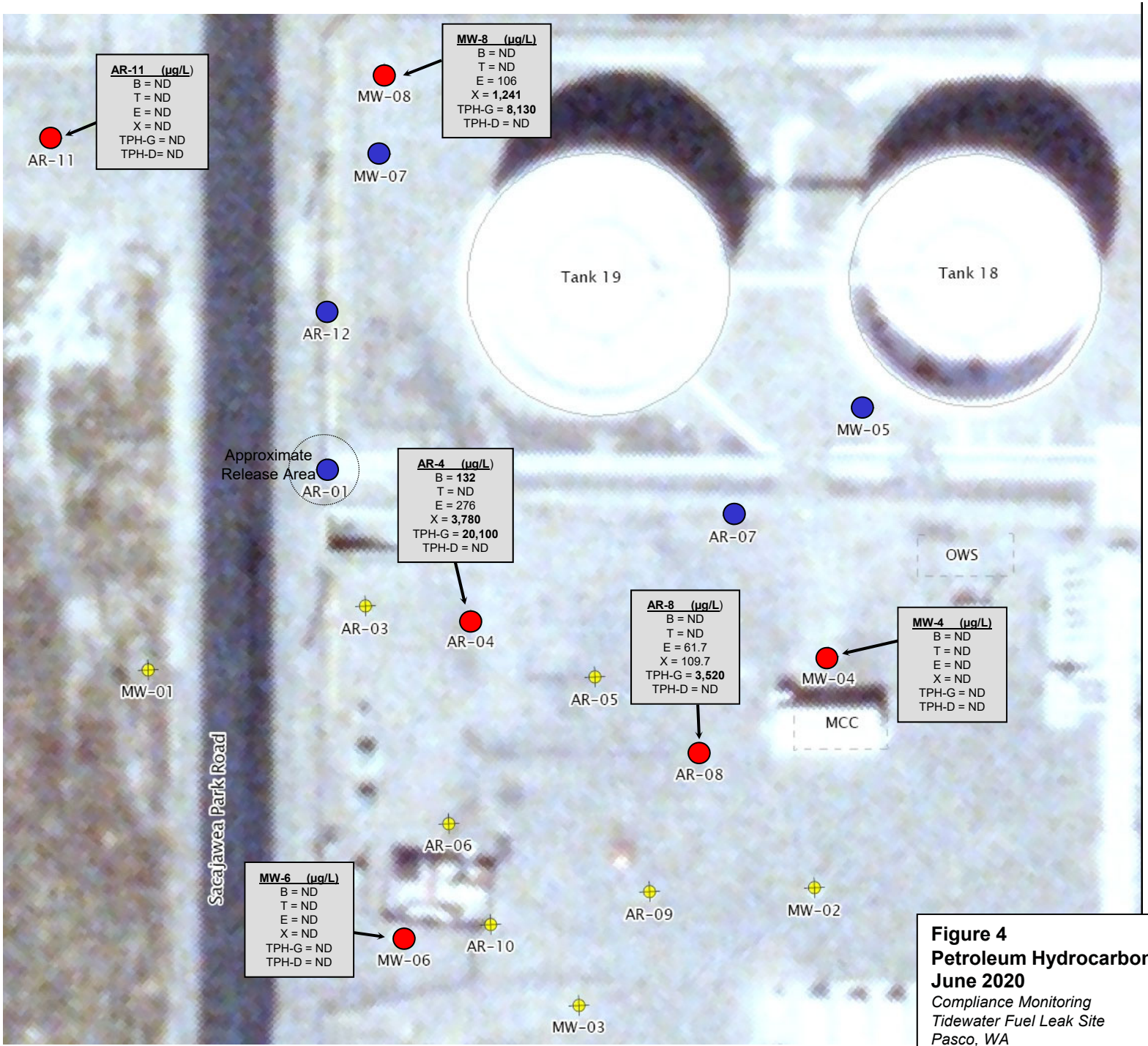
- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well
- 344.53 Groundwater Elevation in Feet Above Mean Sea Level (amsl)
- Inferred Groundwater Flow Direction

North

0 inch 1
0 feet 90

Figure 3
Groundwater Elevations – June 2020
Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

JACOBS



LEGEND

- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well

µg/L – micrograms per liter
BOLD = MCL exceedance
ND = Analyte not detected

B = Benzene
T = Toluene
E = Ethylbenzene
X = Total xylenes
TPH-G = Gasoline
TPH-D = Diesel

North

0 inch 1
0 feet 90

Figure 4
Petroleum Hydrocarbons in Groundwater
June 2020
Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

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Appendix A
Field Forms

Tidewater Monitoring Wells - Screen and Field Measurements

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Field Team: Bartow, Iverson Date: 6-24-20

Well	As-built TD (bgs)	Screen Interval (bgs)	Well in Good Condition?	Sheen?	Depth to Free Product	DTW (btc)	TD (btc)	FP thick	Notes/Comments
AR-11	88	73 - 88	yes	—	—	78.54	86.42	—	BLG-561 Tag
MW-4	90	75 - 90	yes			78.04	89.25		Tag AFS-980, missing bolts
MW-6	90	75 - 90	yes	—	—	78.44	89.88	—	Tag AFS-981
MW-5	90	75 - 90	yes	—	—	80.97	91.31	—	Tag may be at bot of monument.
AR-8	88	73 - 88	yes	—	—	78.99	85.05	—	Tag BLG-558 in gravel, black cap, under cover
AR-4	88	73 - 88	yes			82.52	89.5(aprox)		Tag BLG-554, white PVC pipe
MW-8	90	75 - 90	yes	—		83.16	93.78		Ack SFS tag nearby, not attached
MW-7	90	75 - 90	yes	—	—	83.26	94.60	—	No tag, white cap, metal stickup
AR-12	88	73 - 88	yes	—	—	81.50	82.82	—	BLG-562 PVC pipe behind yellow barrier
AR-7	88	73 - 88	yes	—	—	81.41	91.58	—	BLG-557 white PVC pipe
AR-1	88	73 - 88	see below	—	—	79.83	87.28	—	* see below ~~No tag, white pvc pipe, black cap~~

Notes

MW-6 needs new washers
* no bolts, flush mount, tag BLG-551 odor by concrete pylon, ~~and~~ odor, plug is loose

Shaded = Free product/sheen in well (2006)

Groundwater Purging and Sampling Form

D3383500

SITE: Tidewater Fuel Leak Site Project Number ~~703907.18.01~~ **Well ID:** MW-8

Field Team: S. Barton, A. Iversan Date: 6/24/20

Weather/Temp: 91°F Sunny Arrival Time to Well: 1200

Purge Method: ☒ Submersible ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 83.17

Notes: 15.4 ft Volt FP Depth: — Total Well Depth (ft btc): 93.78

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1225	Begin Pumping								
1255	83.17	8	7.00	0.948	4.25	20.33	-77	5.8	clear slight yellow no odor
1300	83.18	8.5	7.01	0.940	4.13	20.74	-78	6.0	clear "
1305	83.18	9.25	7.02	0.943	4.22	20.73	-76	6.0	clear "
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW8-2006 **Sample Time:** 1313

Analysis:
- ☒ BTEX (8260B)
- ☒ NWTPH-Gx
- ☒ NWTPH-Dx
- ☒ NWTPH-Rx
- ☒ SO4, NO3 (300.0)
- ☒ Manganese (6010B)
- ☒ Methane (RSK-175)
- ☒ Ferrous Iron (SM3500)
- ☐ _____
- ☐ _____

Fe2+ Field Screen Result: _____

QC SAMPLE: ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (GAL): ~15 gallons

QC Sample ID: _____ QC Sample Time: _____

Comments: condensation in horiba screen had to open up back + let it evaporate to see parameters.

1307 Oxy 21.6 1300 everything else ∅

Groundwater Purging and Sampling Form

SITE: Tidewater Fuel Leak Site **Project Number** ~~703907.18.01~~ D3383500 **Well ID:** AR-4

Field Team: S Bertow / A Iverson **Date:** 6/24/20

Weather/Temp: 94°F sunny **Arrival Time to Well:** 1410

Purge Method: ☒ Submersible ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 82.74

Notes: Volts 15.8 **FP Depth:** — **Total Well Depth (ft btc):** _____

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1430	*Begin Pumping*								
1448	82.58	2.5	6.87	1.00	0.20	19.32	-187	10.4	black initially now clear
1455	82.57	4	6.90	0.973	0.14	20.04	-185	0	clear
1506	82.55	4.5	6.9	1.00	0.23	21.47	-183	6.2	clear
1505	82.55	5.25	6.9	0.998	0.20	22.61	-182	6.4	clear
1510	82.57	5.5	6.91	0.995	0.19	21.67	-175	2.0	clear
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method
[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO
[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: AR4-2006 **Sample Time:** 1515

Analysis:
- ☒ BTEX (8260B)
- ☒ NWTPH-Gx
- ☒ NWTPH-Dx
- ☒ NWTPH-Rx
- ☒ SO4, NO3 (300.0)
- ☒ Manganese (6010B)
- ☒ Methane (RSK-175)
- ☒ Ferrous Iron (SM3500)
- ☐ _____
- ☐ _____

Fe2+ Field Screen Result: _____

QC SAMPLE : ☐ *Field Duplicate* ☐ *MS/MSD* ☐ *EQ Rinsate Blank* TOTAL PURGED (GAL): _____

QC Sample ID : _____ *QC Sample Time:* _____

Comments: 34" stickup height

only 21.8 O M other parameters 1440

9

JACOBS Groundwater Purging and Sampling Form

SITE: Tidewater Fuel Leak Site Project Number D3383500 **Well ID:** AR-11

Field Team: S. Bartow, A. Iverson Date: 6/26/20

Weather/Temp: 87° F Sunny Arrival Time to Well: 1045

Purge Method: ☒ Submersible ☐ Peristaltic ☐ Grab ☐ Other: ____ **Initial DTW (ft btc):** 78.58

Notes: ~16.2 volts FP Depth: — Total Well Depth (ft btc): 86.42

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1114	*Begin Pumping*								
1120	78.58	1.25	7.36	1.03	6.77	18.67	107	93.9	tan, turbid
1125	78.58	2.5	7.33	1.02	5.61	19.75	113	25.9	light tan
1130	78.59	3.5	7.31	1.03	5.32	19.92	118	5.25	clear colorless
1135	78.58	4.0	7.32	1.03	5.07	19.91	120	11.7	clear "
1140	78.58	4.5	7.31	1.03	5.10	20.10	122	10.7	clear "
1145	78.58	5.0	7.3	1.04	5.34	20.08	125	11.5	
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: AR11 - 200L **Sample Time:** 1145

Analysis:
- ☒ BTEX (8260B)
- ☒ NWTPH-Gx
- ☒ NWTPH-Dx
- ☒ NWTPH-Rx
- ☒ SO4, NO3 (300.0)
- ☒ Manganese (6010B)
- ☒ Methane (RSK-175)
- ☒ Ferrous Iron (SM3500)
- ☐ ____
- ☐ ____

Fe2+ Field Screen Result: 56

QC SAMPLE: ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (GAL): 6

QC Sample ID: ____ QC Sample Time: ____

Comments: ____

JACOBS

Groundwater Purging and Sampling Form

SITE: Tidewater Fuel Leak Site Project Number D3383500 **Well ID:** MW6

Field Team: S. Bartan, A. Iversan Date: 6/26/10

Weather/Temp: ~~94°~~ 92°F Sunny HOT Arrival Time to Well: 1240

Purge Method: ☒ Submersible ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 78.44

Notes: 16.4 Volts FP Depth: — Total Well Depth (ft btc): _____

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1252	*Begin Pumping*								
1257	78.48	0.5	7.29	0.978	5.89	19.84	120	16.8	clear, colorless
1302	78.42	1.0	7.22	0.974	5.82	19.48	130	5.65	" "
1307	78.47	1.75	7.20	0.966	5.20	19.72	138	5.35	" "
1314	78.47	2.25	7.18	0.971	5.82	20.03	141	5.81	" "
1319	78.47	3.0	7.18	0.9	5.45	20.12	145	5.7	" "
1324	78.47	3.5	7.17	0.974	5.66	20.43	149	5.58	" "
1329	78.47	4	7.16	0.972	5.61	20.54	151	2.7	" "
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method: minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6 - 2006 **Sample Time:** 1330

Analysis:
- ☒ BTEX (8260B)
- ☒ NWTPH-Gx
- ☒ NWTPH-Dx
- ☒ NWTPH-Rx
- ☒ SO4, NO3 (300.0)
- ☒ Manganese (6010B)
- ☒ Methane (RSK-175)
- ☒ Ferrous Iron (SM3500)
- ☐ _____
- ☐ _____

Fe2+ Field Screen Result: _____

QC SAMPLE: ☐ *Field Duplicate* ☐ *MS/MSD* ☐ *EQ Rinsate Blank* TOTAL PURGED (GAL): _____

QC Sample ID: _____ *QC Sample Time:* _____

Comments: _____

Co

JACOBS Groundwater Purging and Sampling Form

SITE: Tidewater Fuel Leak Site Project Number D3383500 **Well ID:** MW-04

Field Team: Barlow / Iverson Date: 6/22/20

Weather/Temp: 46° F / Sunny Arrival Time to Well: 1345

Purge Method: ☐ Submersible ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 78.28

Notes: V-156 FP Depth: _____ Total Well Depth (ft btc): 89.25

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1414	*Begin Pumping*								
1419	78.28	1 gal	7.23	~~1.56~~ 1.03	5.23	19.70	136	5.1	
1424	78.25	1.75 gal	7.22	1.03	4.46	20.27	141	4.4	
1429	78.24	2.25	7.21	1.03	4.34	20.13	145	2.5	
1434	78.23	~~2~~ 2.75	7.20	1.03	4.87	20.30	149	1.5	
1439	78.23	3.5	7.20	1.03	4.62	20.38	152	1.5	
1444	78.23	4.0	7.20	1.03	4.58	20.39	154	1.9	
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method: minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4-2021 **Sample Time:** 1450

Analysis:
- ☑ BTEX (8260B)
- ☑ NWTPH-Gx
- ☑ NWTPH-Dx
- ☑ NWTPH-Rx
- ☑ SO4, NO3 (300.0)
- ☐ Manganese (6010B)
- ☑ Methane (RSK-175)
- ☑ Ferrous Iron (SM3500)
- ☐ _____
- ☐ _____

Fe2+ Field Screen Result: _____

QC SAMPLE: ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (GAL): 4

QC Sample ID: _____ QC Sample Time: _____

Comments: _____

JACOBS Groundwater Purging and Sampling Form

SITE: Tidewater Fuel Leak Site Project Number D3383500 **Well ID:** AR-8

Field Team: S. Burton, A. Iverson Date: 6/26/10

Weather/Temp: 99°F HOT! Sunny Arrival Time to Well: 1520

Purge Method: ☒ Submersible ☐ Peristaltic ☐ Grab ☐ Other: ____ **Initial DTW (ft btc):** 78.99

Notes: pump at 15.7 Volts FP Depth: — Total Well Depth (ft btc): 85.05

Field Parameters									
Time [1]	DTW [2]	Purge Vol. (gal)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	Temp (°C)	ORP (mV)	Turbidity (NTU)	Note color, odor, etc.
1606	Begin Pumping								
1611	79.03	0.75	7.20	0.808	0.15	20.13	-191	0	odor, some fine sediment
1616	79.05	1.25	7.15	0.815	0.46	21.86	-171	0	odor clear colorless
1621	79.03	2	7.14	0.813	0.20	20.31	-178	0	odor " "
1626	79.03	2.5	7.14	0.814	0.11	20.28	-180	0	odor " "
1631	79.03	3	7.13	0.815	0.04	20.33	-179	2.2	" " "
Stabilization Criteria [3]	-	-	± 0.1 units	± 3%	± 0.3 mg/L	-	± 10 mV	± 10% [4]	-

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved once field parameters stabilize for 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: AR8-2006 **Sample Time:** 1635

Analysis:
- ☒ BTEX (8260B)
- ☒ NWTPH-Gx
- ☒ NWTPH-Dx
- ☒ NWTPH-Rx
- ☒ SO4, NO3 (300.0)
- ☒ Manganese (6010B)
- ☒ Methane (RSK-175)
- ☒ Ferrous Iron (SM3500)
- ☐ _____
- ☐ _____

Fe2+ Field Screen Result: _____

QC SAMPLE: ☒ Field Duplicate ☒ MS/MSD ☒ EQ Rinsate Blank TOTAL PURGED (GAL): _____

QC Sample ID: FD-2006 QC Sample Time: _____

Comments: MS/MSD

EB-2006

Appendix B
Historic Groundwater Elevations

Appendix B - Historical Groundwater Elevation Measurements

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Sampled	Reference Point Elevation (feet NGVD)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet NGVD)	Groundwater Elevation Change in Feet From Previous Reading
MW-1 [a]	6/28/2010	421.82	77.23	0	344.59	--
	12/14/2010		77.72	0	344.1	-0.49
	5/28/2014		77.35	0	344.47	0.37
MW-2 [a]	6/29/2010	422.95	78.37	0	344.58	--
	12/15/2010		78.86	0	344.09	-0.49
	5/28/2014		78.49	0	344.46	0.37
MW-3 [a]	6/29/2010	422.37	77.84	0	344.53	--
	12/15/2010		78.33	0	344.04	-0.49
	5/28/2014		77.92	0	344.45	0.41
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
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
MW-6	6/28/2010	422.5	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
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	343.7	-0.77
	6/24/2020		83.26	0	343.99	0.29
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

Appendix B - Historical Groundwater Elevation Measurements

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Sampled	Reference Point Elevation (feet NGVD)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet NGVD)	Groundwater Elevation Change in Feet From Previous Reading
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 [b]	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	0.30
AR-2 [a]	6/29/2010	NA	NA	NA	NA	--
	12/16/2010		NA	NA	NA	NA
	5/28/2014		NA	NA	NA	NA
AR-3 [a]	6/29/2010	428.01	NA	NA	NA	--
	12/15/2010		NA	NA	NA	NA
	5/28/2014		NA	NA	NA	NA
AR-4	6/29/2010	426.47	81.90	0	344.57	--
	12/15/2010		82.38	0	344.09	-0.48
	5/29/2014		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
AR-5 [a]	6/29/2010	423.08	78.52	0	344.56	--
	12/15/2010		79.00	0	344.08	-0.48
	5/29/2014		78.62	0	344.46	0.38
AR-6 [a]	6/29/2010	425.17	80.61	0	344.56	--
	12/15/2010		81.11	0	344.06	-0.5
	5/29/2014		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
	5/29/2014		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
AR-8	6/29/2010	423.02	78.43	0	344.59	--
	12/15/2010		78.94	0	344.08	-0.51
	5/29/2014		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	0.30
AR-9 [a]	6/29/2010	423.05	78.46	0	344.59	--
	12/15/2010		78.95	0	344.1	-0.49
	5/29/2014		78.60		344.45	0.35

Appendix B - Historical Groundwater Elevation Measurements

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Sampled	Reference Point Elevation (feet NGVD)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet NGVD)	Groundwater Elevation Change in Feet From Previous Reading
AR-10 [a]	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		344.46	0.37
AR-11	6/28/2010	422.62	78.00	0	344.62	--
	12/14/2010		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
AR-12	6/29/2010	425.50	80.96	sheen	344.54	--
	12/15/2010		dry	NA	NA	NA
	5/28/2014		dry	NA	NA	NA
	5/1/2018		81.02	0	344.48	NA
	6/25/2019		dry	NA	NA	NA
	6/24/2020		81.50	0	344.00	NA

Notes:

a - Well not part of CMP program

b - Well AR-1 was re-surveyed in December 2018 and is applied to calculating GW elevations starting in May 2018

NGVD = National Geodetic Vertical Datum of 1929

N/A = Not applicable or not available

Appendix C
Laboratory Data Report

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Client:	Jacobs	Work Order:	WAF1044
Address:	999 W. Riverside Ave., Ste. 500 Spokane, WA 99201	Project: Reported:	Tidewater CMP 7/20/2020 09:05
Attn:	Reuben Greer		

Analytical Results Report

Sample Location:	MW8-2006		
Lab/Sample Number:	WAF1044-01	Collect Date:	06/24/20 14:50
Date Received:	06/27/20 11:01	Collected By:	Anna Iverson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	25.3	mg/L	1.00	6/30/20 14:13	ARC	EPA 300.0	H3
Sulfate	100	mg/L	1.00	6/30/20 14:13	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	0.268	mg/L	0.00100	7/10/20 13:47	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/8/20 22:40	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/8/20 22:40	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/8/20 22:40	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*92.6%*		*50-150*	*7/8/20 22:40*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	8.13	mg/L	0.100	6/30/20 11:36	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*97.1%*		*50-150*	*6/30/20 11:36*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	25.0	7/7/20 20:55	NDE	EPA 8260D	
Toluene	ND	ug/L	25.0	7/7/20 20:55	NDE	EPA 8260D	
Ethylbenzene	106	ug/L	25.0	7/7/20 20:55	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	843	ug/L	50.0	7/7/20 20:55	NDE	EPA 8260D	
o-Xylene (MCL for total)	398	ug/L	25.0	7/7/20 20:55	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.6%*		*70-130*	*7/7/20 20:55*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*101%*		*70-130*	*7/7/20 20:55*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*101%*		*70-130*	*7/7/20 20:55*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: AR4-2006
Lab/Sample Number: WAF1044-02 Collect Date: 06/24/20 13:13
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	8.17	mg/L	0.100	6/27/20 14:16	ARC	EPA 300.0	H3
Sulfate	51.5	mg/L	0.500	6/30/20 14:29	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	2.00	mg/L	0.0100	7/10/20 14:40	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/8/20 23:36	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/8/20 23:36	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/8/20 23:36	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*90.6%*		*50-150*	*7/8/20 23:36*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	20.1	mg/L	0.250	6/30/20 18:34	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*101%*		*50-150*	*6/30/20 18:34*	*NDE*	*NWTPH-Gx*	
Benzene	132	ug/L	50.0	7/7/20 21:26	NDE	EPA 8260D	
Toluene	ND	ug/L	50.0	7/7/20 21:26	NDE	EPA 8260D	
Ethylbenzene	276	ug/L	50.0	7/7/20 21:26	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	1900	ug/L	100	7/7/20 21:26	NDE	EPA 8260D	
o-Xylene (MCL for total)	1880	ug/L	50.0	7/7/20 21:26	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.4%*		*70-130*	*7/7/20 21:26*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*102%*		*70-130*	*7/7/20 21:26*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*100%*		*70-130*	*7/7/20 21:26*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: AR11-2006
Lab/Sample Number: WAF1044-03 Collect Date: 06/26/20 11:45
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	34.2	mg/L	1.00	6/30/20 14:46	ARC	EPA 300.0	H2
Sulfate	133	mg/L	1.00	6/30/20 14:46	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	0.00364	mg/L	0.00100	7/10/20 13:52	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 1:27	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 1:27	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/9/20 1:27	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*90.7%*		*50-150*	*7/9/20 1:27*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	ND	mg/L	0.100	6/30/20 12:52	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*101%*		*50-150*	*6/30/20 12:52*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	0.500	7/7/20 18:22	NDE	EPA 8260D	
Toluene	ND	ug/L	0.500	7/7/20 18:22	NDE	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	7/7/20 18:22	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	ND	ug/L	1.00	7/7/20 18:22	NDE	EPA 8260D	
o-Xylene (MCL for total)	ND	ug/L	0.500	7/7/20 18:22	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*100%*		*70-130*	*7/7/20 18:22*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*100%*		*70-130*	*7/7/20 18:22*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*100%*		*70-130*	*7/7/20 18:22*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: MW6-2006
Lab/Sample Number: WAF1044-04 Collect Date: 06/26/20 13:30
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	29.5	mg/L	1.00	6/30/20 15:02	ARC	EPA 300.0	H2
Sulfate	115	mg/L	1.00	6/30/20 15:02	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	ND	mg/L	0.00100	7/10/20 13:54	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 2:23	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 2:23	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/9/20 2:23	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*93.4%*		*50-150*	*7/9/20 2:23*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	ND	mg/L	0.100	6/30/20 13:30	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*103%*		*50-150*	*6/30/20 13:30*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	0.500	7/7/20 18:53	NDE	EPA 8260D	
Toluene	ND	ug/L	0.500	7/7/20 18:53	NDE	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	7/7/20 18:53	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	ND	ug/L	1.00	7/7/20 18:53	NDE	EPA 8260D	
o-Xylene (MCL for total)	ND	ug/L	0.500	7/7/20 18:53	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*101%*		*70-130*	*7/7/20 18:53*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*99.0%*		*70-130*	*7/7/20 18:53*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*100%*		*70-130*	*7/7/20 18:53*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: MW4-2006
Lab/Sample Number: WAF1044-05 Collect Date: 06/26/20 14:50
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	34.3	mg/L	1.00	6/30/20 15:19	ARC	EPA 300.0	H2
Sulfate	134	mg/L	1.00	6/30/20 15:19	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	ND	mg/L	0.00100	7/10/20 13:56	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 3:18	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 3:18	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/9/20 3:18	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*92.9%*		*50-150*	*7/9/20 3:18*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	ND	mg/L	0.100	6/30/20 14:07	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*103%*		*50-150*	*6/30/20 14:07*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	0.500	7/7/20 19:24	NDE	EPA 8260D	
Toluene	ND	ug/L	0.500	7/7/20 19:24	NDE	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	7/7/20 19:24	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	ND	ug/L	1.00	7/7/20 19:24	NDE	EPA 8260D	
o-Xylene (MCL for total)	ND	ug/L	0.500	7/7/20 19:24	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.6%*		*70-130*	*7/7/20 19:24*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*99.4%*		*70-130*	*7/7/20 19:24*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*101%*		*70-130*	*7/7/20 19:24*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: AR8-2006
Lab/Sample Number: WAF1044-06 Collect Date: 06/26/20 16:35
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	0.288	mg/L	0.100	6/27/20 15:22	ARC	EPA 300.0	
Sulfate	57.7	mg/L	0.500	6/30/20 15:35	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	0.997	mg/L	0.00100	7/10/20 13:59	TRC	EPA 200.8	M2
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 4:14	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 4:14	ARC	NWTPH-Dx	
Diesel	Non target analyte in the	mg/L	0.160	7/9/20 4:14	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*92.9%*		*50-150*	*7/9/20 4:14*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	3.52	mg/L	0.100	6/30/20 14:46	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*96.8%*		*50-150*	*6/30/20 14:46*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	1.25	7/7/20 21:57	NDE	EPA 8260D	
Toluene	ND	ug/L	1.25	7/7/20 21:57	NDE	EPA 8260D	
Ethylbenzene	61.7	ug/L	1.25	7/7/20 21:57	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	35.6	ug/L	2.50	7/7/20 21:57	NDE	EPA 8260D	
o-Xylene (MCL for total)	74.1	ug/L	1.25	7/7/20 21:57	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.0%*		*70-130*	*7/7/20 21:57*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*98.8%*		*70-130*	*7/7/20 21:57*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*99.2%*		*70-130*	*7/7/20 21:57*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location:	AR8-2006		
Lab/Sample Number:	WAF1044-06	Collect Date:	06/26/20 16:35
Date Received:	06/27/20 11:01	Collected By:	Anna Iverson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Sulfate	55.8	mg/L	0.100	6/27/20 15:22	ARC	EPA 300.0	

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Analytical Results Report

(Continued)

Sample Location: FD-2006
Lab/Sample Number: WAF1044-07 Collect Date: 06/26/20 12:00
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate-N	0.240	mg/L	0.100	6/27/20 16:11	ARC	EPA 300.0	
Sulfate	55.7	mg/L	0.500	6/30/20 16:59	ARC	EPA 300.0	
Total Metals							
Iron (II)	0.00	mg/L		6/27/20 15:15	MMS	SM 3500-Fe B	
Metals by ICP-MS							
Manganese	1.05	mg/L	0.0100	7/10/20 14:42	TRC	EPA 200.8	
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 7:00	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 7:00	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/9/20 7:00	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*91.9%*		*50-150*	*7/9/20 7:00*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	3.22	mg/L	0.100	6/30/20 15:23	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*96.7%*		*50-150*	*6/30/20 15:23*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	1.25	7/7/20 22:28	NDE	EPA 8260D	
Toluene	ND	ug/L	1.25	7/7/20 22:28	NDE	EPA 8260D	
Ethylbenzene	62.6	ug/L	1.25	7/7/20 22:28	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	32.4	ug/L	2.50	7/7/20 22:28	NDE	EPA 8260D	
o-Xylene (MCL for total)	71.4	ug/L	1.25	7/7/20 22:28	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.4%*		*70-130*	*7/7/20 22:28*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*98.4%*		*70-130*	*7/7/20 22:28*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*99.8%*		*70-130*	*7/7/20 22:28*	*NDE*	*EPA 8260D*	

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Analytical Results Report

(Continued)

Sample Location: EB-2006
Lab/Sample Number: WAF1044-08 Collect Date: 06/26/20 17:00
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Hydrocarbons							
Lube Oil	ND	mg/L	0.400	7/9/20 7:56	ARC	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/9/20 7:56	ARC	NWTPH-Dx	
Diesel	ND	mg/L	0.160	7/9/20 7:56	ARC	NWTPH-Dx	
Surrogate: n-Hexacosane	*90.4%*		*50-150*	*7/9/20 7:56*	*ARC*	*NWTPH-Dx*	
Volatiles							
Gasoline	ND	mg/L	0.100	6/30/20 16:02	NDE	NWTPH-Gx	R9
Surrogate: 4-Bromofluorobenzene	*102%*		*50-150*	*6/30/20 16:02*	*NDE*	*NWTPH-Gx*	
Benzene	ND	ug/L	0.500	7/7/20 19:54	NDE	EPA 8260D	
Toluene	ND	ug/L	0.500	7/7/20 19:54	NDE	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	7/7/20 19:54	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	ND	ug/L	1.00	7/7/20 19:54	NDE	EPA 8260D	
o-Xylene (MCL for total)	ND	ug/L	0.500	7/7/20 19:54	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*101%*		*70-130*	*7/7/20 19:54*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*101%*		*70-130*	*7/7/20 19:54*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*99.6%*		*70-130*	*7/7/20 19:54*	*NDE*	*EPA 8260D*	

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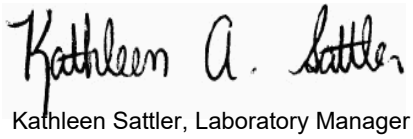
Analytical Results Report

(Continued)

Sample Location: Trip Blank
Lab/Sample Number: WAF1044-09 Collect Date: 06/26/20 17:00
Date Received: 06/27/20 11:01 Collected By: Anna Iverson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Volatiles							
Benzene	ND	ug/L	0.200	7/7/20 20:24	NDE	EPA 8260D	
Toluene	ND	ug/L	0.500	7/7/20 20:24	NDE	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	7/7/20 20:24	NDE	EPA 8260D	
m/p Xylenes (MCL for total)	ND	ug/L	1.00	7/7/20 20:24	NDE	EPA 8260D	
o-Xylene (MCL for total)	ND	ug/L	0.500	7/7/20 20:24	NDE	EPA 8260D	
Total Xylenes	ND	ug/L	0.500	7/7/20 20:24	NDE	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*100%*		*70-130*	*7/7/20 20:24*	*NDE*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*100%*		*70-130*	*7/7/20 20:24*	*NDE*	*EPA 8260D*	
Surrogate: Toluene-d8	*100%*		*70-130*	*7/7/20 20:24*	*NDE*	*EPA 8260D*	

Authorized Signature,



Kathleen Sattler, Laboratory Manager

H2	Initial analysis within holding time, Reanalysis for the required dilution was past holding time.
H3	Sample was received past holding time.
M2	Matrix spike recovery was low; the associated blank spike recovery was acceptable. Potential matrix effect.
R9	Sample RPD exceeded the laboratory acceptance limit.
PQL	Practical Quantitation Limit
ND	Not Detected
MCL	EPA's Maximum Contaminant Level
Dry	Sample results reported on a dry weight basis
*	Not a certified analyte
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was spiked or duplicated.

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Quality Control Data

Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BAF0993 - W Ions										
Blank (BAF0993-BLK1)					Prepared & Analyzed: 6/27/2020					
Nitrate/N	ND		0.100	mg/L						
Sulfate	ND		0.100	mg/L						
LCS (BAF0993-BS1)					Prepared & Analyzed: 6/27/2020					
Nitrate/N	3.91			mg/L	4.00		97.6	90-110		
Sulfate	3.87			mg/L	4.00		96.8	90-110		
Matrix Spike (BAF0993-MS1)		**Source: WAF1044-06**			Prepared & Analyzed: 6/27/2020					
Nitrate/N	4.19		0.100	mg/L	4.02	0.288	97.2	80-120		
Sulfate	59.5		0.100	mg/L	4.02	55.8	90.4	80-120		
Matrix Spike Dup (BAF0993-MSD1)		**Source: WAF1044-06**			Prepared & Analyzed: 6/27/2020					
Nitrate/N	3.90		0.100	mg/L	4.02	0.288	90.0	80-120	7.07	20
Sulfate	59.4		0.100	mg/L	4.02	55.8	89.4	80-120	0.0713	20
Batch: BAG0002 - W Ions										
Blank (BAG0002-BLK1)					Prepared & Analyzed: 6/30/2020					
Nitrate/N	ND		0.100	mg/L						
Sulfate	ND		0.100	mg/L						
LCS (BAG0002-BS1)					Prepared & Analyzed: 6/30/2020					
Nitrate/N	3.92			mg/L	4.00		98.1	90-110		
Sulfate	3.89			mg/L	4.00		97.4	90-110		
LCS Dup (BAG0002-BSD1)					Prepared & Analyzed: 6/30/2020					
Nitrate/N	3.90			mg/L	4.00		97.6	90-110	0.575	20
Sulfate	3.87			mg/L	4.00		96.7	90-110	0.683	20

Quality Control Data

Metals by ICP-MS

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BAF1039 - W 3010 Digest										
Blank (BAF1039-BLK1)					Prepared: 6/30/2020 Analyzed: 7/10/2020					
Manganese	ND		0.00100	mg/L						
LCS (BAF1039-BS1)					Prepared: 6/30/2020 Analyzed: 7/10/2020					
Manganese	0.0486		0.00100	mg/L	0.0500		97.2	85-115		
Matrix Spike (BAF1039-MS1)		**Source: WAF1044-06**			Prepared: 6/30/2020 Analyzed: 7/10/2020					
Manganese	1.05		0.00100	mg/L	0.0500	0.997	112	70-130		
Matrix Spike Dup (BAF1039-MSD1)		**Source: WAF1044-06**			Prepared: 6/30/2020 Analyzed: 7/10/2020					
Manganese	1.01	M2	0.00100	mg/L	0.0500	0.997	20.8	70-130	4.44	20

Quality Control Data

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Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BAG0149 - W TPH-Dx										
Blank (BAG0149-BLK1)					Prepared: 7/7/2020 Analyzed: 7/8/2020					
Diesel	ND		0.160	mg/L						
Lube Oil	ND		0.400	mg/L						
Mineral Oil	ND		0.160	mg/L						
Surrogate: n-Hexacosane			*46.2*	*ppm*	*50.0*		*92.4*	*50-150*		
LCS (BAG0149-BS1)					Prepared: 7/7/2020 Analyzed: 7/8/2020					
Diesel	0.832		0.160	mg/L	1.00		83.2	70-130		
Lube Oil	ND		0.400	mg/L				70-130		
Surrogate: n-Hexacosane			*46.4*	*ppm*	*50.0*		*92.8*	*50-150*		
Duplicate (BAG0149-DUP1)		**Source: WAF1044-02**			Prepared: 7/7/2020 Analyzed: 7/9/2020					
Diesel	ND		0.160	mg/L		ND				20
Lube Oil	ND		0.400	mg/L		ND				20
Mineral Oil	ND		0.160	mg/L		ND				20
Surrogate: n-Hexacosane			*45.0*	*ppm*	*50.0*		*90.0*	*50-150*		
Matrix Spike (BAG0149-MS1)		**Source: WAF1044-06**			Prepared: 7/7/2020 Analyzed: 7/9/2020					
Diesel	1.38		0.160	mg/L	1.00	te in the Diesel r	74.9	70-130		
Lube Oil	ND		0.400	mg/L		ND		70-130		
Surrogate: n-Hexacosane			*46.0*	*ppm*	*50.0*		*92.0*	*50-150*		
Matrix Spike Dup (BAG0149-MSD1)		**Source: WAF1044-06**			Prepared: 7/7/2020 Analyzed: 7/9/2020					
Diesel	1.40		0.160	mg/L	1.00	te in the Diesel r	77.3	70-130	1.75	20
Lube Oil	ND		0.400	mg/L		ND		70-130		20
Surrogate: n-Hexacosane			*45.5*	*ppm*	*50.0*		*91.1*	*50-150*		

Quality Control Data

(Continued)

Volatiles

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BAG0027 - W VOC										
Blank (BAG0027-BLK1)					Prepared & Analyzed: 6/30/2020					
Gasoline	ND		0.100	mg/L						
Surrogate: 4-Bromofluorobenzene			*102*	*ug/L*	*100*		*102*	*50-150*		
LCS (BAG0027-BS1)					Prepared & Analyzed: 6/30/2020					
Gasoline	2.93		0.100	mg/L	2.69		109	80-120		
Surrogate: 4-Bromofluorobenzene			*99.8*	*ug/L*	*100*		*99.8*	*50-150*		
Duplicate (BAG0027-DUP1)		**Source: WAF1044-08**			Prepared & Analyzed: 6/30/2020					
Gasoline	0.0232	R9	0.100	mg/L		0.0358			42.7	20
Surrogate: 4-Bromofluorobenzene			*103*	*ug/L*	*100*		*103*	*50-150*		
Matrix Spike (BAG0027-MS1)		**Source: WAF1044-06**			Prepared & Analyzed: 6/30/2020					
Gasoline	5.83		0.100	mg/L	2.69	3.52	85.7	70-130		
Surrogate: 4-Bromofluorobenzene			*93.5*	*ug/L*	*100*		*93.5*	*50-150*		
Matrix Spike Dup (BAG0027-MSD1)		**Source: WAF1044-06**			Prepared & Analyzed: 6/30/2020					
Gasoline	6.11		0.100	mg/L	2.69	3.52	96.3	70-130	4.76	20

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Quality Control Data
(Continued)

Volatiles (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BAG0027 - W VOC (Continued)										
Matrix Spike Dup (BAG0027-MSD1)	**Source: WAF1044-06**				Prepared & Analyzed: 6/30/2020					
Surrogate: 4-Bromofluorobenzene			*97.4*	*ug/L*	*100*		*97.4*	*50-150*		
Batch: BAG0183 - W VOC										
Blank (BAG0183-BLK1)					Prepared & Analyzed: 7/7/2020					
Ethylbenzene	ND		0.500	ug/L						
m+p-Xylene	ND		1.00	ug/L						
o-Xylene	ND		0.500	ug/L						
Benzene	ND		0.500	ug/L						
Toluene	ND		0.500	ug/L						
Benzene	ND		0.200	ug/L						
Ethylbenzene	ND		0.500	ug/L						
Toluene	ND		0.500	ug/L						
m+p-Xylene	ND		1.00	ug/L						
o-Xylene	ND		0.500	ug/L						
Total Xylene	ND		0.500	ug/L						
Surrogate: Toluene-d8			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*5.04*	*ug/L*	*5.00*		*101*	*70-130*		
Surrogate: Toluene-d8			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*5.04*	*ug/L*	*5.00*		*101*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		
LCS (BAG0183-BS1)					Prepared & Analyzed: 7/7/2020					
Benzene	4.05		0.500	ug/L	5.00		81.0	70-130		
Ethylbenzene	3.76		0.500	ug/L	5.00		75.2	70-130		
o-Xylene	4.22		0.500	ug/L	5.00		84.4	70-130		
Toluene	3.81		0.500	ug/L	5.00		76.2	70-130		
Benzene	4.05		0.200	ug/L	5.00		81.0	70-130		
Ethylbenzene	3.76		0.500	ug/L	5.00		75.2	70-130		
Toluene	3.81		0.500	ug/L	5.00		76.2	70-130		
o-Xylene	4.22		0.500	ug/L	5.00		84.4	70-130		
Surrogate: Toluene-d8			*4.96*	*ug/L*	*5.00*		*99.2*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*5.04*	*ug/L*	*5.00*		*101*	*70-130*		
Surrogate: Toluene-d8			*4.96*	*ug/L*	*5.00*		*99.2*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*5.04*	*ug/L*	*5.00*		*101*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*4.97*	*ug/L*	*5.00*		*99.4*	*70-130*		

WAF1044

Due: 07/13/20

Anatek Labs, Inc.

Chain of Custody Record

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504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

Anatek Log-In #

Company Name: Jacobs
Address: 999 W Riverside Ave Ste 500
City: SPOKANE State: WA Zip: 99201
Phone: 509-464-7215
Fax:

Project Manager: REUBEN GREER
Project Name & #: TIDEWATER CMP
Email Address: reuben.greer@jacobs.com
Purchase Order #:
Sampler Name & phone: ANNA IVERSON 206-856-0377

Turn Around Time & Reporting

Please refer to our normal turn around times at: http://www.anateklabs.com/services/guidelines/reporting.asp

X Normal
__Next Day*
__2nd Day*
__Other*_____

*All rush order requests must be prior approved.

__Phone
__Mail
__Fax
__Email

Provide Sample Description

List Analyses Requested

Note Special Instructions/Comments

SWBS

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative	BTEX 8260B	NWTPH-GX	NWTPH-DX	Ferrous Fe	Mn	SO_4, NO_3	Methane RSK175	NWTPH-DX HEAVY OIL			
1	MW8-2006	6/24/2000 1450	W	8			X	X	X	X	X	X	X	X			
2	AR4-2006	6/24/200 ~~1515~~ 1313	W	8			X	X	X	X	X	X	X	X			
3	AR11-2006	6/26/200 1145	W	8			X	X	X	X	X	X	Y	X			
4	MW6-2006	6/26/200 1330	W	8			X	X	X	X	X	X	X	X			
5	MW4-2006	6/26/2000 1450	W	8			X	X	X	X	X	X	X	X			
6	AR8-2006	6/26/2000 1635	W	8			X	X	X	X	X	X	X	X			MS/MSD
7	FD-2006	6/26/2000 1200	W	8			X	X	X	X	X	X	X	X			
8	EB-2006	6/26/2000 1700	W	7			X	X	X					X			

	Printed Name	Signature	Company	Date	Time
Relinquished by	Anna Iverson		Jacobs	6-27-20	10:30
Received by	Magen Schmitz		Anatek	6-27-20	11:01
Relinquished by					
Received by					
Relinquished by					
Received by					

Inspection Checklist

Received Intact?	(Y)	N
Labels & Chains Agree?	(Y)	N
Containers Sealed?	(Y)	N
VOC Head Space?	(Y)	N

Cooler/Ice/Hand

Temperature (°C): 5-9 IR 1

Preservative: HCl 200203, 200139 <2
HNO3 200994 <2 pH 200115

Date & Time: 6-27-2020/1410

Inspected By: KAS

Analytical Resources, Incorporated
Analytical Chemists and Consultants

07 July 2020

Kathy Sattler
Anatek Labs, Inc.
504 East Sprague, Suite D
Spokane, WA 99202

RE: WAF1044

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
20F0494	N/A

Shelly Fishel

Digitally signed by Shelly Fishel
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., cn=Shelly Fishel, email=shelly.fishel@arilabs.com
Date: 2020.07.07 14:19:34 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

20F0494

Anatek Labs, Inc.

SUBCONTRACT ORDER

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Sending Laboratory:

Anatek Labs, Inc.- Spokane
504 E Sprague Ave, Suite D
Spokane, WA 99202
Phone: 509-838-3999
Fax: 509-838-4433

Project Manager: Kathleen Sattler
kathy@anateklabs.com

Subcontracted Laboratory:

Analytical Resources
4611 S. 134th Pl. #100
Tukwila, WA 98168
Phone: (206) 695-6200
Fax:

Work Order: WAF1044

Analysis	Due	Expires	Comments
Lab Sample ID: WAF1044-01 ***Water*** ***Sampled: 06/24/2020 14:50***			
Client Sample Name: MW8-2006			
W Methane	07/09/2020	07/08/2020 14:50	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			
Lab Sample ID: WAF1044-02 ***Water*** ***Sampled: 06/24/2020 13:13***			
Client Sample Name: AR4-2006			
W Methane	07/09/2020	07/08/2020 13:13	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			
Lab Sample ID: WAF1044-03 ***Water*** ***Sampled: 06/26/2020 11:45***			
Client Sample Name: AR11-2006			
W Methane	07/09/2020	07/10/2020 11:45	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			
Lab Sample ID: WAF1044-04 ***Water*** ***Sampled: 06/26/2020 13:30***			
Client Sample Name: MW6-2006			
W Methane	07/09/2020	07/10/2020 13:30	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			
Lab Sample ID: WAF1044-05 ***Water*** ***Sampled: 06/26/2020 14:50***			
Client Sample Name: MW4-2006			
W Methane	07/09/2020	07/10/2020 14:50	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			

ok to analyze out of holding - Wz 6/29/20

Released By	Date	Received By	Date
Wendy Oz	6/29/20	Jacob Huff	06/30/2020 1129

20F0494

Anatek Labs, Inc.

SUBCONTRACT ORDER
(Continued)

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Work Order: WAF1044 (Continued)

Analysis	Due	Expires	Comments
Lab Sample ID: WAF1044-06 ***Water*** ***Sampled: 06/26/2020 16:35***			
Client Sample Name: AR8-2006			
W Methane	07/09/2020	07/10/2020 16:35	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C) G 44mL HCl (D) G 44mL HCl (M)			
Lab Sample ID: WAF1044-07 ***Water*** ***Sampled: 06/26/2020 12:00***			
Client Sample Name: FD-2006			
W Methane	07/09/2020	07/10/2020 12:00	
Containers Supplied: G 44mL HCl (B) G 44mL HCl (C)			

Released By Wendy [signature] Date 6/29/20 (28 struck)
Received By Jacob Walter [signature] Date 06/30/2020 1129

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WAF1044-01	20F0494-01	Water	24-Jun-2020 14:50	30-Jun-2020 11:29
WAF1044-02	20F0494-02	Water	24-Jun-2020 13:13	30-Jun-2020 11:29
WAF1044-03	20F0494-03	Water	24-Jun-2020 11:45	30-Jun-2020 11:29
WAF1044-04	20F0494-04	Water	24-Jun-2020 13:30	30-Jun-2020 11:29
WAF1044-05	20F0494-05	Water	24-Jun-2020 14:50	30-Jun-2020 11:29
WAF1044-06	20F0494-06	Water	24-Jun-2020 16:35	30-Jun-2020 11:29
WAF1044-07	20F0494-07	Water	24-Jun-2020 12:00	30-Jun-2020 11:29

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Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

Work Order Case Narrative

Client: Anatek Labs, Inc.
Project: WAF1044
Work Order: 20F0494

Sample receipt

Samples as listed on the preceding page were received 30-Jun-2020 11:29 under ARI work order 20F0494. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD recoveries and RPD were within limits.

Sample specific QC was performed in association with sample 20F0494-06 in batch BIG0003. The duplicate RPD was within control limits. The matrix spike/matrix spike duplicate percent recoveries and RPD were within control limits.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anatek Labs
Project Name: WAF1044
COC No(s): _____ NA
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Assigned ARI Job No: 20F0494
Tracking No: 7708 2567 7660 NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1129 2.8

If cooler temperature is out of compliance fill out form 00070F
Temp Gun ID#: DOO 5206

Cooler Accepted by: JJ Date: 06/30/2020 Time: 1129

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [signature] Date: 6/26/2020 Time: 1240 Labels checked by: SLF

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-01

20F0494-01 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 14:50

Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 09:13

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-01 A

Preparation Batch: BIG0003 — Sample Size: 10 mL

Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*72-122 %*	*81.4*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-02

20F0494-02 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 13:13
Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 09:26

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-02 A
Preparation Batch: BIG0003 — Sample Size: 10 mL
Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	742	ug/L	
Surrogate: Propane			*72-122 %*	*84.4*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-03

20F0494-03 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 11:45

Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 09:40

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-03 A

Preparation Batch: BIG0003 — Sample Size: 10 mL

Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*72-122 %*	*87.4*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-04

20F0494-04 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 13:30

Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 09:53

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-04 A

Preparation Batch: BIG0003 — Sample Size: 10 mL

Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*72-122 %*	*84.7*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-05

20F0494-05 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 14:50
Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 10:06

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-05 A
Preparation Batch: BIG0003 — Sample Size: 10 mL
Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*72-122 %*	*91.0*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-06

20F0494-06 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 16:35

Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 10:19

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-06 A

Preparation Batch: BIG0003 — Sample Size: 10 mL

Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	6.57	ug/L	
Surrogate: Propane			*72-122 %*	*82.0*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

WAF1044-07

20F0494-07 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/24/2020 12:00

Instrument: FID6 Analyst: PB — Analyzed: 07/01/2020 10:33

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20F0494-07 A

Preparation Batch: BIG0003 — Sample Size: 10 mL

Prepared: 07/01/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	6.38	ug/L	
Surrogate: Propane			*72-122 %*	*85.8*	*%*	

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

Dissolved Gases - Quality Control

Batch BIG0003 - EPA 5030C (Purge and Trap)

Instrument: FID6 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIG0003-BLK1)				Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 08:17						
Methane	ND	0.65	ug/L							U
Surrogate: Propane	1680		ug/L	*1800*		*93.3*	*72-122*			
LCS (BIG0003-BS1)				Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 07:16						
Methane	673	0.65	ug/L	656		103	80-120			
Surrogate: Propane	1820		ug/L	*1800*		*101*	*62-122*			
LCS Dup (BIG0003-BSD1)				Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 07:29						
Methane	702	0.65	ug/L	656		107	80-120	4.24	30	
Surrogate: Propane	1840		ug/L	*1800*		*102*	*62-122*			
Duplicate (BIG0003-DUP1)	**Source: 20F0494-06**			Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 10:59						
Methane	ND	0.65	ug/L		6.57					U
Surrogate: Propane	1520		ug/L	*1800*	*1480*	*84.6*	*72-122*			
Matrix Spike (BIG0003-MS1)	**Source: 20F0494-06**			Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 11:12						
Methane	605	0.65	ug/L	656	6.57	91.2	80-120			
Surrogate: Propane	1460		ug/L	*1800*	*1480*	*81.2*	*62-122*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BIG0003-MSD1)	**Source: 20F0494-06**			Prepared: 01-Jul-2020 Analyzed: 01-Jul-2020 11:26						
Methane	622	0.65	ug/L	656	6.57	93.8	80-120	2.71	30	
Surrogate: Propane	1570		ug/L	*1800*	*1480*	*87.2*	*62-122*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

Certified Analyses included in this Report

Analyte	Certifications
EPA RSK-175 in Water	
Methane	NELAP
Methane	
Methane	NELAP
Methane	NELAP
Ethane	NELAP
Ethane	NELAP
Ethane	
Ethane	NELAP
Ethene	
Ethene	NELAP
Ethene	NELAP
Ethene	NELAP
Acetylene	NELAP
Acetylene	NELAP
Acetylene	NELAP
Acetylene	

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021

Anatek Labs, Inc.	Project: WAF1044	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Kathy Sattler	07-Jul-2020 14:18

Notes and Definitions

*	Flagged value is not within established control limits.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Appendix D
Historical Groundwater Monitoring Results

Appendix D
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
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**
	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
	May-14	*1.0 U*	1.4	21	86	1,280	*20 U*	*50 U*
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
	Mar-06	NS	NS	NS	NS	NS	NS	NS
	Nov-07	**8.0**	46	35	610	**7,400**	**23,000**	**<4700**
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	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*
	May-14	*1.0 U*	11	280	755	**9,570**	*20 U*	*50 U*
	May-18	*0.5 U*	0.90	145	200	**4,970**	*50 U*	*250 U*
	Jun-19	*0.5 U*	0.53	88.0	157.2	**4,830**	*100 U*	*500 U*
	Jun-20	*1.25 U*	*1.25 U*	61.7	109.7	**3,520**	*160 U*	*400 U*

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

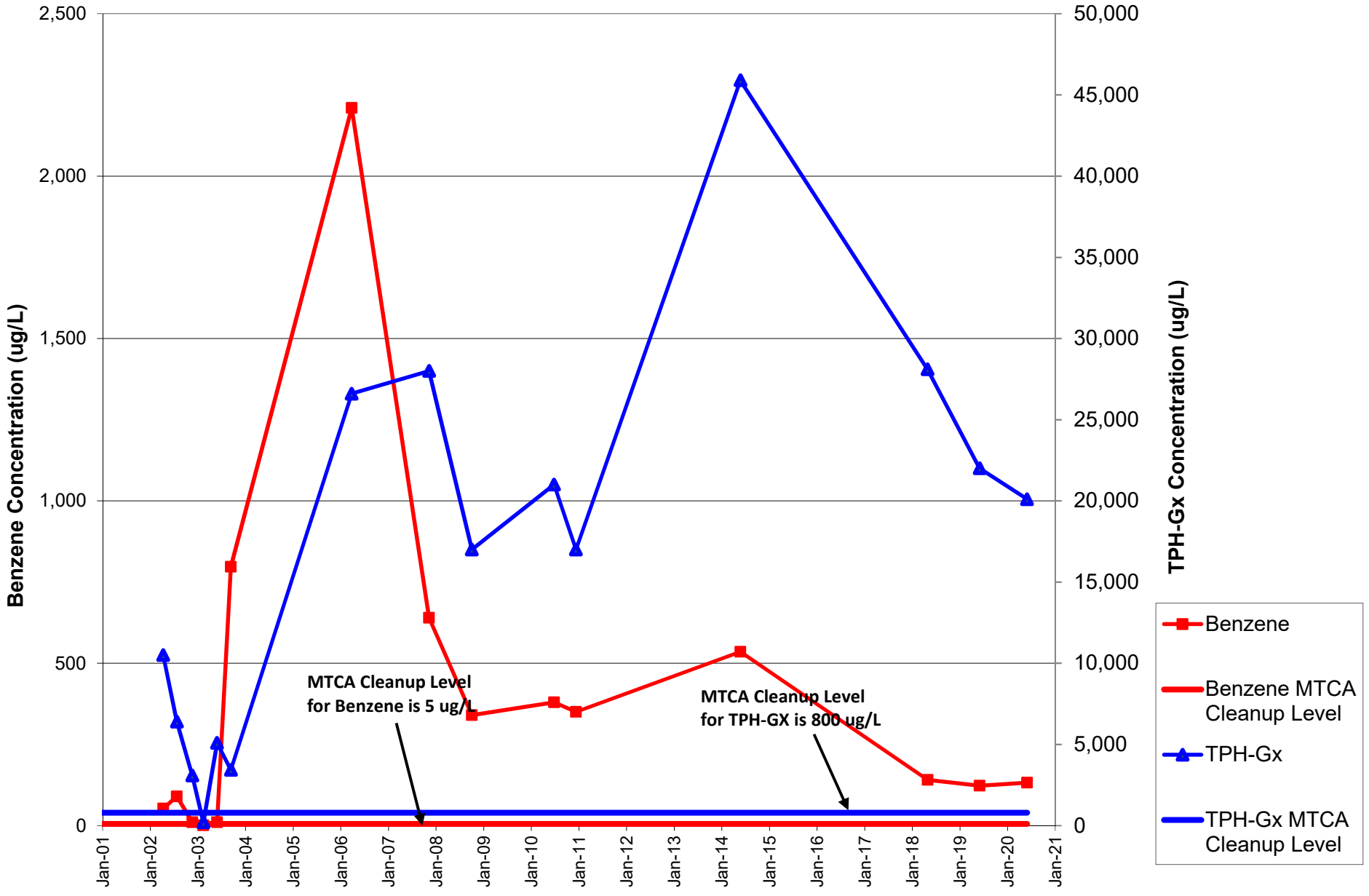
Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
AR-9	Nov-01	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Nov-02	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Dec-03	*1 U*	*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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	*NS*	*NS*	*NS*
	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*	*0.5 U*	*100 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
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
	Feb-03	**369**	15	32	33.8	240	NA	NA
	Jun-03	**131**	68	35	128	**1,420**	NA	NA
	Sep-03	**112**	69	26	NR	431	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
	Nov-07	*0.2 U*	0.20	0.5	*0.6 U*	*50 U*	*190*	**670**
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	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*

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

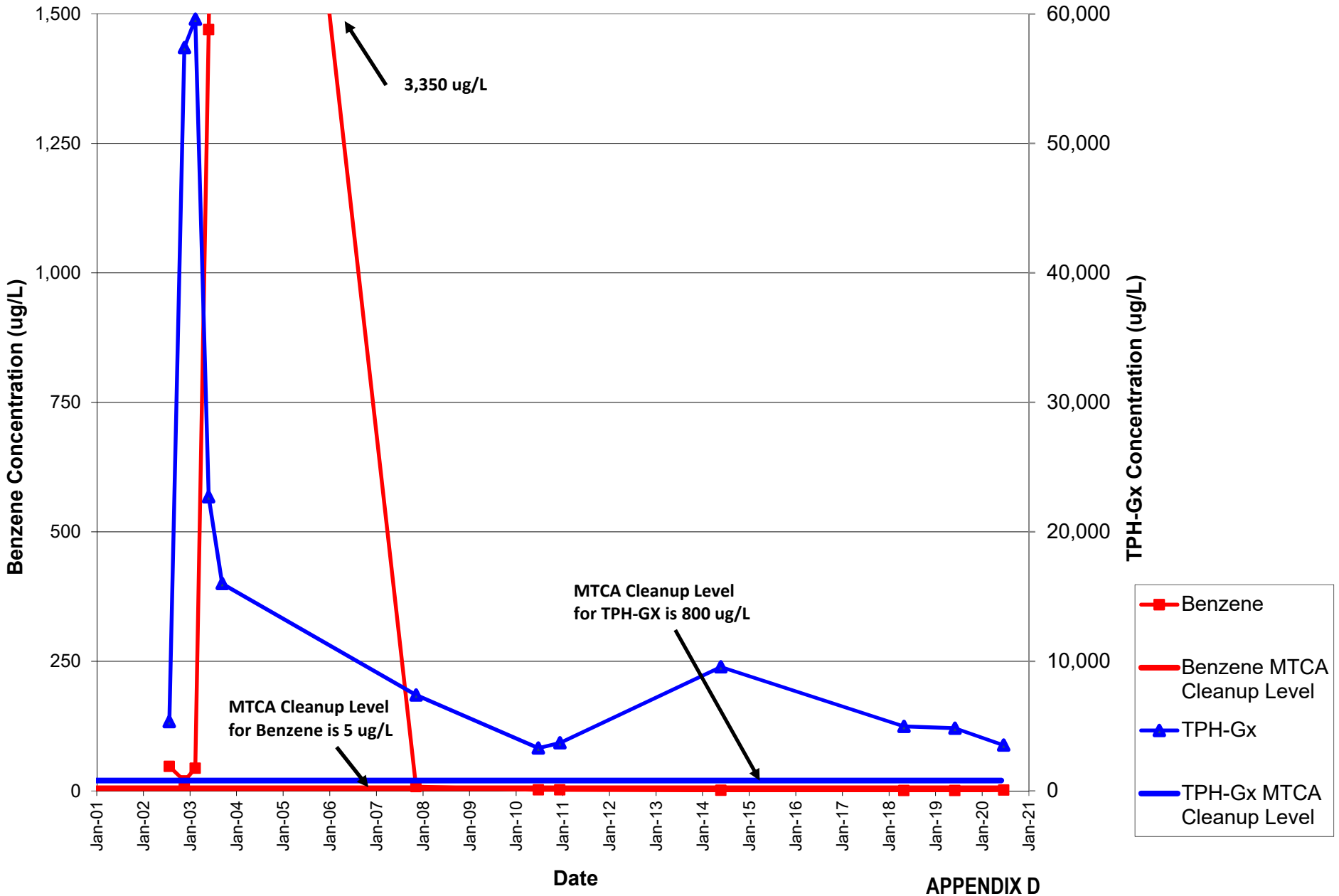
Well ID	Date	Benzene (µg/L) MCL 5	Toluene (µg/L) MCL 1,000	Ethylbenzene (µg/L) MCL 700	Total Xylenes (µg/L) 1,000	TPH-G (µg/L) MCL 800/1,000	TPH-D (µg/L) MCL 500	TPH-D - Heavy Oil (µg/L) MCL 500
MW-3	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	270	NA
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	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*	*0.5 U*	*100 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*
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
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	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*	*0.5 U*	*100 U*	*160 U*	*400 U*
MW-7	Mar-01	**990**	**3,000**	130	**1,260**	**11,000,000**	**1,240**	**510**
	Mar-09	NS	NS	NS	NS	NS	NS	NS
	Nov-07	**70**	530	53	930	**7,000**	**2,000**	300
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	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**
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	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	*1.25 U*	*1.25 U*	61.7	109.7	**3,520**	*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
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

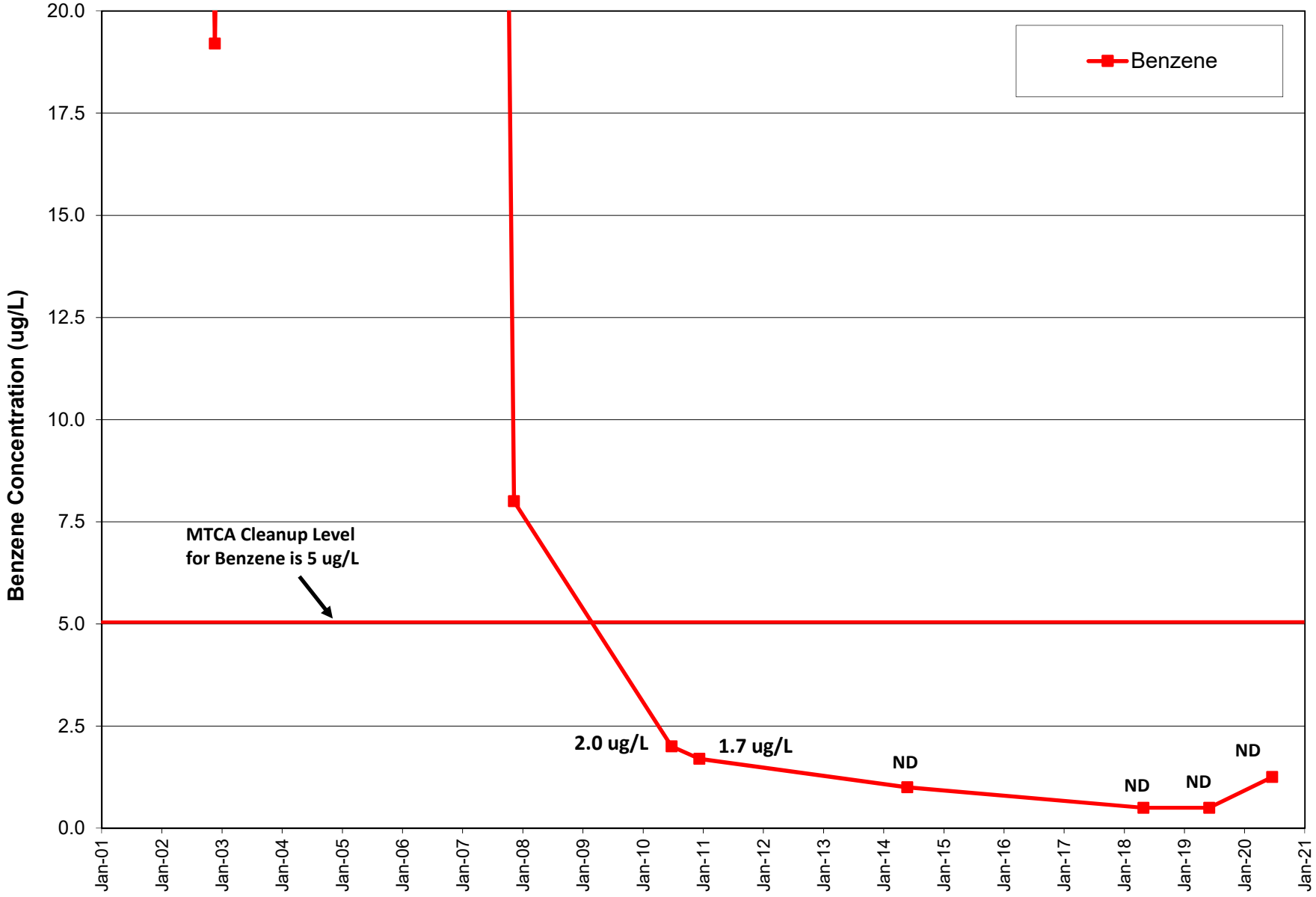
Appendix E
TPH-G and Benzene Time Series



APPENDIX D
AR-4 Benzene and TPH-GX Concentrations
Tidewater Fuel Leak Site

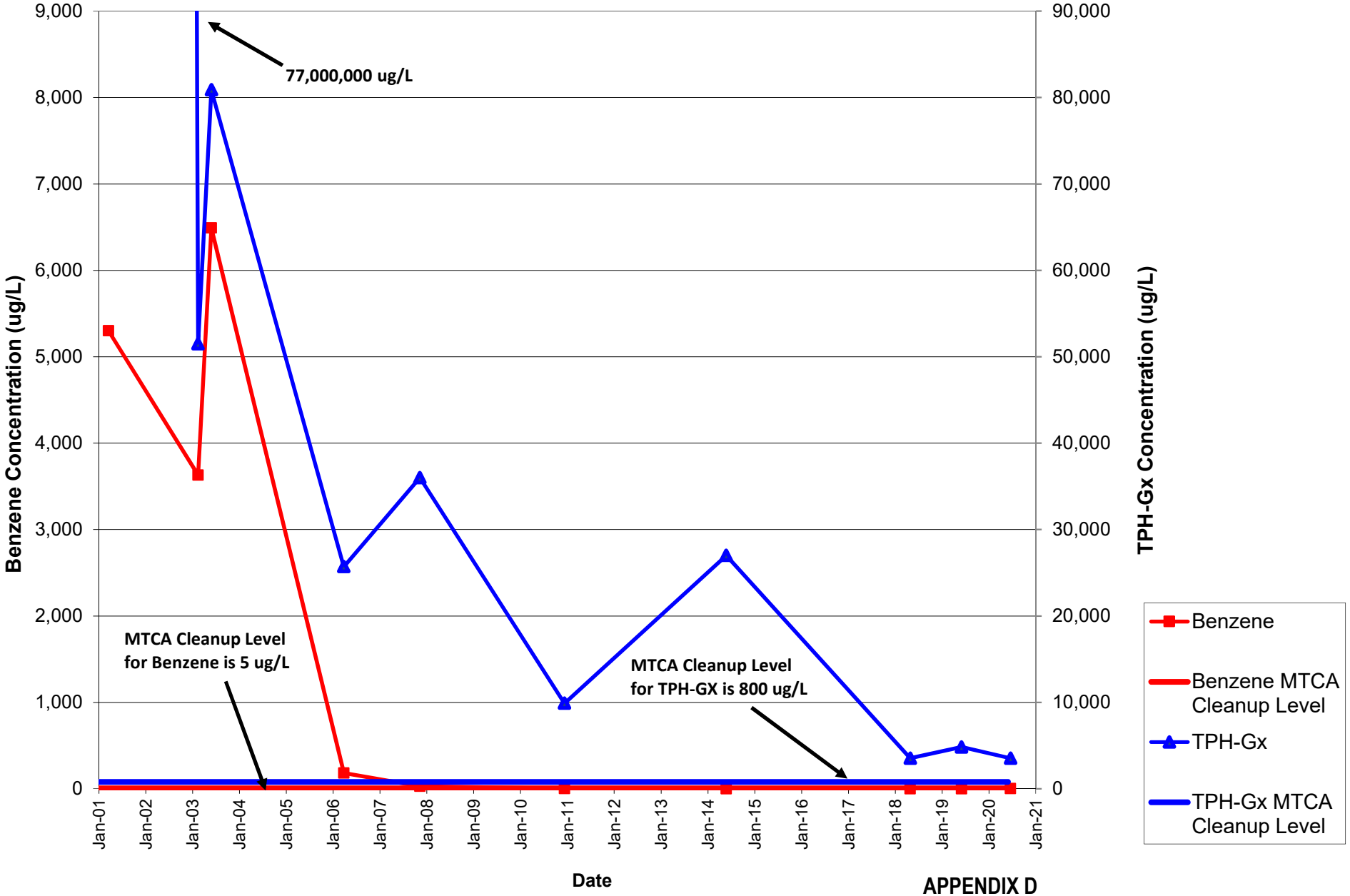


APPENDIX D
AR-8 Benzene and TPH-Gx Concentrations
Tidewater Fuel Leak Site

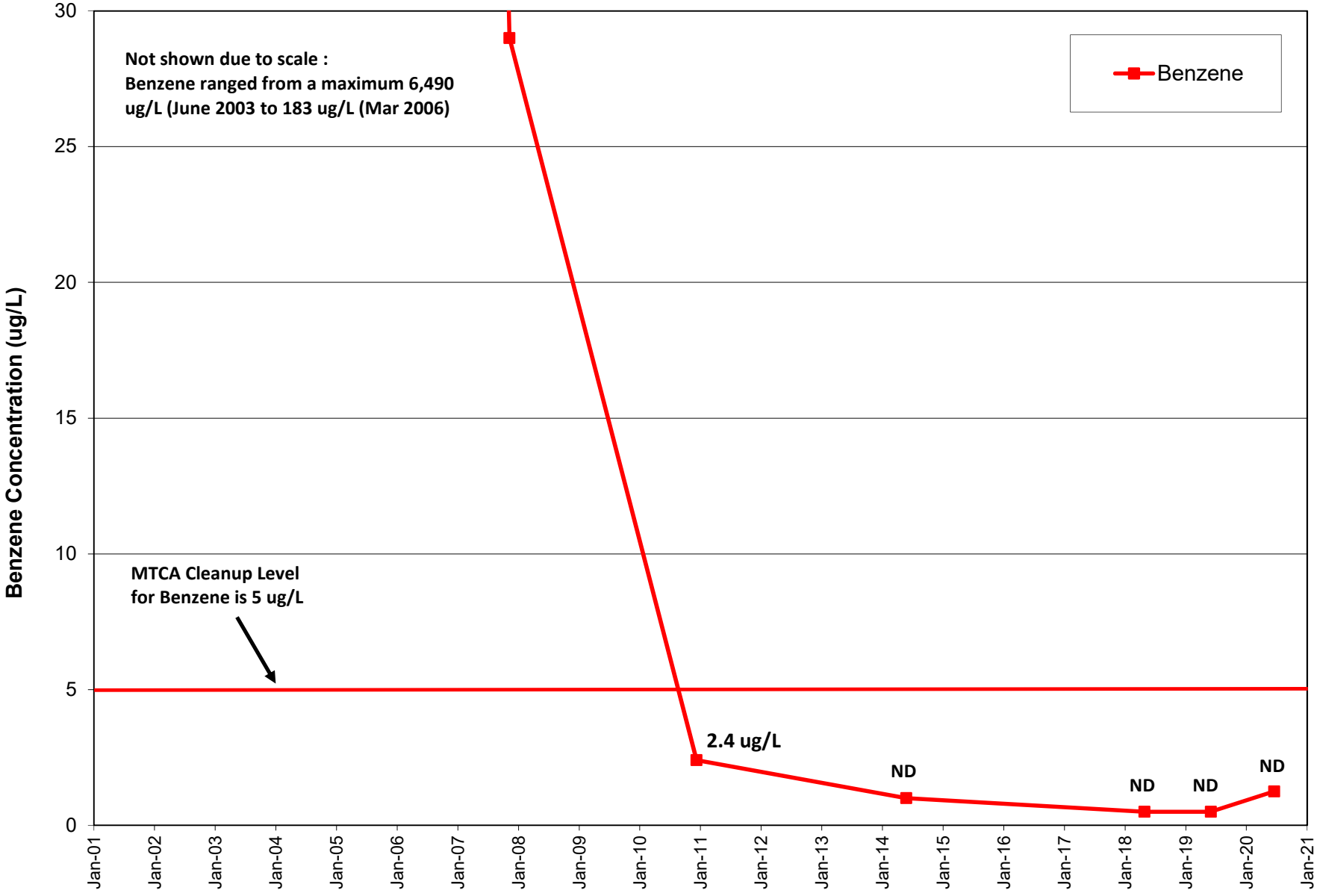


Note: ND - Not Detected

APPENDIX D
AR-8 Benzene - Zoomed Scale
Tidewater Fuel Leak Site



APPENDIX D
MW-8 Benzene and TPH-GX Concentrations
Tidewater Fuel Leak Site



Note: ND - Not Detected

APPENDIX D
MW-8 Benzene - Zoomed Scale
Tidewater Fuel Leak Site