2014 ANNUAL SITE REPORT
BP WEST COAST PRODUCTS TERMINAL, HARBOR ISLAND
1652 SW LANDER STREET
SEATTLE, WASHINGTON

CONSENT DECREE NO. 00-2-05714-8SEA

April 2015

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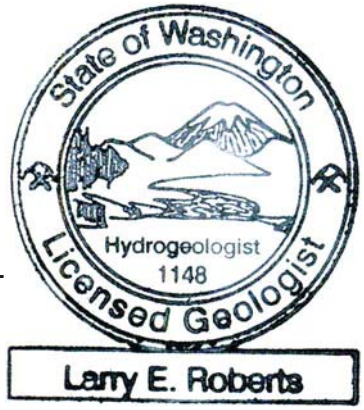

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS .....

EXECUTIVE SUMMARY .....

1. INTRODUCTION **1-1**

2. SITE DESCRIPTION AND HISTORY **2-1**

2.1. Site Regulatory Status 2-1
2.2. Cleanup Criteria 2-2

3. SUMMARY OF SELECTED REMEDIAL ACTIONS AND IMPLEMENTATION **3-1**

3.1. Waterfront Remedial Actions 3-1
3.1.1. Waterfront Groundwater/LNAPL Recovery System 3-1
3.1.1.1. Recovery System History 3-2
3.1.1.2. Recovery System Drawdown 3-3
3.1.1.3. LNAPL/Groundwater Recovery 3-4
3.1.1.4. Recovery System Maintenance and Repairs 3-5
3.1.1.5. Recovery Well Redevelopment 3-5
3.1.2. Waterfront Soil Vapor Extraction System 3-6
3.1.3. Waterfront Air Sparging System 3-6
3.2. Containment Boom Monitoring 3-6
3.3. Inland Soil and Groundwater Remedial Actions 3-7
3.3.1. Inland SVE System 3-8

4. GROUNDWATER MONITORING ACTIVITIES **4-1**

4.1. Plant 1 Performance Monitoring 4-1
4.1.1. Plant 1 Monitoring Well Network 4-1
4.1.2. Petroleum Hydrocarbon Monitoring 4-2
4.1.3. cPAH Monitoring 4-3
4.1.4. Biochemical Parameter Monitoring 4-4
4.1.5. LNAPL Monitoring 4-4
4.1.6. Groundwater Elevation Monitoring 4-4
4.2. Plant 2 Performance Monitoring 4-5
4.3. Data Validation 4-6

5. ADDITIONAL ACTIVITIES **5-1**

5.1. Third 5-Year Review 5-1
5.2. Proposed Seawall Replacement 5-1

6. SUMMARY OF ACTIVITIES/CONCLUSIONS **6-1**

7. REFERENCES **7-1**

TABLES

1. Waterfront Groundwater Petroleum Hydrocarbon History and Recovery Rates
2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
3. Waterfront Systems Recovered Petroleum Hydrocarbon History
4. Containment Boom Sheen Monitoring
5. Inland SVE System Petroleum Hydrocarbon Recovery Rates
6. Groundwater Monitoring Analytical Results for TPH and Benzene
7. Groundwater Monitoring Analytical Results for cPAHs
8. Monthly Groundwater LNAPL and Sheen Monitoring
9. 2014 Quarterly Performance Monitoring Groundwater Elevations

FIGURES

1. Site Location Map
2. Areas of Remediation - Plant 1
3. Areas of Remediation - Plant 2
4. Plant 1 Remediation System
5. Final System Influent vs. Effluent Gasoline Concentrations
6. Final System Influent vs. Effluent Benzene Concentrations
7. Final System Influent vs. Effluent Diesel Concentrations
8. Groundwater Recovery Rates vs. Tidal Stage
9. Cumulative Waterfront LNAPL Recovery Through December 2014
10. 2014 Sheen Observations - Loading Rack Area
11. 2014 Sheen Observations - Warehouse Area
12. Areas of Restriction - Plant 2
13. Areas of Restriction - Plant 1
14. Plant 1 Monitoring Well Network
15. Inland SVE System Remediation System Layout
16. Inland SVE System Cumulative Hydrocarbon Recovery
17. Inland SVE System Gasoline History
18. Inland SVE System Benzene History
19. Inland SVE Biodegradation and Vapor Recovery
20. Inland SVE System Capture Zone Area Hydrograph
21. Benzene History from AMW-01 and AMW-02
22. Benzene History from Wells Within Inland SVE System Capture Zone
23. Gasoline History from Wells Within Inland SVE System Capture Zone
24. Plant 1 Water Table Elevation Map March 2014
25. Plant 1 Water Table Elevation Map September 2014
26. Plant 1 Waterfront Hydrograph
27. Plant 2 Monitoring Well Network

APPENDICES

A. Discharge Monitoring Reports and Data
B. Sheen Observations 2002 Through 2012

List of Abbreviations and Acronyms

ARCO	-	Atlantic Richfield Company
BP	-	British Petroleum Company
BTEX	-	Benzene, Toluene, Ethylbenzene, Xylenes
cPAHs	-	Carcinogenic Polycyclic Aromatic Hydrocarbons
CAP	-	Cleanup Action Plan
CATOX	-	Catalytic Oxidation
CCR	-	Construction Completion Report
DAS	-	Diffused Air Stripper
Ecology	-	The Washington State Department of Ecology
EDR	-	Engineering Design Report
EPA	-	United States Environmental Protection Agency
FFS	-	Focused Feasibility Study
GPM	-	Gallons per Minute
IHSs	-	Indicator Hazardous Substances
OHW	-	Ordinary High Water level
KCDNR	-	King County Department of Natural Resources
LNAPL	-	Light Non-Aqueous Phase Liquid
MHHW	-	Mean Higher High Water
MTCA	-	Model Toxics Control Act
NMFS	-	National Marine Fisheries Service
PRP	-	Potentially Responsible Party
PRR	-	Periodic Review Report
Product	-	Free Phase Hydrocarbons
O&M	-	Operation and Maintenance
OU	-	Operable Unit
OWS	-	Oil Water Separator
PPMV	-	Parts Per Million by Volume
PSCAA	-	Puget Sound Clean Air Agency
RI	-	Remedial Investigation
RI/FS	-	Remedial Investigation and Feasibility Study
SAP	-	Sampling and Analysis Plan
S&GOU	-	Harbor Island Soil and Groundwater Operable Unit
SVE	-	Soil Vapor Extraction
TPH	-	Total Petroleum Hydrocarbons
USACE	-	United States Army Corps of Engineers
USFWS	-	United Stated Fish and Wildlife Service
WAC	-	Washington Administrative Code
WDFS	-	Washington Department of Fish and Wildlife
WDNR	-	Washington Department of Natural Resources

Executive Summary

On-going remedial actions conducted at the BP West Coast Products (BP) Terminal 21T (formerly ARCO) (the Site) located on Harbor Island, Seattle, Washington have been conducted since 2002 per a Consent Decree and build upon interim actions conducted from 1992 to 2002. This report summarizes 2014 actions. The Consent Decree, entered into in 2000, required implementation of remedies to address petroleum hydrocarbon impacted groundwater and soil. Remedies include operating active remediation systems in inaccessible areas (e.g. beneath structures) adjacent to the Duwamish Waterway, excavation of accessible soil "hot spots" at inland areas, and natural attenuation of inaccessible soil hot spots. A Groundwater Monitoring and Contingency Program was set to determine the effectiveness of remedial actions. The Consent Decree established restoration timetables for removal of petroleum product, and for groundwater restoration as measured at property boundaries. These timetables have been extended and remedial actions are ongoing to meet Site cleanup objectives.

Ongoing monitoring shows that waterfront remedial actions are achieving cleanup goals. Ecology and BP determined that Plant 1 waterfront groundwater/LNAPL recovery, soil vapor extraction (SVE), and air sparging remediation systems effectively protect the Duwamish Waterway and have removed most LNAPL and hydrocarbons in this area. Waterfront SVE and air sparging have been discontinued with Ecology's approval, as their operation no longer benefits ongoing remedial actions. Groundwater samples from compliance wells located along the waterfront are mainly below cleanup levels for indicator hazardous substances (IHSs), except for benzene detected in two wells located at the southern end of Plant 1. In 2014, seven of eight samples analyzed for benzene from these two wells were below the cleanup level, continuing a declining concentration trend in these wells. The operating recovery system provides hydraulic control and recover dissolved IHSs, including benzene, in this area.

Inland soil remedial actions (excavation, natural attenuation, and SVE) are effective in protecting groundwater at property boundaries. Ecology determined that remedial actions at Plant 2, in the north-central portion of the Island, appear complete. At Plant 1, an old source of highly weathered hydrocarbons was located in the "smear" zone, inland from the waterfront near the Site's southern boundary. A second SVE system was installed in this area in 2008 to accelerate soil and groundwater cleanup. Data collected from this system indicate it operates as designed, and has improved groundwater quality in the area.

Plans to enhance the Site's seismic stability by installing a seawall along the Plant 1 waterfront are ongoing. The seawall design has been developed and modified over time. Installation was delayed in 2014, primarily due to permitting issues. Pending permit approval, installation of the seawall along the northern portion of Plant 1 is planned. A new seawall will affect Site hydrology, which will be further evaluated following installation.

In 2014, Ecology conducted a five-year review for 2010 to 2014. The review determined that the requirements of the Consent Decree are being met and that no additional cleanup actions are required other than continuing the ongoing specific cleanup actions and compliance monitoring.

1. Introduction

TechSolve Environmental Inc. (TechSolve) has prepared this report on behalf of British Petroleum (BP) to summarize remedial investigation and cleanup activities conducted during 2014 at BP West Coast Products (formerly Atlantic Richfield Company [ARCO]) Terminal (the Site) located on Harbor Island in Seattle, Washington. This report has been prepared to satisfy Annual Reporting Requirements of Model Toxics Control Act (MTCA) Consent Decree No. 00-2-05714-8SEA, cooperatively entered into between ARCO and the Washington State Department of Ecology (Ecology). The Consent Decree was entered into court on March 24, 2000 (Ecology, 2000b) by the Washington State Attorney General.

This report is organized into seven sections and includes two appendices. Many of the required background and general discussion components summarized in this Annual Site Report have been further explained in previous documents submitted to Ecology and are referenced in the appropriate sections. The report is organized as follows:

- Section 1 – Provides a summary of the project, descriptions of the reporting requirements for the Site, and summarizes the organization of this report.
- Section 2 – Provides descriptions of the Site history and regulatory status, historical investigations, selection of remedial actions, and cleanup action levels for the Site.
- Section 3 – Summarizes remedial actions that have occurred at the Site.
- Section 4 – Summarizes groundwater monitoring activities conducted at the Site and provides results and findings of these activities.
- Section 5 – Provides a summary of additional activities conducted at the Site in 2014, including continued planning for a new seawall at Plant 1 and Ecology's Five Year Review.
- Section 6 – Summarizes the information presented in this report.
- Section 7 – Documents the references cited in this report.
- Appendix A: KCDNR Discharge Reports – Provides the two 2014 semi-annual discharge reports provided to the King County Department of Natural Resources (KCDNR).
- Appendix B: Sheen Observations – Documents the occurrence of sheen within booms located on the Duwamish Waterway from 2002 through 2013.

2. Site Description and History

The Site is located on Harbor Island and consists of two separate bulk fuel storage plants (Figure 1). Harbor Island is a 455-acre man-made island that lies between the East and West Waterways of the Duwamish River. Plant 1 occupies about 12 acres on the western portion of the island, along the West Waterway of the Duwamish River. Plant 2 occupies about 3.5 acres in the north-central part of the island. Both plants were constructed in the 1930s and have operated as bulk fuel storage and transfer facilities under several owners since that time. ARCO assumed operation of Plant 1 in the 1940s and Plant 2 in the 1950s.

Harbor Island was created primarily from marine sediments dredged from the Duwamish River. Currently, about 95 percent of the island is covered with industrial buildings, paved roads, or other impervious surfaces. The pervious surfaces of the island consist primarily of land adjacent to aboveground storage tanks and railroad tracks.

In the northern portion of the island, where the Site is located, groundwater flows in a radial pattern outward from the island center and enters the marine surface water at the island's edge. This flow pattern was reconfirmed in 2014, as discussed in Section 4.1.6. Groundwater is an artifact of island construction and local recharge is from rainfall and, possibly, leaking underground utilities (e.g., storm sewers and public water supply piping). Recharge of island-wide groundwater from rainfall has decreased significantly over the past several decades due to substantial increases in impermeable surface areas from island redevelopment activities. Ecology and the United States Environmental Protection Agency (EPA) have determined that groundwater beneath Harbor Island is non-potable, and this determination is unlikely to change due to extensive industrial land use on the island.

2.1. Site Regulatory Status

Harbor Island was placed on the National Priorities List in 1983 as a Superfund Site due to elevated levels of hazardous substances in soil, primarily lead. The Harbor Island Superfund Site consists of several operable units (OUs). The BP Terminal, along with the adjacent Shell (formerly Equiva Services, LLC, Equilon, and Texaco) and Kinder Morgan (formerly GATX and Shell) terminals, form the Tank Farm OU. Ecology is the lead regulatory agency for the Tank Farm OU. A large portion of the island is included in the Soil and Groundwater OU (S&GOU), which is under EPA jurisdiction. ARCO is involved with these two OUs as discussed below.

ARCO and Ecology cooperatively entered into Agreed Order No. DE 92 TC-N158 in 1992 (Ecology, 1992) to conduct Site characterization activities and develop remedial actions. Remedial Investigation/Feasibility Studies (RI/FS) completed in 1997 (Geraghty & Miller, 1994, 1996, and 1997) showed that hazardous substances present in groundwater and soil at the Site were primarily highly weathered total petroleum hydrocarbons (TPH) as diesel (TPH-D) with lesser amounts of weathered gasoline (TPH-G) and heavier oil (TPH-O). The weathered TPH likely resulted from historic spills at the Site. The RI/FS showed the primary area of impact at the Site was a petroleum-based light non-aqueous phase liquid (LNAPL) plume located beneath the warehouse adjacent to the Duwamish River at Plant 1. Secondary areas of concern included

petroleum impacted soils located within the Plant 1 and Plant 2 tank farms (Figure 2 and 3). Site-specific cleanup alternatives for groundwater and soil were next developed and evaluated to protect human health and the environment at the Site.

ARCO entered into a Consent Decree with Ecology in 2000 for implementing remedial actions at the Site. Separate cleanup actions for the Plant 1 Waterfront area and for Plant 1 and 2 soils were specified in a Cleanup Action Plan (CAP) (Ecology, 1999) and in an Engineering Design Report (EDR) (TechSolv and AG&M, 2000a). Cleanup actions were selected from site-specific cleanup action alternatives developed as part of a Focused Feasibility Study (FFS) (Geraghty & Miller, 1997). Elements of the selected cleanup actions include:

- Pumping and treatment for an LNAPL plume and dissolved hydrocarbon recovery.
- Excavation of accessible TPH impacted soil "hot spots" in the inland portions of Plant 1 and Plant 2.
- Air Sparging and Soil Vapor Extraction (SVE) for accelerated mass removal of residual hydrocarbons in inaccessible soils.
- Groundwater compliance monitoring.
- Natural attenuation.
- Deed restrictions.
- Institutional controls.

A period of 18 months was established for removal of LNAPL beneath the warehouse, and 5 years for groundwater restoration as measured at property boundaries. Additional contingency actions have been implemented at the Site, including continued operation of the waterfront recovery system beyond 5 years and installation of a second SVE system to address inaccessible hot spot soils inland from the waterfront at Plant 1, as further discussed in Section 3.3.

ARCO also entered into a Consent Decree with EPA in 1994 (EPA, 1994) to have minor participation in the long term monitoring activities and for funding EPA oversight for the S&GOU. ARCO, Lockheed, and Equilon equally share 75% of one share of the 8.75 total shares for the Potentially Responsible Party (PRP) group, bringing ARCO's overall commitment to the S&GOU to approximately 2.9%. As a PRP to the S&GOU, ARCO assisted with preparation and implementation of the Groundwater Monitoring Plan.

2.2. Cleanup Criteria

Indicator hazardous substances (IHSs) for the Site were identified and defined in the CAP. The following section provides a summary of IHSs and Site cleanup levels.

The subsurface soil cleanup action level for TPH at the primary area of concern (Plant 1) was set to meet remedial objectives of protecting surface water at property boundaries and

shorelines. The Total TPH (TPH-G+TPH-D+TPH-O) cleanup level is also protective for other chemical constituents in petroleum product (i.e., benzene, toluene, ethylbenzene, xylenes [BTEX]) and is:

Total TPH	10,000 milligrams/kilogram (mg/kg)

The subsurface soil cleanup action level for TPH at the secondary area of concern (Plant 2) was set to meet remedial objectives of protecting surface water at property boundaries by improving general groundwater conditions at the source. This cleanup level was also set to enhance the timely restoration of impacted areas through natural attenuation, and is:

Total TPH	20,000 mg/kg

Site groundwater cleanup levels established by Ecology were based on surface water standards, to be protective of aquatic organisms in the Duwamish River. These standards are adopted ambient water quality criteria (WAC 173-201A and Section 304 of the Federal Clean Water Act). Surface water standards were not established for TPH when the CAP was approved; therefore, groundwater cleanup levels for TPH-G, TPH-D, and TPH-O were selected by Ecology as protective cleanup goals. Site groundwater cleanup levels are:

Product (LNAPL)	No sheen
Benzene	71 micrograms/liter (µg/L)
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)	0.031 µg/L
Copper	2.9 µg/L
TPH-G	1,000 µg/L
TPH-D	10,000 µg/L
TPH-O	10,000 µg/L

3. Summary of Selected Remedial Actions and Implementation

The following sections summarize remedial actions selected for the Site based on the RI/FS and subsequent investigations, and the status of their implementation. The active portions of the accessible soil remedies have been completed and have been detailed in other referenced documents. The inaccessible soil and groundwater remedies are ongoing and, therefore, are discussed at greater length than the accessible soil remedies.

3.1. Waterfront Remedial Actions

Groundwater remedial actions have been conducted along the waterfront at Plant 1 (Figure 2) since 1992. An interim groundwater/LNAPL recovery system operated from 1992 through 2002, and an interim SVE system operated from 1996 through 2002. Final remediation systems were installed in 2002, described in the EDR (TechSolv, 2002), and are summarized below.

Final remediation system designs were based upon interim system success, and consisted of a combination of SVE, groundwater/LNAPL recovery, and air sparging. The groundwater/LNAPL recovery system was designed to capture LNAPL and dissolved hydrocarbons in groundwater and provide hydraulic control along the waterfront. The air sparging system was designed to mobilize LNAPL to aide in capture, to enhance in-situ biodegradation of residual hydrocarbons, and to strip volatile hydrocarbons from groundwater. The SVE system was designed to capture volatile hydrocarbons vapors and enhance in-situ biodegradation of residual hydrocarbons in the vadose zone. The main components of these systems are located along the waterfront, in the warehouse and by the truck loading rack area of Plant 1 (Figure 4). These systems are further discussed in the following sections.

The February 28, 2001 Nisqually earthquake damaged the warehouse at the Site, delaying installation of final remediation systems until repairs were made (TechSolv, 2002). System construction activities were completed in 2003 and were detailed in the Construction Completion Report (CCR) (TechSolv, 2003c). The CCR was prepared following system testing and startup and documented that Consent Decree and EDR requirements were followed during system construction. The CCR was approved by Ecology in 2004 (Ecology, 2004a).

Operation and maintenance (O&M) requirements for the final remediation system were presented in the Final O&M Manual (TechSolv, 2003d), which was approved by Ecology in 2004 (Ecology, 2004a) The O&M Manual presents descriptions of systems, startup and shutdown procedures, alarm condition causes and remedies, normal operating conditions, system safety features, waste handling procedures, and vendor-supplied manuals for system components. The O&M manual is utilized as a working field document and a copy is maintained on-site. The manual is updated as system operations/procedures change or as equipment is replaced.

3.1.1. Waterfront Groundwater/LNAPL Recovery System

The waterfront groundwater/LNAPL recovery system captures LNAPL and groundwater containing dissolved hydrocarbons. The system utilizes total-fluid pumps in recovery wells to

pump LNAPL and groundwater to the remediation system treatment area. The system consists of 10 recovery wells (GM-11S, RW-1, RW-2, RW-4, RW-5, RW-6, RW-7, RW-8, RW-9, RW-10) located along the waterfront at Plant 1 (Figure 4). Recovered LNAPL and groundwater are pumped into an oil/water separator (OWS), which separates LNAPL from groundwater. LNAPL is recycled off-site. Separated groundwater enters a diffused air stripper (DAS), which strips dissolved volatile hydrocarbons from wastewater. Treated groundwater flows through a totalizer and to the sanitary sewer. The OWS and DAS help achieve compliance with KCDNR sanitary sewer discharge requirements.

3.1.1.1. Recovery System History

Well RW-1 has been utilized for groundwater recovery since interim system startup in 1992. Well RW-4 operated as part of the interim system from 1998 to 1999 and has operated since 2001 with Wells RW-2, RW-5, and RW-6, following system installation activities north of the warehouse. Well GM-11S was converted from a monitoring well to a recovery well in 2000 after LNAPL was observed in the well. Wells RW-7, RW-8, RW-9, and RW-10 were completed during final system construction and brought on-line during final startup in 2002.

In 2003, decreased LNAPL recovery triggered a soil investigation at Plant 1 (TechSolv, 2003b). Soil cores analyzed for LNAPL presence showed no LNAPL existing outside recovery wells' capture zones, supporting data showing most LNAPL has been recovered from the warehouse area.

The groundwater/LNAPL recovery system is monitored weekly and maintenance is performed as needed to ensure that the system operates as designed and in accordance with permit requirements. Compliance testing of influent and effluent streams (Table 1) is conducted monthly to ensure compliance with KCDNR Permit 7592-04 for Sample Site A43262 and Puget Sound Clean Air Agency (PSCAA) Discharge Authorization No. 9817 requirements.

In 2014, Permit 7592-04 required semi-annual submittal of compliance monitoring data and monthly submittal of gallons of processed groundwater discharged to sanitary sewer. The two 2014 semi-annual KCDNR Waste Discharge Self-Monitoring Reports are included in Appendix A. Analytical results from compliance testing (Table 1, Figures 5 through 7) show that the treatment system effectively treated recovered groundwater and met discharge compliance requirements. During 2014, monitoring results showed discharges were below permitted limits during all monitoring periods. Should discharges exceed permit guidelines, recovery systems will be shut down and KCDNR contacted regarding the exceedance. To date, monitoring of analytes has shown that the system continues to operate as designed.

PSCAA air discharge authorization Notice of Construction No. 9817 was renewed in 2008, allowing for continued air discharge from both the now discontinued waterfront SVE system and the DAS portion of the groundwater/LNAPL recovery system. Air monitoring data are collected to verify compliance with PSCAA's air discharge limits and are provided to PSCAA upon request. In 2014, air discharges from the DAS were below PSCAA's exemption threshold for soil and groundwater remediation projects listed in PSCAA Regulation I, Article 6, Section

6.03(c)(94), indicating that air permitting is no longer required. Permits and air data are retained by TechSolve and are available for review upon request.

Groundwater samples are voluntarily collected semi-annually from individual recovery wells to evaluate trends in shallow groundwater quality in these wells (Table 2). In 2014, samples from three of ten recovery wells (RW-4, RW-8, and RW-9) exceeded the TPH-D cleanup level, samples from two wells (RW-2 and RW-4) exceeded the TPH-G cleanup level, and samples from a single well (RW-2) exceeded the benzene cleanup level. TPH and benzene concentrations detected in samples from the remaining six recovery wells (GM-11S, RW-1, RW-5, RW-6, RW-7, and RW-10) were below their respective groundwater cleanup levels. Data continue to show that groundwater/LNAPL pumping has reduced concentrations of dissolved hydrocarbons in shallow groundwater to below groundwater cleanup levels (Section 2.2.) in most recovery wells and that much of the available TPH-D, TPH-G, and benzene has been recovered.

Based upon the sampling results listed above, shallow groundwater containing concentrations of dissolved TPH-G and benzene above cleanup levels appears to be limited to the northern end of the warehouse and truck loading rack area. Remaining TPH-D above the cleanup level appears to be limited to the southern portion of the remediation system. This data trend has been consistent over the past several years. Recovery wells will continue to be voluntarily monitored in 2015 to evaluate data trends.

3.1.1.2. Recovery System Drawdown

The groundwater/LNAPL recovery system was designed to pump shallow groundwater, with water table drawdown extending to the bottom of the LNAPL smear zone (approximately 4 feet in total height). Pumping tests (TechSolv, 1999a) showed that an appropriate capture zone could be achieved with pumping rates from 0.7 to 0.9 gallons per minute (gpm) per well. These pumping rates were confirmed to achieve the desired drawdown during groundwater/LNAPL recovery system startup testing.

Groundwater/LNAPL recovery system operation data collected through 2014 (Table 1) have shown that the desired water table drawdown and hydraulic capture/control are being achieved along the waterfront. Recovery wells are visually monitored during routine O&M activities to ensure that proper drawdown and capture are being achieved. Fouling in the soil formation surrounding recovery well screens appears to have decreased recovery rates over time, when compared to historic rates. Fouling is mainly from biological growth and associated deposits generated by high iron and manganese concentrations in groundwater. These biological deposits are routinely cleaned from wells, pumps, and associated piping to prevent fouling and blockages. Preventative maintenance and redevelopment activities were performed on groundwater recovery wells in 2014 to remove fouling and attempt to improve pumping rates. These activities included well jetting, and surging, as further discussed in Section 3.1.1.4. While fouling may reduce pumping rates, desired drawdown is being achieved and the system continues to respond to tidally-influenced changes in groundwater elevation.

Groundwater elevations vary daily in groundwater/LNAPL recovery wells due to tidal fluctuations in the adjacent Duwamish Waterway. Testing has shown that while the Duwamish Waterway fluctuates up to 14 feet during a daily tidal cycle, shallow groundwater only fluctuates about 1 foot over the same period (TechSolv, 2004). The RI, determined that the difference in tidal response for shallow groundwater versus deeper groundwater is due to the dampening effect of the western warehouse foundation (driven interlocking sheet piling underlying the warehouse foundation), bulkheads at the island edge, and decreased seepage through a silty/clay layer that partially separates upper and lower water tables in some areas.

Pumping rate data, collected multiple times a day during various tidal stages, continue to show that fluctuations in tidal elevations affect groundwater/LNAPL recovery system pumping. These data show a direct correlation between tidal elevation and groundwater recovery rates (Figure 8). These data indicate that the groundwater/LNAPL recovery system affects deeper groundwater and that the system achieves desired drawdown without adjustment to account for tidal fluctuations (i.e., total-fluids pumps automatically pump faster during high tides).

In 2010, BP started planning for the installation of a new seawall along the northern shoreline at Plant 1 to enhance seismic stability of the Site. If installed, the final design of the seawall is anticipated to reduce tidal fluctuations in groundwater and will likely affect the operation of the groundwater/LNAPL recovery system, as is further discussed in Section 5.

3.1.1.3. LNAPL/Groundwater Recovery

Data from groundwater/LNAPL recovery system operation indicate that the majority of LNAPL has been removed from beneath the warehouse and loading rack areas, as required by the Consent Decree. Table 1 details quantities and concentrations of recovered LNAPL and dissolved hydrocarbons since final groundwater/LNAPL recovery system startup in 2002. Low LNAPL and dissolved hydrocarbon recovery rates over the past several years indicate only a minor amount of LNAPL remains beneath the warehouse and loading rack areas. LNAPL collection data shown in Table 1 are only recorded when a sufficient quantity has been generated to warrant off-site recycling, which has not occurred since 2008. Most LNAPL currently recovered occurs as a sheen or thin layer that is removed from the recovery system with biological residue as waste, which cannot be quantified in LNAPL recovery totals.

The cumulative amount of LNAPL recovered by both interim and final groundwater/LNAPL recovery systems is about 10,098 gallons (Figure 9 and Table 3). The final system has recovered 395 gallons of LNAPL from October 2002 through December 2014, and 392 gallons of dissolved hydrocarbons (Tables 3 and 4). The total combined recovery including recovered LNAPL, dissolved hydrocarbons, historical SVE recovery, and biodegradation processes (discussed in Section 3.1.2), is about 29,756 gallons of LNAPL recovered to date (Tables 3 and 4). Influent concentrations of IHSs in recovered groundwater for 2014 are shown on Figures 5 through 7, and listed in Table 1.

Influent concentrations of dissolved IHSs in recovered groundwater have decreased over time, consistent with decreasing concentrations seen in individual recovery wells (Section

3.1.1.1), indicating groundwater conditions at the Site have improved. Concentrations of IHSs do vary over time and often appear higher during winter months when the overall groundwater elevation is generally higher, as discussed in Section 4.1.6. Data indicate that the source of dissolved hydrocarbons is primarily residual hydrocarbons in the smear zone at the water table and that groundwater recovery continues to be an effective means of reducing dissolved hydrocarbon concentrations in groundwater.

3.1.1.4. Recovery System Maintenance and Repairs

Since startup, the groundwater/LNAPL recovery system has remained operational to date. The system, or individual portions of the system, were taken off-line periodically in 2014 to perform maintenance or repair activities. Separate portions of the system were also shutdown from time to time to address sediment, scale, and biofouling buildup on pumps and in groundwater piping, attributed to high concentrations of iron and manganese in groundwater.

While most system shutdowns in 2014 were limited to a day or less, the system was taken offline from June 24th through July 23rd, 2014 due to a malfunctioning flow totalizer. The downtime was required for manufacturer maintenance and calibration of the flowmeter. To prevent similar future downtime instances from occurring, a second flowmeter was purchased that can replace the existing meter while it is being serviced.

Independent corrosion engineers have performed annual integrity inspections on steel total fluids piping since 2003. Piping is also inspected as part of system routine O&M activities. Inspections evaluate piping at recovery wellheads, along the waterway, and at other accessible areas. Corrosion inspections confirm that systems can continue operation and that systems are connected to the Terminal cathodic protection system, protecting buried pipe from external corrosion. Annual reports are prepared by the corrosion engineers summarize the inspections. Reports are kept on file at TechSolve's office and are available for review upon request.

The most recent corrosion inspection was conducted on April 17, 2014. The results of this inspection determined that while steel total fluids piping is susceptible to corrosion, the thickness of system piping is adequate to safely convey recovered remediation fluids. The inspection also recommended the application of protective coatings to exposed piping, which has been completed to the extent practical.

Groundwater conveyance piping has been replaced as needed due to corrosion or when internal blockages could not be addressed by standard maintenance activities. No piping replacements occurred in 2014. The last major piping replacement event occurred in December 2012, as discussed in the 2012 Annual Site Report (TechSolve, 2013).

3.1.1.5. Recovery Well Redevelopment

Well redevelopment is conducted as needed to improve well productivity by cleaning and removing sediment, scale, and biofouling from well screens and surrounding sand packs. Redevelopment activities have been conducted during previous years, as discussed in past

reports (TechSolve, 2012 and TechSolve, 2013). In 2014, recovery wells were jetted, and pumped to remove sediment and fouling from the base of the wells. Improvements in production from redevelopment were evaluated by monitoring pumping rates at each well before and after treatment and moderate improvements in production were observed. Redevelopment activities will be conducted as needed in 2015 to maintain and improve productivity from groundwater recovery wells.

3.1.2. Waterfront Soil Vapor Extraction System

Operation of the waterfront SVE system was discontinued in May 2008 as the system was no longer recovering measurable concentrations of hydrocarbons and was no longer influencing the biodegradation of inaccessible hot spot soils. SVE system shutdown was approved by Ecology during the 5-year review (Ecology, 2008).

About 3,582 gallons of TPH-G (as vapor) was recovered by the waterfront SVE system. Additionally, enhanced biodegradation from SVE system operation added about 16,075 gallons, for a total of 19,657 gallons of petroleum hydrocarbons recovered by SVE (Table 3, Figure 9), as calculated from SVE vapor stream monitoring data. Waterfront SVE system operation was discussed in greater detail in previous Annual Reports (e.g. TechSolv, 2009).

3.1.3. Waterfront Air Sparging System

Air sparging along the waterfront was discontinued in May 2008 as SVE air monitoring data indicated air-sparging operations were no longer volatilizing measurable quantities of hydrocarbons. Additionally, air-sparging operations were likely causing increased fouling in the groundwater/LNAPL recovery system. Additional information on air sparging system operation was presented in previous Annual Reports (e.g. TechSolv, 2009).

3.2. Containment Boom Monitoring

Two oil sorbent booms are maintained in the West Duwamish Waterway adjacent to Plant 1 to contain oil sheens that have historically appeared on water. Booms are located near the loading rack area and middle of the warehouse (Figure 4). Boom locations are selected to best contain occasional sheens, which likely originate from small cracks and discontinuities in the warehouse foundation or island bulkhead. The foundation and bulkhead act as a “hanging” wall, trapping LNAPL while allowing groundwater to flow beneath the base of the foundation and bulkhead.

Booms are monitored weekly, at a minimum, for the presence of oil sheens and integrity, and augmented by checks made by Terminal personnel. Booms are replaced when integrity monitoring determines it necessary. A Containment Boom Log (Table 4) is maintained on-site to document sheens observances, or lack thereof, within the booms and the date and time of inspection. The extent of observed sheens are recorded on a scale from zero to two, with zero representing no sheen, one representing a light sheen visible in a portion of the boom, and two representing a heavy sheen visible throughout the boom. The Duwamish Waterway tidal stage is also recorded to evaluate if sheens correlate with tidal stage. Results of containment boom

monitoring in 2014 are shown for the loading rack area and warehouse area booms on Figures 10 and 11, respectively. Figures showing sheen observations from previous years are included in Appendix B.

Results of sheen monitoring indicate that sheens on the Duwamish Waterway have been infrequent and relatively minor since startup of the final system in October 2002. The number of sheen events in 2014 continued a decreasing trend when compared to previous years, with 2 light sheens observed during the 103 inspections conducted in 2014. These detected sheens were contained within the warehouse area boom and sheen impacts were mitigated by the boom. No sheens have been observed in the loading rack area boom since February 2009.

The first sheen event was observed when the system was in operation and was observed as very light sheen targeting in one small area of the boom. The second sheen event occurred when the system was offline for flowmeter servicing (Section 3.1.1.4), and was observed as a light sheen in one area of the boom. A correlation between system shutdown and sheen occurrences has been observed and documented in past reports (TechSolve 2014), and indicate that groundwater/LNAPL recovery system operation prevents sheen occurrences, as designed.

The Western Duwamish Waterway adjacent to the Terminal is also monitored for "orphan" sheens from off-site sources, occurring outside boomed areas. Historical orphan sheens often could not be correlated to specific sources; however, some sheens appeared to emanate from the Lander Street and Florida Street stormwater outfalls (Figure 2). The Terminal does not connect to storm sewer systems that feed these outfalls. The Terminal and TechSolve continue to monitor for orphan sheens and documentation of these sheens is maintained at TechSolve's office. No such sheens were observed in 2014, or in several preceding years.

3.3. Inland Soil and Groundwater Remedial Actions

The primary remedy for soils above subsurface soil cleanup action levels (Section 2.2) for TPH was excavation of accessible "hot spot" soils. In-situ treatment methods, including natural attenuation and SVE, were also selected to treat remaining inaccessible hot spot soils located beneath, buildings, paved drive area, etc. Areas identified for cleanup actions are shown on Figures 2 and 3. Additionally, a Restrictive Covenant, effective May 30, 2000, restricts property to "industrial use" only and imposes restrictions on activities in selected areas of the Site (primarily soil disturbance activities or those that create new exposure routes in identified areas). Excavation and in-situ soil remedy plans were described in the EDR (TechSolv and AG&M, 2000a) and in the Inland Soils Plans and Specifications (TechSolv and AG&M, 2000b).

Cleanup actions for inland soils accessible for excavation at Plants 1 and 2 were completed in 2000. Excavations focused on predetermined areas with additional areas excavated as conditions dictated. A total of 3,470 cubic yards of contaminated soil was removed from Plant 1 and Plant 2, as detailed in the TPH Hot Spot Soils Excavation Completion Report (TechSolv and AG&M, 2001).

Ongoing performance groundwater monitoring, conducted following the soil excavations, showed that cleanup objectives for inland soils at Plant 2 had been met. In 2004, Ecology

concurred that cleanup objectives at Plant 2 appeared to have been met, that remaining inaccessible TPH in soils (Figure 12) is being adequately treated by natural attenuation, and that remedial actions appeared to be complete (Ecology, 2004a).

Inaccessible hot spot soils were identified at Plant 1 following soil excavation activities (Figure 13). At the southern property boundary, groundwater monitoring indicated that excavations had not restored groundwater quality to meet cleanup standards within the 5 years restoration period, most notably in Well AR-03 (Section 4). Groundwater in Well AR-03 (Figure 14) is monitored for benzene, TPH-G, TPH-D, and TPH-O, and detected concentrations of benzene and TPH-G often fluctuated and exceeded associated cleanup levels. Fluctuating concentrations of TPH (most notably benzene) detected in Well AR-03 directly correlated to seasonal water table elevation fluctuations indicating that the source was located in the vadose zone, which becomes saturated during periods of high precipitation.

A focused soil probing investigation was conducted in 2005 south of the Plant 1 Tank Farm. The investigation showed TPH-G and benzene to exist within an approximate one-acre source area in soils south of the Plant 1 Tank Farm and that this source area was responsible for continued groundwater impacts at the property boundary (TechSolv, 2006). Additional wells were installed in this area in 2006 to monitor groundwater conditions, as discussed in Section 4.1, and contingency remedial actions were implemented as discussed below.

3.3.1. Inland SVE System

Contingency remedial actions for soil and groundwater were evaluated in 2007 to remediate the hydrocarbon source area described in the previous section. SVE with catalytic oxidation (CATOX) emission control was selected as the preferred remedial alternative. System design (Figure 15), installation, pilot testing, and startup occurred in 2008, and the system has remained in operation to date. O&M requirements for the final remediation system have been incorporated in the Final O&M Manual (TechSolv, 2003d), which is a working field document updated as system operations change or as equipment is replaced. Air emission control requirements were set by PSCAA in Notice of Construction No. 9858.

The system is inspected weekly, when operating, and air samples are collected and analyzed monthly to ensure compliance with PSCAA requirements, to monitor changes in the vapor stream, and to calculate hydrocarbon recovery rates.

Through 2014, the Inland SVE System has recovered approximately 7,940 pounds (1,291 gallons) of TPH-G (Table 5 and Figure 16). Concentrations of TPH-G and benzene in recovered influent vapor streams decreased sharply after initial system startup and have generally been well below PSCAA discharge limits of 50 Parts Per Million by Volume (ppmv) for TPH-G and 0.5 ppmv for benzene since late 2008 (Figures 17 and 18). CATOX emission control was discontinued in 2009 as influent hydrocarbon vapor concentrations are now below PSCAA treatment thresholds (TechSolv, 2010). Air discharges in 2014 were also below PSCAA's exemption threshold for soil and groundwater remediation projects listed in PSCAA Regulation I, Article 6, Section 6.03(c)(94), indicating that air discharge permitting is no longer required.

In addition to direct hydrocarbon recovery, SVE enhances biodegradation of residual hydrocarbons is soil due to the induced airflow SVE creates within these soils. Biodegradation calculations use influent flow rates and carbon dioxide levels above background (atmospheric) to estimate the mass of hydrocarbons reduced by enhanced biodegradation. Through December 2014, enhanced biodegradation is estimated to have reduced an additional 4,355 gallons of hydrocarbons, bringing combined biodegradation and vapor recovery of petroleum hydrocarbons to 5,642 gallons (Table 5 and Figure 19). Carbon dioxide concentrations measured during 2014 were at atmospheric levels, indicating that the bulk of hydrocarbons available to aerobic biodegradation have been reduced or captured.

Operation of the Inland SVE System has been periodically discontinued due to high seasonal groundwater elevations, discussed in Section 4.1.6. High groundwater elevations increases water capture, SVE system fouling, and at times submerge the horizontal SVE well screens. System operation is discontinued during these periods until groundwater elevations fall to acceptable levels. Well gauging frequency is increased when the system is off-line to better assess water level changes in the area of the Inland SVE System.

High groundwater elevation has necessitated SVE shutdown from December 2010 through June 2011, from November 2012 through April 2013, and the system has been shut down since December 2014. A hydrograph for the inland area (Figure 20) shows groundwater elevations recorded from wells located within the Inland SVE System's capture zone.

Restarting the SVE system will be evaluated once groundwater elevations have fallen. System operation is to be discontinued once site cleanup objectives for this area are met or it is determined that system operation no longer benefits ongoing remedial actions.

In 2013 and 2014, system operation was adjusted to increase vapor recovery from the southwestern horizontal recovery wells. This system modification was conducted in response to concentrations of IHSs (mainly benzene and TPH-G) detected in groundwater above cleanup levels in Monitoring Wells GM-15S and MW-3-T9 (Figure 14). The system was modified by throttling back the northeastern recovery wells to increase capture from the southwestern recovery wells. Groundwater concentrations of IHSs in Wells GM-15S and MW-3-T9 have now fallen below cleanup levels. Groundwater monitoring data for wells located within the SVE system's capture zone show that the system has improved inland groundwater quality in this area as further discussed in Section 4.1.2.

4. Groundwater Monitoring Activities

Groundwater monitoring activities have been conducted at the Site since 1997 on a network of selected wells. Monitoring activities were conducted voluntarily from 1997 through 1999. Since 2000, groundwater monitoring has been conducted per the requirements of the Consent Decree's Groundwater Compliance Monitoring and Contingency Program (TechSolv, 1999b) with periodic revisions as noted below.

Groundwater monitoring is conducted in accordance with the methods and procedures described in the Sampling and Analysis Plan (SAP) included with the RI. Groundwater samples are analyzed for selected IHSs including TPH-G, TPH-D, TPH-O, benzene, and cPAHs. Monitoring activities also include monthly inspections for the presence of LNAPL in selected wells. Analytes and selected wells have been periodically deleted from the monitoring program with Ecology's approval, due to analyte concentrations consistently below cleanup levels. Wells have also been installed and added to the program. Voluntary and performance groundwater monitoring data are included in Tables 7 through 10. The results of groundwater monitoring activities are summarized in the following sections.

4.1. Plant 1 Performance Monitoring

Performance monitoring at Plant 1 has included quarterly groundwater monitoring for TPH-G, TPH-D, TPH-O, benzene, cPAHs, biochemical parameters, groundwater elevations, and the presence of LNAPL. Monitoring results at Plant 1 (Tables 7 through 10) and revisions to the monitoring program are discussed in the following sections.

4.1.1. Plant 1 Monitoring Well Network

The Plant 1 monitoring well network (Figure 14) currently includes Wells AMW-01 through AMW-05, GM-14S, GM-15S, GM-16S, GM-17S, GM-24S, AR-03, and MW-1-T9 through MW-4-T9. The monitoring history and rationale for these wells is based on the following:

- Monitoring Wells AMW-01 through AMW-05 were installed and first sampled in 2000 as compliance wells along the waterfront, per requirements of the Consent Decree. These wells are screened to allow representative sampling in the zone of groundwater discharge located beneath the existing warehouse foundation and Island bulkhead and above the brackish groundwater. These wells are screened deeper than other wells in the monitoring well network utilized to monitor shallower groundwater conditions.

- Monitoring Well GM-14S was added to the monitoring well network in the third quarter of 2007, as requested by Ecology. GM-14S was originally utilized to monitor for sheen presence on groundwater. As sheens are no longer being detected in this well, performance monitoring was initiated to monitor water quality in this area of the Site.

- Well GM-15S is located down-gradient from Plant 1 soil remedy excavations (Figure 2) and is located within the Inland SVE system's capture zone. Based upon limited hydrocarbon detections, the monitoring frequency of GM-15S was reduced, with

concurrence from Ecology (Ecology, 2009), from quarterly to semi-annually. Following 2013 detections of IHSs (TPH-G and benzene) above cleanup levels, the monitoring frequency of GM-15S was voluntarily increased to quarterly. While concentrations of IHSs fell to historic levels and below cleanup levels in the fourth quarter of 2013, GM-15S will continues to be monitored quarterly to provide additional data from this well.

- Wells GM-16S and GM-17S are hydraulically up-gradient of the Site. Monitoring for IHSs was discontinued, with Ecology's approval in 2000 (Ecology, 2000a), as sufficient background data had been collected from these wells. Monitoring for IHSs was resumed in 2007, as recommended by Ecology, to monitor for IHSs potentially migrating onto the property from up-gradient, off-site sources. The groundwater sampling frequency in these wells was reduced in 2009, with concurrence from Ecology (Ecology, 2009), from quarterly to semi-annually as IHS concentrations have been below cleanup levels since resuming sampling.

- Well GM-24S is located within the Plant 1 soil remedy excavation area.

- Well AR-03 is located south of the southern property boundary, down-gradient from the Plant 1 soil remedy excavations, and within the Inland SVE System capture zone.

- Wells MW-1-T9 through MW-4-T9 were installed and added to the monitoring well network in 2005 to further evaluate groundwater quality down-gradient from Plant 1 soil remedy excavations (as discussed in the 2006 Annual Report). These wells are located within the Inland SVE system's capture zone.

4.1.2. Petroleum Hydrocarbon Monitoring

Compliance Monitoring Wells AMW-01 through AMW-05, located along the waterfront, have been below cleanup levels for TPH-G, TPH-D, and TPH-O for all quarterly groundwater monitoring events since installation (Table 6). These wells have also been below cleanup levels for benzene, with the exception of Wells AMW-01 and AMW-02.

Well AMW-01 has exceeded the 71 µg/L cleanup standard for benzene in 40 of 57 quarters since monitoring began in the fourth quarter of 2000. However, over the past 4 years benzene has been below the cleanup level in 10 of 16 quarters and was below the cleanup level in each of the last 3 quarters of 2013 and 2014, as shown in Figure 21.

Well AMW-02 has exceeded the benzene cleanup level in 13 of 32 quarters since benzene was first detected above the cleanup level in the first quarter of 2007. However, benzene was below the cleanup level during the last 10 monitoring events, since being last detected above the cleanup level in the second quarter of 2012, as shown in Figure 21.

Efforts made to determine a source of benzene in the area of AMW-01 and AMW-02 have been inconclusive; however, remediation activities have been implemented to mitigate known sources of benzene and these actions appear to have reduced benzene concentrations in these wells. The Inland SVE system has been in operation since 2008 (Section 3.3) and has improved

groundwater quality up-gradient of Wells AMW-01 and AMW-02. Additionally, improvements in shallow groundwater quality above cleanup levels in these wells have been observed due to ongoing waterfront remedial actions (Section 3.1).

In the up-gradient area of Plant 1, IHSs have not been detected at or above cleanup standards in Monitoring Wells GM-16S and GM-17S since monitoring was resumed in 2007. These wells will be monitored semi-annually in the first and third quarters of 2015 to evaluate for the potential migration of IHSs onto the Site from off-site sources.

Well GM-14S has been below cleanup levels for TPH-D, TPH-O, and benzene (Table 6) since sampling resumed in this well in the third quarter of 2007, following the cessation of sheens being observed in the well (Section 3.2). Concentrations of TPH-G have been detected above the cleanup standard in 21 of 30 quarters since monitoring resumed in Well GM-14S in 2007. TPH-G concentrations detected in well GM-14S appear stable and this well is located hydraulically up-gradient from the groundwater/LNAPL recovery system.

Results of groundwater monitoring from wells in and down-gradient of the former soil hot spot area in Plant 1 (Wells GM-24S, AR-03, GM-15S, MW-1-T9, MW-2-T9, MW-3-T9, and MW-4-T9) show that soil removal actions completed in 2000 (Section 3.3) stabilized concentrations of dissolved hydrocarbons in this area. Groundwater quality improved further in this area following installation and startup of the Inland SVE System in 2008, (Section 3.3.1), which was a contingency actions to remediate remaining inaccessible hydrocarbons. Groundwater quality improvements due to SVE operation can be seen in the decreasing concentrations of benzene and TPH-G in monitoring wells located within the SVE capture zone (Figures 22 and 23). Data presented in Table 6 show concentrations of IHSs in 2014 were below cleanup levels in all wells listed above, except for TPH-G in Well MW-3-T9 in the first quarter and in Well GM-24S in the second quarter.

Concentrations of TPH-G detected in Wells GM-24S and MW-3-T9 were below the cleanup level in three of four quarters in 2014 in each well. The single TPH-G exceedances in 2014 were within historic ranges in both wells. TPH-G concentrations detected in these two wells appear to be decreasing with time, indicating that biodegradation is occurring in the area of these wells.

With the exception of the limited exceedances listed above, detected concentrations of IHSs in groundwater have been reduced in the area of the Inland SVE system. Monitoring data will be further evaluated in 2015 and any trends will be discussed in future reports.

4.1.3. cPAH Monitoring

Selected wells at Plant 1 have been monitored for cPAHs. Monitoring for cPAHs was discontinued in 2003, per Ecology's approval (Ecology, 2003b), as historical monitoring rarely detected these compounds (Table 7). Monitoring for cPAHs was voluntarily resumed in compliance monitoring Wells AMW-01 through AMW-05 in 2004 following a recommendation by Ecology and to assist in determining when cleanup objectives have been met. Since resuming monitoring, concentrations of cPAHs have been rarely detected, and occasional

detections have often been associated with laboratory quality control deficiencies that affect the validity of reported data. These laboratory issues have been discussed in more detail in previous Annual Site Reports. The limited detections of cPAHs have only slightly exceeded the laboratory detection limit (0.025 µg/L) for these compounds. Based upon these findings, the cPAH sampling frequency was decreased in 2009 to an annual basis, with concurrence from Ecology (Ecology, 2009).

There were no exceedances of the cPAH cleanup level during the most recent December 2014 monitoring event (Table 7). Monitoring for concentrations of cPAHs in these compliance wells will next occur in December 2015.

4.1.4. Biochemical Parameter Monitoring

Monitoring for biochemical parameters has been conducted at the Site to determine the effectiveness of natural attenuation in inaccessible soils containing TPH above cleanup levels. Monitoring of biochemical parameters has been suspended until additional Site cleanup goals are achieved (TechSolv, 2005a). Results of the last biochemical sampling were included in the 2006 Annual Site Report (TechSolv, 2007).

4.1.5. LNAPL Monitoring

The monitoring program includes monthly inspection for LNAPL presence in three monitoring wells in Plant 1 (Wells GM-11S, GM-12S, and GM-13S). Monitoring Well GM-14S (located inside the main Plant 1 tank farm) was removed from the monthly LNAPL monitoring program in 2004, with concurrence from Ecology (Ecology, 2004b), as this well had been free of LNAPL and sheens since June 1999.

Results of LNAPL monitoring have shown a reduction in LNAPL occurrence in Plant 1 (Table 8). No sheens or LNAPL have ever been detected in Well GM-12S (located up-gradient from the warehouse). Well GM-13S (located inside the southern end of the warehouse) has periodically had sheens over time, but no sheens have been observed in this well since November 2012.

Measurable LNAPL was detected in Well GM-11S (located outside the northeast end of the warehouse) in 1999 and the well was subsequently converted to an LNAPL recovery well in April 2000. Only a sheen has been detected in this well since being converted to a recovery well. A sheen was last detected in GM-11S in September 2013, continuing a decreasing sheen appearance trend observed since LNAPL monitoring was initiated in this well.

4.1.6. Groundwater Elevation Monitoring

Water table elevations were recorded quarterly in 2014 for Plant 1 (most Plant 2 monitoring has been discontinued as discussed in the following section) and corresponding water table elevation maps were prepared to show overall groundwater flow patterns for 2014 (Table 9, Figures 24 and 25). Monitoring Well MW-06, located in Plant 1 east of the northeast corner of the warehouse, is not part of the groundwater monitoring program but is used to provide water level data in this area. Wells closest to the waterfront that are part of the monitoring program

(GM-13S, and AMW-01 through AMW-05) are not used for water table elevation maps due to tidal fluctuations that affect these wells. Additionally, startup testing showed that the groundwater elevation in Well GM-13S is depressed by groundwater/LNAPL recovery system pumping.

Groundwater contour maps for the first and third quarters of 2014 (Figures 24 and 25) are included as they correspond to the quarters with the highest and lowest groundwater elevations recorded in 2014, respectively. Groundwater elevations and flow patterns shown for 2014 are similar to those observed during the RI and in previous years. Groundwater contour maps are no longer required for the Annual Site Report (Ecology, 2009) due to consistent flow patterns from year to year and are included voluntarily. Site flow directions can vary seasonally but are generally west towards the waterway, and south to southwest along the southern property boundary. Groundwater gradients are similar each year and range from approximately 0.001 feet per foot (ft/ft) from the main tank farm to the waterfront, to 0.01 ft/ft at the southern boundary of Plant 1.

Hydrographs for selected wells in the waterfront area (Figure 26) and in the southern boundary area of Plant 1 (Figure 20) show trends in water table elevations over time for the Site. The data for both areas show seasonal fluctuations of the water table and indicate that all wells are responding to these fluctuations (i.e., none of the wells are screened in groundwater isolated from other wells, such as would occur with “perched” groundwater). Hydrographs show that higher water table elevations occur during wetter winter and spring months than in drier summer and fall months. Groundwater elevations appear to have trended upward over the past decade. These variations and trends in water table elevation generally coincide with precipitation data for the area. Groundwater elevation data will continue to be monitored in 2015 to evaluate any ongoing trends.

4.2. Plant 2 Performance Monitoring

Ongoing performance groundwater monitoring results, conducted following soil excavation, showed that cleanup objectives for diesel impacted inland soils at the Plant 2 diesel tank farm had been met (see Section 3.3). However, concentrations of TPH-G and benzene were detected above cleanup levels following excavation activities in well GM-19S. Results of a subsequent investigation conducted in 2002 (TechSolv, 2003a) concluded that TPH-G and benzene detected in Well GM-19S was from an unidentified off-site source. Monitoring at Plant 2 was discontinued except for TPH-G and benzene in Monitoring Well GM-19S (Figure 27), as agreed to by Ecology (Ecology, 2004b). Additional details regarding discontinuing Plant 2 monitoring were included in previous reports (e.g. TechSolv, 2009). Well GM-19S continues to be monitored semi-annually for TPH-G and benzene during the first and third quarters, which typically corresponds with the groundwater elevation seasonal high and low, respectively. The results of monitoring for TPH-G and benzene in 2014 are included in Table 6. Detected concentrations of benzene and TPH-G were below the associated cleanup levels in both quarters in 2014. Benzene concentrations last exceeded the associated cleanup level in the third quarter of 2013. TPH-G concentrations in GM-19S have been below the cleanup level since 2007.

4.3. Data Validation

Laboratory analytical results were reported with associated laboratory quality assurance/quality control data. The analytical reports were reviewed and the data were validated per the requirements of the CAP. Data validation resulted in qualification of some analytical results. Data qualifiers modify the values reported by the laboratory, but do not affect our understanding of the overall conditions of the Site. The data qualifiers are included in Tables 7 and 8. Laboratory reports and additional information regarding the justification for data qualification are retained at the TechSolve and are available upon request. All data qualifiers from the four quarters of 2014 were relatively minimal and were included with quarterly progress reports submitted to Ecology.

5. Additional Activities

Notable additional activities that occurred in 2014 included conducting a 5-year review with Ecology and the continuing preparation for the proposed replacement of a portion of the seawall. These activities are discussed in further detail below.

5.1. Third 5-Year Review

In 2014, Ecology initiated the Third Five Year Review. This review of cleanup actions and monitoring results is performed by Ecology to ensure that human health and the environment are being protected at the Site. This review focused on the last five years from 2010 to 2014. In addition to the review of past reports and data, Ecology conducted a site visit on December 4, 2014 and conducted interviews with the BP Project Manager and consultants.

The review, site visit, and interviews were utilized by Ecology to develop a Periodic Review Report (PRR) for BP Harbor Island Terminal for 2010 through 2014. The PRR satisfied the requirements for the state MTCA periodic review; and is being used to assist the EPA Five-Year Review for the Harbor Island Superfund Site. A public comment period on the PRR was held December 19, 2014 through January 26, 2015. Ecology notified BP that the PRR was finalized in March 2015 (Ecology, 2015a).

Ecology stated (Ecology, 2015b) that the PRR report shows that the BP Terminal and the two other petroleum terminals at Harbor Island are in compliance with the MTCA requirements and legal agreement called the Consent Decree. The report shows that the cleanup actions completed appear to be protective of human health and the environment, and some cleanup actions will continue at specific locations with groundwater compliance monitoring.

Based on this periodic review for 2010 through 2014, Ecology has determined that the requirements of the Consent Decree for BP Harbor Island Terminal are being met and no additional cleanup actions are required other than continued specific cleanup actions and compliance monitoring. Next periodic review is scheduled for 2019.

5.2. Proposed Seawall Replacement

In 2010, BP initiated plans to install a new seawall waterward of the existing timber bulkhead that acts to separate the Duwamish West Waterway from Plant 1. The project is intended to provide a long-term solution to the seismic protection of the Site. Seawall design details have been provided to Ecology and were summarized in previous reports (TechSolve, 2013 and TechSolve, 2014).

The Army Corp of Engineers (ACOE) is yet to approve project permitting and the timeline for installing the new seawall and is yet to be finalized. Changes to the final designs may occur and will be provided to Ecology when available.

Seawall designs and construction activities have been reviewed to ensure compliance with the requirements of the Consent Decree and Restrictive Covenant, and have been modified to avoid potentially damaging existing remediation system components and monitoring wells. Ecology will be notified and consulted if modifications or alterations to the monitoring well network or recovery systems are required.

Recovery system components located adjacent to the seawall will be inspected for integrity throughout seawall construction will be repaired or replaced, as needed, if damaged. Best management practices will be implemented during construction, such as booming waterways to contain sheens generated by construction activities.

Installation of the seawall will affect hydrology at the Site and waterfront groundwater/LNAPL recovery system groundwater capture. Formal evaluations of the seawall's impact on Site hydrology will be conducted following completion of the seawall installation, as agreed to by Ecology (Ecology, 2012).

6. Summary of Activities/Conclusions

Activities completed at the Site during 2014 and resulting conclusions are summarized below.

- Operation of the groundwater/LNAPL recovery system continues to protects the Duwamish Waterway by removing petroleum hydrocarbons from groundwater. The system provides hydraulic control along the waterfront and is helping to achieve cleanup objectives.

- Maintenance and inspection of the groundwater/LNAPL recovery system indicate the system operates as designed, is intact, and can continue operation. Detailed corrosion evaluations continue to be conducted annually. Field staff continue to conduct routine inspections to ensure system integrity and system components are replaced or upgraded as necessary. Well redevelopment activities are also conducted to maintain groundwater production in wells.

- Recovery systems have removed most recoverable LNAPL from beneath the warehouse and truck loading rack areas. LNAPL was only detected as a sheen or thin film in a few wells and the frequency of sheens observed during monthly monitoring is decreasing.

- Monitoring results show that remediation systems have reduced both dissolved hydrocarbons in groundwater and the frequency of hydrocarbon sheens in the Duwamish Waterway. Concentrations of IHSs have been below cleanup levels in most waterfront recovery wells. All compliance wells were below cleanup levels in 2014, with the exception of benzene in Well AMW-01 in a single quarter. The frequency of benzene detections above the cleanup level in this well has decreased. Well AMW-01 exceeded the benzene standard in only the first quarter of 2014, continuing reduction in both the frequency of benzene exceedances and benzene concentrations in this well.

- Groundwater data collected in and down-gradient of a former soil hot spot area at Plant 1 indicate that remedial actions have stabilized and reduced petroleum hydrocarbons in this area. Some residual hydrocarbons may remain in inaccessible soils in this area, affecting groundwater during seasonal highs. The bulk of residual hydrocarbons have been captured directly, and indirectly degraded by enhanced biodegradation, from SVE operation. Since 2008, operation of the Inland SVE System has recovered 1,291 gallons of TPH-G. SVE has also contributed to the enhanced biodegradation of an estimated 4,355 gallons. The quantities of hydrocarbons both being captured and biodegraded by the SVE system have greatly reduced over time, indicating that the system has captured or degraded most of the available hydrocarbons in this area.

- Groundwater monitoring activities through 2014 at Plant 2 show a continuing reduction in dissolved hydrocarbons detected in Monitoring Well GM-19S, which is impacted by an off-site source. TPH-G and benzene concentrations in groundwater have steadily declined in GM-19S over time. TPH-G concentrations have been below the cleanup level

for the past 6 years and benzene concentrations exceeded the cleanup level only once in the past 3 years. All other remediation and monitoring activities required for this portion of the Site have been successfully completed.

- A new seawall is proposed to be installed waterward of the existing Island bulkhead along the waterfront at Plant 1 to enhance seismic stability of the Site. Seawall designs are reviewed and shares with Ecology to ensure compliance with the requirements of the Consent Decree. Ecology will be notified and consulted if the new seawall will require modification of monitoring wells or recovery systems. The effects of the new seawall on the Site hydrology and continuing remedial actions will be fully evaluated following seawall installation, as previously discussed with Ecology.

- Ecology conducted a five-year review for the period from 2010 to 2014. The review was finalized in early 2015 and determined that the requirements of the Consent Decree are being met and that no additional cleanup actions are required other than continuing the ongoing specific cleanup actions and compliance monitoring.

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TABLES

1. Waterfront Groundwater Petroleum Hydrocarbon History and Recovery Rates
2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
3. Waterfront Systems Recovered Petroleum Hydrocarbon History
4. Containment Boom Sheen Monitoring
5. Inland SVE System Petroleum Hydrocarbon Recovery Rates
6. Groundwater Monitoring Analytical Results for TPH and Benzene
7. Groundwater Monitoring Analytical Results for cPAHs
8. Monthly Groundwater LNAPL and Sheen Monitoring
9. 2014 Quarterly Performance Monitoring Groundwater Elevations

Table 1. Waterfront Groundwater System Petroleum Hydrocarbon History and Recovery Rates
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington

GROUNDWATER SYSTEM EFFICIENCIES

SAMPLE DATE	UNITS	Influent Benzene	Effluent Benzene	% Reduction	Influent Diesel	Effluent Diesel	% Reduction	Influent Ethylbenzene	Effluent Ethylbenzene	% Reduction	Influent Gasoline	Effluent Gasoline	% Reduction	Influent Oil	Effluent Oil	% Reduction	Influent Toluene	Effluent Toluene	% Reduction	Influent Xylenes	Effluent Xylenes	% Reduction
2002 Averages	µg/L	225.3	14.3	91%	7,315	7,020	4%	55.2	6.2	75%	1,770	336	82%	831	804	5%	17.0	2.5	88%	88.8	9.9	87%
2003 Averages	µg/L	137.7	19.5	76%	4,945	4,648	-1%	44.5	12.9	69%	1,854	678	62%	760	763	0%	42.7	5.4	61%	154.1	50.3	68%
2004 Averages	µg/L	93.5	3.2	82%	10,285	9,342	-6%	76.8	4.7	79%	4,383	840	59%	762	1,026	-8%	116.6	2.2	82%	356.6	23.0	75%
2005 Averages	µg/L	76.7	14.5	84%	4,162	5,987	-9%	170.8	45.4	81%	10,090	3,229	70%	864	750	15%	566.9	121.0	84%	1,327.7	367.9	78%
2006 Averages	µg/L	38.9	1.2	89%	11,263	2,174	42%	42.1	0.9	90%	4,944	202	94%	665	666	0%	55.6	0.8	77%	485.1	5.2	96%
2007 Averages	µg/L	8.8	1.5	60%	1,223	906	18%	6.6	0.8	56%	407	115	63%	598	598	0%	1.0	0.5	21%	19.8	1.9	50%
2008 Averages	µg/L	10.0	1.1	70%	540	468	6%	5.5	0.7	39%	279	76	61%	505	504	0%	0.7	0.5	40%	10.6	1.6	65%
2009 Averages	µg/L	5.2	1.0	48%	369	561	8%	4.1	1.6	31%	407	182	46%	497	489	2%	0.8	0.7	44%	15.2	7.4	33%
2010 Averages	µg/L	3.9	0.7	76%		2,193	*NA*	6.8	1.7	78%	915	336	*65%*		*410*	*NA*	*0.9*	*0.9*	*NA*	26	6.7	69%
2011 Averages	µg/L	3.2	0.5	80%		1,714	*NA*	2.4	1.0	53%	439	89	*69%*		*492*	*NA*	*1.0*	*1.0*	*NA*	7	3.0	29%
2012 Averages	µg/L	3.6	1.3	48%		2,787	*NA*	1.9	1.2	37%	362	144	*61%*		*636*	*NA*	*1.0*	*1.0*	*NA*	6	3.4	48%
2013 Averages	µg/L	1.0	0.5	45%		1,333	*NA*	1.1	0.5	49%	356	124	*57%*		*433*	*NA*	*0.5*	*0.5*	*NA*	2	1.0	78%
1/14/2014	µg/L	12	*0.15*	99%		780	*NA*	1.9	*0.15*	92%	440	22	*95%*		160	*NA*	2.0	*0.15*	*93%*	3.5	*0.45*	87%
2/11/2014	µg/L	0.33	*0.15*	55%		1,600	*NA*	0.33	*0.15*	55%	800	150	*81%*		230	*NA*	*0.15*	*0.15*	*NA*	1.5	*0.45*	70%
3/20/2014	µg/L	1.4	*1.1*	21%		1,600	*NA*	*0.89*	*0.89*	NA	530	19	96%		280	*NA*	*0.89*	*0.89*	*NA*	*0.82*	*0.82*	*NA*
4/16/2014	µg/L	2.2	0.24	89%		2,400	*NA*	0.66	*0.13*	80%	1,400	470	66%		260	*NA*	0.58	*0.16*	*72%*	1.8	0.19	89%
5/21/2014	µg/L	0.24	*0.14*	42%		820	*NA*	0.27	*0.13*	52%	360	52	*86%*		230	*NA*	0.44	*0.16*	*64%*	3.6	*0.12*	97%
6/19/2014	µg/L	0.43	0.16	63%		510	*NA*	*0.13*	*0.13*	NA	290	180	*38%*		65	*NA*	*0.16*	*0.16*	*NA*	0.33	*0.12*	64%
7/24/2014	µg/L	*0.7*	*0.14*	80%		1,000	*NA*	*0.65*	*0.1*	80%	240	24	*90%*		180	*NA*	*0.2*	*0.2*	*NA*	*0.6*	0.31	48%
8/13/2014	µg/L	1	*0.70*	30%		2,700	*NA*	1.5	0.79	47%	1,500	310	*79%*		360	*NA*	*0.8*	*0.8*	*NA*	4.7	2.6	45%
9/17/2014	µg/L	0.28	*0.14*	50%		2,400	*NA*	0.15	*0.13*	12%	150	*10*	*93%*		340	*NA*	*0.16*	*0.16*	*NA*	0.35	*0.12*	66%
10/15/2014	µg/L	0.44	*0.14*	68%		880	*NA*	0.17	*0.13*	24%	190	32	*83%*		48	*NA*	*0.16*	*0.16*	*NA*	0.30	*0.12*	60%
11/18/2014	µg/L	0.33	*0.14*	58%		2,500	*NA*	0.13	*0.13*	0%	230	*64*	*72%*		350	*NA*	*0.16*	*0.16*	*NA*	0.21	*0.15*	29%
12/17/2014	µg/L	0.86	*0.14*	84%		3,200	*NA*	0.16	*0.13*	19%	340	*130*	*62%*		330	*NA*	*0.16*	*0.16*	*NA*	0.15	*0.12*	20%
SURFACE WATER CLEANUP LEVELS		71 µg/L			10,000 µg/L			NA			1,000 µg/L			10,000 µg/L			NA			NA		
KCDNR DISCHARGE LIMITS			70 µg/L			100,000 µg/L			1,700 µg/L			NA			100,000 µg/L			1,400 µg/L			NA	
2014 Averages		1.7 µg/L	.28 µg/L	61%	NA	1,699 µg/L	NA	.58 µg/L	.25 µg/L	46%	539 µg/L	122 µg/L	1 µg/L	NA	236 µg/L	NA	.49 µg/L	.27 µg/L	NA	1.5 µg/L	.46 µg/L	61%

METRO DISCHARGE DATA

Observation Date	Days Operational since last monitoring reading	Average flow (GPM)	Total Flow Between Observation dates (gallons)	Pounds of Benzene Removed	Pounds of Gasoline Removed	Pounds of Diesel Removed	Pounds of Oil Removed	Pounds of Toluene Removed	Pounds of Ethylbenzene Removed	Pounds of Xylenes Recovered	Total Gallons Gas, Diesel, and Oil
2002 Totals and Averages	65	4.18	322,785	0.62	4.99	19.42	2.30	0.05	0.13	0.22	**3.90**
2003 Totals and Averages	361	8.03	4,114,867	4.43	62.20	169.14	26.05	1.18	1.47	5.05	**37.76**
2004 Totals and Averages	338	9.58	4,570,461	3.54	175.70	419.25	28.95	5.35	3.16	14.66	**92.43**
2005 Totals and Averages	359	11.17	5,827,144	3.43	447.43	155.78	41.55	25.29	7.69	59.98	**100.52**
2006 Totals and Averages	365	6.40	3,220,733	0.80	192.72	663.65	19.09	2.85	1.89	20.04	**128.92**
2007 Totals and Averages	360	3.17	1,599,607	0.15	9.08	18.30	8.40	0.02	0.11	0.48	**5.20**
2008 Totals and Averages	363	3.19	1,645,810	0.14	3.95	7.21	6.95	0.01	0.08	0.15	**2.59**
2009 Totals and Averages	369	2.98	1,569,390	0.07	5.75	7.81	6.40	0.01	0.06	0.22	**2.89**
2010 Totals and Averages	372	2.17	1,185,127	0.04	8.62	18.84	4.26	0.01	0.05	0.19	**4.66**
2011 Totals and Averages	355	1.90	949,880	0.03	5.13	17.55	3.54	0.01	0.03	0.13	**3.81**
2012 Totals and Averages	371	1.89	948,600	0.03	3.97	25.92	3.47	0.01	0.02	0.04	**4.81**
2013 Totals and Averages	365	1.33	700,450	0.01	2.26	8.80	3.43	0.00	0.01	0.02	**2.08**
1/14/2014	27	1.66	64,520	0.0036	0.26	0.61	0.12	0.0008	0.0008	0.0017	**0.14**
2/11/2014	28	1.23	49,470	0.0025	0.26	0.49	0.08	0.0004	0.0005	0.0010	**0.12**
3/19/2014	36	1.75	90,820	0.0007	0.50	1.21	0.19	0.0004	0.0005	0.0009	**0.28**
4/16/2014	26	1.33	49,920	0.0007	0.40	0.83	0.11	0.0003	0.0003	0.0005	**0.20**
5/21/2014	35	1.37	69,150	0.0007	0.51	0.93	0.14	0.0003	0.0003	0.0016	**0.23**
6/19/2014	29	1.57	65,510	0.0002	0.18	0.36	0.08	0.0002	0.0001	0.0011	**0.09**
7/24/2014	5	2.53	18,220	0.0001	0.04	0.11	0.02	0.0000	0.0001	0.0001	**0.03**
8/13/2014	20	1.52	43,850	0.0003	0.32	0.68	0.10	0.0002	0.0004	0.0010	**0.16**
9/17/2014	35	1.53	77,300	0.0004	0.53	1.64	0.23	0.0003	0.0005	0.0016	**0.35**
10/15/2014	28	1.69	68,190	0.0002	0.10	0.93	0.11	0.0001	0.0001	0.0002	**0.16**
11/19/2014	35	1.59	80,090	0.0003	0.14	1.13	0.13	0.0001	0.0001	0.0002	**0.20**
12/17/2014	28	2.09	84,440	0.0004	0.20	2.01	0.24	0.0001	0.0001	0.0001	**0.35**
2014 Totals and Averages	332	1.66	761,480	0.01	3.43	10.95	1.55	0.00	0.00	0.01	**2.33**
		TOTALS:	**27,044,244 gal**	**13.30**	**925.22**	**1542.61**	**155.96**	**34.79**	**14.71**	**101.19**	
Maximum permitted GPM:		**27.8**	**Gallons Gas, Diesel, & Oil Recovered:**	**150.44**	**221.00**	**20.44**		**TOTAL GALLONS RECOVERED:**			**391.89**

Oil Water Separator Data

Observation Date	Monthly LNAPL Recovery (gal)
February-03	19.6
April-03	6.9
May-03	2.5
July-03	2
December-03	20
January-04	25
June-04	35
August-04	50
September-04	8
November-04	10
December-04	3.5
January-05	0
February-05	35
July-05	110
February-06	5
March-06	2
December-06	30
March-08	30
Total Gallons LNAPL Recovered	**395**

TOTAL PETROLEUM RECOVERY	
Total lbs Dissolved Gas, Diesel, and Oil Recovered in Groundwater (2002-Present)	2,624 lbs
Total Gallons Dissolved Gas, Diesel, and Oil Recovered in Groundwater (2002-Present)*	**392 gal**
Total Gallons LNAPL Recovered by Final Recovery System (2002-Present)	**395 gal**
Total Gallons LNAPL Recovered by Interim Recovery System (1992-2002)	**9,312 gal**
Total Gallons of TPH Vapor Recovered by Final SVE System (2003-2008)**	**2,334 gal**
Total Gallons of TPH Vapor Recovered by Interim SVE System (1996-2002)**	**1,248 gal**
Total Gallons TPH Recovered from Final SVE System due to Biodegradation (2003-2008)***	**11,411 gal**
Total Gallons TPH Recovered from Interim SVE System due to Biodegradation (1996-2002)***	**4,664 gal**
Total Gallons Recovered by Final Recovery Systems (2002-Present)	**14,532 gal**
Total Gallons Recovered by Interim Recovery Systems (1992-2002)	**15,223 gal**
Total Gallons of Petroleum Removed (1992-Present)	**29,756 gal**

Definitions:

gal - gallons
GPM - Gallons per minute
NA - Not available
LNAPL - Light non-aqueous phase liquid (oil)
SVE - Soil vapor extraction
TPH - Total petroleum hydrocarbons
µg/L - micrograms per liter

Notes:

LNAPL Recovery is recorded periodically when sufficient product has been accumulated to be transported off-site for disposal.
Influent diesel and oil samples are no longer analyzed, as influent and effluent samples are collected before and after, respectively, a diffused air stripper, which is not intended or effective at removing diesel or oil.
Effluent sample data are representative of the outflow water to King County Metro sanitary sewer.
The average µg/L of the preceding month and the month of reference are used to calculate pounds of compound removed.
If the influent concentrations are below the laboratories method detection limit, the percent reduction is calculated using the method detection limit. The actual percent reduction is ≥ the reported value.

* Calculation of lbs of Recovered Product:
To convert µg/L to lbs/gallon - (µg/L)x(3.785l/gal)=ug/gal, (ug/gal)x(ug/(2.2046x10-9lbs))=lbs/gal
lbs/gal of chemical constituent x total gallons recovered =lbs of chemical recovered
Density of Gasoline utilized for conversions from pounds to gallons is 6.15 lbs/gal
Density of Diesel utilized for conversions from pounds to gallons 6.98 lbs/gal
Density of Oil utilized for conversions from pounds to gallons 7.63 lbs/gal
Benzene, toluene, ethylbenzene, and xylenes volumes are not included in the Total Gallons calculations, as they are assumed to be included in TPH as gasoline.

** / *** SVE Recovery Calculations for TPH and Biodegradation, which are maintained in separate tables.

C = Average Influent TPH concentration (ppmv)
Q = Influent Flow Rate (SCFM)
Mc = Molecular wt. of Carbon Dioxide = 44
Mg = Molecular wt. of Gasoline = 87
Density of Gasoline for conversions is 6.15 lbs/gal

** TPH recovered by SVE system was calculated in lbs/hr = C x Q x Mg x 1.583 x 10^{-7}
1.583 x 10^{-7} is a constant and is derived as follows:
10^{-6} ppmv x 60min/1hr x 1 lb Mole/379 cu.ft.
SVE TPH recovery calculations are based on TPH concentrations in the SVE stream, SVE hrs of operation, and SVE measured flow rates.

Table 2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well ID	Date	Gasoline mg/l	Diesel mg/l	Oil mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Xylenes ug/l
RW-10	Nov-03	0.625			1.2	0.892	2.42	3.07
RW-10	Aug-04	0.661	**36.2**	3.46	0.5	0.5	0.653	1.99
RW-10	Feb-05	0.473	1.21	0.75	0.5	0.5	0.5	1.41
RW-10	Nov-05	0.420	13.3	1.63	0.5	0.5	0.5	1
RW-10	Mar-06	0.066	4.14	0.75	0.5	0.5	0.5	1
RW-10	Nov-06	0.930	3.48	1.09	0.5	0.5	0.5	1
RW-10	May-07	0.073	0.255	*0.5*	0.5	0.5	0.5	1
RW-10	Nov-07	0.246	4.65	0.841	0.5	0.5	0.5	1
RW-10	Apr-08	0.235	1.91	*0.515*	0.5	0.5	0.5	1
RW-10	Nov-08	0.347	8.21	0.946	0.5	0.5	0.5	1
RW-10	Apr-09	0.448	5.95	0.804	0.5	0.5	0.5	1.36
RW-10	Nov-09	0.320	5.2	0.78	*0.5*	*1*	*1*	*2*
RW-10	Apr-10	0.460	2.3	*0.49*	*0.5*	*1*	*1*	*2*
RW-10	Nov-10	0.251	2.4	0.65	*0.5*	*1*	*1*	*3*
RW-10	Apr-11	0.6	1.5	0.68	*0.5*	*1*	*1*	*3*
RW-10	Nov-11	0.171	0.22	*0.39*	*0.5*	*1*	*1*	*3*
RW-10	Apr-12	0.366	0.51	0.46	*0.5*	*1*	*1*	*3*
RW-10	Nov-12	*0.1*	*0.11*	*0.11*	*0.5*	*0.5*	*0.5*	*1.5*
RW-10	Apr-13	0.2	0.36	*0.49*	*0.5*	*0.5*	*0.5*	*0.5*
RW-10	Nov-13	0.13	*0.25*	*0.25*	*0.5*	*0.5*	*0.5*	*1*
RW-10	Apr-14	0.16	1.6	0.73	*0.14*	*0.16*	*0.13*	0.13
RW-10	Nov-14	0.11	0.78	0.36	*1.0*	*1.0*	*1.0*	*3.0*
RW-10	Average	0.3	4.5	0.8	0.5	0.7	0.7	1.7
RW-9	Nov-03	**13.10**			5	43.2	146	1180
RW-9	Aug-04	**1.24**	**94.9**	2.19	0.5	0.5	1.23	1.64
RW-9	Feb-05	0.907	**22.1**	<15	0.5	0.5	3.64	4.74
RW-9	Nov-05	0.568	4.31	0.708	0.5	0.5	0.968	1.45
RW-9	Mar-06	0.166	1.68	0.75	0.5	0.5	0.5	1
RW-9	Nov-06	0.359	5.98	1.17	0.5	0.5	0.647	1.09
RW-9	May-07	0.402	2.08	*0.5*	5.43	0.5	1.4	1.49
RW-9	Nov-07	0.184	**70.1**	**11.6**	0.5	*0.5*	*0.5*	*1*
RW-9	Apr-08	0.170	**18.2**	2.94	3.21	*0.5*	*0.5*	*1*
RW-9	Nov-08	0.130	**49.5**	8.21	0.5	*0.5*	*0.5*	*1*
RW-9	Apr-09	0.280	**45.1**	6.71	0.5	*0.5*	*0.5*	*1*
RW-9	Nov-09	0.670	**32**	6.8	1.5	*1*	*1*	*2*
RW-9	Apr-10	**6.0**	**110**	**24**	*0.5*	*1*	*1*	*2*
RW-9	Nov-10	0.207	2.0	0.53	*0.5*	*1*	*1*	*3*
RW-9	Apr-11	**1.12**	**276**	**45.9**	*0.5*	*1*	*1*	*3*
RW-9	Nov-11	0.289	2.3	*0.39*	*0.5*	*1*	*1*	*3*
RW-9	Apr-12	0.113	**33.2**	5.3	0.72	*1*	*1*	*3*
RW-9	Nov-12	*0.1*	8.2	8.4	0.5	*0.5*	*0.5*	*1.5*
RW-9	Apr-13	0.1	**44.0**	8.5	*0.5*	*0.5*	*0.5*	*0.5*
RW-9	Nov-13	0.062	**14.0**	2.6	*0.5*	*0.5*	*0.5*	*1*
RW-9	Apr-14	0.14	**56.0**	**16**	*0.14*	*0.16*	*0.13*	*0.12*
RW-9	Nov-14	0.14	7.1	2.7	*1.0*	*1.0*	*1.0*	*3.0*
RW-9	Average	**1.2**	**42.8**	7.8	1.1	2.6	7.5	55.3
RW-8	Nov-03	0.367			0.5	0.5	0.787	2.23
RW-8	Aug-04	0.181	**19.8**	2.19	0.5	0.5	0.53	2.13
RW-8	Feb-05	0.218	2.58	0.75	0.5	0.5	0.564	3.04
RW-8	Nov-05	0.099	0.575	0.721	0.5	0.5	0.5	1
RW-8	Mar-06	0.050	1.44	0.75	0.5	0.5	0.5	1
RW-8	Nov-06	0.050	3.58	0.762	0.5	0.5	0.5	1
RW-8	May-07	0.068	0.273	*0.5*	0.5	0.5	0.5	1
RW-8	Nov-07	0.065	0.29	0.543	0.5	0.5	0.5	1
RW-8	Apr-08	0.067	0.279	*0.529*	0.5	0.5	0.5	1
RW-8	Nov-08	0.088	3.85	0.492	0.5	0.5	0.5	1
RW-8	Apr-09	0.091	0.255	*0.476*	0.5	0.5	0.5	1
RW-8	Nov-09	0.140	1.3	*0.47*	*0.5*	*1*	*1*	*2*
RW-8	Apr-10	0.150	1.1	*0.49*	*0.5*	*1*	*1*	*2*
RW-8	Nov-10	0.105	1.0	*0.39*	*0.5*	*1*	*1*	*3*
RW-8	Apr-11	0.0995	2.6	0.59	*0.5*	*1*	*1*	*3*
RW-8	Nov-11	0.183	1.7	*0.39*	*0.5*	*1*	*1*	*3*
RW-8	Apr-12	*0.05*	1.3	*0.39*	*0.5*	*1*	*1*	*3*
RW-8	Nov-12	0.185	4.0	3.6	*0.5*	*0.5*	*0.5*	*1.5*
RW-8	Apr-13	0.062	2.7	0.52	*0.5*	*0.5*	*0.5*	*0.5*
RW-8	Nov-13	0.1	0.82	*0.25*	*0.5*	*0.5*	*0.5*	*1*
RW-8	Apr-14	0.13	3.40	0.91	0.15	*0.16*	*0.13*	0.52
RW-8	Nov-14	0.14	**10.0**	3.2	*1.0*	*1.0*	*1.0*	*3.0*
RW-8	Average	0.1	3.0	0.9	0.5	0.6	0.7	1.7
Groundwater Cleanup Level		**1.0**	**10.0**	**10.0**	**71**			
Reporting Limits/Units		0.05 mg/l	0.25 mg/l	.750 mg/l	0.5 ug/l	0.5 ug/l	0.5 ug/l	1.0 ug/l

Table 2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well ID	Date	Gasoline mg/l	Diesel mg/l	Oil mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Xylenes ug/l
RW-7	Nov-03	0.148			0.5	0.5	0.518	2.87
RW-7	Aug-04	0.050	7.6	1.2	0.5	0.5	0.5	1.09
RW-7	Feb-05	0.050	1.21	0.75	0.5	0.5	0.5	1
RW-7	Nov-05	0.050	0.35	0.728	0.5	0.5	0.5	1
RW-7	Mar-06	0.050	0.25	0.75	0.5	0.5	0.5	1
RW-7	Nov-06	0.063	3.16	1.34	0.5	0.5	0.5	1
RW-7	May-07	0.414	0.49	*0.515*	0.5	0.5	0.5	1
RW-7	Nov-07	0.187	0.25	*0.5*	0.5	0.5	0.5	1
RW-7	Apr-08	0.063	0.25	*0.5*	0.5	0.5	0.5	1
RW-7	Nov-08	0.071	0.236	*0.472*	0.5	0.5	0.5	1
RW-7	Apr-09	0.123	0.238	*0.476*	0.5	0.5	0.5	1
RW-7	Nov-09	0.075	0.69	*0.47*	*0.5*	*1*	*1*	*2*
RW-7	Apr-10	0.140	0.85	*0.49*	*0.5*	*1*	*1*	*2*
RW-7	Nov-10	0.11	0.46	*0.4*	*0.5*	*1*	*1*	*3*
RW-7	Apr-11	0.207	1.1	*0.41*	*0.5*	*1*	*1*	*3*
RW-7	Nov-11	*0.05*	0.13	*0.4*	*0.5*	*1*	*1*	*3*
RW-7	Apr-12	*0.05*	0.21	*0.42*	*0.5*	*1*	*1*	*3*
RW-7	Nov-12	*0.1*	0.32	0.37	*0.5*	*0.5*	*0.5*	*1.5*
RW-7	Apr-13	0.081	0.63	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
RW-7	Nov-13	*0.05*	0.45	*0.24*	*0.5*	*0.5*	*0.5*	*1*
RW-7	Apr-14	0.07	2.4	0.6	0.17	*0.16*	0.17	0.23
RW-7	Nov-14	0.064	0.92	*0.25*	*1.0*	*1.0*	*1.0*	*3.0*
RW-7	Average	0.1	1.1	0.6	0.5	0.6	0.6	1.6
RW-1	Nov-03	0.858	8.73	1.34	1.03	0.758	2.71	3.39
RW-1	Aug-04	**1.00**	**31.6**	2.08	0.685	0.787	2.1	4.18
RW-1	Feb-05	**1.03**	**18.9**	0.75	10.5	4.66	4.06	20.2
RW-1	Nov-05	0.547	2.19	0.708	0.5	0.5	0.5	1.67
RW-1	Mar-06	0.144	4.78	0.802	0.5	0.5	0.5	1
RW-1	Nov-06	0.173	3.28	*0.487*	0.5	0.5	0.5	1
RW-1	May-07	0.081	0.972	*0.526*	0.5	0.5	0.5	1
RW-1	Nov-07	0.056	0.596	*0.505*	0.5	0.5	0.5	1
RW-1	Apr-08	0.068	0.25	*0.5*	0.5	0.5	0.5	1
RW-1	Nov-08	0.050	0.274	*0.472*	0.5	0.5	0.5	1
RW-1	Apr-09	0.074	0.332	*0.481*	0.5	0.5	0.5	1
RW-1	Nov-09	0.073	0.44	*0.47*	*0.5*	*1*	*1*	*2*
RW-1	Apr-10	0.071	0.31	*0.49*	*0.5*	*1*	*1*	*2*
RW-1	Nov-10	0.143	0.32	*0.39*	*0.5*	*1*	*1*	*3*
RW-1	Apr-11	0.0991	0.95	*0.39*	*0.5*	*1*	*1*	*3*
RW-1	Nov-11	0.14	6.9	1.6	*0.5*	*1*	*1*	*3*
RW-1	Apr-12	0.131	0.86	*0.4*	0.53	*1*	*1*	*3*
RW-1	Nov-12	*0.1*	0.23	0.35	*0.5*	*0.5*	*0.5*	*1.5*
RW-1	Apr-13	0.15	0.47	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
RW-1	Nov-13	0.12	0.4	*0.25*	*0.5*	*0.5*	*0.5*	*1*
RW-1	Apr-14	0.17	0.9	0.34	0.3	*0.16*	0.35	0.44
RW-1	Nov-14	0.19	0.72	*0.25*	*1.0*	*1.0*	*1.0*	*3.0*
RW-1	Average	0.2	3.8	0.6	1.0	0.9	1.0	2.7
RW-6	Nov-03	**1.81**			**569**	23.1	10	116
RW-6	Aug-04	0.067	0.25	0.75	0.5	0.5	0.5	1
RW-6	Feb-05	0.101	0.25	0.75	0.5	0.5	0.788	1.3
RW-6	Nov-05	**8.19**	**115**	***14.7***	7.62	2.56	53.6	524
RW-6	Mar-06	**31.80**	**560**	**300**	12.7	9.15	96.7	568
RW-6	Nov-06	**1.14**	**26.8**	*1.05*	0.591	0.5	0.636	10
RW-6	May-07	**1.02**	**38.9**	*5.05*	34	1.44	16.6	15.2
RW-6	Nov-07	0.05	1.9	*5.32*	0.5	0.5	0.5	1
RW-6	Apr-08	0.33	5.56	0.542	10.2	1.22	9.56	6.9
RW-6	Nov-08	0.05	0.734	*0.472*	0.5	0.5	0.5	1
RW-6	Apr-09	0.175	1.14	*0.476*	6.93	0.5	3.08	3.32
RW-6	Nov-09	*0.050*	0.73	*0.47*	*0.5*	*1*	*1*	*2*
RW-6	Apr-10	**1.10**	3.2	*0.49*	53	2	9.4	6.7
RW-6	Nov-10	0.266	2.5	*0.39*	*0.5*	*1*	*1*	*3*
RW-6	Apr-11	0.595	*0.37*	*0.41*	15.1	*1*	9.5	6.7
RW-6	Nov-11	*0.05*	0.21	*0.38*	*0.5*	*1*	*1*	*3*
RW-6	Apr-12	*0.05*	0.98	*0.4*	1.1	*1*	*1*	*3*
RW-6	Nov-12	*0.1*	*0.11*	*0.11*	*0.5*	*0.5*	*0.5*	*1.5*
RW-6	Apr-13	0.18	1.1	*0.49*	0.82	*0.5*	*0.5*	0.55
RW-6	Nov-13	0.052	0.29	*0.25*	*0.5*	*0.5*	*0.5*	*1*
RW-6	Apr-14	0.19	1.4	0.36	2.1	0.34	1.3	0.64
RW-6	Nov-14	0.068	0.46	*0.25*	*1.0*	*1.0*	*1.0*	*3.0*
RW-6	Average	**2.2**	**36.3**	**15.9**	32.7	2.3	10.0	58.1
Groundwater Cleanup Level		**1.0**	**10.0**	**10.0**	**71**			
Reporting Limits/Units		0.05 mg/l	0.25 mg/l	.750 mg/l	0.5 ug/l	0.5 ug/l	0.5 ug/l	1.0 ug/l

Table 2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well ID	Date	Gasoline mg/l	Diesel mg/l	Oil mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Xylenes ug/l
RW-5	Nov-03	**2.10**	4.13	0.75	5.21	0.657	83.5	186
RW-5	Aug-04	**7.60**	**14.5**	1.55	1.93	1.67	324	630
RW-5	Feb-05	**3.18**	**17.4**	***15***	**37.8**	40	38.5	287
RW-5	Nov-05	**19.60**	**1240**	***361***	**43.2**	42	66.2	879
RW-5	Mar-06	**1.79**	**13.3**	7.5	1.06	24.2	8.03	129
RW-5	Nov-06	0.741	8	1.67	0.5	0.5	0.732	4.23
RW-5	May-07	**2.920**	**13.9**	2.01	22.1	0.705	16.7	60.1
RW-5	Nov-07	1.430	2.16	0.639	1.08	0.5	1.87	2.07
RW-5	Apr-08	0.240	7.71	2.17	5.64	0.5	1.19	1.48
RW-5	Nov-08	**1.520**	0.916	*0.472*	6.32	0.5	2.85	3.55
RW-5	Apr-09	0.873	**11.7**	2.45	**93.3**	2.42	8.74	16.5
RW-5	Nov-09	0.066	0.4	*0.47*	*0.5*	*1*	*1*	*2*
RW-5	Apr-10	0.570	1.4	*0.49*	7.3	*1*	15	29
RW-5	Nov-10	0.785	0.9	*0.39*	30.5	*1*	2	5.3
RW-5	Apr-11	0.801	1.3	*0.41*	10.3	*1*	3.5	7
RW-5	Nov-11	0.18	1.2	*0.39*	9.2	*1*	5.6	3.9
RW-5	Apr-12	0.746	0.35	*0.41*	14.1	*1*	6.8	26
RW-5	Nov-12	*0.1*	0.38	0.41	1.6	*0.5*	*0.5*	*1.5*
RW-5	Apr-13	0.18	**26**	2.2	0.57	*0.5*	*0.5*	*0.5*
RW-5	Nov-13	0.22	*0.25*	*0.25*	0.83	*0.5*	*0.5*	*1*
RW-5	Apr-14	0.46	2.8	0.79	5.2	0.55	1.9	4.1
RW-5	Nov-14	0.28	1.7	0.56	*1.0*	*1.0*	*1.0*	*3.0*
RW-5	Average	**2.1**	**62.3**	**18.3**	13.6	5.6	26.8	103.7
RW-4	Nov-03	**4.89**			36.1	44.3	337	281
RW-4	Aug-04	**182.0**	**681**	***150***	**617**	7740	2750	15,200
RW-4	Feb-05	**49.4**	**2,610**	***765***	**347**	2830	834	7,210
RW-4	Nov-05	**77.5**	**3,650**	***1820***	**341**	6940	1100	8,010
RW-4	Mar-06	**26.1**	**440**	**150**	30.2	654	346	3,340
RW-4	Nov-06	**7.23**	**139**	*5.26*	65.2	157	47	1,090
RW-4	May-07	0.82	8.08	*0.543*	3.97	0.547	3.89	77.5
RW-4	Nov-07	**1.29**	0.553	*0.543*	1.97	0.536	3.5	106
RW-4	Apr-08	0.07	2.91	*0.532*	0.5	0.5	0.5	4.57
RW-4	Nov-08	0.73	6.43	*0.472*	6.86	0.5	3.6	28.2
RW-4	Apr-09	0.565	7.93	*0.481*	8.17	0.5	1.43	18.3
RW-4	Nov-09	**5.5**	**25**	1.2	22	1.9	30	310
RW-4	Apr-10	**4.2**	**10**	*0.49*	46	1.6	24	155
RW-4	Nov-10	**2.61**	**20**	0.86	39.9	*1.0*	15	47.9
RW-4	Apr-11	**5.73**	**29.5**	1.2	67.9	1.2	44.8	158
RW-4	Nov-11	**4.51**	**56.2**	1.4	48.5	*1.0*	43.6	98.3
RW-4	Apr-12	**6.24**	**38.1**	1.4	56.8	*1.2*	45.3	106
RW-4	Nov-12	0.771	**10.7**	9.2	7.5	*0.5*	3.9	10.1
RW-4	Apr-13	**1.1**	7.1	*0.5*	16	*0.5*	5.4	2.32
RW-4	Nov-13	0.77	0.63	*0.25*	12	*0.5*	6.2	12
RW-4	Apr-14	**3.7**	**50**	2.7	14	0.49	14	22
RW-4	Nov-14	**1.9**	8.7	0.57	15	*1.0*	16	23
RW-4	Average	**17.6**	**371.5**	**138.7**	**82.0**	835.4	258.0	1650.5
RW-2	Nov-03	**2.07**			**820**	369	34.5	124
RW-2	Aug-04	**7.03**	46	1.41	**2,270**	382	354	1,180
RW-2	Feb-05	**4.65**	1.02	0.75	**1,690**	450	296	752
RW-2	Nov-05	**2.82**	0.76	0.708	**1,540**	299	159	353
RW-2	Mar-06	**2.39**	6.84	3.75	**1,120**	112	138	224
RW-2	Nov-06	**13.10**	**14.3**	1.05	**1,830**	516	410	1,810
RW-2	May-07	**8.25**	6.35	*0.505*	**254**	33.1	237	1,150
RW-2	Nov-07	**3.55**	3.32	*0.538*	**895**	5	79.4	172
RW-2	Apr-08	**2.06**	**10.0**	*0.515*	**245**	5	58	190
RW-2	Nov-08	**1.42**	1.1	*0.481*	**360**	4.04	17.6	40
RW-2	Apr-09	0.497	0.864	*0.476*	49	1.78	9.49	22
RW-2	Nov-09	**2.4**	2.6	*0.48*	**400**	23	150	410
RW-2	Apr-10	**1.5**	1.0	*0.49*	**200**	1.5	66	98
RW-2	Nov-10	0.36	8.1	*0.6*	34.9	*1.0*	7.7	23.3
RW-2	Apr-11	**1.0**	1.5	*0.39*	**146**	1.3	27.8	51.7
RW-2	Nov-11	0.96	0.69	*0.39*	**363**	4.7	36.5	63.8
RW-2	Apr-12	0.57	**13.9**	*0.74*	**139**	*1.0*	13.7	17.4
RW-2	Nov-12	0.71	1.0	*0.91*	**196**	1.2	11.2	8.3
RW-2	Apr-13	0.47	3.0	*0.49*	**230**	2.0	20	6.6
RW-2	Nov-13	0.40	4.6	*0.25*	**80**	2.9	6.2	5.5
RW-2	Apr-14	**2.20**	7.2	0.53	**290**	100	84	79
RW-2	Nov-14	**2.30**	3.2	0.29	**460**	10	140	140
RW-2	Average	**2.8**	6.5	0.7	**618.7**	105.7	107.1	314.6
Groundwater Cleanup Level		**1.0**	**10.0**	**10.0**	**71**			
Reporting Limits/Units		0.05 mg/l	0.25 mg/l	.750 mg/l	0.5 ug/l	0.5 ug/l	0.5 ug/l	1.0 ug/l

Table 2. Waterfront Groundwater Recovery Wells Petroleum Hydrocarbon History
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well ID	Date	Gasoline mg/l	Diesel mg/l	Oil mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Xylenes ug/l
GM-11S	Nov-03	**2.28**			**614**	38.3	67.2	141
GM-11S	Aug-04	**2.06**	**57**	3.93	**506**	2.17	49.3	84.1
GM-11S	Feb-05	**2.42**	**25.1**	<15	55.6	0.848	25.5	17.3
GM-11S	Nov-05	**2.15**	**37.4**	<7.14	**124**	3.66	13.7	5.34
GM-11S	Mar-06	**1.41**	**17.8**	7.5	**218**	2.5	24.5	5
GM-11S	Nov-06	0.131	**10.8**	*1.05*	13.5	0.5	2.86	1.59
GM-11S	May-07	**1.68**	1.1	*0.556*	**175**	2.5	81.2	35.1
GM-11S	Nov-07	**2.20**	2.34	*0.505*	56.2	4.16	48.4	34.3
GM-11S	Apr-08	**1.93**	0.319	*0.532*	65.7	1.76	185	132
GM-11S	Nov-08	**1.66**	1.23	*0.472*	**95.3**	1.76	44.5	14.8
GM-11S	Apr-09	**1.26**	0.942	*0.481*	5.34	0.898	19.1	11.1
GM-11S	Aug-09	**1.90**	1.2	*0.48*	71	2.4	37	6.3
GM-11S	Nov-09	**1.50**	3.6	*0.48*	36	1.1	48	24
GM-11S	Apr-10	**3.00**	5	0.5	46	1.6	93	156
GM-11S	Nov-10	**1.39**	1.8	*0.48*	42	1.9	64.9	37.1
GM-11S	Apr-11	**1.42**	0.52	*0.4*	18.4	*1*	26.5	20.1
GM-11S	Nov-11	**2.28**	0.47	*0.38*	30.9	1.7	22.9	10.3
GM-11S	Apr-12	**2.24**	1.1	*0.38*	33	1.7	59.2	40.4
GM-11S	Nov-12	0.671	0.83	0.62	11.4	0.86	44.6	27.9
GM-11S	Apr-13	0.5	0.35	*0.49*	20	0.52	23	9.1
GM-11S	Nov-13	0.33	0.47	0.58	4.1	0.6	10	1
GM-11S	Apr-14	**1.2**	3.9	1.4	10	0.82	23	2.7
GM-11S	Nov-14	0.72	0.83	0.4	6.5	8.7	*1.0*	*3.0*
GM-11S	Average	**1.6**	7.9	1.1	**98.2**	3.6	44.1	35.6
Groundwater Cleanup Level		**1.0**	**10.0**	**10.0**	**71**			
Reporting Limits/Units		0.05 mg/l	0.25 mg/l	.750 mg/l	0.5 ug/l	0.5 ug/l	0.5 ug/l	1.0 ug/l

Detection limits for many of the Oil analyses were raised due to sample dilution for diesel analyses.
These samples are listed with a "<" notation.
Values highlighted in bold exceed the cleanup level

Total Gallonage of Recovered Petroleum Hydrocarbons

Date	Monthly LNAPL Recovery	Dissolved LNAPL Recovery*	Cumulative LNAPL Recovery	Monthly SVE Recovery (Vapor Phase)	Monthly SVE Recovery (Biodegredation)	Cumulative SVE Recovery	Total Recovery
9-Aug-92	0.0	NA	0	NA	NA	NA	0
10-Aug-92	1.2	NA	1	NA	NA	NA	1
11-Aug-92	27.4	NA	29	NA	NA	NA	29
19-Aug-92	43.6	NA	72	NA	NA	NA	72
25-Aug-92	7.3	NA	80	NA	NA	NA	80
26-Aug-92	19.0	NA	99	NA	NA	NA	99
27-Aug-92	19.4	NA	118	NA	NA	NA	118
11-Sep-92	5.4	NA	123	NA	NA	NA	123
13-Sep-92	31.8	NA	155	NA	NA	NA	155
18-Dec-92	17.8	NA	173	NA	NA	NA	173
4-Jan-93	45.0	NA	218	NA	NA	NA	218
3-Feb-93	120.3	NA	338	NA	NA	NA	338
4-Feb-93	11.1	NA	349	NA	NA	NA	349
5-Feb-93	14.8	NA	364	NA	NA	NA	364
8-Feb-93	38.9	NA	403	NA	NA	NA	403
16-Feb-93	72.7	NA	476	NA	NA	NA	476
18-Feb-93	23.5	NA	499	NA	NA	NA	499
1-Mar-93	89.4	NA	589	NA	NA	NA	589
15-Mar-93	253.8	NA	842	NA	NA	NA	842
16-Mar-93	20.2	NA	863	NA	NA	NA	863
25-Mar-93	98.0	NA	961	NA	NA	NA	961
31-Mar-93	52.1	NA	1,013	NA	NA	NA	1,013
8-Apr-93	108.6	NA	1,121	NA	NA	NA	1,121
12-Apr-93	86.5	NA	1,208	NA	NA	NA	1,208
14-Apr-93	37.5	NA	1,245	NA	NA	NA	1,245
15-Apr-93	21.8	NA	1,267	NA	NA	NA	1,267
29-Apr-93	114.0	NA	1,381	NA	NA	NA	1,381
5-May-93	57.9	NA	1,439	NA	NA	NA	1,439
10-May-93	128.9	NA	1,568	NA	NA	NA	1,568
14-May-93	175.4	NA	1,743	NA	NA	NA	1,743
19-May-93	236.7	NA	1,980	NA	NA	NA	1,980
28-May-93	279.7	NA	2,260	NA	NA	NA	2,260
3-Jun-93	2.4	NA	2,262	NA	NA	NA	2,262
4-Jun-93	78.0	NA	2,340	NA	NA	NA	2,340
11-Jun-93	40.5	NA	2,380	NA	NA	NA	2,380
25-Jun-93	216.6	NA	2,597	NA	NA	NA	2,597
6-Jul-93	167.9	NA	2,765	NA	NA	NA	2,765
9-Jul-93	15.1	NA	2,780	NA	NA	NA	2,780
16-Jul-93	3.3	NA	2,783	NA	NA	NA	2,783
29-Jul-93	9.2	NA	2,792	NA	NA	NA	2,792
30-Oct-93	1007.6	NA	3,800	NA	NA	NA	3,800
15-Mar-94	900.0	NA	4,700	NA	NA	NA	4,700
30-Jun-94	900.0	NA	5,600	NA	NA	NA	5,600
28-Sep-94	300.0	NA	5,900	NA	NA	NA	5,900
27-Dec-94	300.0	NA	6,200	NA	NA	NA	6,200
27-Mar-95	300.0	NA	6,500	NA	NA	NA	6,500
25-Jun-95	300.0	NA	6,800	NA	NA	NA	6,800
23-Sep-95	100.0	NA	6,900	NA	NA	NA	6,900
22-Dec-95	98.0	NA	6,998	NA	NA	NA	6,998
1-Jan-96	103.0	NA	7,101	11.4	24.8	36	7,137
28-Feb-96	140.0	NA	7,241	22.7	49.6	108	7,349

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Total Gallonage of Recovered Petroleum Hydrocarbons

Date	Monthly LNAPL Recovery	Dissolved LNAPL Recovery*	Cumulative LNAPL Recovery	Monthly SVE Recovery (Vapor Phase)	Monthly SVE Recovery (Biodegredation)	Cumulative SVE Recovery	Total Recovery
28-Mar-96	229.0	NA	7,470	88.5	155.4	352	7,822
24-Apr-96	60.5	NA	7,531	64.9	126.4	544	8,074
31-May-96	56.0	NA	7,586	54.4	150.8	749	8,335
26-Jun-96	61.0	NA	7,648	60.7	139.8	949	8,597
17-Jul-96	201.9	NA	7,849	62.9	158.0	1,170	9,020
16-Aug-96	312.9	NA	8,162	85.3	242.3	1,498	9,660
18-Sep-96	216.2	NA	8,379	23.8	74.8	1,596	9,975
16-Oct-96	120.5	NA	8,499	72.9	248.3	1,918	10,417
20-Nov-96	99.3	NA	8,598	30.8	155.2	2,104	10,702
12-Dec-96	17.2	NA	8,615	8.4	79.5	2,192	10,807
16-Jan-97	38.9	NA	8,654	8.3	75.8	2,276	10,930
14-Feb-97	2.3	NA	8,657	6.4	53.8	2,336	10,993
13-Mar-97	23.1	NA	8,680	7.5	42.4	2,386	11,066
14-Apr-97	86.6	NA	8,766	14.3	16.3	2,417	11,183
15-May-97	164.9	NA	8,931	18.2	42.0	2,477	11,408
24-Jun-97	70.2	NA	9,001	0.0	0.0	2,477	11,478
24-Jul-97	41.1	NA	9,043	2.7	13.9	2,493	11,536
24-Aug-97	0.0	NA	9,043	1.9	9.6	2,505	11,547
30-Sep-97	6.26	NA	9,049	2.2	11.4	2,518	11,567
31-Oct-97	23.68	NA	9,072	0.0	0.0	2,518	11,591
30-Nov-97	9.04	NA	9,081	0.0	0.0	2,518	11,600
15-Dec-97	7.19	NA	9,089	0.5	2.5	2,521	11,610
14-Jan-98	10.29	NA	9,099	1.0	5.0	2,527	11,626
13-Feb-98	6.5	NA	9,105	3.4	17.5	2,548	11,654
16-Mar-98	5.72	NA	9,111	2.4	12.2	2,563	11,674
14-Apr-98	0.01	NA	9,111	4.1	20.9	2,588	11,699
19-May-98	0.0	NA	9,111	5.1	25.9	2,619	11,730
15-Jun-98	0.0	NA	9,111	0.6	3.1	2,622	11,734
15-Jul-98	0.0	NA	9,111	0.0	0.0	2,622	11,734
15-Aug-98	0.0	NA	9,111	0.0	0.0	2,622	11,734
15-Sep-98	0.0	NA	9,111	0.0	0.0	2,622	11,734
15-Oct-98	7.7	NA	9,119	2.6	13.1	2,638	11,757
18-Nov-98	0.33	NA	9,119	4.8	24.5	2,667	11,787
13-Dec-98	0.0	NA	9,119	3.5	18.0	2,689	11,808
14-Jan-99	0.08	NA	9,119	3.3	16.9	2,709	11,828
17-Feb-99	0.0	NA	9,119	4.6	23.8	2,737	11,857
15-Mar-99	0.0	NA	9,119	3.8	19.4	2,761	11,880
15-Apr-99	0.0	NA	9,119	4.0	20.6	2,785	11,905
13-May-99	0.0	NA	9,119	3.9	20.2	2,809	11,929
15-Jun-99	0.0	NA	9,119	3.9	19.7	2,833	11,952
15-Jul-99	0.0	NA	9,119	4.1	21.2	2,858	11,978
17-Aug-99	0.0	NA	9,119	4.0	20.6	2,883	12,002
16-Sep-99	0.0	NA	9,119	3.9	19.8	2,907	12,026
20-Oct-99	0.0	NA	9,119	4.1	20.8	2,932	12,051
19-Nov-99	0.0	NA	9,119	3.7	18.8	2,954	12,073
21-Dec-99	0.0	NA	9,119	3.7	18.9	2,977	12,096
21-Jan-00	0.0	NA	9,119	3.5	18.1	2,998	12,118
16-Feb-00	0.0	NA	9,119	3.2	16.6	3,018	12,137
21-Mar-00	0.0	NA	9,119	4.4	22.6	3,045	12,164
14-Apr-00	0.0	NA	9,119	4.5	23.2	3,073	12,192
15-May-00	0.0	NA	9,119	2.6	13.5	3,089	12,208

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Total Gallonage of Recovered Petroleum Hydrocarbons

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15-Jun-00	0.1	NA	9,119	4.2	21.3	3,114	12,234
19-Jul-00	0.0	NA	9,119	3.9	20.2	3,138	12,258
18-Aug-00	0.1	NA	9,119	1.5	7.7	3,148	12,267
20-Sep-00	7.3	NA	9,127	2.8	14.1	3,165	12,291
12-Oct-00	0.0	NA	9,127	2.4	12.3	3,179	12,306
14-Nov-00	32.9	NA	9,160	2.9	14.8	3,197	12,357
14-Dec-00	20.1	NA	9,180	2.6	13.5	3,213	12,393
11-Jan-01	0.9	NA	9,181	2.5	12.6	3,228	12,409
15-Feb-01	0.0	NA	9,181	0.5	2.5	3,231	12,412
15-Mar-01	0.2	NA	9,181	0.0	0.0	3,231	12,412
20-Apr-01	0.0	NA	9,181	0.0	0.1	3,231	12,412
18-May-01	0.0	NA	9,181	6.8	35.0	3,273	12,454
11-Jun-01	0.8	NA	9,182	10.8	55.1	3,339	12,520
24-Jul-01	0.1	NA	9,182	43.9	224.4	3,607	12,789
21-Aug-01	0.3	NA	9,182	0.0	0.0	3,607	12,789
6-Sep-01	0.1	NA	9,182	0.0	0.0	3,607	12,789
19-Oct-01	0.0	NA	9,182	13.5	69.2	3,690	12,872
15-Nov-01	106.9	NA	9,289	33.7	172.2	3,896	13,185
10-Dec-01	17.5	NA	9,306	0.0	0.0	3,896	13,202
16-Jan-02	5.6	NA	9,312	34.6	177.0	4,107	13,419
21-Feb-02	0.0	NA	9,312	39.5	202.1	4,349	13,661
15-Mar-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-Apr-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-May-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-Jun-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-Jul-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-Aug-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
24-Sep-02	0.0	NA	9,312	0.0	0.0	4,349	13,661
15-Oct-02	0.0	0.0	9,312	68.5	254.2	4,672	13,984
26-Nov-02	0.0	1.2	9,313	137.6	525.5	5,335	14,648
26-Dec-02	0.0	2.7	9,316	94.0	482.8	5,912	15,227
16-Jan-03	19.6	2.6	9,338	49.5	451.8	6,413	15,751
20-Feb-03	0.0	3.7	9,342	33.5	320.1	6,766	16,108
11-Mar-03	0.0	4.6	9,346	27.5	328.1	7,122	16,468
15-Apr-03	6.9	3.9	9,357	15.4	423.1	7,560	16,918
15-May-03	2.5	2.8	9,362	18.3	346.5	7,925	17,288
17-Jun-03	0.0	1.8	9,364	18.6	353.4	8,297	17,661
15-Jul-03	2.0	1.3	9,367	32.4	290.4	8,620	17,987
13-Aug-03	0.0	2.4	9,370	49.2	295.0	8,964	18,334
16-Sep-03	0.0	2.6	9,373	26.5	364.0	9,355	18,727
14-Oct-03	0.0	2.5	9,375	23.0	316.1	9,694	19,069
19-Nov-03	0.0	3.2	9,378	36.6	404.9	10,135	19,514
17-Dec-03	20.0	6.4	9,405	12.0	317.3	10,465	19,869
13-Jan-04	25.0	31.3	9,461	2.8	293.2	10,761	20,222
10-Feb-04	0.0	19.7	9,481	3.8	186.1	10,951	20,431
17-Mar-04	0.0	1.5	9,482	5.2	297.0	11,253	20,735
15-Apr-04	0.0	0.8	9,483	11.0	198.0	11,462	20,945
25-May-04	0.0	3.0	9,486	40.4	356.7	11,859	21,345
17-Jun-04	35.0	2.7	9,524	57.1	103.2	12,019	21,543
13-Jul-04	0.0	8.2	9,532	64.7	260.4	12,344	21,876
13-Aug-04	50.0	11.9	9,594	22.1	233.1	12,599	22,193

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Total Gallonage of Recovered Petroleum Hydrocarbons

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16-Sep-04	8.0	6.3	9,608	32.0	147.8	12,779	22,387
13-Oct-04	0.0	1.8	9,610	62.2	117.5	12,959	22,568
19-Nov-04	10.0	3.1	9,623	118.5	156.7	13,234	22,856
15-Dec-04	3.5	2.0	9,629	84.4	124.7	13,443	23,071
13-Jan-05	0.0	3.7	9,632	80.6	90.3	13,614	23,245
15-Feb-05	35.0	5.3	9,673	83.4	128.0	13,825	23,494
15-Mar-05	0.0	2.7	9,675	121.9	162.7	14,110	23,781
15-Apr-05	0.0	6.2	9,681	136.0	170.8	14,417	24,094
20-May-05	0.0	13.6	9,695	83.0	156.7	14,656	24,347
16-Jun-05	0.0	13.6	9,709	61.6	106.7	14,825	24,529
15-Jul-05	110.0	15.9	9,835	86.0	168.1	15,079	24,909
12-Aug-05	0.0	7.9	9,842	100.3	142.0	15,321	25,159
15-Sep-05	0.0	10.2	9,853	96.4	145.9	15,564	25,412
14-Oct-05	0.0	7.7	9,860	66.3	179.5	15,809	25,671
17-Nov-05	0.0	5.8	9,866	92.2	188.9	16,090	25,958
19-Dec-05	0.0	7.8	9,874	49.2	104.0	16,244	26,119
25-Jan-06	0.0	77.0	9,951	83.8	152.8	16,480	26,433
14-Feb-06	5.0	35.5	9,992	40.3	74.2	16,595	26,629
15-Mar-06	2.0	3.1	9,997	59.4	112.3	16,766	26,838
14-Apr-06	0.0	4.0	10,001	47.3	116.2	16,930	27,005
17-May-06	0.0	4.9	10,005	37.9	132.2	17,100	27,179
14-Jun-06	0.0	1.1	10,007	20.7	93.2	17,214	27,298
12-Jul-06	0.0	0.2	10,007	13.8	76.5	17,304	27,389
08-Aug-06	0.0	0.0	10,007	9.2	28.7	17,342	27,427
16-Aug-06	0.0	0.2	10,007	2.4	20.9	17,365	27,451
13-Sep-06	0.0	0.7	10,008	6.4	70.7	17,442	27,528
12-Oct-06	0.0	0.5	10,008	5.2	71.9	17,519	27,606
17-Nov-06	0.0	0.6	10,009	2.8	100.3	17,622	27,710
19-Dec-06	30.0	1.1	10,040	0.6	97.3	17,720	27,839
19-Jan-07	0.0	1.2	10,041	0.0	93.0	17,813	27,933
16-Feb-07	0.0	0.7	10,042	0.8	81.7	17,896	28,016
16-Mar-07	0.0	0.5	10,042	1.8	89.2	17,987	28,108
19-Apr-07	0.0	0.8	10,043	2.8	123.9	18,113	28,235
03-May-07	0.0	0.0	10,043	1.9	52.2	18,168	28,289
17-May-07	0.0	0.7	10,044	2.6	47.2	18,217	28,286
14-Jun-07	0.0	0.4	10,044	7.8	96.2	18,321	28,390
13-Jul-07	0.0	0.3	10,044	7.3	107.5	18,436	28,505
16-Aug-07	0.0	0.2	10,045	5.2	139.9	18,581	28,650
10-Sep-07	0.0	0.1	10,045	4.4	116.7	18,703	28,772
17-Oct-07	0.0	0.1	10,045	6.4	160.4	18,869	28,939
16-Nov-07	0.0	0.2	10,045	5.1	112.7	18,987	29,056
14-Dec-07	0.0	0.1	10,045	12.6	103.2	19,103	29,172
22-Jan-08	0.0	0.4	10,046	22.0	143.0	19,268	29,337
14-Feb-08	0.0	0.4	10,046	5.9	83.5	19,357	29,427
14-Mar-08	30.0	0.3	10,076	5.1	86.1	19,448	29,518
18-Apr-08	0.0	0.2	10,076	5.4	111.5	19,565	29,642
16-May-08	0.0	0.1	10,077	4.1	88.0	19,657	29,734
18-Jun-08	0.0	0.1	10,077	0.0	0.0	19,657	29,734
16-Jul-08	0.0	0.2	10,077	0.0	0.0	19,657	29,734
18-Aug-08	0.0	0.2	10,077	0.0	0.0	19,657	29,735
16-Sep-08	0.0	0.1	10,077	0.0	0.0	19,657	29,735

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15-Oct-08	0.0	0.1	10,077	0.0	0.0	19,657	29,735
14-Nov-08	0.0	0.2	10,078	0.0	0.0	19,657	29,735
11-Dec-08	0.0	0.1	10,078	0.0	0.0	19,657	29,735
14-Jan-09	0.0	0.2	10,078	0.0	0.0	19,657	29,735
18-Feb-09	0.0	0.1	10,078	0.0	0.0	19,657	29,736
17-Mar-09	0.0	0.1	10,078	0.0	0.0	19,657	29,736
16-Apr-09	0.0	0.1	10,078	0.0	0.0	19,657	29,736
14-May-09	0.0	0.1	10,078	0.0	0.0	19,657	29,736
16-Jun-09	0.0	0.1	10,079	0.0	0.0	19,657	29,736
22-Jul-09	0.0	0.3	10,079	0.0	0.0	19,657	29,736
17-Aug-09	0.0	0.4	10,079	0.0	0.0	19,657	29,737
14-Sep-09	0.0	0.3	10,080	0.0	0.0	19,657	29,737
20-Oct-09	0.0	0.2	10,080	0.0	0.0	19,657	29,737
18-Nov-09	0.0	0.6	10,080	0.0	0.0	19,657	29,738
15-Dec-09	0.0	0.3	10,081	0.0	0.0	19,657	29,738
21-Jan-10	0.0	1.7	10,082	0.0	0.0	19,657	29,740
17-Feb-10	0.0	0.8	10,083	0.0	0.0	19,657	29,740
17-Mar-10	0.0	0.4	10,084	0.0	0.0	19,657	29,741
15-Apr-10	0.0	0.3	10,084	0.0	0.0	19,657	29,741
19-May-10	0.0	0.3	10,084	0.0	0.0	19,657	29,741
16-Jun-10	0.0	0.1	10,084	0.0	0.0	19,657	29,742
28-Jul-10	0.0	0.1	10,084	0.0	0.0	19,657	29,742
18-Aug-10	0.0	0.0	10,084	0.0	0.0	19,657	29,742
21-Sep-10	0.0	0.1	10,084	0.0	0.0	19,657	29,742
19-Oct-10	0.0	0.1	10,084	0.0	0.0	19,657	29,742
29-Nov-10	0.0	0.1	10,085	0.0	0.0	19,657	29,742
22-Dec-10	0.0	0.7	10,085	0.0	0.0	19,657	29,743
19-Jan-11	0.0	1.2	10,087	0.0	0.0	19,657	29,744
15-Feb-11	0.0	0.5	10,087	0.0	0.0	19,657	29,744
29-Mar-11	0.0	0.5	10,088	0.0	0.0	19,657	29,745
21-Apr-11	0.0	0.2	10,088	0.0	0.0	19,657	29,745
18-May-11	0.0	0.5	10,088	0.0	0.0	19,657	29,746
14-Jun-11	0.0	0.3	10,088	0.0	0.0	19,657	29,746
20-Jul-11	0.0	0.1	10,089	0.0	0.0	19,657	29,746
17-Aug-11	0.0	0.0	10,089	0.0	0.0	19,657	29,746
14-Sep-11	0.0	0.0	10,089	0.0	0.0	19,657	29,746
11-Oct-11	0.0	0.1	10,089	0.0	0.0	19,657	29,746
22-Nov-11	0.0	0.3	10,089	0.0	0.0	19,657	29,746
13-Dec-11	0.0	0.1	10,089	0.0	0.0	19,657	29,747
23-Jan-12	0.0	1.8	10,091	0.0	0.0	19,657	29,748
14-Feb-12	0.0	0.9	10,092	0.0	0.0	19,657	29,749
13-Mar-12	0.0	0.2	10,092	0.0	0.0	19,657	29,749
16-Apr-12	0.0	0.8	10,093	0.0	0.0	19,657	29,750
16-May-12	0.0	0.5	10,093	0.0	0.0	19,657	29,751
13-Jun-12	0.0	0.1	10,093	0.0	0.0	19,657	29,751
20-Jul-12	0.0	0.1	10,093	0.0	0.0	19,657	29,751
23-Aug-12	0.0	0.2	10,094	0.0	0.0	19,657	29,751
5-Sep-12	0.0	0.1	10,094	0.0	0.0	19,657	29,751
24-Oct-12	0.0	0.2	10,094	0.0	0.0	19,657	29,751
18-Dec-12	0.0	0.0	10,094	0.0	0.0	19,657	29,751
23-Jan-13	0.0	0.5	10,094	0.0	0.0	19,657	29,752

Note: NA - The soil vapor extraction system was not brought online until January of 1996
* - Dissolved LNAPL recovery was not recorded until completion of the final remediation system in Oct 2002.

Total Gallonage of Recovered Petroleum Hydrocarbons

Date	Monthly LNAPL Recovery	Dissolved LNAPL Recovery*	Cumulative LNAPL Recovery	Monthly SVE Recovery (Vapor Phase)	Monthly SVE Recovery (Biodegredation)	Cumulative SVE Recovery	Total Recovery
21-Feb-13	0.0	0.1	10,095	0.0	0.0	19,657	29,752
13-Mar-13	0.0	0.1	10,095	0.0	0.0	19,657	29,752
17-Apr-13	0.0	0.2	10,095	0.0	0.0	19,657	29,752
22-May-13	0.0	0.1	10,095	0.0	0.0	19,657	29,752
12-Jun-13	0.0	0.1	10,095	0.0	0.0	19,657	29,752
24-Jul-13	0.0	0.3	10,095	0.0	0.0	19,657	29,753
20-Aug-13	0.0	0.2	10,095	0.0	0.0	19,657	29,753
24-Sep-13	0.0	0.1	10,096	0.0	0.0	19,657	29,753
15-Oct-13	0.0	0.0	10,096	0.0	0.0	19,657	29,753
20-Nov-13	0.0	0.2	10,096	0.0	0.0	19,657	29,753
18-Dec-13	0.0	0.2	10,096	0.0	0.0	19,657	29,753
14-Jan-14	0.0	0.1	10,096	0.0	0.0	19,657	29,754
11-Feb-14	0.0	0.1	10,096	0.0	0.0	19,657	29,754
20-Mar-14	0.0	0.3	10,097	0.0	0.0	19,657	29,754
16-Apr-14	0.0	0.2	10,097	0.0	0.0	19,657	29,754
21-May-14	0.0	0.2	10,097	0.0	0.0	19,657	29,754
19-Jun-14	0.0	0.1	10,097	0.0	0.0	19,657	29,754
24-Jul-14	0.0	0.0	10,097	0.0	0.0	19,657	29,755
13-Aug-14	0.0	0.2	10,097	0.0	0.0	19,657	29,755
17-Sep-14	0.0	0.4	10,098	0.0	0.0	19,657	29,755
15-Oct-14	0.0	0.2	10,098	0.0	0.0	19,657	29,755
19-Nov-14	0.0	0.2	10,098	0.0	0.0	19,657	29,755
17-Dec-14	0.0	0.4	10,098	0.0	0.0	19,657	29,756

Total LNAPL Recovery (gal)	Total Dissolved LNAPL Recovery* (gal)	Total LNAPL Recovery (gal)	Total SVE Recovery (vapor phase) (gal)	Total SVE Recovery (biodegredation) (gal)	Total SVE Recovery (gal)	Total Recovery (gal)
9,706	392	10,098	3,582	16,075	19,657	29,756

Note: NA - The soil vapor extraction system was not brought online until January of 1996
* - Dissolved LNAPL recovery was not recorded until completion of the final remediation system in Oct 2002.

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
1/11/2000	medium	1	no	0.0	**yes**	1.0
1/21/2000	high	2	no	0.0	no	0.0
2/16/2000	medium	1	no	0.0	no	0.0
2/22/2000	high	2	no	0.0	no	0.0
2/23/2000	medium	1	no	0.0	no	0.0
2/24/2000	low	0	no	0.0	no	0.0
3/15/2000	medium	1	no	0.0	no	0.0
3/16/2000	medium	1	no	0.0	no	0.0
3/21/2000	low	0	no	0.0	**yes**	**1.0**
4/14/2000	medium	1	no	0.0	**yes**	**1.0**
6/15/2000	low	0	no	0.0	no	0.0
6/28/2000	low	0	**yes**	**1.0**	no	0.0
6/29/2000	low	0	no	0.0	no	0.0
7/11/2000	high	2	no	0.0	no	0.0
7/19/2000	low	0	no	0.0	no	0.0
8/15/2000	low	0	no	0.0	no	0.0
10/12/2000	low	0	no	0.0	no	0.0
11/14/2000	medium	1	no	0.0	no	0.0
12/14/2000	high	2	no	0.0	no	0.0
1/11/2001	medium	1	no	0.0	no	0.0
2/15/2001	medium	1	no	0.0	no	0.0
4/12/2001	medium	1	**yes**	**1.0**	no	0.0
4/13/2001	medium	1	no	0.0	no	0.0
5/16/2001	low	0	no	0.0	no	0.0
5/17/2001	low	0	no	0.0	no	0.0
5/18/2001	low	0	no	0.0	no	0.0
5/21/2001	low	0	no	0.0	no	0.0
5/23/2001	low	0	no	0.0	no	0.0
5/29/2001	low	0	no	0.0	no	0.0
6/11/2001	medium	1	no	0.0	no	0.0
7/23/2001	low	0	no	0.0	no	0.0
8/21/2001	medium	1	no	0.0	no	0.0
9/6/2001	high	2	no	0.0	no	0.0
10/16/2001	low	0	no	0.0	no	0.0
11/15/2001	medium	1	no	0.0	no	0.0
12/10/2001	medium	1	no	0.0	no	0.0
1/4/2002	high	2	no	0.0	no	0.0
1/9/2002	medium	1	no	0.0	**yes**	**1.0**
1/11/2002	medium	1	no	0.0	**yes**	**1.0**
1/16/2002	high	2	no	0.0	**yes**	**1.0**

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
1/22/2002	medium	1	no	0.0	**yes**	**1.0**
1/23/2002	low	0	no	0.0	**yes**	**1.0**
2/4/2002	high	2	no	0.0	no	0.0
2/18/2002	medium	1	**yes**	**1.0**	no	0.0
2/21/2002	medium	1	no	0.0	**yes**	**2.0**
3/21/2002	medium	1	no	0.0	**yes**	**1.0**
3/25/2002	medium	1	no	0.0	no	0.0
3/26/2002	medium	1	no	0.0	no	0.0
3/27/2002	medium	1	no	0.0	**yes**	2.0
4/4/2002	high	2	no	0.0	no	0.0
5/3/2002	low	0	no	0.0	no	0.0
5/7/2002	medium	1	**yes**	**1.0**	no	0.0
5/21/2002	medium	1	**yes**	**1.0**	**yes**	**1.0**
6/6/2002	medium	1	**yes**	**1.0**	no	0.0
6/18/2002	low	0	no	0.0	no	0.0
6/27/2002	high	2	**yes**	**1.0**	**yes**	**1.0**
7/10/2002	medium	1	**yes**	**1.0**	**yes**	**1.0**
7/29/2002	medium	1	**yes**	**1.0**	no	0.0
8/21/2002	low	0	no	0.0	no	0.0
9/9/2002	high	2	**yes**	**1.0**	**yes**	**1.0**
9/20/2002	medium	1	**yes**	**1.0**	no	0.0
10/9/2002	high	2	no	0.0	no	0.0
11/25/2002	high	2	no	0.0	no	0.0
11/27/2002	high	2	no	0.0	no	0.0
12/19/2002	medium	1	no	0.0	no	0.0
12/20/2002	high	2	no	0.0	no	0.0
1/16/2003	medium	1	no	0.0	no	0.0
2/3/2003	medium	1	no	0.0	no	0.0
2/10/2003	medium	1	no	0.0	no	0.0
2/10/2003	low	0	no	0.0	no	0.0
2/11/2003	medium	1	no	0.0	no	0.0
2/11/2003	high	2	no	0.0	no	0.0
2/11/2003	low	0	no	0.0	no	0.0
2/12/2003	medium	1	no	0.0	no	0.0
2/13/2003	high	2	no	0.0	no	0.0
2/13/2003	medium	1	no	0.0	no	0.0
2/14/2003	high	2	no	0.0	no	0.0
2/20/2003	high	2	no	0.0	no	0.0
2/20/2003	medium	1	no	0.0	no	0.0
2/20/2003	low	0	no	0.0	no	0.0
2/21/2003	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
2/21/2003	medium	1	no	0.0	no	0.0
3/3/2003	medium	1	no	0.0	no	0.0
3/10/2003	medium	1	no	0.0	no	0.0
3/11/2003	high	2	no	0.0	no	0.0
3/18/2003	medium	1	no	0.0	no	0.0
4/1/2003	low	0	no	0.0	no	0.0
4/8/2003	high	2	no	0.0	**yes**	**2.0**
4/15/2003	low	0	no	0.0	**yes**	**2.0**
4/21/2003	high	2	no	0.0	no	0.0
5/15/2003	low	0	no	0.0	no	0.0
5/20/2003	medium	1	no	0.0	no	0.0
5/21/2003	medium	1	no	0.0	no	0.0
5/27/2003	low	0	no	0.0	no	0.0
6/3/2003	medium	1	no	0.0	no	0.0
6/17/2003	medium	1	no	0.0	no	0.0
7/15/2003	medium	1	no	0.0	no	0.0
7/21/2003	low	0	no	0.0	no	0.0
8/7/2003	low	0	no	0.0	no	0.0
8/13/2003	medium	1	no	0.0	no	0.0
9/15/2003	high	2	no	0.0	no	0.0
9/16/2003	high	2	no	0.0	no	0.0
9/17/2003	medium	1	no	0.0	no	0.0
9/19/2003	medium	1	no	0.0	no	0.0
10/9/2003	medium	1	**yes**	**1.0**	no	0.0
10/14/2003	high	2	no	0.0	no	0.0
11/12/2003	high	2	no	0.0	no	0.0
11/19/2003	high	2	no	0.0	no	0.0
12/17/2003	medium	1	no	0.0	no	0.0
12/23/2003	medium	1	no	0.0	no	0.0
1/13/2004	medium	1	no	0.0	**yes**	**1.0**
1/24/2004	high	2	no	0.0	no	0.0
2/10/2004	medium	1	no	0.0	**yes**	**1.0**
2/23/2004	medium	1	**yes**	**1.0**	no	0.0
3/17/2004	medium	1	no	0.0	no	0.0
3/19/2004	medium	1	no	0.0	no	0.0
4/15/2004	medium	1	**yes**	**1.0**	no	0.0
4/19/2004	medium	1	no	0.0	no	0.0
4/22/2004	medium	1	no	0.0	no	0.0
5/24/2004	medium	1	no	0.0	no	0.0
5/25/2004	medium	1	no	0.0	no	0.0
6/14/2004	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
6/15/2004	low	0	no	0.0	no	0.0
6/23/2004	high	2	no	0.0	no	0.0
6/28/2004	low	0	no	0.0	no	0.0
6/29/2004	medium	1	no	0.0	no	0.0
6/30/2004	medium	1	no	0.0	no	0.0
7/12/2004	low	0	no	0.0	no	0.0
7/13/2004	low	0	no	0.0	no	0.0
8/11/2004	high	2	no	0.0	no	0.0
8/12/2004	low	0	no	0.0	no	0.0
8/24/2004	medium	1	no	0.0	no	0.0
9/2/2004	high	2	no	0.0	no	0.0
9/3/2004	high	2	no	0.0	no	0.0
9/7/2004	medium	1	no	0.0	no	0.0
9/10/2004	low	0	no	0.0	no	0.0
9/16/2004	high	2	no	0.0	no	0.0
9/21/2004	medium	1	no	0.0	no	0.0
9/22/2004	medium	1	no	0.0	no	0.0
9/23/2004	medium	1	no	0.0	no	0.0
10/5/2004	medium	1	no	0.0	no	0.0
10/13/2004	medium	1	**yes**	**1.0**	no	0.0
10/15/2004	high	2	no	0.0	no	0.0
10/18/2004	high	2	no	0.0	no	0.0
10/25/2004	low	0	no	0.0	no	0.0
11/4/2004	medium	1	no	0.0	no	0.0
11/18/2004	high	2	no	0.0	no	0.0
11/23/2004	medium	1	no	0.0	no	0.0
12/3/2004	low	0	no	0.0	no	0.0
12/15/2004	high	2	no	0.0	no	0.0
12/23/2004	medium	1	no	0.0	no	0.0
1/4/2005	high	2	no	0.0	no	0.0
1/13/2005	high	2	no	0.0	no	0.0
1/21/2005	low	0	no	0.0	no	0.0
2/1/2005	high	**2**	**no**	**0.0**	**yes**	**1.0**
2/2/2005	high	**2**	**no**	**0.0**	**yes**	**2.0**
2/3/2005	medium	**1**	**no**	**0.0**	**yes**	**1.0**
2/4/2005	medium	**1**	**no**	**0.0**	**yes**	**1.0**
2/7/2005	low	**0**	**no**	**0.0**	**yes**	**1.0**
2/8/2005	low	0	no	0.0	no	0.0
2/15/2005	high	2	no	0.0	no	0.0
2/25/2005	high	2	no	0.0	no	0.0
3/2/2005	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
3/8/2005	low	0	no	0.0	no	0.0
3/15/2005	high	2	no	0.0	no	0.0
4/4/2005	low	0	no	0.0	no	0.0
4/11/2015	high	**2**	**no**	**0.0**	**yes**	**1.0**
4/13/2005	medium	**1**	**no**	**0.0**	**yes**	**2.0**
4/14/2005	high	**2**	**no**	**0.0**	**yes**	**1.0**
4/15/2005	medium	**1**	**no**	**0.0**	**yes**	**2.0**
4/18/2005	low	0	no	0.0	no	0.0
4/25/2005	medium	1	no	0.0	no	0.0
5/2/2005	low	0	no	0.0	no	0.0
5/9/2005	medium	1	no	0.0	no	0.0
5/16/2005	low	0	no	0.0	no	0.0
5/20/2005	low	0	no	0.0	no	0.0
5/23/2005	medium	1	no	0.0	no	0.0
5/30/2005	medium	1	no	0.0	no	0.0
6/6/2005	medium	1	no	0.0	no	0.0
6/10/2005	medium	1	no	0.0	no	0.0
6/13/2005	high	2	no	0.0	no	0.0
6/20/2005	low	0	no	0.0	no	0.0
6/27/2005	high	2	no	0.0	no	0.0
7/4/2005	medium	1	no	0.0	no	0.0
7/11/2005	high	**2**	no	0.0	**yes**	**1.0**
7/15/2005	medium	1	no	0.0	no	0.0
7/18/2005	low	0	no	0.0	no	0.0
7/25/2005	high	2	no	0.0	no	0.0
8/1/2005	low	0	no	0.0	no	0.0
8/8/2005	high	2	no	0.0	no	0.0
8/12/2005	medium	1	no	0.0	no	0.0
8/15/2005	low	0	no	0.0	no	0.0
8/22/2005	medium	1	no	0.0	no	0.0
8/29/2005	low	0	no	0.0	no	0.0
9/5/2005	medium	1	no	0.0	no	0.0
9/12/2005	medium	1	no	0.0	no	0.0
9/14/2005	low	0	no	0.0	no	0.0
9/19/2005	medium	1	no	0.0	no	0.0
9/26/2005	low	0	no	0.0	no	0.0
10/3/2005	medium	1	no	0.0	no	0.0
10/10/2005	medium	1	no	0.0	no	0.0
10/14/2005	low	0	no	0.0	no	0.0
10/17/2005	medium	1	no	0.0	no	0.0
10/24/2005	medium	1	no	0.0	no	0.0
10/31/2005	low	0	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
11/7/2005	high	2	no	0.0	no	0.0
11/14/2005	low	0	no	0.0	no	0.0
11/21/2005	high	2	no	0.0	no	0.0
11/23/2005	medium	1	no	0.0	no	0.0
11/28/2005	low	0	no	0.0	no	0.0
11/29/2005	medium	1	no	0.0	no	0.0
11/30/2005	medium	1	no	0.0	no	0.0
12/1/2005	high	2	no	0.0	no	0.0
12/2/2005	high	2	no	0.0	no	0.0
12/5/2005	high	2	no	0.0	no	0.0
12/6/2005	medium	1	no	0.0	no	0.0
12/7/2005	high	2	no	0.0	no	0.0
12/9/2005	high	2	no	0.0	no	0.0
12/15/2005	high	**2**	no	0.0	**yes**	**1.0**
12/19/2005	high	**2**	no	0.0	**yes**	**1.0**
1/25/2006	low	0	**yes**	**2.0**	**yes**	**2.0**
2/8/2006			no	0.0	**yes**	**1.0**
2/9/2006			no	0.0	**yes**	**1.0**
2/10/2006			no	0.0	**yes**	**1.0**
2/13/2006	medium	1	no	0.0	**yes**	**1.0**
2/14/2006	medium	1	no	0.0	**yes**	**1.0**
3/15/2006	low	0	no	0.0	no	0.0
3/17/2006	low	0	no	0.0	no	0.0
3/21/2006	high	2	no	0.0	no	0.0
3/27/2006	low	0	no	0.0	no	0.0
4/3/2006	high	2	no	0.0	no	0.0
4/11/2006	medium	1	no	0.0	no	0.0
4/14/2006	medium	1	no	0.0	no	0.0
4/17/2006	high	2	no	0.0	no	0.0
4/24/2006	low	0	no	0.0	no	0.0
4/25/2006	medium	1	no	0.0	no	0.0
4/26/2006	medium	1	no	0.0	no	0.0
4/27/2006	medium	1	no	0.0	no	0.0
4/28/2006	medium	1	no	0.0	no	0.0
5/1/2006	medium	1	no	0.0	no	0.0
5/9/2006	low	0	no	0.0	no	0.0
5/17/2006	high	2	no	0.0	no	0.0
5/18/2006	high	2	no	0.0	no	0.0
5/22/2006	low	0	no	0.0	no	0.0
5/30/2006	medium	1	no	0.0	no	0.0
5/31/2006	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
6/1/2006	high	2	no	0.0	no	0.0
6/5/2006	medium	1	**yes**	**0.5**	no	0.0
6/12/2006	low	0	no	0.0	no	0.0
6/14/2006	medium	1	no	0.0	no	0.0
7/12/2006	low	0	no	0.0	no	0.0
7/19/2006	medium	1	**yes**	**1.0**	no	0.0
7/24/2006	high	2	no	0.0	no	0.0
7/25/2006	low	0	**yes**	**1.0**	no	0.0
7/31/2006	high	2	no	0.0	**yes**	**1.0**
8/2/2006	high	2	no	0.0	no	0.0
8/8/2006	high	2	no	0.0	no	0.0
8/14/2006	high	2	**yes**	**1.0**	**yes**	**1.0**
8/16/2006	medium	1	**yes**	**2.0**	**yes**	**1.0**
8/21/2006	low	0	no	0.0	no	0.0
8/25/2006	high	2	**yes**	**0.5**	**yes**	**0.5**
8/28/2006	high	2	**yes**	**0.5**	no	0.0
8/29/2006	high	2	no	0.0	no	0.0
9/1/2006	medium	1	no	0.0	no	0.0
9/5/2006	low	0	no	0.0	no	0.0
9/6/2006	low	0	no	0.0	no	0.0
9/11/2006	high	2	no	0.0	no	0.0
9/13/2006	high	2	**yes**	**1.0**	**yes**	**1.0**
9/18/2006	low	0	no	0.0	**yes**	**1.0**
9/19/2006	low	0	**yes**	**2.0**	no	0.0
9/22/2006	high	2	no	0.0	no	0.0
9/25/2006	high	2	no	0.0	**yes**	**1.0**
9/27/2006	high	2	no	0.0	no	0.0
10/2/2006	medium	1	no	0.0	no	0.0
10/5/2006	low	0	no	0.0	no	0.0
10/6/2006	high	2	no	0.0	no	0.0
10/9/2006	high	2	no	0.0	no	0.0
10/12/2006	high	2	no	0.0	no	0.0
10/16/2006	medium	1	no	0.0	no	0.0
10/17/2006	high	2	**yes**	**1.0**	no	0.0
10/23/2006	high	2	no	0.0	no	0.0
10/25/2006	high	2	no	0.0	no	0.0
10/30/2006	high	2	no	0.0	no	0.0
10/31/2006	high	2	**yes**	**1.0**	no	0.0
11/1/2006	medium	1	no	0.0	no	0.0
11/6/2006	high	2	no	0.0	no	0.0
11/7/2006	high	2	no	0.0	no	0.0
11/8/2006	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
11/9/2006	high	2	no	0.0	no	0.0
11/13/2006	high	2	no	0.0	**yes**	**1.0**
11/17/2006	medium	1	no	0.0	no	0.0
11/20/2006	high	2	no	0.0	no	0.0
11/27/2006	high	2	no	0.0	no	0.0
11/30/2006	high	2	no	0.0	no	0.0
12/4/2006	medium	1	no	0.0	**yes**	**1.0**
12/5/2006	high	2	**yes**	**1.0**	no	0.0
12/11/2006	high	2	no	0.0	no	0.0
12/12/2006	medium	1	no	0.0	no	0.0
12/13/2006	high	2	no	0.0	no	0.0
12/14/2006	high	2	no	0.0	no	0.0
12/15/2006	medium	1	**yes**	**1.0**	no	0.0
12/16/2006	medium	1	no	0.0	no	0.0
12/18/2006	medium	1	no	0.0	no	0.0
12/19/2006	high	2	no	0.0	**yes**	**1.0**
12/21/2006	high	2	no	0.0	no	0.0
12/22/2006	high	2	no	0.0	no	0.0
1/2/2007	high	2	no	0.0	no	0.0
1/5/2007	high	2	no	0.0	no	0.0
1/8/2007	high	2	no	0.0	no	0.0
1/9/2007	high	2	no	0.0	no	0.0
1/10/2007	high	2	no	0.0	no	0.0
1/15/2007	high	2	no	0.0	no	0.0
1/19/2007	high	2	no	0.0	**yes**	**1.0**
1/22/2007	high	2	no	0.0	**yes**	**0.5**
1/29/2007	high	2	no	0.0	**yes**	**1.0**
1/31/2007	high	2	**yes**	**1.0**	no	0.0
2/2/2007	high	2	no	0.0	no	0.0
2/5/2007	high	2	no	0.0	no	0.0
2/6/2007	high	2	no	0.0	no	0.0
2/7/2007	high	2	no	0.0	no	0.0
2/12/2007	high	2	no	0.0	no	0.0
2/14/2007	high	2	no	0.0	no	0.0
2/16/2007	high	2	no	0.0	no	0.0
2/20/2007	high	2	no	0.0	no	0.0
2/26/2007	high	2	no	0.0	no	0.0
3/5/2007	medium	1	no	0.0	no	0.0
3/7/2007	medium	1	no	0.0	no	0.0
3/13/2007	high	2	no	0.0	no	0.0
3/16/2007	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
3/19/2007	low	0	no	0.0	no	0.0
3/20/2007	medium	1	no	0.0	no	0.0
3/21/2007	high	2	no	0.0	no	0.0
3/22/2007	high	2	no	0.0	no	0.0
3/26/2007	high	2	no	0.0	no	0.0
3/30/2007	medium	1	no	0.0	no	0.0
4/2/2007	high	2	no	0.0	no	0.0
4/6/2007	high	2	**yes**	**1.0**	no	0.0
4/9/2007	high	2	no	0.0	no	0.0
4/12/2007	high	2	no	0.0	no	0.0
4/13/2007	medium	1	no	0.0	no	0.0
4/16/2007	low	0	no	0.0	no	0.0
4/19/2007	medium	1	no	0.0	no	0.0
4/23/2007	high	2	no	0.0	no	0.0
4/24/2007	high	2	**yes**	**1.0**	no	0.0
4/26/2007	medium	1	no	0.0	no	0.0
4/27/2007	high	2	no	0.0	no	0.0
4/30/2007	low	0	no	0.0	no	0.0
5/3/2007	medium	1	no	0.0	no	0.0
5/8/2007	high	2	no	0.0	no	0.0
5/9/2007	high	2	no	0.0	no	0.0
5/14/2007	low	0	no	0.0	no	0.0
5/17/2007	medium	1	no	0.0	no	0.0
5/21/2007	high	2	no	0.0	no	0.0
5/23/2007	medium	1	no	0.0	no	0.0
6/1/2007	medium	1	no	0.0	no	0.0
6/4/2007	high	2	**yes**	**1.0**	**yes**	**1.0**
6/6/2007	high	2	no	0.0	no	0.0
6/7/2007	medium	1	**yes**	**1.0**	no	0.0
6/11/2007	low	0	no	0.0	no	0.0
6/13/2007	low	0	no	0.0	no	0.0
6/14/2007	low	0	no	0.0	no	0.0
6/18/2007	medium	1	no	0.0	no	0.0
6/19/2007	high	2	no	0.0	no	0.0
6/25/2007	low	0	no	0.0	no	0.0
7/2/2007	high	2	**yes**	**2.0**	no	0.0
7/9/2007	low	0	no	0.0	no	0.0
7/13/2007	low	0	no	0.0	no	0.0
7/16/2007	low	0	no	0.0	no	0.0
7/23/2007	low	0	no	0.0	no	0.0
7/30/2007	medium	1	no	0.0	no	0.0
7/31/2007	high	2	**yes**	**1.0**	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
8/6/2007	medium	1	no	0.0	no	0.0
8/8/2007	low	0	no	0.0	no	0.0
8/13/2007	medium	1	no	0.0	no	0.0
8/16/2007	high	2	no	0.0	no	0.0
8/20/2007	high	2	no	0.0	no	0.0
8/22/2007	medium	1	no	0.0	no	0.0
8/23/2007	medium	1	no	0.0	no	0.0
8/24/2007	low	0	no	0.0	no	0.0
8/27/2007	low	0	no	0.0	no	0.0
8/30/2007	low	0	no	0.0	no	0.0
9/4/2007	medium	1	no	0.0	no	0.0
9/10/2007	medium	1	no	0.0	no	0.0
9/13/2007	medium	1	no	0.0	no	0.0
9/14/2007	high	2	no	0.0	no	0.0
9/17/2007	high	2	no	0.0	no	0.0
9/18/2007	high	2	no	0.0	no	0.0
9/19/2007	high	2	no	0.0	no	0.0
9/20/2007	medium	1	no	0.0	no	0.0
9/24/2007	low	0	no	0.0	no	0.0
10/1/2007	high	2	no	0.0	no	0.0
10/2/2007	high	2	no	0.0	no	0.0
10/3/2007	medium	1	no	0.0	no	0.0
10/5/2007	low	0	no	0.0	no	0.0
10/8/2007	medium	1	no	0.0	no	0.0
10/9/2007	high	2	no	0.0	no	0.0
10/11/2007	high	2	no	0.0	no	0.0
10/15/2007	high	2	no	0.0	no	0.0
10/17/2007	medium	1	no	0.0	no	0.0
10/22/2007	low	0	no	0.0	no	0.0
10/24/2007	medium	1	no	0.0	no	0.0
10/25/2007	high	2	no	0.0	no	0.0
10/29/2007	high	2	no	0.0	no	0.0
10/31/2007	low	0	no	0.0	no	0.0
11/1/2007	low	0	no	0.0	no	0.0
11/2/2007	low	0	no	0.0	no	0.0
11/5/2007	low	0	no	0.0	no	0.0
11/6/2007	low	0	no	0.0	no	0.0
11/12/2007	high	2	no	0.0	no	0.0
11/13/2007	high	2	no	0.0	no	0.0
11/15/2007	high	2	no	0.0	no	0.0
11/16/2007	high	2	no	0.0	no	0.0
11/19/2007	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
11/26/2007	high	2	no	0.0	no	0.0
11/27/2007	high	2	**yes**	**0.5**	no	0.0
12/3/2007	high	2	no	0.0	no	0.0
12/10/2007	high	2	no	0.0	no	0.0
12/11/2007	high	2	no	0.0	no	0.0
12/14/2007	high	2	no	0.0	no	0.0
12/17/2007	high	2	no	0.0	no	0.0
12/19/2007	high	2	no	0.0	no	0.0
12/20/2007	high	2	no	0.0	no	0.0
12/24/2007	medium	1	no	0.0	no	0.0
1/2/2008	high	2	no	0.0	yes	1.0
1/7/2008	high	2	no	0.0	no	0.0
1/11/2008	high	2	no	0.0	no	0.0
1/14/2008	high	2	no	0.0	no	0.0
1/21/2008	high	2	no	0.0	no	0.0
1/22/2008	high	2	no	0.0	no	0.0
1/28/2008	high	2	no	0.0	no	0.0
1/29/2008	high	2	no	0.0	no	0.0
2/4/2008	high	2	**yes**	**0.5**	no	0.0
2/11/2008	medium	1	no	0.0	no	0.0
2/12/2008	high	2	no	0.0	no	0.0
2/14/2008	high	2	no	0.0	no	0.0
2/19/2008	high	2	no	0.0	no	0.0
2/20/2008	high	2	no	0.0	no	0.0
2/25/2008	high	2	no	0.0	no	0.0
2/28/2008	high	2	no	0.0	no	0.0
3/3/2008	medium	1	no	0.0	no	0.0
3/4/2008	medium	1	no	0.0	no	0.0
3/10/2008	high	2	no	0.0	no	0.0
3/11/2008	high	2	no	0.0	no	0.0
3/12/2008	high	2	no	0.0	no	0.0
3/14/2008	high	2	no	0.0	no	0.0
3/17/2008	medium	1	no	0.0	no	0.0
3/24/2008	high	2	no	0.0	no	0.0
3/26/2008	high	2	no	0.0	no	0.0
3/31/2008	medium	1	no	0.0	no	0.0
4/1/2008	medium	1	no	0.0	no	0.0
4/7/2008	high	2	no	0.0	no	0.0
4/10/2008	medium	1	**yes**	**0.5**	no	0.0
4/11/2008	medium	1	no	0.0	no	0.0
4/15/2008	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
4/16/2008	low	0	no	0.0	no	0.0
4/18/2008	low	0	no	0.0	no	0.0
4/21/2008	medium	1	no	0.0	no	0.0
4/22/2008	medium	1	no	0.0	no	0.0
4/28/2008	medium	1	no	0.0	no	0.0
5/2/2008	low	0	no	0.0	no	0.0
5/5/2008	medium	1	no	0.0	no	0.0
5/12/2008	medium	1	no	0.0	no	0.0
5/16/2008	medium	1	no	0.0	no	0.0
5/19/2008	low	0	no	0.0	no	0.0
5/21/2008	low	0	no	0.0	no	0.0
5/23/2008	high	2	no	0.0	no	0.0
5/27/2008	medium	1	**yes**	**0.5**	no	0.0
5/29/2008	medium	1	no	0.0	no	0.0
6/2/2008	low	0	no	0.0	no	0.0
6/9/2008	medium	1	no	0.0	no	0.0
6/12/2008	medium	1	no	0.0	no	0.0
6/17/2008	low	0	no	0.0	no	0.0
6/18/2008	low	0	no	0.0	no	0.0
6/19/2008	medium	1	no	0.0	no	0.0
6/23/2008	high	2	yes	1.0	no	0.0
6/25/2008	medium	1	no	0.0	no	0.0
6/26/2008	medium	1	no	0.0	no	0.0
6/27/2008	low	0	no	0.0	no	0.0
6/30/2008	low	0	no	0.0	no	0.0
7/7/2008	high	2	no	0.0	no	0.0
7/8/2008	high	2	no	0.0	no	0.0
7/14/2008	low	0	no	0.0	no	0.0
7/16/2008	medium	1	**yes**	**1.0**	**yes**	**1.0**
7/21/2008	high	2	no	0.0	no	0.0
7/22/2008	high	2	no	0.0	no	0.0
7/23/2008	high	2	no	0.0	no	0.0
7/28/2008	low	0	no	0.0	no	0.0
7/30/2008	low	0	no	0.0	no	0.0
7/31/2008	low	0	no	0.0	no	0.0
8/4/2008	high	2	no	0.0	no	0.0
8/5/2008	high	2	no	0.0	no	0.0
8/6/2008	high	2	no	0.0	no	0.0
8/7/2008	high	2	no	0.0	no	0.0
8/8/2008	medium	1	no	0.0	no	0.0
8/11/2008	low	0	no	0.0	no	0.0
8/12/2008	low	0	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
8/13/2008	low	0	no	0.0	no	0.0
8/18/2008	medium	1	no	0.0	no	0.0
8/19/2008	high	2	yes	1.0	no	0.0
8/20/2008	high	2	no	0.0	no	0.0
8/21/2008	high	2	no	0.0	no	0.0
8/25/2008	medium	1	no	0.0	no	0.0
8/27/2008	low	0	no	0.0	no	0.0
9/2/2008	medium	1	no	0.0	no	0.0
9/8/2008	medium	1	no	0.0	no	0.0
9/16/2008	medium	1	no	0.0	no	0.0
9/17/2008	high	2	no	0.0	no	0.0
9/18/2008	high	2	no	0.0	no	0.0
9/19/2008	high	2	no	0.0	no	0.0
9/22/2008	high	2	no	0.0	no	0.0
9/23/2008	medium	1	no	0.0	no	0.0
9/24/2008	low	0	no	0.0	no	0.0
9/29/2008	high	2	no	0.0	no	0.0
9/30/2008	high	2	no	0.0	no	0.0
10/1/2008	high	2	no	0.0	no	0.0
10/2/2008	high	2	no	0.0	no	0.0
10/6/2008	high	2	no	0.0	no	0.0
10/13/2008	medium	1	no	0.0	no	0.0
10/15/2008	medium	1	no	0.0	no	0.0
10/17/2008	high	2	no	0.0	no	0.0
10/20/2008	high	2	no	0.0	no	0.0
10/21/2008	high	2	no	0.0	no	0.0
10/24/2008	low	0	no	0.0	no	0.0
10/25/2008	medium	1	no	0.0	no	0.0
10/27/2008	high	2	no	0.0	no	0.0
11/3/2008	high	2	no	0.0	no	0.0
11/6/2008	high	2	no	0.0	no	0.0
11/10/2008	medium	1	no	0.0	no	0.0
11/14/2008	high	2	no	0.0	no	0.0
11/17/2008	high	2	no	0.0	no	0.0
11/18/2008	high	2	no	0.0	no	0.0
11/21/2008	medium	1	no	0.0	no	0.0
11/24/2008	medium	1	no	0.0	no	0.0
11/25/2008	high	2	no	0.0	no	0.0
12/1/2008	high	2	no	0.0	no	0.0
12/2/2008	high	2	no	0.0	no	0.0
12/3/2008	high	2	no	0.0	no	0.0
12/8/2008	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
12/11/2008	high	2	no	0.0	no	0.0
12/12/2008	high	2	no	0.0	no	0.0
12/15/2008	high	2	no	0.0	no	0.0
12/16/2008	high	2	no	0.0	no	0.0
12/17/2008	high	2	no	0.0	no	0.0
12/23/2008	high	2	no	0.0	no	0.0
12/29/2008	high	2	no	0.0	no	0.0
1/5/2009	high	2	no	0.0	no	0.0
1/12/2009	high	2	no	0.0	no	0.0
1/14/2009	high	2	no	0.0	no	0.0
1/15/2009	high	2	no	0.0	no	0.0
1/16/2009	high	2	no	0.0	no	0.0
1/20/2009	high	2	no	0.0	no	0.0
1/22/2009	high	2	no	0.0	no	0.0
1/26/2009	medium	1	no	0.0	no	0.0
1/27/2009	high	2	no	0.0	no	0.0
1/28/2009	medium	1	no	0.0	no	0.0
1/29/2009	medium	1	no	0.0	no	0.0
1/30/2009	medium	1	no	0.0	no	0.0
2/2/2009	high	2	no	0.0	no	0.0
2/5/2009	high	2	no	0.0	**yes**	**0.5**
2/9/2009	high	2	no	0.0	no	0.0
2/11/2009	medium	1	no	0.0	no	0.0
2/17/2009	high	2	**yes**	**0.5**	no	0.0
2/18/2009	high	2	no	0.0	no	0.0
2/23/2009	high	2	no	0.0	no	0.0
2/26/2009	medium	1	no	0.0	no	0.0
3/3/2009	high	2	no	0.0	no	0.0
3/9/2009	medium	1	no	0.0	no	0.0
3/11/2009	medium	1	no	0.0	no	0.0
3/16/2009	medium	1	no	0.0	no	0.0
3/17/2009	high	2	no	0.0	no	0.0
3/18/2009	high	2	no	0.0	no	0.0
3/23/2009	medium	1	no	0.0	no	0.0
3/30/2009	high	2	no	0.0	no	0.0
3/31/2009	high	2	no	0.0	no	0.0
4/6/2009	medium	1	no	0.0	no	0.0
4/7/2009	medium	1	no	0.0	no	0.0
4/13/2009	high	2	no	0.0	no	0.0
4/15/2009	high	2	no	0.0	no	0.0
4/16/2009	low	0	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
4/21/2009	low	0	no	0.0	no	0.0
4/27/2009	medium	1	no	0.0	no	0.0
4/28/2009	high	2	no	0.0	no	0.0
4/29/2009	high	2	no	0.0	no	0.0
5/4/2009	low	0	no	0.0	no	0.0
5/11/2009	medium	1	no	0.0	no	0.0
5/14/0009	high	2	no	0.0	no	0.0
5/15/2009	high	2	no	0.0	no	0.0
5/18/2009	medium	1	no	0.0	no	0.0
5/26/2009	medium	1	no	0.0	no	0.0
5/27/2009	medium	1	no	0.0	no	0.0
6/1/2009	medium	1	no	0.0	no	0.0
6/2/2009	medium	1	no	0.0	no	0.0
6/4/2009	low	0	no	0.0	no	0.0
6/8/2009	medium	1	no	0.0	no	0.0
6/10/2009	high	2	no	0.0	no	0.0
6/11/2009	medium	1	no	0.0	no	0.0
6/15/2009	high	2	no	0.0	no	0.0
6/16/2009	medium	1	no	0.0	no	0.0
6/19/2009	high	2	no	0.0	no	0.0
6/22/2009	low	0	no	0.0	no	0.0
6/25/2009	high	2	no	0.0	no	0.0
6/29/2009	high	2	no	0.0	no	0.0
7/6/2009	low	0	no	0.0	no	0.0
7/13/2009	high	2	no	0.0	no	0.0
7/15/2009	high	2	no	0.0	no	0.0
7/16/2009	low	0	no	0.0	no	0.0
7/20/2009	low	0	no	0.0	no	0.0
7/22/2009	low	0	no	0.0	no	0.0
7/27/2009	high	2	no	0.0	no	0.0
8/3/2009	low	0	no	0.0	no	0.0
8/10/2009	high	2	**yes**	**0.5**	no	0.0
8/14/2009	low	0	no	0.0	no	0.0
8/17/2009	low	0	no	0.0	no	0.0
8/18/2009	low	0	no	0.0	no	0.0
8/24/2009	high	2	no	0.0	no	0.0
8/31/2009	low	0	no	0.0	no	0.0
9/1/2009	medium	1	no	0.0	no	0.0
9/8/2009	high	2	no	0.0	no	0.0
9/11/2009	high	2	no	0.0	no	0.0
9/14/2009	medium	1	no	0.0	no	0.0
9/16/2009	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
9/17/2009	medium	1	no	0.0	no	0.0
9/18/2009	high	2	no	0.0	no	0.0
9/21/2009	high	2	no	0.0	no	0.0
9/28/2009	low	0	no	0.0	no	0.0
10/1/2009	medium	1	no	0.0	no	0.0
10/7/2009	high	2	no	0.0	no	0.0
10/12/2009	medium	1	no	0.0	no	0.0
10/20/2009	high	2	**yes**	**0.5**	no	0.0
10/21/2009	high	2	no	0.0	no	0.0
10/26/2009	medium	1	no	0.0	no	0.0
10/27/2009	medium	1	no	0.0	no	0.0
11/2/2009	medium	1	no	0.0	no	0.0
11/3/2009	high	2	no	0.0	no	0.0
11/10/2009	medium	1	no	0.0	no	0.0
11/16/2009	high	2	no	0.0	no	0.0
11/17/2009	high	2	no	0.0	no	0.0
11/18/2009	high	2	no	0.0	no	0.0
11/23/2009	high	2	no	0.0	no	0.0
11/24/2009	high	2	no	0.0	no	0.0
11/30/2009	high	2	no	0.0	no	0.0
12/3/2009	high	2	no	0.0	no	0.0
12/4/2009	high	2	no	0.0	no	0.0
12/7/2009	high	2	no	0.0	no	0.0
12/8/2009	high	2	no	0.0	no	0.0
12/9/2009	high	2	no	0.0	no	0.0
12/10/2009	medium	1	no	0.0	no	0.0
12/11/2009	high	2	no	0.0	no	0.0
12/14/2009	high	2	**yes**	**1.0**	no	0.0
12/15/2009	high	2	no	0.0	no	0.0
12/16/2009	high	2	no	0.0	no	0.0
12/17/2009	high	2	no	0.0	no	0.0
12/21/2009	high	2	no	0.0	no	0.0
12/28/2009	high	2	no	0.0	no	0.0
1/4/2010	high	2	no	0.0	no	0.0
1/5/2010	high	2	no	0.0	no	0.0
1/6/2010	high	2	no	0.0	no	0.0
1/7/2010	high	2	no	0.0	no	0.0
1/11/2010	high	2	no	0.0	no	0.0
1/14/2010	high	2	no	0.0	no	0.0
1/19/2010	high	2	no	0.0	no	0.0
1/20/2010	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
1/21/2010	high	2	no	0.0	no	0.0
1/25/2010	high	2	no	0.0	no	0.0
1/27/2010	high	2	no	0.0	no	0.0
2/1/2010	high	2	no	0.0	no	0.0
2/2/2010	high	2	no	0.0	no	0.0
2/8/2010	high	2	no	0.0	no	0.0
2/9/2010	high	2	no	0.0	no	0.0
2/16/2010	high	2	no	0.0	no	0.0
2/17/2010	high	2	no	0.0	no	0.0
2/18/2010	high	2	no	0.0	no	0.0
2/19/2010	high	2	no	0.0	no	0.0
2/22/2010	high	2	no	0.0	no	0.0
3/1/2010	high	2	**yes**	**1.0**	no	0.0
3/8/2010	high	2	no	0.0	no	0.0
3/12/2010	high	2	no	0.0	no	0.0
3/16/2010	high	2	no	0.0	no	0.0
3/17/2010	medium	1	no	0.0	no	0.0
3/19/2010	high	2	no	0.0	no	0.0
3/22/2010	high	2	no	0.0	no	0.0
3/25/2010	high	2	no	0.0	no	0.0
3/30/2010	high	2	no	0.0	no	0.0
3/31/2010	high	2	no	0.0	no	0.0
4/1/2010	high	2	no	0.0	no	0.0
4/2/2010	high	2	no	0.0	no	0.0
4/5/2010	high	2	no	0.0	no	0.0
4/6/2010	high	2	no	0.0	no	0.0
4/9/2010	medium	1	no	0.0	no	0.0
4/12/2010	medium	1	no	0.0	no	0.0
4/14/2010	medium	1	no	0.0	no	0.0
4/15/2010	medium	1	no	0.0	no	0.0
4/16/2010	medium	1	no	0.0	no	0.0
4/19/2010	high	2	no	0.0	no	0.0
4/20/2010	high	2	no	0.0	no	0.0
4/27/2010	high	2	no	0.0	no	0.0
4/28/2010	high	2	no	0.0	no	0.0
4/29/2010	high	2	no	0.0	no	0.0
5/3/2010	high	2	no	0.0	no	0.0
5/5/2010	medium	1	no	0.0	no	0.0
5/6/2010	medium	1	no	0.0	no	0.0
5/7/2010	medium	1	no	0.0	no	0.0
5/10/2010	medium	1	no	0.0	no	0.0
5/17/2010	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
5/18/2010	high	2	no	0.0	no	0.0
5/24/2010	low	0	no	0.0	no	0.0
6/1/2010	medium	1	no	0.0	no	0.0
6/7/2010	low	0	no	0.0	no	0.0
6/9/2010	low	0	no	0.0	no	0.0
6/10/2010	low	0	no	0.0	no	0.0
6/14/2010	high	2	no	0.0	no	0.0
6/16/2010	high	2	no	0.0	no	0.0
6/17/2010	medium	1	no	0.0	no	0.0
6/21/2010	low	0	no	0.0	no	0.0
6/24/2010	low	0	no	0.0	no	0.0
6/28/2010	high	2	no	0.0	no	0.0
7/6/2010	low	0	no	0.0	no	0.0
7/8/2010	low	0	no	0.0	no	0.0
7/12/2010	medium	1	no	0.0	no	0.0
7/13/2010	medium	1	no	0.0	no	0.0
7/14/2010	medium	1	no	0.0	no	0.0
7/15/2010	high	2	no	0.0	no	0.0
7/16/2010	high	2	no	0.0	no	0.0
7/19/2010	low	0	**yes**	**1.0**	no	0.0
7/20/2010	medium	1	**yes**	**1.0**	no	0.0
7/21/2010	low	0	no	0.0	no	0.0
7/22/2010	low	0	no	0.0	no	0.0
7/26/2010	high	1	no	0.0	no	0.0
7/28/2010	medium	1	no	0.0	no	0.0
7/29/2010	medium	1	no	0.0	no	0.0
8/2/2010	medium	1	no	0.0	no	0.0
8/3/2010	low	0	no	0.0	no	0.0
8/9/2010	medium	1	no	0.0	no	0.0
8/11/2010	high	2	no	0.0	no	0.0
8/16/2010	medium	1	no	0.0	no	0.0
8/18/2010	low	0	no	0.0	no	0.0
8/19/2010	low	0	no	0.0	no	0.0
8/23/2010	medium	1	no	0.0	no	0.0
8/24/2010	high	2	no	0.0	no	0.0
8/30/2010	high	2	no	0.0	no	0.0
8/31/2010	high	2	no	0.0	no	0.0
9/1/2010	high	2	no	0.0	no	0.0
9/2/2010	low	0	no	0.0	no	0.0
9/3/2010	low	0	no	0.0	no	0.0
9/7/2010	low	0	no	0.0	no	0.0
9/14/2010	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
9/15/2010	low	0	no	0.0	no	0.0
9/16/2010	low	0	no	0.0	no	0.0
9/20/2010	medium	1	no	0.0	no	0.0
9/21/2010	medium	1	no	0.0	no	0.0
9/22/2010	medium	1	no	0.0	no	0.0
9/27/2010	high	2	no	0.0	no	0.0
9/30/2010	high	2	no	0.0	no	0.0
10/4/2010	low	0	no	0.0	no	0.0
10/7/2010	medium	1	no	0.0	no	0.0
10/11/2010	high	2	no	0.0	no	0.0
10/14/2010	medium	1	no	0.0	no	0.0
10/18/2010	medium	1	no	0.0	no	0.0
10/19/2010	medium	1	no	0.0	no	0.0
10/20/2010	medium	1	no	0.0	no	0.0
10/21/2010	medium	1	no	0.0	no	0.0
10/25/2010	high	2	no	0.0	no	0.0
10/29/2010	high	2	no	0.0	no	0.0
11/1/2010	low	0	no	0.0	no	0.0
11/2/2010	medium	1	no	0.0	no	0.0
11/8/2010	high	2	no	0.0	no	0.0
11/11/2010	high	2	no	0.0	no	0.0
11/15/2010	medium	1	no	0.0	no	0.0
11/16/2010	medium	1	no	0.0	no	0.0
11/17/2010	medium	1	no	0.0	no	0.0
11/18/2010	medium	1	no	0.0	no	0.0
11/22/2010	high	2	no	0.0	no	0.0
11/29/2010	high	2	no	0.0	no	0.0
11/30/2010	medium	1	no	0.0	no	0.0
12/1/2010	medium	1	no	0.0	no	0.0
12/2/2010	medium	1	no	0.0	no	0.0
12/3/2010	medium	1	no	0.0	no	0.0
12/6/2010	high	2	no	0.0	no	0.0
12/7/2010	high	2	no	0.0	no	0.0
12/8/2010	high	2	no	0.0	no	0.0
12/13/2010	high	2	no	0.0	no	0.0
12/14/2010	high	2	no	0.0	no	0.0
12/15/2010	high	2	no	0.0	no	0.0
12/16/2010	high	2	no	0.0	no	0.0
12/20/2010	high	2	no	0.0	no	0.0
12/22/2010	high	2	no	0.0	no	0.0
12/23/2010	high	2	no	0.0	no	0.0
12/24/2010	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
12/27/2010	high	2	no	0.0	no	0.0
1/3/2011	high	2	no	0.0	no	0.0
1/10/2011	high	2	no	0.0	no	0.0
1/17/2011	high	2	no	0.0	no	0.0
1/18/2011	high	2	no	0.0	no	0.0
1/19/2011	high	2	no	0.0	no	0.0
1/24/2011	high	2	no	0.0	no	0.0
1/27/2011	high	2	no	0.0	no	0.0
1/31/2011	high	2	no	0.0	no	0.0
2/4/2011	high	2	no	0.0	no	0.0
2/7/2011	high	2	no	0.0	no	0.0
2/8/2011	high	2	no	0.0	no	0.0
2/14/2011	high	2	no	0.0	no	0.0
2/15/2011	high	2	no	0.0	no	0.0
2/16/2011	high	2	no	0.0	no	0.0
2/22/2011	high	2	no	0.0	no	0.0
2/25/2011	high	2	no	0.0	no	0.0
2/28/2011	high	2	no	0.0	no	0.0
3/2/2011	high	2	no	0.0	no	0.0
3/9/2011	high	2	no	0.0	no	0.0
3/10/2011	high	2	no	0.0	no	0.0
3/11/2011	high	2	no	0.0	no	0.0
3/14/2011	high	2	no	0.0	no	0.0
3/21/2011	high	2	no	0.0	no	0.0
3/22/2011	high	2	no	0.0	no	0.0
3/23/2011	high	2	no	0.0	no	0.0
3/24/2011	high	2	no	0.0	no	0.0
3/28/2011	high	2	no	0.0	no	0.0
3/29/2011	high	2	no	0.0	no	0.0
4/4/2011	high	2	no	0.0	no	0.0
4/5/2011	high	2	no	0.0	no	0.0
4/11/2011	high	2	no	0.0	no	0.0
4/12/2011	high	2	no	0.0	no	0.0
4/13/2011	high	2	no	0.0	no	0.0
4/19/2011	high	2	no	0.0	no	0.0
4/20/2011	high	2	no	0.0	no	0.0
4/21/2011	high	2	no	0.0	no	0.0
4/22/2011	high	2	no	0.0	no	0.0
4/25/2011	medium	1	no	0.0	no	0.0
4/27/2011	medium	1	**yes**	**1.0**	no	0.0
5/2/2011	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
5/9/2011	high	2	no	0.0	no	0.0
5/16/2011	medium	1	no	0.0	no	0.0
5/18/2011	high	2	no	0.0	no	0.0
5/19/2011	high	2	no	0.0	no	0.0
5/23/2011	high	2	no	0.0	no	0.0
6/1/2011	medium	1	no	0.0	no	0.0
6/6/2011	high	2	no	0.0	no	0.0
6/10/2011	medium	1	**yes**	**1.0**	no	0.0
6/13/2011	low	0	no	0.0	no	0.0
6/14/2011	low	0	no	0.0	no	0.0
6/15/2011	low	0	no	0.0	no	0.0
6/20/2011	high	2	no	0.0	no	0.0
6/22/2011	medium	1	**yes**	**0.5**	no	0.0
6/23/2011	medium	1	no	0.0	no	0.0
6/27/2011	low	0	no	0.0	no	0.0
6/30/2011	medium	1	no	0.0	no	0.0
7/6/2011	high	2	no	0.0	no	0.0
7/11/2011	low	0	no	0.0	no	0.0
7/18/2011	high	2	no	0.0	no	0.0
7/19/2011	high	2	no	0.0	no	0.0
7/20/2011	high	2	no	0.0	no	0.0
7/25/2011	low	0	no	0.0	no	0.0
7/29/2011	medium	1	no	0.0	no	0.0
8/1/2011	high	2	no	0.0	no	0.0
8/8/2011	low	0	no	0.0	no	0.0
8/15/2011	high	2	no	0.0	no	0.0
8/16/2011	high	2	no	0.0	no	0.0
8/17/2011	high	2	no	0.0	no	0.0
8/22/2011	low	0	no	0.0	no	0.0
8/24/2011	high	2	no	0.0	no	0.0
8/29/2011	medium	1	no	0.0	no	0.0
8/31/2011	medium	1	no	0.0	no	0.0
9/6/2011	medium	1	no	0.0	no	0.0
9/12/2011	high	2	no	0.0	no	0.0
9/13/2011	high	2	no	0.0	no	0.0
9/14/2011	high	2	no	0.0	no	0.0
9/20/2011	medium	1	no	0.0	no	0.0
9/26/2011	medium	1	no	0.0	no	0.0
9/27/2011	high	2	no	0.0	no	0.0
9/28/2011	high	2	no	0.0	no	0.0
9/29/2011	high	2	no	0.0	no	0.0
10/3/2011	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
10/10/2011	high	2	no	0.0	no	0.0
10/11/2011	high	2	no	0.0	no	0.0
10/12/2011	high	2	no	0.0	no	0.0
10/17/2011	high	2	no	0.0	no	0.0
10/18/2011	high	2	no	0.0	no	0.0
10/19/2011	high	2	no	0.0	no	0.0
10/20/2011	high	2	no	0.0	no	0.0
10/24/2011	medium	1	no	0.0	no	0.0
10/31/2011	high	2	no	0.0	no	0.0
11/8/2011	medium	1	no	0.0	no	0.0
11/14/2011	high	2	no	0.0	no	0.0
11/21/2011	medium	1	no	0.0	no	0.0
11/22/2011	high	2	no	0.0	no	0.0
11/23/2011	high	2	no	0.0	no	0.0
11/28/2011	high	2	no	0.0	no	0.0
11/29/2011	high	2	no	0.0	no	0.0
12/5/2011	medium	1	no	0.0	no	0.0
12/12/2011	high	2	no	0.0	no	0.0
12/13/2011	high	2	no	0.0	no	0.0
12/14/2011	high	2	no	0.0	no	0.0
12/19/2011	high	2	no	0.0	no	0.0
12/20/2011	high	2	no	0.0	no	0.0
12/21/2011	high	2	no	0.0	no	0.0
12/27/2011	high	2	no	0.0	no	0.0
1/3/2012	high	2	no	0.0	no	0.0
1/9/2012	high	2	no	0.0	no	0.0
1/17/2012	high	2	no	0.0	no	0.0
1/23/2012	high	2	no	0.0	no	0.0
1/24/2012	high	2	no	0.0	no	0.0
1/25/2012	high	2	no	0.0	no	0.0
1/27/2012	high	2	no	0.0	no	0.0
1/30/2012	high	2	no	0.0	no	0.0
2/6/2012	high	2	no	0.0	no	0.0
2/13/2012	high	2	no	0.0	no	0.0
2/21/2012	medium	1	no	0.0	no	0.0
2/27/2012	high	2	no	0.0	no	0.0
2/24/2012	high	2	no	0.0	no	0.0
3/1/2012	medium	1	no	0.0	no	0.0
3/2/2012	high	2	no	0.0	no	0.0
3/5/2012	high	2	no	0.0	no	0.0
3/12/2012	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
3/13/2012	high	2	no	0.0	no	0.0
3/14/2012	medium	1	no	0.0	no	0.0
3/15/2012	high	2	no	0.0	no	0.0
3/19/2012	high	2	no	0.0	no	0.0
3/20/2012	high	2	no	0.0	no	0.0
.3/21/2012	high	2	no	0.0	no	0.0
3/22/2012	high	2	no	0.0	no	0.0
3/26/2012	high	2	no	0.0	no	0.0
3/28/2012	high	2	no	0.0	no	0.0
4/2/2012	medium	1	no	0.0	no	0.0
4/5/2012	medium	1	no	0.0	no	0.0
4/9/2012	high	2	no	0.0	no	0.0
4/16/2012	medium	1	no	0.0	no	0.0
4/17/2012	medium	1	no	0.0	no	0.0
4/18/2012	high	2	no	0.0	no	0.0
4/19/2012	medium	1	no	0.0	no	0.0
4/23/2012	medium	1	no	0.0	no	0.0
4/30/2012	medium	1	no	0.0	no	0.0
5/2/2012	medium	1	no	0.0	no	0.0
5/7/2012	high	2	no	0.0	no	0.0
5/8/2012	high	2	no	0.0	no	0.0
5/14/2012	medium	1	no	0.0	no	0.0
5/15/2012	low	0	no	0.0	no	0.0
5/16/2012	medium	1	no	0.0	no	0.0
5/21/2012	high	2	no	0.0	no	0.0
5/22/2012	high	2	no	0.0	no	0.0
5/23/2012	high	2	no	0.0	no	0.0
5/24/2012	high	2	no	0.0	no	0.0
5/29/2012	high	2	no	0.0	no	0.0
5/31/2012	low	0	no	0.0	no	0.0
6/4/2012	medium	1	no	0.0	no	0.0
6/11/2012	medium	1	no	0.0	no	0.0
6/12/2012	medium	1	no	0.0	no	0.0
6/13/2012	medium	1	no	0.0	no	0.0
6/20/2012	high	2	no	0.0	no	0.0
6/25/2012	medium	1	no	0.0	no	0.0
7/2/2012	low	0	no	0.0	no	0.0
7/9/2012	medium	1	**yes**	**0.5**	no	0.0
7/10/2012	high	2	no	0.0	no	0.0
7/11/2012	high	2	no	0.0	no	0.0
7/12/2012	high	2	**yes**	**0.5**	no	0.0
7/16/2012	low	0	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
7/17/2012	low	0	no	0.0	no	0.0
7/19/2012	low	0	no	0.0	no	0.0
7/20/2012	low	0	no	0.0	no	0.0
7/23/2012	high	2	no	0.0	no	0.0
7/30/2012	low	0	no	0.0	no	0.0
8/6/2012	high	2	no	0.0	no	0.0
8/7/2012	medium	1	no	0.0	no	0.0
8/10/2012	medium	1	no	0.0	no	0.0
8/13/2012	low	0	no	0.0	no	0.0
8/14/2012	low	0	no	0.0	no	0.0
8/15/2012	low	0	no	0.0	no	0.0
8/20/2012	high	2	no	0.0	no	0.0
8/23/2012	high	2	no	0.0	no	0.0
8/28/2012	low	0	no	0.0	no	0.0
8/29/2012	low	0	no	0.0	no	0.0
9/4/2012	high	2	no	0.0	no	0.0
9/5/2012	high	2	no	0.0	no	0.0
9/7/2012	high	2	no	0.0	no	0.0
9/10/2012	low	0	no	0.0	no	0.0
9/11/2012	low	0	no	0.0	no	0.0
9/17/2012	high	2	no	0.0	no	0.0
9/18/2012	high	2	no	0.0	no	0.0
9/19/2012	high	2	no	0.0	no	0.0
9/20/2012	high	2	no	0.0	no	0.0
9/21/2012	high	2	no	0.0	no	0.0
9/25/2102	low	0	no	0.0	no	0.0
9/26/2012	low	0	no	0.0	no	0.0
9/27/2012	low	0	no	0.0	no	0.0
10/1/2012	high	2	no	0.0	no	0.0
10/9/2012	low	0	no	0.0	no	0.0
10/15/2012	high	2	no	0.0	no	0.0
10/16/2012	high	2	no	0.0	no	0.0
10/22/2012	high	2	no	0.0	no	0.0
10/23/2012	high	2	no	0.0	no	0.0
10/24/2012	high	2	no	0.0	no	0.0
10/25/2012	high	2	no	0.0	no	0.0
10/26/2012	high	2	no	0.0	no	0.0
10/29/2012	high	2	no	0.0	no	0.0
11/7/2012	high	2	**yes**	**0.5**	no	0.0
11/12/2012	high	2	no	0.0	no	0.0
11/13/2012	medium	1	no	0.0	no	0.0
11/19/2012	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
11/27/2012	high	2	**yes**	**0.5**	no	0.0
11/28/2012	high	2	no	0.0	no	0.0
12/5/2012	high	2	no	0.0	no	0.0
12/6/2012	high	2	**yes**	**0.5**	no	0.0
12/7/2012	high	2	no	0.0	no	0.0
12/12/2012	medium	1	**yes**	**0.5**	no	0.0
12/13/2012	medium	1	no	0.0	no	0.0
12/14/2012	medium	1	no	0.0	no	0.0
12/17/2012	high	2	no	0.0	no	0.0
12/18/2012	high	2	no	0.0	no	0.0
12/19/2012	high	2	no	0.0	no	0.0
12/20/2012	high	2	no	0.0	no	0.0
12/24/2012	high	2	no	0.0	no	0.0
1/2/2013	high	2	no	0.0	no	0.0
1/3/2013	high	2	no	0.0	no	0.0
1/7/2013	high	2	no	0.0	no	0.0
1/14/2013	high	2	no	0.0	no	0.0
1/22/2013	high	2	no	0.0	no	0.0
1/23/2013	high	2	no	0.0	no	0.0
1/28/2013	high	2	no	0.0	no	0.0
1/30/2013	high	2	no	0.0	no	0.0
1/31/2013	high	2	no	0.0	no	0.0
2/1/2013	high	2	no	0.0	no	0.0
2/4/2013	high	2	no	0.0	no	0.0
2/11/2013	high	2	no	0.0	no	0.0
2/19/2013	high	2	no	0.0	no	0.0
2/20/2013	high	2	no	0.0	no	0.0
2/21/2013	high	2	no	0.0	no	0.0
2/25/2013	high	2	no	0.0	no	0.0
3/5/2013	high	2	no	0.0	no	0.0
3/6/2013	medium	1	no	0.0	no	0.0
3/11/2013	medium	1	no	0.0	no	0.0
3/12/2013	high	2	no	0.0	no	0.0
3/13/2013	high	2	no	0.0	no	0.0
3/18/2013	high	2	no	0.0	no	0.0
3/25/2013	high	2	no	0.0	no	0.0
4/1/2013	high	2	no	0.0	no	0.0
4/2/2013	high	2	no	0.0	no	0.0
4/8/2013	medium	1	no	0.0	no	0.0
4/9/2013	medium	1	no	0.0	no	0.0
4/10/2013	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
4/15/2013	high	2	no	0.0	no	0.0
4/16/2013	high	2	no	0.0	no	0.0
4/18/2013	high	2	no	0.0	no	0.0
4/22/2013	medium	1	no	0.0	no	0.0
4/23/2013	medium	1	no	0.0	no	0.0
4/24/2013	low	0	no	0.0	no	0.0
4/25/2013	medium	1	no	0.0	no	0.0
4/29/2013	high	2	no	0.0	no	0.0
4/30/2013	high	2	no	0.0	no	0.0
5/6/2013	low	0	no	0.0	no	0.0
5/7/2013	medium	1	no	0.0	no	0.0
5/13/2013	high	2	no	0.0	no	0.0
5/17/2013	medium	1	no	0.0	no	0.0
5/20/2013	medium	1	no	0.0	no	0.0
5/21/2013	medium	1	no	0.0	no	0.0
5/22/2013	medium	1	no	0.0	no	0.0
5/23/2013	medium	1	no	0.0	no	0.0
5/28/2013	high	2	no	0.0	no	0.0
6/3/2013	medium	1	no	0.0	no	0.0
6/5/2013	low	0	no	0.0	no	0.0
6/10/2013	high	2	no	0.0	no	0.0
6/11/2013	high	2	no	0.0	no	0.0
6/12/2013	high	2	no	0.0	no	0.0
6/17/2013	medium	1	no	0.0	no	0.0
6/18/2013	medium	1	no	0.0	no	0.0
6/19/2013	medium	1	no	0.0	no	0.0
6/24/2013	high	2	no	0.0	no	0.0
6/25/2013	high	2	no	0.0	no	0.0
6/26/2013	high	2	no	0.0	no	0.0
7/1/2013	medium	1	no	0.0	no	0.0
7/8/2013	medium	1	no	0.0	no	0.0
7/15/2013	medium	1	no	0.0	no	0.0
7/18/2013	high	2	no	0.0	no	0.0
7/22/2013	medium	1	no	0.0	no	0.0
7/23/2013	medium	1	no	0.0	no	0.0
7/24/2013	high	2	no	0.0	no	0.0
7/29/2013	medium	1	no	0.0	no	0.0
8/5/2013	medium	1	no	0.0	no	0.0
8/12/2013	high	2	no	0.0	no	0.0
8/19/2013	low	0	no	0.0	no	0.0
8/20/2013	medium	1	no	0.0	no	0.0
8/21/2013	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
8/26/2013	high	2	no	0.0	no	0.0
8/27/2013	medium	1	no	0.0	no	0.0
9/3/2013	medium	1	no	0.0	no	0.0
9/9/2013	high	2	no	0.0	no	0.0
9/10/2013	high	2	no	0.0	no	0.0
9/11/2013	medium	1	no	0.0	no	0.0
9/12/2013	medium	1	no	0.0	no	0.0
9/16/2013	low	0	no	0.0	no	0.0
9/17/2013	medium	1	no	0.0	no	0.0
9/23/2013	high	2	no	0.0	no	0.0
9/24/2013	high	2	**yes**	**0.5**	no	0.0
9/25/2013	high	2	no	0.0	no	0.0
9/27/2013	high	2	no	0.0	no	0.0
9/30/2013	medium	1	no	0.0	no	0.0
10/2/2013	medium	1	no	0.0	no	0.0
10/7/2013	high	2	no	0.0	no	0.0
10/9/2013	high	2	no	0.0	no	0.0
10/14/2013	low	0	no	0.0	no	0.0
10/15/2013	low	0	no	0.0	no	0.0
10/21/2013	high	2	no	0.0	no	0.0
10/28/2013	high	2	no	0.0	no	0.0
10/29/2013	medium	1	no	0.0	no	0.0
10/30/2013	medium	1	**yes**	**0.5**	no	0.0
10/31/2013	medium	1	no	0.0	no	0.0
11/4/2013	high	2	no	0.0	no	0.0
11/11/2013	high	2	no	0.0	no	0.0
11/13/2013	medium	1	**yes**	**0.5**	no	0.0
11/18/2013	medium	1	no	0.0	no	0.0
11/19/2013	high	2	no	0.0	no	0.0
11/20/2013	high	2	no	0.0	no	0.0
11/25/2013	high	2	no	0.0	no	0.0
12/2/2013	high	2	no	0.0	no	0.0
12/3/2013	high	2	no	0.0	no	0.0
12/9/2013	high	2	no	0.0	no	0.0
12/16/2013	high	2	no	0.0	no	0.0
12/17/2013	high	2	no	0.0	no	0.0
12/18/2013	high	2	no	0.0	no	0.0
12/23/2013	high	2	no	0.0	no	0.0
12/30/2013	medium	1	no	0.0	no	0.0
1/3/2014	high	2	no	0.0	no	0.0
1/6/2014	high	2	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
1/13/2014	high	2	no	0.0	no	0.0
1/14/2014	high	2	no	0.0	no	0.0
1/15/2014	high	2	no	0.0	no	0.0
1/21/2014	high	2	no	0.0	no	0.0
1/27/2014	high	2	no	0.0	no	0.0
1/28/2014	high	2	no	0.0	no	0.0
2/4/2014	high	2	no	0.0	no	0.0
2/10/2014	high	2	no	0.0	no	0.0
2/11/2014	high	2	no	0.0	no	0.0
2/12/2014	high	2	no	0.0	no	0.0
2/18/2014	high	2	no	0.0	no	0.0
2/21/2014	high	2	no	0.0	no	0.0
2/24/2014	high	2	no	0.0	no	0.0
3/3/2014	high	2	no	0.0	no	0.0
3/10/2014	high	2	no	0.0	no	0.0
3/11/2014	high	2	no	0.0	no	0.0
3/12/2014	high	2	no	0.0	no	0.0
3/17/2014	high	2	no	0.0	no	0.0
3/19/2014	high	2	no	0.0	no	0.0
3/20/2014	high	2	no	0.0	no	0.0
3/24/2014	high	2	no	0.0	no	0.0
3/26/2014	high	2	no	0.0	no	0.0
3/27/2014	high	2	no	0.0	no	0.0
3/31/2014	high	2	no	0.0	no	0.0
4/2/2014	high	2	no	0.0	no	0.0
4/7/2014	high	2	no	0.0	no	0.0
4/14/2014	medium	1	no	0.0	no	0.0
4/15/2014	medium	1	no	0.0	no	0.0
4/16/2014	high	2	no	0.0	no	0.0
4/17/2014	high	2	no	0.0	no	0.0
4/21/2014	high	2	no	0.0	no	0.0
4/22/2014	medium	1	no	0.0	no	0.0
4/23/2014	medium	1	no	0.0	no	0.0
4/28/2014	medium	1	no	0.0	no	0.0
4/29/2014	high	2	no	0.0	no	0.0
5/5/2014	high	2	**yes**	**0.5**	no	0.0
5/12/2014	medium	1	no	0.0	no	0.0
5/13/2014	medium	1	no	0.0	no	0.0
5/14/2014	medium	1	no	0.0	no	0.0
5/19/2014	high	2	no	0.0	no	0.0
5/20/2014	high	2	no	0.0	no	0.0
5/21/2014	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
5/27/2014	low	0	no	0.0	no	0.0
6/2/2014	high	2	no	0.0	no	0.0
6/9/2014	low	0	no	0.0	no	0.0
6/10/2014	medium	1	no	0.0	no	0.0
6/16/2014	high	2	no	0.0	no	0.0
6/17/2014	high	2	no	0.0	no	0.0
6/18/2014	high	2	no	0.0	no	0.0
6/23/2014	low	0	no	0.0	no	0.0
6/24/2014	low	0	**yes**	**1.0**	no	0.0
6/30/2014	high	2	no	0.0	no	0.0
7/72014	medium	1	no	0.0	no	0.0
7/8/2014	medium	1	no	0.0	no	0.0
7/14/2014	high	2	no	0.0	no	0.0
7/15/2014	high	2	no	0.0	no	0.0
7/21/2014	low	0	no	0.0	no	0.0
7/25/2014	medium	1	no	0.0	no	0.0
7/28/2014	high	2	no	0.0	no	0.0
7/30/2014	low	0	no	0.0	no	0.0
8/4/2014	medium	1	no	0.0	no	0.0
8/11/2014	medium	1	no	0.0	no	0.0
8/12/2014	high	2	no	0.0	no	0.0
8/13/2014	high	2	no	0.0	no	0.0
8/18/2014	low	0	no	0.0	no	0.0
8/20/2014	medium	1	no	0.0	no	0.0
8/25/2014	high	2	no	0.0	no	0.0
9/2/2014	low	0	no	0.0	no	0.0
9/8/2014	medium	1	no	0.0	no	0.0
9/9/2014	high	2	no	0.0	no	0.0
9/10/2014	high	2	no	0.0	no	0.0
9/16/2014	medium	1	no	0.0	no	0.0
9/17/2014	medium	1	no	0.0	no	0.0
9/22/2014	medium	1	no	0.0	no	0.0
9/29/2014	high	2	no	0.0	no	0.0
10/6/2014	medium	1	no	0.0	no	0.0
10/9/2014	high	2	no	0.0	no	0.0
10/14/2014	high	2	no	0.0	no	0.0
10/15/2014	high	2	no	0.0	no	0.0
10/20/2014	medium	1	no	0.0	no	0.0
10/21/2014	medium	1	no	0.0	no	0.0
10/27/2014	high	2	no	0.0	no	0.0
10/28/2014	high	2	no	0.0	no	0.0
11/3/2014	medium	1	no	0.0	no	0.0

Table 4. Containment Boom Sheen Monitoring
BP West Coast Products Terminal 21T, Harbor Island, Seattle

Date	Tide		Warehouse Area		Loading Rack Area	
	Status (low, Medium, high, ebb, flood)	Measurement	Sheen (yes or No)	Appearance of Sheen (See Note)	Sheen (yes or No)	Appearance of Sheen (See Note)
11/10/2014	high	2	no	0.0	no	0.0
11/17/2014	medium	1	no	0.0	no	0.0
11/18/2014	medium	1	no	0.0	no	0.0
11/19/2014	medium	1	no	0.0	no	0.0
11/24/2014	high	2	no	0.0	no	0.0
12/1/2014	high	2	no	0.0	no	0.0
12/2/2014	high	2	no	0.0	no	0.0
12/3/2014	medium	1	no	0.0	no	0.0
12/4/2014	high	2	no	0.0	no	0.0
12/8/2014	high	2	no	0.0	no	0.0
12/9/2014	high	2	no	0.0	no	0.0
12/10/2014	high	2	no	0.0	no	0.0
12/15/2014	high	2	no	0.0	no	0.0
12/16/2014	high	2	no	0.0	no	0.0
12/17/2014	high	2	no	0.0	no	0.0
12/22/2014	high	2	no	0.0	no	0.0
12/29/2014	high	2	no	0.0	no	0.0

Notes:
* Sheen Appearance is rated from 0.0 to 3.0 using criteria below;
0.0 No sheen present
1.0 Light sheen visible in one location
2.0 Sheen visible in several locations and is brightly colored
3.0 Sheen covers large areas of boom and is outside boom and/or is thick dark liquid floating on surface

** Tide Level is rated from 0.0 to 4.0 using the criteria below;
0.0 Low Tide
1.0 Medium Tide
2.0 High Tide
3.0 Ebb Tide
4.0 Flood Stage

on* North of warehouse wells were not operational

Table 5. Inland SVE System Petroleum Hydrocarbon Recovery Rates
BP West Coast Products Terminal 21T, Seattle, Washington

Date	Total Hours of Operation	Hours Operated Over Period	Total HSVE Flow Rate from wells (SCFM)	Influent Gasoline Range Organics (GRO) (mg/m^3)	GRO Recovered Over Period (lbs)	Cumulative GRO recovery (lbs)	GRO avg lbs/day over period	Influent Benzene (mg/m^3)	Benzene Recovered Over Period (lbs)	Cumulative Benzene Recovery (lbs)	Avg % CO_2 - Atmospheric concentration (0.04%)	Pounds GRO Destruction From Enhanced Biodegradation Over Period (lbs)	Cumulative GRO Destruction From Enhanced Biodegradation (gal)
2008 Averages & Totals	2,690	2,677	175	4,400	6,072	6,928	58.8	8.78	7.0	7.8	0.38	2,989	486
2009 Averages & Totals	11,245	8,555	258	59.0	551	7,479	1.55	*0.11*	1.1	8.9	0.23	11,748	2,396
2010 Averages & Totals	19,872	8,628	257	9.1	71	7,550	0.20	*0.36*	2.2	11.1	0.18	9,233	3,898
2011 Averages & Totals	23,503	3,583	247	25.5	117	7,667	0.78	*0.56*	1.9	13.0	0.18	2,748	4,344
2012 Averages & Totals	31,631	8,128	246	12.6	87	7,754	0.26	*0.54*	4.1	17.1	0.002	66	4,355
2013 Averages & Totals	37,638	6,007	257	26.6	158	7,912	0.63	0.07	0.2	17.3	0	0	4,355
1/15/2014	38,308	671	235	12.0	4.8	7,917	0.17	0.99	*0.30*	17.59	0	0	4,355
2/12/2014	38,979	671	267	2.3	4.5	7,922	0.16	*0.017*	*0.32*	17.91	0	0	4,355
3/20/2014	39,620	641	260	*1.8*	1.3	7,923	0.05	*0.017*	*0.01*	17.92	0	0	4,355
4/16/2014	40,263	643	263	*1.5*	1.0	7,924	0.04	*0.017*	*0.01*	17.9	0	0	4,355
5/21/2014	41,101	838	249	5.9	3.0	7,927	0.04	*0.017*	*0.01*	17.9	0	0	4,355
6/18/2014	41,771	670	251	1.9	2.4	7,929	0.04	*0.017*	*0.01*	18.0	0	0	4,355
7/25/2014	42,657	886	268	*0.82*	1.2	7,931	0.03	*0.0013*	*0.00*	0.0	0	0	4,355
8/13/2014	43,113	456	253	NR	1.9	7,933	0.10	0.029	*0.03*	0.0	0	0	4,355
9/17/2014	43,953	840	242	7.9	3.4	7,936	0.10	0.087	*0.09*	0.1	0	0	4,355
10/14/2014	44,625	672	260	1.4	2.9	7,939	0.10	*0.0013*	0.00	0.0	0	0	4,355
11/18/2014	45,464	839	258	*0.82*	0.9	7,940	0.03	*0.0013*	0.00	0.0	0	0	4,355
12/17/2014	46,135	670	251	*0.82*	0.5	7,940	0.02	*0.0013*	0.00	0.0	0	0	4,355
Total Combined Recovery lbs (Bio+GRO): 34,723				**Total lbs of Gasoline (GRO): 7,940**				**Total lbs Benzene: 18.05**			**Total lbs from Biodegradation: 26,783**		
Total Combined Recovery gal (Bio+GRO): 5,646				**Total gal of Gasoline (GRO): 1,291**				**Total gal of Benzene: 2.46**			**Total gal from Biodegradation: 4,355**		

Notes:

Samples are collected from the SVE influent vapor stream (air) for all analyses.
Samples are analyzed for concentrations of gasoline range organics (GRO) and benzene, toluene, ethylbenzene, & xylenes (BTEX) at an accredited lab.
Samples analysis methodologies utilized include TO-3 or NWTPH-Gx for GRO and TO-15, TO-3, or 8021b for BTEX.
Pounds of gasoline are converted to gallons by assuming that 6.15 lbs equals 1.0 gallons.
Pounds of benzene are converted to gallons by assuming that 7.33 lbs equals 1.0 gallons.
Total pounds of recovered gasoline starts at 839 pounds, as this was the amount recovered during pilot testing.
Total pounds of recovered benzene starts at 0.80 pounds, as this was the amount recovered during pilot testing.
Benzene and Gasoline recovery are biased high, as recoveries are calculated assuming analytes are present at associated detection limits. This provides a protective estimate of analyte concentrations below detection limits.
Analytes were not detected from analyses for all values listed in *italic* . The associated detection limits for the analyses are the value listed in *italic* .
The SVE system was shutdown from December 2010 through June 2011 and November 2012 through April 2013 due to high groundwater elevations that submerged horizontal SVE screens. The SVE system was restarted once the groundwater elevation had fallen to a save level for system operation.
Due to a laboratory oversight, benzene concentrations could not be quantified for the April 17, 2013 air sample. The May 17, 2013 air sample was analyzed for benzene using EPA Method TO-15, which generated data to a much lower detection limit than historically reported. No benzene was detected in this sample.

Enhanced Biodegradation Calculations:

C = Average Influent CO_2 concentration (%)
Q = Influent Flow Rate (SCFM)
Mc = Molecular wt. of Carbon Dioxide = 44
CO_2 recovery (lbs/hr) = C x Q x Mc x 5.277 x 10-4
5.277 x 10-4 is a constant and is derived as follows:
1/100% x 60min/1hr x 1 lb Mole/379 cu.ft. x 1/3
Note: SVE TPH as CO_2 recovery rates were calculated by assuming that for every 3 lbs of CO_2 detected, 1 lb of TPH is metabolized, and that all CO_2 present in vapor stream above background atmospheric concentrations (0.04%) is attributable to microbial degradation of hydrocarbons in soil.

August 2014 GRO concentrations were not utilized to calculate GRO recovery. Laboratory analyses for GRO were biased high by the presence of non-target analytes, identified as siloxane compounds not typically found in gasoline and is not present at the site. This data was excluded to avoid artificially elevating gasoline capture.

Definitions:

Avg - average
Bio - biodegradation of petroleum hydrocarbons
CO_2 - carbon dioxide
gal - gallons
GRO - gasoline range organics (gasoline range petroleum hydrocarbons)
hr - hour
HSVE - horizontal soil vapor extraction
lbs - pounds
mg/m^3 - milligrams per cubic meter
NA - not available (see reasons above)
NR - not reported
SCFM - standard cubic feet per minute
SVE - soil vapor extraction
TPH - total petroleum hydrocarbons

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1					
AMW-01	12/21/2000	ND	1,310	ND	14.0
AMW-01	3/28/2001	59.3	2,600	ND	69.6
AMW-01	6/13/2001	105 U	944	ND	**470**
AMW-01	10/4/2001	ND	851	ND	**152**
AMW-01	12/12/2001	ND	1700 J	ND UJ	**1,260**
AMW-01	3/7/2002	153	1,410	ND	**1,410**
AMW-01	6/12/2002	143 J	2,100	ND	**1,680**
AMW-01	9/19/2002	139 J	571 J	ND UJ	**1,180**
AMW-01	12/17/2002	196	2,190	ND	**74.6**
AMW-01	3/26/2003	101	2,100	ND	**933**
AMW-01	6/27/2003	ND	2,090	ND	**1,260**
AMW-01	9/18/2003	55	2,140	ND	48.5
AMW-01	12/22/2003	136	1750 J	ND	**571**
AMW-01	3/8/2004	ND UJ	ND	ND	**961**
AMW-01	6/16/2004	138	386	ND	**1,540**
AMW-01	9/28/2004	83	ND	ND	**292**
AMW-01	12/6/2004	103	ND	ND	**411**
AMW-01	3/10/2005	113	ND	ND	**812**
AMW-01	6/21/2005	129	ND	ND	**1,130**
AMW-01	9/27/2005	77	ND UJ	ND	**181 J**
AMW-01	12/13/2005	ND UJ	342	ND	**132**
AMW-01	3/21/2006	88	ND	ND	**363**
AMW-01	7/6/2006	ND UJ	ND	ND	**912**
AMW-01	9/18/2006	91.7	ND	ND	7.38
AMW-01	12/12/2006	**1,650 J**	ND UJ	ND UJ	**539 J**
AMW-01	3/21/2007	89.9	ND	ND	**457**
AMW-01	6/6/2007	61	ND	ND	**486**
AMW-01	9/12/2007	65	ND	ND	**157**
AMW-01	12/18/2007	ND	ND	ND	10.6 J
AMW-01	3/25/2008	ND	ND	ND	**76**
AMW-01	6/25/2008	64.9	ND	ND	**370**
AMW-01	9/17/2008	55.0	ND	ND	**162**
AMW-01	12/16/2008	ND	ND	ND	**330**
AMW-01	3/11/2009	ND	ND	ND	**374**
AMW-01	6/10/2009	ND	R	R	**240 J**
AMW-01	9/16/2009	ND	ND	ND	7.4
AMW-01	12/16/2009	ND	ND	ND	**280**
AMW-01	3/30/2010	ND	ND	ND	**310**
AMW-01	6/9/2010	ND	720	ND	**280**
AMW-01	9/14/2010	ND	ND	ND	69.7
AMW-01	12/14/2010	ND	ND	ND	**282**
AMW-01	3/22/2011	ND	ND	ND	**247**
AMW-01	6/22/2011	ND	300 J	ND	39.6
AMW-01	9/27/2011	ND	ND	ND	22.2
AMW-01	12/20/2011	ND	ND	ND	**151**
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-01	3/20/2012	ND	ND	ND	**178**
AMW-01	6/21/2012	ND	ND	ND	**77**
AMW-01	9/10/2012	ND	ND	ND	38.7 J
AMW-01	12/19/2012	ND	ND	ND	61.2
AMW-01	3/19/2013	ND	ND	ND	**110**
AMW-01	6/25/2013	ND	ND	ND	12
AMW-01	9/10/2013	ND	ND	ND	17
AMW-01	12/10/2013	ND	ND	ND	17
AMW-01	3/11/2014	ND	990 J	ND	**77**
AMW-01	6/10/2014	ND UJ	1,100	ND	7.3
AMW-01	9/9/2014	ND	440 J	ND UJ	8.4
AMW-01	12/9/2014	ND	1,500	ND	20
AMW-02	12/21/2000	ND	803	ND	3.14
AMW-02	3/28/2001	Not accessible due to earthquake damage to warehouse.			
AMW-02	6/13/2001	ND	999	ND	3.88 U
AMW-02	10/4/2001	ND	1,200	ND	10.90
AMW-02	12/12/2001	ND	1,500 J	ND UJ	5.47
AMW-02	3/7/2002	Not accessible due to repair of earthquake damage to warehouse.			
AMW-02	6/12/2002	ND	2,420	ND	1.49
AMW-02	9/19/2002	ND UJ	495 J	ND UJ	1.61
AMW-02	12/17/2002	ND	1,890	ND	4.08
AMW-02	3/26/2003	ND	2,200	ND	5.23
AMW-02	6/27/2003	ND	1,680	ND	1.11
AMW-02	9/18/2003	ND	2,430	790	2.01
AMW-02	12/22/2003	ND	1,880 J	ND	ND
AMW-02	3/8/2004	ND	ND	ND	ND
AMW-02	6/16/2004	ND	ND	ND	2.40
AMW-02	9/28/2004	ND	ND	ND	0.85
AMW-02	12/8/2004	ND	ND	ND	23.2
AMW-02	3/10/2005	ND	ND	ND	38.4
AMW-02	6/21/2005	ND	ND	ND	16.1
AMW-02	9/27/2005	ND	ND	ND	9.04
AMW-02	12/13/2005	ND	366	ND	7.26
AMW-02	3/21/2006	ND	ND	ND	2.16
AMW-02	7/6/2006	ND	ND	ND	41.1
AMW-02	9/18/2006	ND	ND	ND	3.18
AMW-02	12/12/2006	84.5 UJ	ND UJ	ND UJ	25.8 J
AMW-02	3/21/2007	ND	ND	ND	**92.2**
AMW-02	6/6/2007	ND	ND	ND	**442**
AMW-02	9/12/2007	ND	ND	ND	4.03 J
AMW-02	12/18/2007	ND	ND	ND	66.2
AMW-02	3/25/2008	75.9	ND	ND	**343**
AMW-02	6/25/2008	ND	ND	ND	**125**
AMW-02	9/17/2008	ND	ND	ND	30.7
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-02	12/16/2008	ND	ND	ND	**189**
AMW-02	3/11/2009	ND	ND	ND	**421**
AMW-02	6/10/2009	ND	R	R	**100**
AMW-02	9/14/2010	ND	ND	ND	22.6
AMW-02	12/14/2010	ND	ND	ND	**96.2**
AMW-02	9/16/2009	ND	ND	ND	12
AMW-02	12/16/2009	ND	ND	ND	**110**
AMW-02	3/30/2010	ND	1,000	ND	**210**
AMW-02	6/9/2010	ND	1,000	260	**130**
AMW-02	3/22/2011	ND	ND	ND	**149**
AMW-02	6/22/2011	ND	ND	ND	20.0
AMW-02	9/27/2011	ND	ND	ND	6.5
AMW-02	12/20/2011	ND	ND	ND	12.2
AMW-02	3/20/2012	ND	ND	ND	31.6
AMW-02	6/21/2012	ND	ND	ND	**82.5**
AMW-02	9/10/2012	ND	ND	ND	12.7 J
AMW-02	12/19/2012	ND	ND	ND	12.4
AMW-02	3/19/2013	ND	ND	ND	9.3
AMW-02	6/25/2015	ND	ND	ND	13.0
AMW-02	9/10/2013	ND	ND	ND	8.1
AMW-02	12/10/2013	ND	ND	ND	5.7
AMW-02	3/11/2014	ND	ND	ND	19.0
AMW-02	6/10/2014	ND UJ	320	ND	12.0
AMW-02	9/9/2014	ND	270	ND	29.0
AMW-02	12/9/2014	ND	530	ND	15.0
AMW-03	12/21/2000	127	1,420	ND	ND
AMW-03	3/28/2001	Not accessible due to earthquake damage to warehouse.			
AMW-03	6/13/2001	ND	745	ND	ND
AMW-03	10/4/2001	ND	1,210	ND	ND
AMW-03	12/12/2001	ND	1,080 J	ND UJ	ND
AMW-03	3/7/2002	Not accessible due to earthquake damage to warehouse.			
AMW-03	6/12/2002	ND	1,070	ND	ND
AMW-03	9/19/2002	ND UJ	643 J	ND UJ	ND UJ
AMW-03	12/17/2002	ND	1,160	ND	ND
AMW-03	3/26/2003	ND	1,240	ND	ND
AMW-03	6/27/2003	ND	713	ND	ND
AMW-03	9/18/2003	ND	1,050	ND	ND
AMW-03	12/22/2003	ND	374 J	ND	ND
AMW-03	3/8/2004	ND	ND	ND	ND
AMW-03	6/16/2004	ND	ND	ND	1.02
AMW-03	9/28/2004	ND	ND	ND	ND
AMW-03	12/8/2004	ND	ND UJ	ND UJ	ND
AMW-03	3/10/2005	ND	ND	ND	1.56
AMW-03	6/21/2005	ND	ND	ND	0.99
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-03	9/27/2005	ND	ND UJ	ND	0.997
AMW-03	12/13/2005	ND	ND	ND	0.828
AMW-03	3/21/2006	ND	ND	ND	2.770
AMW-03	7/6/2006	ND	ND	ND	2.28
AMW-03	9/18/2006	ND	ND	ND	ND
AMW-03	12/12/2006	ND UJ	ND UJ	ND UJ	0.974 J
AMW-03	3/21/2007	ND	ND	ND	ND
AMW-03	6/6/2007	ND	ND	ND	ND
AMW-03	9/12/2007	ND	ND	ND	ND UJ
AMW-03	12/18/2007	ND	ND	ND	ND
AMW-03	3/25/2008	ND	ND	ND	ND
AMW-03	6/25/2008	ND	ND	ND	ND
AMW-03	9/17/2008	ND	ND	ND	ND
AMW-03	12/16/2008	ND	ND	ND	ND
AMW-03	3/11/2009	ND	ND	ND	ND
AMW-03	6/10/2009	ND	R	R	ND
AMW-03	9/16/2009	ND	ND	ND	ND
AMW-03	12/16/2009	ND	ND	ND	ND
AMW-03	3/30/2010	ND	400	ND	ND
AMW-03	6/9/2010	ND	230	ND	ND
AMW-03	9/14/2010	ND	ND	ND	ND
AMW-03	12/14/2010	ND	ND	ND	ND
AMW-03	3/22/2011	ND	ND	ND	0.54
AMW-03	6/22/2011	ND	ND	ND	ND
AMW-03	9/27/2011	ND	ND	ND	ND
AMW-03	12/20/2011	ND	ND	ND	ND
AMW-03	3/20/2012	ND	ND	ND	0.52
AMW-03	6/21/2012	ND	ND	ND	ND
AMW-03	9/10/2012	ND	ND	ND	ND
AMW-03	12/19/2012	ND	ND	ND	ND
AMW-03	3/19/2013	ND	ND	ND	ND
AMW-03	6/25/2013	ND	ND	ND	ND
AMW-03	9/10/2013	ND	ND	ND	ND
AMW-03	12/10/2013	ND	ND	ND	ND
AMW-03	3/11/2014	ND	320 J	ND	ND
AMW-03	6/10/2014	ND UJ	430	ND	ND
AMW-03	9/9/2014	ND	360	ND	ND
AMW-03	12/9/2014	ND	570	ND	ND
AMW-04	12/21/2000	ND	1,570	ND	0.66
AMW-04	3/28/2001	ND	1,660	ND	0.766
AMW-04	6/13/2001	ND	987	ND	ND
AMW-04	10/4/2001	ND	379	ND	ND
AMW-04	12/12/2001	ND	930 J	ND UJ	ND
AMW-04	3/7/2002	ND	519	ND	2.94
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-04	6/12/2002	ND	1,200	ND	0.63
AMW-04	9/19/2002	ND UJ	760 J	ND UJ	1.45 J
AMW-04	12/17/2002	ND	1,070	ND	ND
AMW-04	3/26/2003	ND	1,240	ND	0.84
AMW-04	6/27/2003	ND	875	ND	ND
AMW-04	9/18/2003	ND	1,660	ND	ND
AMW-04	12/22/2003	ND	686 J	ND	1.73
AMW-04	3/8/2004	ND	ND	ND	ND
AMW-04	6/16/2004	ND	ND	ND	ND
AMW-04	9/27/2004	ND	ND	ND	ND
AMW-04	12/6/2004	ND	ND	ND	ND
AMW-04	3/10/2005	ND	ND	ND	ND
AMW-04	6/21/2005	ND	ND	ND	ND
AMW-04	9/27/2005	ND	ND UJ	ND	ND
AMW-04	12/13/2005	ND UJ	ND	ND	ND UJ
AMW-04	3/21/2006	ND	ND	ND	0.65
AMW-04	7/6/2006	ND UJ	ND	ND	ND UJ
AMW-04	9/18/2006	ND	ND	ND	ND
AMW-04	12/12/2006	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	3/21/2007	ND	ND	ND	0.64
AMW-04	6/6/2007	ND	ND	ND	ND
AMW-04	9/12/2007	ND	ND	ND	ND UJ
AMW-04	12/18/2007	ND	ND	ND	ND
AMW-04	3/26/2008	ND	ND	ND	ND
AMW-04	6/25/2008	ND	ND	ND	ND
AMW-04	9/17/2008	ND	ND	ND	ND
AMW-04	12/16/2008	ND	ND	ND	0.63
AMW-04	3/11/2009	ND	ND	ND	ND
AMW-04	6/10/2009	ND	R	R	ND
AMW-04	9/16/2009	ND	ND	ND	ND
AMW-04	12/16/2009	ND UJ	ND	ND	ND
AMW-04	3/30/2010	ND	610	ND	0.57
AMW-04	6/9/2010	ND	430	ND	ND
AMW-04	9/14/2010	ND	ND	ND	ND
AMW-04	12/14/2010	ND	ND	ND	ND
AMW-04	3/22/2011	ND	ND	ND	ND
AMW-04	6/22/2011	ND	ND	ND	ND
AMW-04	9/27/2011	ND	ND	ND	ND
AMW-04	12/27/2011	ND	ND	ND	ND
AMW-04	3/20/2012	ND	ND	ND	ND
AMW-04	6/21/2012	ND	ND	ND	ND
AMW-04	9/10/2012	ND	ND	ND	ND
AMW-04	12/19/2012	ND	ND	ND	ND
AMW-04	3/19/2013	ND	ND	ND	ND
AMW-04	6/25/2013	ND	ND	ND	ND
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-04	9/10/2013	ND	ND	ND	ND
AMW-04	12/10/2013	ND	ND	ND	ND
AMW-04	3/11/2014	ND	780 J	ND	ND
AMW-04	6/10/2014	ND UJ	400	ND	ND
AMW-04	9/9/2014	ND	480	ND	ND
AMW-04	12/9/2014	ND	630	ND	ND
AMW-05	12/21/2000	ND	1,450	ND	ND
AMW-05	3/28/2001	ND	1,360	ND	ND
AMW-05	6/13/2001	ND	440	ND	ND
AMW-05	10/4/2001	71.4 U	318	ND	ND
AMW-05	12/12/2001	ND	940 J	ND UJ	ND
AMW-05	3/7/2002	ND	1,100	ND	2.12
AMW-05	6/12/2002	78	1,180	ND	0.701
AMW-05	9/19/2002	ND UJ	760 J	ND UJ	1.45 J
AMW-05	12/17/2002	ND	1,820	ND	ND
AMW-05	3/26/2003	ND	1,900	ND	0.577
AMW-05	3/27/2003	ND	381 J	ND UJ	ND
AMW-05	9/19/2003	ND	2,150	ND	ND
AMW-05	12/22/2003	ND	1,420 J	ND	0.833
AMW-05	3/8/2004	ND	ND	ND	ND
AMW-05	6/16/2004	ND	ND	ND	ND
AMW-05	9/27/2004	ND	ND	ND	ND
AMW-05	12/6/2004	ND	ND	ND	ND
AMW-05	3/10/2005	ND	ND	ND	ND
AMW-05	6/21/2005	ND	ND	ND	ND
AMW-05	9/27/2005	ND	ND UJ	ND	ND
AMW-05	12/13/2005	ND	ND	ND	0.727
AMW-05	3/21/2006	ND	ND	ND	0.692
AMW-05	7/6/2006	ND	ND	ND	ND
AMW-05	9/18/2006	ND	ND	ND	ND
AMW-05	12/12/2006	ND UJ	ND UJ	ND UJ	0.565 J
AMW-05	3/21/2007	ND	ND	ND	1.11
AMW-05	6/6/2007	ND	ND	ND	ND
AMW-05	9/12/2007	ND	ND	ND	ND UJ
AMW-05	12/18/2007	ND	ND	ND	ND
AMW-05	3/26/2008	ND	ND	ND	ND
AMW-05	6/25/2008	ND	ND	ND UJ	ND
AMW-05	9/17/2008	ND	ND	ND UJ	ND
AMW-05	12/16/2008	ND	ND	ND	0.768
AMW-05	3/11/2009	ND	ND	ND	0.885
AMW-05	6/10/2009	ND	R	R	ND
AMW-05	9/16/2009	54	ND	ND	ND
AMW-05	12/16/2009	ND UJ	ND	ND	ND
AMW-05	3/30/2010	ND	890	ND	1.3
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AMW-05	6/9/2010	ND	640	ND	ND
AMW-05	9/14/2010	ND	ND	ND	ND
AMW-05	12/14/2010	ND	ND	ND	ND
AMW-05	3/22/2011	ND	ND	ND	ND
AMW-05	6/22/2011	ND	ND	ND	ND
AMW-05	9/27/2011	ND	ND	ND	ND
AMW-05	12/20/2011	ND	ND	ND	ND
AMW-05	3/20/2012	ND	ND	ND	ND
AMW-05	6/21/2012	ND	ND	ND	ND
AMW-05	9/10/2012	ND	ND	ND	ND
AMW-05	12/19/2012	ND	ND	ND	ND
AMW-05	3/19/2013	ND	ND	ND	ND
AMW-05	6/25/2013	ND	ND	ND	ND
AMW-05	9/10/2013	ND	ND	ND	ND
AMW-05	12/10/2013	ND	ND	ND	ND
AMW-05	3/11/2014	ND	ND	ND	ND
AMW-05	6/10/2014	ND UJ	560	ND	ND
AMW-05	9/9/2014	ND	300	ND	ND
AMW-05	12/9/2014	ND	460	ND	ND
GM-11S	4/10/1997	**3,910**	2,210	1,230	**616 J**
GM-11S	7/8/1997	960 J	1,090	ND	46.9 J
GM-11S	10/21/1997	**1,570**	1,260	ND	**126**
GM-11S	1/21/1998	390	788	ND	**250**
GM-11S	3/11/1998	**1,800**	776	ND	**640**
GM-11S	7/6/1998	680	470 J	ND	41
GM-11S	10/20/1998	260	584	ND	27
GM-11S	12/15/1998	**1,300**	1,090	ND	**500**
GM-11S	3/26/1999	**1,100**	779	ND	**220**
GM-11S	6/23/1999	710	520	ND	**92**
GM-11S	CONVERTED TO RECOVERY WELL - SAMPLING DISCONTINUED				
GM-12S	4/10/1997	140	4,500	2,720	42.9
GM-12S	7/8/1997	160	4,590	3,450	ND
GM-12S	10/20/1997	ND	600	1,630	ND
GM-12S	1/21/1998	ND	1,210	2,040	ND
GM-12S	3/10/1998	ND	2,040	ND	ND
GM-12S	7/6/1998	140	2,830	1,980	0.8
GM-12S	10/20/1998	77	1,200	775	ND
GM-12S	3/26/1999	280	2,080 J	1,100 J	0.5
GM-12S	6/23/1999	260	1,530	ND	ND
GM-12S	WELL DELETED FROM MONITORING PROGRAM				
GM-14S	9/13/2007	608	1020	ND	0.97
GM-14S	12/20/2007	389	341	ND	1.02
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
GM-14S	3/27/2008	172	ND	ND	0.538
GM-14S	6/27/2008	**2,680 J**	577	ND	2.5 J
GM-14S	9/19/2008	**1,440**	719	ND	1.32
GM-14S	12/17/2008	**1,630 J**	963	ND	1.6
GM-14S	3/12/2009	**1,300**	562	ND	7.98
GM-14S	6/11/2009	**2,500**	R	R	ND
GM-14S	9/18/2009	**2,300**	1,600	ND	ND
GM-14S	12/17/2009	750	870	ND	ND
GM-14S	4/1/2010	**2,000**	880	ND	ND
GM-14S	6/10/2010	**1,900 J**	3,200	560	11 J
GM-14S	9/16/2010	**2,070**	690	ND	ND
GM-14S	12/15/2010	245	400	ND	ND
GM-14S	3/23/2011	748	350	ND	ND
GM-14S	6/23/2011	**2,190**	590	ND	ND
GM-14S	9/28/2011	**3,660**	840	ND	ND
GM-14S	12/21/2011	**3,150**	1,200	ND	ND
GM-14S	3/21/2012	903	480	ND	ND
GM-14S	6/22/2012	**3,050**	500	ND	ND
GM-14S	9/11/2012	**3,330**	920	ND	ND
GM-14S	12/20/2012	464	480	ND	ND
GM-14S	3/20/2013	**1,400**	340	ND	ND
GM-14S	6/26/2013	**2,200**	770	ND	1.3
GM-14S	9/11/2013	**1,700**	810	ND	0.77
GM-14S	12/11/2013	**3,300**	570	ND	ND
GM-14S	3/12/2014	760	1,600	940	0.53
GM-14S	6/11/2014	**2,000 J**	1,300	ND	1.2
GM-14S	9/10/2014	**2,900 J**	1,100	ND	0.87
GM-14S	12/10/2014	**1,000**	1,800	1,200	0.84
GM-15S	4/9/1997	ND	290	ND	ND
GM-15S	7/8/1997	170	800	ND	1.4
GM-15S	10/21/1997	ND	ND	ND	ND
GM-15S	1/21/1998	ND	293	ND	ND
GM-15S	3/11/1998	ND	ND	ND	ND
GM-15S	7/7/1998	54	253	ND	ND
GM-15S	10/21/1998	310	550	ND	ND
GM-15S	12/15/1998	120	342	ND	ND
GM-15S	3/25/1999	ND	ND	ND	ND
GM-15S	6/23/1999	76	ND	ND	ND
GM-15S	9/27/1999	NS	NS	NS	NS
GM-15S	12/14/1999	160 U	316	ND	ND
GM-15S	3/24/2000	ND	451	ND	ND
GM-15S	6/30/2000	167	1,200	ND	ND
GM-15S	9/27/2000	355 J	1,130 J	ND	ND UJ
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
GM-15S	12/21/2000	801	1,990	ND	ND
GM-15S	3/27/2001	548	2,810	ND	0.747 J
GM-15S	6/12/2001	909	1,040	ND	2.58 U
GM-15S	10/3/2001	955	1,220	ND	10.9 J
GM-15S	12/11/2001	578	1,100	ND	9.62
GM-15S	3/6/2002	434	1,430	ND	12.1
GM-15S	6/10/2002	786	2,530	ND	14.7
GM-15S	9/18/2002	825 J	1,320 J	ND UJ	9.38 J
GM-15S	12/16/2002	738	1,690 J	ND	4.16
GM-15S	3/25/2003	833 J	2,920	ND	3.57 J
GM-15S	6/26/2003	616	2,940 J	ND	2.49 J
GM-15S	9/19/2003	636	1,530	ND	1.58
GM-15S	12/22/2003	672	647 J	ND	1.47 J
GM-15S	3/8/2004	458 J	ND	ND	2.83 J
GM-15S	6/17/2004	836 J	356	ND	1.26
GM-15S	9/28/2004	655	ND	ND	1.62 J
GM-15S	12/8/2004	847	ND	ND	1.53
GM-15S	3/11/2005	587	ND	ND	1.07 J
GM-15S	6/22/2005	984 J	ND	ND	0.682
GM-15S	9/28/2005	840	ND	ND	1.43 J
GM-15S	12/14/2005	702	ND	ND	1.27
GM-15S	3/22/2006	317	ND	ND	0.614
GM-15S	7/7/2006	647	ND	ND	0.767
GM-15S	9/19/2006	533	ND	ND	0.836
GM-15S	12/13/2006	494 J	ND UJ	ND UJ	ND UJ
GM-15S	3/22/2007	420	ND	ND	ND
GM-15S	6/7/2007	404	ND	ND	0.505
GM-15S	9/13/2007	180	ND	ND	ND UJ
GM-15S	12/19/2007	549	ND	ND	0.943
GM-15S	3/26/2008	404	ND	ND	0.613
GM-15S	6/26/2008	480	ND	ND	0.665
GM-15S	9/18/2008	445	ND	ND	0.599
GM-15S	12/17/2008	Well not sampled, sampling reduced to a semi-annual event			
GM-15S	3/12/2009	695	ND	ND	19.6
GM-15S	9/16/2009	390	ND	ND	ND
GM-15S	3/30/2010	670	520	ND	1.1
GM-15S	9/15/2010	269	ND	ND	6.6
GM-15S	3/23/2011	ND	ND	ND	ND
GM-15S	9/27/2011	427	ND	ND	0.79
GM-15S	3/20/2012	143	ND	ND	ND
GM-15S	9/10/2012	ND	ND	ND	ND
GM-15S	3/19/2013	92	ND	ND	**100**
GM-15S	6/25/2013	**1,300**	ND	ND	**400**
GM-15S	9/10/2013	270	ND	ND	**110**
GM-15S	12/11/2013	320	ND	ND	1.3
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
GM-15S	3/12/2014	110	430 J	ND	ND
GM-15S	6/11/2014	ND	ND	ND	ND
GM-15S	9/9/2014	180	870	ND	ND
GM-15S	12/9/2014	250	520	ND	ND
GM-16S	4/9/1997	ND	3,980	1,630	
GM-16S	7/8/1997	ND	3,890	1,710	ND
GM-16S	10/21/1997	ND	720	ND	ND
GM-16S	1/21/1998	ND	1,390	ND	ND
GM-16S	3/12/1998	ND	5,780	1,620	ND
GM-16S	7/7/1998	ND	1,310	ND	ND
GM-16S	10/20/1998	ND	ND	ND	ND
GM-16S	12/17/1998	ND	2,170	871	ND
GM-16S	3/26/1999	NS	1,990	960	NS
GM-16S	6/28/1999	NS	480	ND	NS
GM-16S	WELL DELETED FROM MONITORING PROGRAM / REINITIATED 3RD QUARTER 2007 ON ECOLOGYS REQUEST				
GM-16S	9/13/2007	ND	ND	ND	ND UJ
GM-16S	12/20/2007	ND	ND	ND	ND
GM-16S	3/27/2008	65.3	ND	ND	ND
GM-16S	6/27/2008	81.1	ND	ND	ND
GM-16S	9/19/2008	72.7	ND	ND	ND
GM-16S	12/17/2008	Well not sampled, sampling has been reduced to a semi-annual event			
GM-16S	3/12/2009	ND	456	ND	ND
GM-16S	9/18/2009	300	750	ND	ND
GM-16S	3/31/2010	390	1,800	ND	ND
GM-16S	9/16/2010	263	490	ND	ND
GM-16S	3/23/2011	193	350	ND	ND
GM-16S	9/28/2011	377	400	ND	ND
GM-16S	3/21/2012	ND	290	ND	ND
GM-16S	9/11/2012	ND	ND	ND	ND
GM-16S	3/20/2013	79	ND	ND	ND
GM-16S	9/11/2013	62	ND	ND	ND
GM-16S	3/12/2014	ND	1,600	ND	ND
GM-16S	9/10/2014	960	1,200	ND	ND
GM-17S	4/9/1997	ND	1,720	900	ND
GM-17S	7/9/1997	ND	720	ND	ND
GM-17S	10/21/1997	ND	ND	ND	ND
GM-17S	1/22/1998	ND	320	ND	ND
GM-17S	3/11/1998	ND	926	ND	ND
GM-17S	7/7/1998	52 J	410 J	ND UJ	ND UJ
GM-17S	10/21/1998	ND	ND	ND	ND
GM-17S	12/15/1998	ND	1,060	ND	ND
GM-17S	3/26/1999	NS	851	ND	NS
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (μg/L)	TPH-D WTPH-DX (μg/L)	TPH-O WTPH-DX (μg/L)	Benzene EPA 8021 & 8260 (μg/L)
Plant 1, continued					
GM-17S	6/28/1999	NS	393	ND	NS
	WELL DELETED FROM MONITORING PROGRAM / REINITIATED 3RD QUARTER 2007				
GM-17S		ON ECOLOGYS REQUEST			
GM-17S	9/13/2007	ND	ND	ND	ND UJ
GM-17S	12/20/2007	ND	ND	ND	ND
GM-17S	3/27/2008	ND	ND	ND	ND
GM-17S	6/27/2008	ND	ND	ND	ND
GM-17S	9/19/2008	ND	ND	ND	ND
GM-17S	12/17/2008	Well not sampled, sampling has been reduced to a semi-annual event			
GM-17S	3/12/2009	ND	ND	ND	ND
GM-17S	9/18/2009	53	ND	ND	ND
GM-17S	3/31/2010	ND	ND	ND	ND
GM-17S	9/16/2010	ND	ND	ND	ND
GM-17S	3/23/2011	ND	ND	ND	ND
GM-17S	9/28/2011	ND	ND	ND	ND
GM-17S	3/21/2012	ND	ND	ND	ND
GM-17S	9/11/2012	ND	ND	ND	ND
GM-17S	3/20/2013	ND	ND	ND	ND
GM-17S	9/11/2013	ND	ND	ND	ND
GM-17S	3/12/2014	ND	420	ND	ND
GM-17S	9/10/2014	ND	ND	ND	ND
GM-24S	4/9/1997	970	2,180	1,070	ND
GM-24S	7/9/1997	**4,040**	1,200	ND	ND
GM-24S	10/22/1997	**2,760**	710	ND	1.1
GM-24S	1/22/1998	**1,300**	841	ND	2.1
GM-24S	3/11/1998	370	765	ND	ND
GM-24S	7/7/1998	**1,500 J**	762 J	ND UJ	ND UJ
GM-24S	10/20/1998	800	929	ND	1.6
GM-24S	12/17/1998	**1,100**	867	ND	ND
GM-24S	3/26/1999	**3,500**	1,470	ND	ND
GM-24S	6/28/1999	**2,600**	1,390	ND	**2,600**
GM-24S	9/29/1999	**2,200**	1,030	ND	0.8
GM-24S	12/14/1999	**1,900**	857	ND	1.3 U
GM-24S	3/24/2000	**2,860**	1,230	ND	ND
GM-24S	6/30/2000	**4,570**	2,110	ND	ND
GM-24S	9/27/2000	**3,080 J**	2,690 J	ND	ND UJ
GM-24S	12/21/2000	**3,420**	4,100	947	ND
GM-24S	3/27/2001	**2,570**	3,120	884	0.704 J
GM-24S	6/12/2001	Tank Farm was inaccessible to sampling activities			
GM-24S	10/3/2001	**2,820**	1,800	ND	3.88 J
GM-24S	12/11/2001	**1,560**	2,250	ND	1.13 J
GM-24S	3/6/2002	**2,180**	2,170	ND	12.1
GM-24S	6/10/2002	**2,230**	1,800	ND	2.2 J
GM-24S	9/18/2002	**1,930 J**	1,130 J	ND UJ	3.79 J
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
GM-24S	12/16/2002	**1,330**	4,250	949	2.32
GM-24S	3/25/2003	**1,510**	1,930	850	0.667 J
GM-24S	6/25/2003	**3,510 J**	ND UJ	ND UJ	3.38 J
GM-24S	9/19/2003	**2,490**	1,610	ND	3.49
GM-24S	12/23/2003	**2,890**	2,220 J	ND	1.66 J
GM-24S	3/9/2004	**2,850**	345	ND	0.928 J
GM-24S	6/17/2004	**2,800**	567	ND	1.66
GM-24S	9/29/2004	**2,190**	0.365	ND	2.25
GM-24S	12/9/2004	**1,910**	ND	ND	2.34
GM-24S	3/11/2005	**2,670**	0.365	ND	1.61
GM-24S	6/22/2005	**3,990**	261	ND	3.68
GM-24S	9/28/2005	**4,190**	296	ND	3.23 J
GM-24S	12/14/2005	**2,430**	293	ND	2.79
GM-24S	3/22/2006	**2,310**	303	ND	1.95 J
GM-24S	7/7/2006	**2,700**	ND	ND	1.82
GM-24S	9/19/2006	**2,480**	535	ND	2.03
GM-24S	12/14/2006	**1,070 J**	ND UJ	ND UJ	ND UJ
GM-24S	3/22/2007	**2,750 J**	427 J	ND	2.97 J
GM-24S	6/7/2007	**2,600 J**	429	ND	2.25
GM-24S	9/13/2007	**1,390 J**	346 J	ND	1.16 J
GM-24S	12/20/2007	**ND UJ**	ND	ND	ND
GM-24S	3/27/2008	578	ND	ND	0.59
GM-24S	6/26/2008	**1,980**	439	ND	2.13
GM-24S	9/19/2008	**1,210**	252	ND	1.34
GM-24S	12/17/2008	**1,260**	ND	ND	1.32 J
GM-24S	3/12/2009	**1,260**	309	ND	1.35
GM-24S	6/11/2009	**1,200**	R	R	ND
GM-24S	9/17/2009	**1,600 J**	850	ND	ND
GM-24S	12/17/2009	620 J	430	ND	ND
GM-24S	4/1/2010	990 J	370	ND	ND
GM-24S	6/10/2010	**1,200**	760 J	ND	2.9 J
GM-24S	9/16/2010	**1,480 J**	460 J	ND	ND
GM-24S	12/15/2010	448	ND	ND	ND
GM-24S	3/23/2011	**2,260**	350	ND	ND
GM-24S	6/23/2011	**1,140 J**	380	ND	ND
GM-24S	9/28/2011	806 J	710 J	ND	ND
GM-24S	12/21/2011	**2,080**	260	ND	ND
GM-24S	3/21/2012	462 J	260	ND	ND
GM-24S	6/22/2012	**1,220**	270	ND	ND
GM-24S	9/11/2012	**2,460**	550	ND	ND
GM-24S	12/20/2012	244	ND	ND	ND
GM-24S	3/20/2013	**1,100**	270	ND	ND
GM-24S	6/26/2013	850 J	390	ND	ND
GM-24S	9/11/2013	500 J	470	ND	ND UJ
GM-24S	12/11/2013	**1,700**	450 J	ND	ND
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
GM-24S	3/12/2014	200 J	300 J	ND	ND
GM-24S	6/11/2014	**1,000**	450	ND	ND
GM-24S	9/10/2014	620 J	720	ND	ND
GM-24S	12/10/2014	840 J	320	ND	ND
AR-03	4/9/1997	**4,560**	5,890 J	1,070 J	**2,780 J**
AR-03	7/8/1997	**2,690**	7,600	1,640	**311**
AR-03	10/21/1997	**2,460**	730	ND	**204**
AR-03	1/21/1998	570	1,740	ND	41
AR-03	3/10/1998	**2,800**	2,490	ND	**850**
AR-03	7/6/1998	**2,900**	2,030	ND	35
AR-03	10/20/1998	990	2,230	ND	ND
AR-03	12/15/1998	780	1,200	ND	50
AR-03	3/25/1999	**3,800**	2,480	ND	**1,600**
AR-03	6/23/1999	**3,300**	2,390	ND	**290**
AR-03	9/29/1999	**3,400**	2,570	ND	10
AR-03	12/14/1999	**2,400**	1,390	ND	**340**
AR-03	3/24/2000	**1,380**	3,600	ND	**574**
AR-03	6/30/2000	**3,230**	7,980	1,040	**523**
AR-03	9/27/2000	**2,320 J**	3,700 J	772	ND UJ
AR-03	12/21/2000	**2,480**	5,140	ND	41.9
AR-03	3/27/2001	**2,050**	3,500	812	**583**
AR-03	6/14/2001	**1,330 J**	2,220	ND	1.59 R
AR-03	10/3/2001	533	1,640	ND	ND
AR-03	12/11/2001	**1,870**	1,790	ND	**661**
AR-03	3/6/2002	**2,890**	4,520	ND	**1800**
AR-03	6/10/2002	**2280 J**	5,590	794	**160 J**
AR-03	9/18/2002	484 J	1,890 J	ND UJ	6.01 J
AR-03	12/16/2002	321	2,830	ND	ND
AR-03	3/26/2003	**2,090**	6,190	ND	**1070 J**
AR-03	6/26/2003	610 J	2,790	ND	28.1
AR-03	9/19/2003	297	1,630	ND	ND
AR-03	12/23/2003	918	1640 J	ND	**228**
AR-03	3/9/2004	**2,350**	ND	ND	**659**
AR-03	6/17/2004	769 J	675	ND	34.3
AR-03	9/29/2004	332	ND	ND	ND
AR-03	12/8/2004	344	ND	ND	6.65
AR-03	3/11/2005	454	ND	ND	12.6
AR-03	6/22/2005	288	ND	ND	1.47
AR-03	9/28/2005	389	ND	ND	ND
AR-03	12/14/2005	520	408	ND	32.7
AR-03	3/22/2006	**2,450**	947	ND	**451**
AR-03	7/7/2006	860	ND	ND	67.3
AR-03	9/19/2006	323	ND	ND	ND
AR-03	12/13/2006	**1,210 J**	ND UJ	ND UJ	**134 J**
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
AR-03	3/22/2007	**1,880 J**	518	ND	**304**
AR-03	6/7/2007	**1,503**	ND	ND	**148**
AR-03	9/13/2007	186	ND	ND	ND
AR-03	12/19/2007	317	ND	ND	1.59
AR-03	3/26/2008	**2,010**	263	ND	172
AR-03	6/26/2008	**2,580**	ND	ND	**72.0**
AR-03	9/17/2008	758	ND	ND	0.79
AR-03	12/17/2008	**1,030 J**	384	ND	0.94
AR-03	3/13/2009	157	462	ND	ND
AR-03	6/11/2009	940	R	R	3.30
AR-03	9/17/2009	**1,200**	590	ND	ND
AR-03	12/16/2009	160	1,100	ND	ND
AR-03	3/31/2010	230	3,700	ND	ND
AR-03	6/10/2010	810	**14,000**	930	ND
AR-03	9/15/2010	676	180	ND	ND
AR-03	12/15/2010	ND	130	ND	ND
AR-03	3/24/2011	ND	390	ND	ND
AR-03	6/23/2011	297	380	ND	ND
AR-03	9/28/2011	821	270	ND	ND
AR-03	12/21/2011	940	170	ND	ND
AR-03	3/21/2012	ND	ND	ND	ND
AR-03	6/21/2012	ND	340	ND	ND
AR-03	9/10/2012	815 J	650 J	ND	ND
AR-03	12/20/2012	ND	460	ND	ND
AR-03	3/20/2013	78	ND	ND	ND
AR-03	6/26/2013	370	ND	ND	ND
AR-03	9/11/2013	540	280	ND	ND
AR-03	12/11/2013	390	560	ND	ND
AR-03	3/12/2014	ND	1,100 J	ND	ND
AR-03	6/10/2014	ND UJ	2,700	ND	ND
AR-03	9/9/2014	260	3,100	850	ND
AR-03	12/10/2014	ND	2,100	1,100	ND
MW-1-T9	12/15/2005	434	785	ND	ND
MW-1-T9	3/22/2006	**1,600**	214	ND	**78.9**
MW-1-T9	7/7/2006	816	ND	ND	0.852
MW-1-T9	9/19/2006	236	ND	ND	ND
MW-1-T9	12/13/2006	307 J	ND UJ	ND UJ	ND UJ
MW-1-T9	3/22/2007	922 J	510	ND	15.8 J
MW-1-T9	6/7/2007	**1,130**	428	ND	0.779
MW-1-T9	9/14/2007	536	ND	ND	ND
MW-1-T9	12/19/2007	120	ND	ND	ND
MW-1-T9	3/26/2008	879	467	ND	18.3
MW-1-T9	6/26/2008	**1,050 J**	ND	ND	7.02
MW-1-T9	9/18/2008	919	ND	ND	0.5
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
MW-1-T9	12/17/2008	374	ND	ND	ND
MW-1-T9	3/13/2009	377	445	ND	0.666
MW-1-T9	6/11/2009	**1,000**	R	R	1.7
MW-1-T9	9/17/2009	980	770	ND	0.5
MW-1-T9	12/17/2009	98	590	ND	ND
MW-1-T9	3/31/2010	**1,300 J**	**11,000**	ND	1.4
MW-1-T9	6/10/2010	820	**14,000**	1,200	0.7
MW-1-T9	9/15/2010	473	160	ND	ND
MW-1-T9	12/15/2010	147	120	ND	ND
MW-1-T9	3/24/2011	256	440	ND	ND
MW-1-T9	6/22/2011	437	370	ND	ND
MW-1-T9	9/29/2011	338	ND	ND	ND
MW-1-T9	12/21/2011	438	110	ND	ND
MW-1-T9	3/22/2012	121	ND	ND	ND
MW-1-T9	6/22/2012	268	260	ND	ND
MW-1-T9	9/10/2012	338	580	ND	ND
MW-1-T9	12/20/2012	170	530	ND	ND
MW-1-T9	3/20/2013	300	ND	ND	ND
MW-1-T9	6/26/2013	380	ND	ND	ND
MW-1-T9	9/11/2013	270	ND	ND	ND
MW-1-T9	12/11/2013	560	160	ND	ND
MW-1-T9	3/12/2014	160	3,700 J	890 J	ND
MW-1-T9	6/11/2014	360	5,800	940	ND
MW-1-T9	9/10/2014	350	3,700	700	ND
MW-1-T9	12/10/2014	160	1,600	ND	ND
MW-2-T9	12/15/2005	**7,870**	2,270	ND	63.9
MW-2-T9	3/22/2006	**8,070**	212	ND	49.6
MW-2-T9	7/7/2006	**2,670 J**	ND	ND	17.8
MW-2-T9	9/19/2006	**1,280**	ND	ND	13.4
MW-2-T9	12/13/2006	**1,980 J**	ND UJ	ND UJ	7.17 J
MW-2-T9	3/22/2007	**3,700 J**	ND	ND	24.1 J
MW-2-T9	6/7/2007	**2830 J**	0.261	ND	16.6 J
MW-2-T9	9/14/2007	748	ND	ND	4.69 J
MW-2-T9	12/19/2007	869	ND	ND	3.82
MW-2-T9	3/26/2008	**3,420**	ND	ND	21.5
MW-2-T9	6/26/2008	**1,170 J**	ND	ND	7.1
MW-2-T9	9/18/2008	**1,100**	ND	ND	1.62
MW-2-T9	12/17/2008	**1,110**	ND	ND	1.93
MW-2-T9	3/13/2009	**1,140**	ND	ND	2.92
MW-2-T9	6/11/2009	**2,200**	R	R	0.75
MW-2-T9	9/17/2009	940	370	ND	ND
MW-2-T9	12/17/2009	**1,200**	1,500	ND	ND
MW-2-T9	3/31/2010	**2,200 J**	1,100	ND	0.75
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
MW-2-T9	6/10/2010	**1500 J**	3,100	340	1.5
MW-2-T9	9/15/2010	683	ND	ND	ND
MW-2-T9	12/15/2010	**1,810**	390	ND	0.53
MW-2-T9	3/24/2011	**2,000**	430	ND	ND
MW-2-T9	6/23/2011	**1,400**	250	ND	ND
MW-2-T9	9/29/2011	962	320	ND	ND
MW-2-T9	12/21/2011	**1,280**	120	ND	ND
MW-2-T9	3/22/2012	426	ND	ND	ND
MW-2-T9	6/22/2012	766	270	ND	ND
MW-2-T9	9/10/2012	**1,710**	460	ND	ND
MW-2-T9	12/20/2012	513	ND UJ	ND UJ	ND
MW-2-T9	3/20/2013	580	ND	ND	ND
MW-2-T9	6/26/2013	650	ND	ND	ND
MW-2-T9	9/10/2013	700	ND	ND	ND
MW-2-T9	12/11/2013	700	240	ND	ND
MW-2-T9	3/12/2014	740	1,400 J	ND	ND
MW-2-T9	6/11/2014	380	1,000	ND	ND
MW-2-T9	9/10/2014	520	680	ND	ND
MW-2-T9	12/10/2014	360	1,100	ND	ND
MW-3-T9	12/15/2005	509	860	ND	2.08
MW-3-T9	3/22/2006	572	543	ND	2.67
MW-3-T9	7/7/2006	749	ND	ND	3.48
MW-3-T9	9/19/2006	609	317	ND	1.48
MW-3-T9	12/13/2006	541	ND	ND	1.33
MW-3-T9	3/22/2007	722	ND	ND	2.33
MW-3-T9	6/7/2007	603	ND	ND	2.1
MW-3-T9	9/14/2007	536	ND	ND	1.68 J
MW-3-T9	12/19/2007	578	ND	ND	1.61
MW-3-T9	3/26/2008	522	ND	ND	1.36
MW-3-T9	6/26/2008	711	ND	ND	4.78
MW-3-T9	9/17/2008	502	ND	ND	0.585
MW-3-T9	12/17/2008	668	ND	ND	5.35
MW-3-T9	3/13/2009	275	ND	ND	0.553
MW-3-T9	6/11/2009	630	2,400	1,800	7
MW-3-T9	9/17/2009	490	ND	ND	ND
MW-3-T9	12/17/2009	580	1,000	ND	ND
MW-3-T9	3/31/2010	690 J	790	ND	5.1
MW-3-T9	6/10/2010	500	2,500	ND	5.2
MW-3-T9	9/15/2010	331	ND	ND	3.8
MW-3-T9	12/15/2010	449	ND	ND	15
MW-3-T9	3/24/2011	826	270	ND	**87.7**
MW-3-T9	6/23/2011	632	ND	ND	69.6
MW-3-T9	9/29/2011	468	ND	ND	40.1
MW-3-T9	12/21/2011	788	ND	ND	58.2
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1, continued					
MW-3-T9	3/22/2012	825	ND	ND	**191**
MW-3-T9	6/21/2012	596	ND	ND	**113**
MW-3-T9	9/10/2012	679	ND	ND	**94.9**
MW-3-T9	12/20/2012	617	760	ND	**172**
MW-3-T9	3/20/2013	700	ND	ND	68
MW-3-T9	6/26/2013	520	ND	ND	55
MW-3-T9	9/10/2013	490	ND	ND	39
MW-3-T9	12/11/2013	980	ND	ND	39
MW-3-T9	3/12/2014	**1,000**	1,400 J	ND	28
MW-3-T9	6/11/2014	670	1,300	ND	14
MW-3-T9	9/10/2014	650	1,400	ND	14
MW-3-T9	12/10/2014	800	1,000	ND	13
MW-4-T9	12/15/2005	ND	ND	ND	1.26
MW-4-T9	3/22/2006	ND	ND	ND	0.836
MW-4-T9	7/7/2006	ND	ND	ND	0.745
MW-4-T9	9/19/2006	ND	ND	ND	1.53
MW-4-T9	12/13/2006	ND UJ	ND UJ	ND UJ	1.46
MW-4-T9	3/22/2007	ND	ND	ND	0.625
MW-4-T9	6/7/2007	81	ND	ND	ND
MW-4-T9	9/14/2007	ND	ND	ND	0.599 J
MW-4-T9	12/19/2007	ND	ND	ND	1.55
MW-4-T9	3/26/2008	ND	ND	ND	ND
MW-4-T9	6/26/2008	ND	ND	ND	ND
MW-4-T9	9/18/2008	ND	ND	ND	0.92
MW-4-T9	12/17/2008	ND	ND	ND	1.1
MW-4-T9	3/13/2009	ND	ND	ND	0.506
MW-4-T9	6/11/2009	ND	R	R	ND
MW-4-T9	9/17/2009	60	ND	ND	ND
MW-4-T9	12/16/2009	ND	ND	ND	ND
MW-4-T9	3/31/2010	ND	ND	ND	ND
MW-4-T9	6/10/2010	ND	210	ND	ND
MW-4-T9	9/15/2010	ND	ND	ND	ND
MW-4-T9	12/15/2010	ND	ND	ND	ND
MW-4-T9	3/24/2011	ND	ND	ND	ND
MW-4-T9	6/23/2011	ND	ND	ND	ND
MW-4-T9	9/28/2011	ND	ND	ND	ND
MW-4-T9	12/21/2011	ND	ND	ND	ND
MW-4-T9	3/21/2012	ND	ND	ND	ND
MW-4-T9	6/21/2012	ND	ND	ND	ND
MW-4-T9	9/10/2012	ND	ND	ND	ND
MW-4-T9	12/20/2012	ND	ND	ND	ND
MW-4-T9	3/20/2013	ND	ND	ND	ND
MW-4-T9	6/26/2013	ND	ND	ND	ND
MW-4-T9	9/10/2013	ND	ND	ND	ND
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 1 Continued					
MW-4-T9	12/11/2013	ND	ND	ND	ND
MW-4-T9	3/12/2014	ND	290 J	ND	ND
MW-4-T9	6/11/2014	ND	480	ND	ND
MW-4-T9	9/9/2014	ND	400	ND	ND
MW-4-T9	12/10/2014	ND	360	ND	ND
Plant 2					
GM-19S	4/10/1997	**1,070**	4,260	1,840	1.3
GM-19S	7/9/1997	**1,030**	1,840	1,150	0.9 J
GM-19S	10/22/1997	800	370	ND	3.6
GM-19S	1/22/1998	400 J	1,320	ND	1.8
GM-19S	3/12/1998	180	1,860	ND	ND
GM-19S	7/8/1998	**1,000 J**	1,660 J	ND UJ	ND UJ
GM-19S	10/21/1998	570	1,260	ND	2.5
GM-19S	12/17/1998	650	1,970	ND	0.9
GM-19S	3/25/1999	72	1,420	793	ND
GM-19S	6/22/1999	**1,600**	1,100	ND	1.5
GM-19S	9/27/1999	**1,900 J**	NS	NS	44 J
GM-19S	12/13/1999	**1,500 J**	1,160	ND	**470**
GM-19S	3/24/2000	ND	1,530	ND	**955**
GM-19S	7/3/2000	771	1,380	ND	**2,330 J**
GM-19S	9/29/2000	ND UJ	2,290 J	776 J	**4,010 J**
GM-19S	12/21/2000	ND	3,150	806	**2,660**
GM-19S	3/28/2001	**2,940**	2,320	994	**1,730**
GM-19S	6/15/2001	**3,270**	1,230	ND	**3,390**
GM-19S	10/5/2001	Not accessible due to island redevelopment activities			
GM-19S	12/13/2001	**5,140**	2,350	985	**1,990**
GM-19S	3/8/2002	**11,000**	1,940	NS	**723**
GM-19S	6/11/2002	**2,720 J**	3,210	810	**710 J**
GM-19S	9/18/2002	**1,320 J**	2,430 J	ND UJ	**1,960 J**
GM-19S	12/16/2002	730	4590 J	1,770	**2,320 J**
GM-19S	3/25/2003	**9,540**	3,350	960	**1,960**
GM-19S	6/25/2003	**3,640**	3,740 J	1,380 J	**596**
GM-19S	9/19/2003	**1,290**	2,010	ND	**469**
GM-19S	12/23/2003	**1,070 J**	2,190 J	ND	**496**
GM-19S	3/9/2004	**1,450**	ND	ND	**832**
GM-19S	6/17/2004	**1,150**	498	ND	**307**
GM-19S	9/29/2004	679 J	NS	NS	**87.8**
GM-19S	12/9/2004	501	NS	NS	47
GM-19S	3/11/2005	649	NS	NS	**210.0**
GM-19S	6/22/2005	NS	NS	NS	**99.7**
GM-19S	9/28/2005	467	NS	NS	43.9
GM-19S	12/14/2005	581	NS	NS	**508**
GM-19S	3/22/2006	**1,710**	NR	NR	**853**
GM-19S	7/7/2006	850	NR	NR	**426**
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 2, continued					
GM-19S	9/19/2006	389	NS	NS	63
GM-19S	12/13/2006	445 J	NS	NS	**167 J**
GM-19S	3/22/2007	**1,070 J**	NS	NS	**1,400**
GM-19S	6/7/2007	200 J	NS	NS	15
GM-19S	9/13/2007	484	NS	NS	**956**
GM-19S	12/19/2007	88	NS	NS	**140**
GM-19S	3/27/2008	560	NS	NS	**869**
GM-19S	6/26/2008	958	NS	NS	**164**
GM-19S	9/19/2008	530	NS	NS	**178**
GM-19S	12/18/2008	Well not sampled, sampling has been reduced to a semi-annual event			
GM-19S	3/12/2009	261	NS	NS	**186**
GM-19S	9/17/2009	510	NS	NS	**140**
GM-19S	3/31/2010	220	NS	NS	**110**
GM-19S	9/15/2010	372	NS	NS	**111**
GM-19S	3/23/2011	56.5	NS	NS	26.9
GM-19S	9/28/2011	709	NS	NS	31.0
GM-19S	3/21/2012	355	NS	NS	8.4
GM-19S	9/11/2012	312	NS	NS	47.0
GM-19S	3/20/2013	330	NR	NR	38.0
GM-19S	9/11/2013	750	NR	NR	**160**
GM-19S	3/12/2014	ND	NR	NR	10
GM-19S	9/10/2014	53	NR	NR	44
GM-19D	4/10/1997	ND	6,680	2,050	**234**
GM-19D	7/9/1997	ND	5,910	1,780	**330**
GM-19D	10/22/1997	70	ND	ND	**263**
GM-19D	1/22/1998	ND	1,820	ND	**260**
GM-19D	3/12/1998	ND	2,630	ND	**140**
GM-19D	7/8/1998	ND UJ	2,120 J	ND UJ	**360 J**
GM-19D	10/21/1998	ND	1,930	ND	**180**
GM-19D	12/17/1998	ND	2,260	ND	**170**
GM-19D	3/25/1999	57	2,280	ND	**150**
GM-19D	6/22/1999	150	1,520	ND	**150**
GM-19D	9/27/1999	75 J	2,460 J	ND UJ	**120 J**
GM-19D	12/13/1999	550 J	1,930	ND	**170**
GM-19D	3/22/2000	ND	2,490	ND	**208**
GM-19D	7/3/2000	ND	5,260	1,280	**225**
GM-19D	9/29/2000	ND UJ	6,490 J	1,470 J	**210 J**
GM-19D	12/21/2000	ND	8,700	984	**225**
GM-19D	3/28/2001	ND	8,100	1,990	**163**
GM-19D	6/12/2001	ND	2,650	ND	**278**
GM-19D	10/5/2001	Not accessible due to island redevelopment activities			
GM-19D	12/13/2001	ND	7,830	1,880	**265**
GM-19D	3/8/2002	ND	3,400	ND	**281**
GM-19D	6/11/2002	63	7,810	1,470	**220**
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 2, continued					
GM-19D	9/18/2002	59.8 J	1,960 UJ	ND UJ	**215**
GM-19D	12/16/2002	52 J	6880 J	1,020	**263**
GM-19D	3/26/2003	ND	2,880	ND UJ	**270**
GM-19D	6/25/2003	ND	6,930	1,770	**222**
GM-19D	9/19/2003	ND	2,300	ND	**241**
GM-19D	12/23/2003	ND	7710 J	1,140	**261**
GM-19D	3/9/2004	82	ND	ND	**173**
GM-19D	6/17/2004	56.1	3,430	ND	**169**
GM-19D		WELL DELETED FROM MONITORING PROGRAM			
GM-21S	4/10/1997	ND	4,640	2,960	ND
GM-21S	7/9/1997	ND	5,080	2,420	ND
GM-21S	10/23/1997	ND	ND	ND	ND
GM-21S	1/23/1998	ND	1,710	ND	ND
GM-21S	3/12/1998	ND	615	ND	ND
GM-21S	7/9/1998	ND	2,190	ND	ND
GM-21S	10/21/1998	ND	694	ND	ND
GM-21S	12/17/1998	ND	1,050	ND	ND
GM-21S	3/25/1999	NS	793	ND	NS
GM-21S	6/22/1999	NS	875	ND	NS
GM-21S	9/27/1999	NS	3,330 J	ND UJ	NS
GM-21S	12/13/1999	NS	648	ND	NS
GM-21S	3/23/2000	ND	1,480	ND	ND
GM-21S	7/6/2000	ND	3,020	ND	ND
GM-21S	9/29/2000	ND UJ	3,310 J	924 J	ND UJ
GM-21S	12/21/2000	NS	NS	NS	NS
GM-21S	3/28/2001	Not accessible due to island redevelopment activities			
GM-21S	6/12/2001	Not accessible due to island redevelopment activities			
GM-21S	10/5/2001	Not accessible due to island redevelopment activities			
GM-21S	12/13/2001	Not accessible due to island redevelopment activities			
GM-21S	3/6/2002	ND	454	ND	ND
GM-21S		WELL DELETED FROM MONITORING PROGRAM			
GM-21D	4/10/1997	ND	1,730 J	810 J	ND
GM-21D	7/9/1997	ND	1,860	ND	ND
GM-21D	10/23/1997	ND	ND	ND	ND
GM-21D	1/23/1998	ND	744	ND	ND
GM-21D	3/12/1998	ND	1,830	ND	ND
GM-21D	7/9/1998	ND	1,030 J	ND UJ	ND
GM-21D	10/21/1998	ND	684	ND	ND
GM-21D	12/17/1998	ND	926	ND	ND
GM-21D	6/22/1999	NS	1,100	ND	NS
GM-21D	9/27/1999	NS	2,330 J	ND UJ	NS
GM-21D	12/13/1999	NS	986	ND	NS
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (μg/L)	TPH-D WTPH-DX (μg/L)	TPH-O WTPH-DX (μg/L)	Benzene EPA 8021 & 8260 (μg/L)
Plant 2, continued					
GM-21D		WELL DELETED FROM MONITORING PROGRAM			
GM-22S		WELL NOT SAMPLED BETWEEN 1997 AND 2000			
GM-22S	3/23/2000	ND	5,060	841	0.538
GM-22S	7/6/2000	ND	8,930	1,050	ND
GM-22S	9/29/2000	ND UJ	3,130 J	1,620 J	2.04 J
GM-22S	12/21/2000	ND	5,070	1,720	ND
GM-22S	3/28/2001	ND	5,430	2,500	ND
GM-22S	6/15/2001	ND	3,110	ND	ND
GM-22S	10/5/2001	Not accessible due to island redevelopment activities			
GM-22S	12/13/2001	55.3	4,780	2,320	ND
GM-22S	3/8/2002	ND	2,710	831	ND
GM-22S		WELL DELETED FROM MONITORING PROGRAM			
GM-23S	4/10/1997	NS	NS	NS	NS
GM-23S	7/9/1997	750	1,830	1,010	ND
GM-23S	10/22/1997	400	ND	ND	ND
GM-23S	1/23/1998	NS	NS	NS	NS
GM-23S	3/12/1998	NS	NS	NS	NS
GM-23S	7/8/1998	480 J	467 J	ND UJ	ND UJ
GM-23S	10/21/1998	500	1,250	ND	ND
GM-23S	12/17/1998	NS	NS	NS	NS
GM-23S	3/25/1999	NS	NS	NS	NS
GM-23S	6/22/1999	680	801	ND	ND
GM-23S	9/28/1999	940	682	ND	ND
GM-23S		WELL DELETED FROM MONITORING PROGRAM			
T-18-1	6/14/2001	ND	1,670	ND	ND
T-18-1	10/5/2001	ND	1,270	ND	ND
T-18-1	12/13/2001	ND	365	ND	ND
T-18-1	3/6/2002	ND	357	ND	ND
T-18-1		WELL DELETED FROM MONITORING PROGRAM			
T-18-2a	6/14/2001	ND	385	ND	ND
T-18-2a	10/5/2001	ND	339	ND	ND
T-18-2a	12/13/2001	ND	323	ND	ND
T-18-2a	3/6/2002	ND	256	ND	ND
T-18-2a		WELL DELETED FROM MONITORING PROGRAM			
MW-03R	6/11/2002	NS	**20,700**	ND	NS
MW-03R	9/18/2002	NS	9,690 J	1,990 J	NS
MW-03R	12/16/2002	NS	NS	NS	NS
MW-03R	3/25/2003	NS	ND	ND UJ	NS
MW-03R	6/26/2006	NS	**10,200**	2,500	NS
MW-03R	9/19/2003	NS	831	ND	NS
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Table 6. Groundwater Monitoring Analytical Results for TPH and Benzene
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TPH-G WTPH-G (µg/L)	TPH-D WTPH-DX (µg/L)	TPH-O WTPH-DX (µg/L)	Benzene EPA 8021 & 8260 (µg/L)
Plant 2, continued					
MW-03R	12/23/2003	NS	472 J	ND	NS
MW-03R	3/9/2004	NR	645	ND	NS
MW-03R	6/17/2004	NR	935	ND	NS
MW-03R		WELL DELETED FROM MONITORING PROGRAM			
Cleanup Level		1,000	10,000	10,000	71
Method Reporting Limit		50	250	750	0.5

Note: Values in **bold** exceed the cleanup level.

J Estimated value.
µg/L Micrograms per liter.
NA Not analyzed.
ND Constituent not detected above reporting limit.
NS Not sampled.
TPH Total petroleum hydrocarbons.
TPH-D Total petroleum hydrocarbons as diesel.
TPH-G Total petroleum hydrocarbons as gasoline.
TPH-O Total petroleum hydrocarbons as oil.
U Undetected.
WTPH-DX Washington State Method for Analysis of Diesel and Oil in Water - Extended.
WTPH-G Washington State Method for Analysis of Gasoline in Water.
EPA 8021 or EPA 9260 - EPA Methods for Analysis of Benzene in Water.

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 1								
GM-11S	4/10/1997	ND	ND	ND	ND	0.01	ND	ND
GM-11S	7/8/1997	ND	ND	ND	ND	0.01 J	ND	0.01 J
GM-11S	10/21/1997	0.02	0.01	0.02	0.01	0.02	0.01	0.01
GM-11S	1/21/1998	ND	ND	ND	ND	0.01 U	ND	ND
GM-11S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-12S	4/10/1997	0.02	0.03	**0.04**	**0.04**	**0.06**	ND	**0.04**
GM-12S	7/8/1997	**0.06 J**	**0.07 J**	**0.11 J**	**0.09 J**	**0.13 J**	0.01 J	**0.06 J**
GM-12S	10/20/1997	**0.07 J**	**0.06 J**	**0.1 J**	**0.09 J**	**0.15 J**	0.01	**0.08 J**
GM-12S	1/21/1998	0.1 U	**0.11**	**0.12**	**0.12 U**	**0.16 U**	**0.04**	**0.11**
GM-12S	3/10/1998	**0.05**	**0.06**	**0.1**	**0.07**	**0.12**	0.02	**0.09**
GM-12S	7/6/1998	0.01	0.01	0.03	0.02	**0.04**	ND	0.03
GM-12S	10/20/1998	0.03	0.03	**0.05**	**0.04**	**0.07 J**	0.01	**0.05**
GM-12S	12/15/1998	NS	NS	NS	NS	NS	NS	NS
GM-12S	3/26/1999	0.01	0.01	0.02	0.02	0.02	ND	0.02 U
GM-12S	6/23/1999	ND	0.01	0.01	0.01	0.01	ND	0.01
GM-12S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-15S	4/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-15S	7/8/1997	ND	0.01 J	0.02 J	0.01 J	ND	ND	0.01 J
GM-15S	10/21/1997	ND	ND	ND	ND	ND	ND	ND
GM-15S	1/21/1998	ND	ND	ND	ND	ND	ND	ND
GM-15S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-16S	4/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-16S	7/8/1997	ND	ND	ND	ND	ND	ND	ND
GM-16S	10/21/1997	ND	ND	ND	ND	ND	ND	ND
GM-16S	1/21/1998	ND	ND	ND	ND	ND	ND	ND
GM-16S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-17S	4/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-17S	7/9/1997	0.01 J	ND	0.01 J	0.01 J	0.02 J	0.01 J	0.01 J
GM-17S	10/21/1997	ND	ND	ND	ND	ND	ND	ND
GM-17S	1/22/1998	ND	ND	ND	ND	ND	ND	ND
GM-17S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-24S	4/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-24S	7/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-24S	10/22/1997	ND	ND	ND	ND	ND	ND	ND
GM-24S	1/22/1998	ND	ND	ND	ND	ND	ND	ND
GM-24S				WELL DELETED FROM cPAH MONITORING PROGRAM				
AR-03	4/9/1997	ND R	ND R	ND R	ND R	ND R	ND R	ND R
AR-03	7/8/1997	ND	ND	ND	ND	ND	ND	ND
AR-03	10/21/1997	ND	ND	ND	ND	ND	ND	ND
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 1, continued								
AR-03	1/21/1998	ND	ND	ND	ND	ND	ND	ND
AR-03				WELL DELETED FROM cPAH MONITORING PROGRAM				
AMW-01	12/21/2000	ND	ND	0.116	ND	ND	ND	ND
AMW-01	3/28/2001	**0.0372 J**	**0.0821 J**	**0.04585 * J**	**0.04585 * J**	**0.0347 J**	ND UJ	ND UJ
AMW-01	6/13/2001	ND	ND	ND *	ND *	ND	**0.052**	ND
AMW-01	10/4/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	12/12/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	3/7/2002	ND	ND	ND	ND	ND	ND	ND
AMW-01	6/12/2002	ND	ND	ND	ND	ND	ND	ND
AMW-01	9/19/2002	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	12/17/2002	0.0292 J	ND	ND	ND	ND	ND	ND
AMW-01	6/16/2004	ND	ND	ND	ND	ND	ND	ND
AMW-01	9/28/2004	ND	ND	ND	ND	ND	ND	ND
AMW-01	12/6/2004	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	3/10/2005	U	U	**0.0509**	U	**0.0637**	**0.0483**	**0.0506**
AMW-01	6/21/2005	0.024	ND	**0.0411**	**0.0502**	**0.0322**	ND	0.0222
AMW-01	9/27/2005	ND	ND	ND	ND	ND	ND	ND
AMW-01	12/13/2005	ND	ND	ND	ND	ND	ND	ND
AMW-01	3/21/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	7/6/2006	ND	ND	ND	ND	ND	ND	ND
AMW-01	9/18/2006	ND	ND	ND	ND	ND	ND	ND
AMW-01	12/12/2006	ND R	ND R	ND R	ND R	ND R	NDR	ND R
AMW-01	3/21/2007	**0.212 J**	**0.177 J**	**0.22 J**	**0.29 J**	**0.215 J**	**0.237 J**	**0.229 J**
AMW-01	6/6/2007	ND	ND	ND	ND	ND	ND	ND
AMW-01	9/12/2007	0.0124 J	ND UJ	ND UJ	ND UJ	0.0133 J	ND UJ	ND UJ
AMW-01	12/18/2007	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	3/25/2008	ND	ND	ND	ND	ND	ND	ND
AMW-01	6/25/2008			cPAH Sampling Reduced to an Annual Event				
AMW-01	12/16/2008	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	12/16/2009	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	12/14/2010	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-01	12/21/2011	ND	ND	0.018	ND	ND	ND	ND
AMW-01	12/19/2012	ND	ND	ND	ND	ND	ND	ND
AMW-01	12/10/2013	ND	ND	ND	ND	ND	ND	ND
AMW-01	12/9/2014	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/21/2000	ND	ND	ND	ND	ND	ND	ND
AMW-02	3/28/2001			Warehouse not accessible due to earthquake damage.				
AMW-02	6/13/2001	ND UJ	ND UJ	ND UJ *	ND UJ *	ND UJ	**0.052 J**	ND UJ
AMW-02	10/4/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-02	12/12/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-02	3/7/2002	NS	NS	NS	NS	NS	NS	NS
AMW-02	6/12/2002	ND	ND	ND	ND	ND	ND	ND
AMW-02	9/19/2002	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 1, continued								
AMW-02	12/17/2002	ND	ND	ND	ND	ND	ND	ND
AMW-02	6/16/2004	ND	ND	ND	ND	**0.0322**	ND	ND
AMW-02	9/28/2004	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/8/2004	ND	ND	ND	ND	ND	ND	ND
AMW-02	3/10/2005	U	U	0.136	U	U	0.0153	0.0143
AMW-02	6/21/2005	ND	ND	ND	ND	ND	ND	ND
AMW-02	9/27/2005	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/13/2005	ND	ND	ND	ND	ND	ND	ND
AMW-02	3/21/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-02	7/6/2006	ND	ND	ND	ND	ND	ND	ND
AMW-02	9/18/2006	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/12/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	NDUJ
AMW-02	3/21/2007	**0.201**	**0.191**	**0.207**	**0.237**	**0.215**	**0.226**	**0.232**
AMW-02	6/6/2007	ND	ND	ND	ND	ND	ND	ND
AMW-02	9/12/2007	ND UJ	ND UJ	ND UJ	ND UJ	0.0117 J	ND UJ	ND UJ
AMW-02	12/18/2008	ND	ND	ND	ND	ND	ND	ND
AMW-02	3/25/2008	ND	ND	ND	ND	ND	ND	ND
AMW-02	6/25/2008	cPAH Sampling Reduced to an Annual Event						
AMW-02	12/16/2008	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/16/2009	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-02	12/14/2010	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-02	12/21/2011	ND	ND	ND	0.017	ND	ND	ND
AMW-02	12/19/2012	ND	ND	ND	ND	ND	ND	ND
AMW-02	12/10/2013	0.016	ND	ND	ND	ND	ND	ND
AMW-02	12/9/2014	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/21/2000	ND	ND	ND	ND	ND	ND	ND
AMW-03	3/28/2001	Warehouse not accessible due to earthquake damage.						
AMW-03	6/13/2001	ND	ND	ND *	ND *	ND	**0.051**	ND
AMW-03	10/4/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-03	12/12/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-03	3/7/2002	NS	NS	NS	NS	NS	NS	NS
AMW-03	6/12/2002	ND	ND	ND	ND	ND	ND	ND
AMW-03	9/19/2002	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-03	12/17/2002	ND	ND	ND	ND	ND	ND	ND
AMW-03	6/16/2004	ND	ND	ND	ND	ND	ND	ND
AMW-03	9/28/2004	ND	ND	ND	ND	ND	ND	ND
AMW-03	1/20/2005	ND	ND	ND	ND	ND	ND	ND
AMW-03	3/10/2005	U	ND	0.142	U	U	ND	ND
AMW-03	6/21/2005	ND	ND	ND	ND	ND	ND	ND
AMW-03	9/27/2005	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/13/2005	ND	ND	ND	ND	ND	ND	ND
AMW-03	3/21/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-03	7/6/2006	ND	ND	ND	ND	ND	ND	ND
AMW-03	9/18/2006	ND	ND	ND	ND	ND	ND	ND
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 1, continued								
AMW-03	12/12/2006	**0.0835J**	NDUJ	0.157J	**0.0387J**	**0.0784J**	**0.116J**	**0.125J**
AMW-03	3/21/2007	**0.0714**	**0.0689**	**0.0583**	**0.0773**	**0.0851**	**0.0823**	**0.0752**
AMW-03	6/6/2007	ND	ND	ND	ND	ND	ND	ND
AMW-03	9/12/2007	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-03	12/18/2007	ND	ND	ND	ND	ND	ND	ND
AMW-03	3/25/2008	ND	ND	ND	ND	ND	ND	ND
AMW-03	6/25/2008	cPAH Sampling Reduced to an Annual Event						
AMW-03	12/16/2008	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/16/2009	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/14/2010	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/21/2011	0.017	0.028	**0.051**	0.017	0.030	ND	0.030
AMW-03	12/19/2012	ND	ND	ND	ND	ND	ND	ND
AMW-03	12/10/2013	ND	ND	ND	0.019	0.016	ND	ND
AMW-03	12/9/2014	ND	ND	0.024	ND	0.027	ND	ND
AMW-04	12/21/2000	ND	ND	ND	ND	ND	ND	ND
AMW-04	3/28/2001	**0.0497**	**0.0762 J**	**0.04325 * J**	**0.04325 * J**	**0.0451 J**	ND UJ	ND UJ
AMW-04	6/13/2001	ND	ND	ND *	ND *	ND	**0.054**	ND
AMW-04	10/4/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	12/12/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	3/7/2002	0.0264	ND	0.0276	ND	**0.0350**	ND	ND
AMW-04	6/12/2002	ND	ND	ND	ND	ND	ND	ND
AMW-04	9/19/2002	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	12/17/2002	**0.0396 J**	ND	ND	ND	ND	ND	ND
AMW-04	6/16/2004	ND	ND	ND	ND	ND	ND	ND
AMW-04	9/27/2004	**0.0338**	ND	0.0116	0.0152	**0.0343**	ND	ND
AMW-04	12/6/2004	ND	ND	ND	ND	ND	ND	ND
AMW-04	3/10/2005	ND	ND	ND	ND	ND	ND	ND
AMW-04	6/21/2005	ND R	ND R	ND R	ND R	ND R	ND R	ND R
AMW-04	9/27/2005	ND	ND	ND	ND	ND	ND	ND
AMW-04	12/13/2005	ND	ND	ND	ND	ND	ND	ND
AMW-04	3/21/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	7/6/2006	ND	ND	ND	ND	ND	ND	ND
AMW-04	9/18/2006	ND	ND	ND	ND	ND	ND	ND
AMW-04	12/12/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	3/21/2007	ND	ND	ND	ND	ND	ND	ND
AMW-04	6/6/2007	ND	ND	ND	ND	ND	ND	ND
AMW-04	9/12/2007	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	12/18/2007	ND	ND	ND	ND	ND	ND	ND
AMW-04	3/26/2008	ND	ND	ND	ND	ND	ND	ND
AMW-04	6/25/2008	cPAH Sampling Reduced to an Annual Event						
AMW-04	12/16/2008	ND	ND	ND	ND	ND	ND	ND
AMW-04	12/16/2009	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-04	12/14/2010	**0.031 J**	0.23 J	**0.034 J**	**0.044 J**	**0.043 J**	**0.085 J**	**0.076 J**
AMW-04	12/21/2011	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 1, continued								
AMW-04	12/19/2012	ND	ND	ND	ND	ND	ND	ND
AMW-04	12/10/2013	ND	ND	ND	ND	ND	ND	ND
AMW-04	12/9/2014	ND	ND	ND	ND	ND	ND	ND
AMW-05	12/21/2000	ND	ND	ND	ND	ND	ND	ND
AMW-05	3/28/2001	0.0280 J	**0.0750 J**	**0.0431 * J**	**0.0431 * J**	0.0301 J	ND UJ	ND UJ
AMW-05	6/13/2001	ND UJ	ND UJ	ND UJ *	ND UJ *	ND UJ	ND UJ	ND UJ
AMW-05	10/4/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	12/12/2001	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	3/7/2002	ND	ND	ND	ND	ND	ND	ND
AMW-05	6/12/2002	ND	ND	ND	ND	ND	ND	ND
AMW-05	9/19/2002	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	12/17/2002	ND	ND	ND	ND	ND	ND	ND
AMW-05	6/16/2004	ND	ND	ND	ND	ND	ND	ND
AMW-05	6/16/2004	ND	ND	ND	ND	ND	ND	ND
AMW-05	12/6/2004	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	3/10/2005	ND	ND	ND	ND	ND	ND	ND
AMW-05	6/21/2005	0.0132	ND	0.0189	0.0185	0.0178	ND	0.0142
AMW-05	9/27/2005	ND	ND	ND	ND	ND	ND	ND
AMW-05	12/13/2005	ND	ND	ND	ND	ND	ND	ND
AMW-05	3/21/2006	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	7/6/2006	ND	ND	ND	ND	ND	ND	ND
AMW-05	9/18/2006	ND	ND	ND	ND	**0.0832 J**	ND	ND
AMW-05	12/12/2006	**0.0771J**	**NDUJ**	**0.157J**	**0.0397J**	**0.0768J**	**0.121J**	**0.129J**
AMW-05	3/21/2007	**0.0499**	**0.0534**	**0.0551**	**0.51**	**0.0562**	**0.051**	**0.0633**
AMW-05	6/6/2007	ND	ND	ND	ND	ND	ND	ND
AMW-05	9/12/2007	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	12/18/2007	ND	ND	ND	ND	ND	ND	ND
AMW-05	3/26/2008	0.0159	ND	ND	ND	0.0116	ND	ND
AMW-05	6/25/2008	cPAH Sampling Reduced to an Annual Event						
AMW-05	12/16/2008	ND	ND	ND	ND	ND	ND	ND
AMW-05	12/16/2009	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ
AMW-05	12/14/2010	0.019 J	0.018 J	0.021 J	0.020 J	0.025 J	ND UJ	ND UJ
AMW-05	12/21/2011	ND	ND	0.018	ND	ND	ND	ND
AMW-05	12/19/2012	ND	ND	ND	ND	ND	ND	ND
AMW-05	12/10/2013	**0.037**	**0.031**	**0.053**	ND	**0.051**	ND	0.030
AMW-05	12/9/2014	ND	ND	ND	ND	ND	ND	ND
Plant 2								
GM-19S	4/10/1997	ND	ND	ND	ND	ND	ND	ND
GM-19S	7/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-19S	10/22/1997	ND	ND	ND	ND	ND	ND	ND
GM-19S	1/22/1998	ND	ND	ND	ND	ND	ND	ND
GM-19S		WELL DELETED FROM cPAH MONITORING PROGRAM						
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Table 7. Groundwater Monitoring Analytical Results for cPAHs
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Benz(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3,-cd)pyrene (µg/L)
Plant 2, continued								
GM-19D	4/10/1997	ND	ND	ND	ND	ND	ND	ND
GM-19D	7/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-19D	10/22/1997	ND	ND	ND	ND	ND	ND	ND
GM-19D	1/22/1998	ND	ND	ND	ND	ND	ND	ND
GM-19D				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-21S	4/10/1997	ND	ND	ND	ND	ND	ND	ND
GM-21S	7/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-21S	10/23/1997	ND	ND	ND	ND	ND	ND	ND
GM-21S	1/23/1998	ND	ND	ND	ND	ND	ND	ND
GM-21S				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-21D	4/10/1997	ND	ND	ND	ND	ND	ND	ND
GM-21D	7/9/1997	0.01 J	0.01 J	0.02 J	0.02 J	0.02 UJ	ND	0.01 J
GM-21D	10/23/1997	ND	ND	ND	ND	ND	ND	ND
GM-21D	1/23/1998	ND	ND	ND	ND	ND	ND	ND
GM-21D				WELL DELETED FROM cPAH MONITORING PROGRAM				
GM-23S	4/10/1997	NS	NS	NS	NS	NS	NS	NS
GM-23S	7/9/1997	ND	ND	ND	ND	ND	ND	ND
GM-23S	10/22/1997	ND	ND	ND	ND	ND	ND	ND
GM-23S	1/23/1998	NS	NS	NS	NS	NS	NS	NS
GM-23S				WELL DELETED FROM cPAH MONITORING PROGRAM				
Cleanup Level		0.031	0.031	0.031	0.031	0.031	0.031	0.031

Note: Values in **bold** exceed the cleanup level.

cPAHs Carcinogenic polynuclear aromatic hydrocarbons.
J Estimated value.
µg/L Micrograms per liter.
NA Not analyzed.
ND Constituent not detected above reporting limit.
R Rejected; the presence or absence of the constituent cannot be verified.
U Undetected.

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1		
GM-11S	9/29/1999	**~0.29 foot**
GM-11S	10/19/1999	**~0.59 foot**
GM-11S	11/19/1999	**~0.51 foot**
GM-11S	12/28/1999	**~0.10 foot**
GM-11S	1/21/2000	**~0.01 foot**
GM-11S	2/16/2000	**~0.01 foot**
GM-11S	3/27/2000	**~0.01 foot**
GM-11S	4/14/2000	**~0.01 foot**
GM-11S	5/15/2000	**~0.34 foot**
GM-11S	6/26/2000	**~0.07 foot**
GM-11S	7/19/2000	None
GM-11S	8/15/2000	None
GM-11S	9/29/2000	**Sheen**
GM-11S	10/12/2000	None
GM-11S	11/14/2000	**~0.03 foot**
GM-11S	12/14/2000	None
GM-11S	1/11/2001	**~0.01 foot**
GM-11S	2/15/2001	None
GM-11S	3/15/2001	None
GM-11S	4/13/2001	None
GM-11S	5/16/2001	**~0.13 foot**
GM-11S	6/11/2001	None
GM-11S	7/24/2001	None
GM-11S	8/21/2001	None
GM-11S	9/6/2001	**Sheen**
GM-11S	10/19/2001	None
GM-11S	11/15/2001	**Sheen**
GM-11S	12/10/2001	**Sheen**
GM-11S	1/16/2002	**Sheen**
GM-11S	2/21/2002	**Sheen**
GM-11S	3/18/2002	**Sheen**
GM-11S	4/18/2002	**Sheen**
GM-11S	5/20/2002	**Sheen**
GM-11S	6/19/2002	**Sheen**
GM-11S	7/15/2002	**Sheen**
GM-11S	8/20/2002	**Sheen**
GM-11S	9/20/2002	**Sheen**
GM-11S	10/15/2002	**Sheen**
GM-11S	11/27/2002	**Sheen**
GM-11S	12/18/2002	**Sheen**
GM-11S	1/16/2003	**Sheen**
GM-11S	2/11/2003	**Sheen**
GM-11S	3/11/2003	**Sheen**
GM-11S	4/15/2003	**Sheen**
GM-11S	5/15/2003	**Sheen**
GM-11S	6/17/2003	**Sheen**
GM-11S	7/15/2003	**Sheen**
GM-11S	8/13/2003	**Sheen**
GM-11S	9/16/2003	**Sheen**
GM-11S	10/14/2003	**Sheen**
GM-11S	11/19/2003	**Sheen**
GM-11S	12/17/2003	**Sheen**
GM-11S	1/13/2004	**Sheen**
GM-11S	2/10/2004	**Sheen**
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-11S	3/17/2004	**Sheen**
GM-11S	4/15/2004	**Sheen**
GM-11S	5/25/2004	**Sheen**
GM-11S	6/13/2004	**Sheen**
GM-11S	7/13/2004	**Sheen**
GM-11S	8/12/2004	**Sheen**
GM-11S	9/16/2004	**Sheen**
GM-11S	10/13/2004	**Sheen**
GM-11S	11/18/2004	**Sheen**
GM-11S	12/16/2004	**Sheen**
GM-11S	1/13/2005	**Sheen**
GM-11S	2/15/2005	**Sheen**
GM-11S	3/15/2005	**Sheen**
GM-11S	4/15/2005	**Sheen**
GM-11S	5/20/2005	**Sheen**
GM-11S	6/10/2005	**Sheen**
GM-11S	7/15/2005	**Sheen**
GM-11S	8/12/2005	**Sheen**
GM-11S	9/14/2005	**Sheen**
GM-11S	10/14/2005	**Sheen**
GM-11S	11/23/2005	**Sheen**
GM-11S	12/19/2005	**Sheen**
GM-11S	1/25/2006	**Sheen**
GM-11S	2/14/2006	**Sheen**
GM-11S	3/15/2006	**Sheen**
GM-11S	4/14/2006	**Sheen**
GM-11S	5/17/2006	**Sheen**
GM-11S	6/14/2006	**Sheen**
GM-11S	7/12/2006	**Sheen**
GM-11S	8/16/2006	**Sheen**
GM-11S	9/13/2006	**Sheen**
GM-11S	10/12/2006	**Sheen**
GM-11S	11/17/2006	**Sheen**
GM-11S	12/19/2006	**Sheen**
GM-11S	1/19/2007	**Sheen**
GM-11S	2/16/2007	**Sheen**
GM-11S	3/19/2007	**Sheen**
GM-11S	4/19/2007	**Sheen**
GM-11S	5/17/2007	**Sheen**
GM-11S	6/14/2007	**Sheen**
GM-11S	7/13/2007	**Sheen**
GM-11S	8/16/2007	**Sheen**
GM-11S	9/10/2007	**Sheen**
GM-11S	10/17/2007	**Sheen**
GM-11S	11/16/2007	**Sheen**
GM-11S	12/14/2007	**Sheen**
GM-11S	1/22/2008	**Sheen**
GM-11S	2/14/2008	**Sheen**
GM-11S	3/14/2008	**Sheen**
GM-11S	4/18/2008	**Sheen**
GM-11S	5/16/2008	**Sheen**
GM-11S	6/18/2008	**Sheen**
GM-11S	7/16/2008	**Sheen**
GM-11S	8/18/2008	**Sheen**
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-11S	9/16/2008	**Sheen**
GM-11S	10/15/2008	**Sheen**
GM-11S	11/14/2008	**Sheen**
GM-11S	12/11/2008	**Sheen**
GM-11S	1/14/2009	**Sheen**
GM-11S	2/18/2009	**Sheen**
GM-11S	3/17/2009	**Sheen**
GM-11S	4/16/2009	None
GM-11S	5/14/2009	None
GM-11S	6/16/2009	None
GM-11S	7/22/2009	**Sheen**
GM-11S	8/18/2009	**Sheen**
GM-11S	9/14/2009	**Sheen**
GM-11S	10/20/2009	**Sheen**
GM-11S	11/18/2009	None
GM-11S	12/15/2009	None
GM-11S	1/21/2010	**Sheen**
GM-11S	2/17/2010	**Sheen**
GM-11S	3/16/2010	**Sheen**
GM-11S	4/15/2010	None
GM-11S	5/18/2010	**Sheen**
GM-11S	6/17/2010	**Sheen**
GM-11S	7/29/2010	**Sheen**
GM-11S	8/19/2010	**Sheen**
GM-11S	9/22/2010	**Sheen**
GM-11S	10/20/2010	**Sheen**
GM-11S	11/30/2010	**Sheen**
GM-11S	12/23/2010	**Sheen**
GM-11S	1/19/2011	**Sheen**
GM-11S	2/16/2011	**Sheen**
GM-11S	3/29/2011	**Sheen**
GM-11S	4/21/2011	**Sheen**
GM-11S	5/19/2011	**Sheen**
GM-11S	6/15/2011	**Sheen**
GM-11S	7/20/2011	None
GM-11S	8/17/2011	None
GM-11S	9/14/2011	None
GM-11S	10/12/2011	None
GM-11S	11/23/2011	None
GM-11S	12/14/2011	None
GM-11S	1/24/2012	None
GM-11S	2/15/2012	None
GM-11S	3/16/2012	None
GM-11S	4/18/2012	None
GM-11S	5/16/2012	None
GM-11S	6/13/2012	None
GM-11S	7/20/2012	None
GM-11S	9/6/2012	None
GM-11S	10/24/2012	None
GM-11S	11/28/2012	None
GM-11S	12/18/2012	None
GM-11S	1/23/2013	**Sheen**
GM-11S	2/21/2013	**Sheen**
GM-11S	8/15/2012	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-11S	3/13/2013	None
GM-11S	4/17/2013	None
GM-11S	5/22/2013	None
GM-11S	6/12/2013	None
GM-11S	7/24/2013	**Sheen**
GM-11S	8/21/2013	None
GM-11S	9/25/2013	**Sheen**
GM-11S	10/15/2013	None
GM-11S	11/20/2013	None
GM-11S	12/18/2013	None
GM-11S	1/15/2014	None
GM-11S	2/12/2014	None
GM-11S	3/20/2014	None
GM-11S	4/16/2014	None
GM-11S	5/21/2014	None
GM-11S	6/18/2014	None
GM-11S	7/25/2014	None
GM-11S	8/13/2014	None
GM-11S	9/17/2014	None
GM-11S	10/15/2014	None
GM-11S	11/18/2014	None
GM-11S	12/17/2014	None
GM-11S	1/14/2015	None
GM-11S	2/11/2015	None
GM-11S	3/18/2015	None
GM-12S	4/14/2000	None
GM-12S	5/15/2000	NM
GM-12S	6/15/2000	NM
GM-12S	7/19/2000	NM
GM-12S	8/15/2000	NM
GM-12S	9/29/2000	None
GM-12S	10/12/2000	None
GM-12S	11/14/2000	None
GM-12S	12/14/2000	None
GM-12S	1/11/2001	None
GM-12S	2/15/2001	None
GM-12S	3/15/2001	None
GM-12S	4/13/2001	None
GM-12S	5/16/2001	None
GM-12S	6/11/2001	None
GM-12S	7/24/2001	None
GM-12S	8/21/2001	None
GM-12S	9/6/2001	None
GM-12S	10/19/2001	None
GM-12S	11/15/2001	None
GM-12S	12/10/2001	None
GM-12S	1/16/2002	NM
GM-12S	2/21/2002	None
GM-12S	3/18/2002	None
GM-12S	4/18/2002	None
GM-12S	5/20/2002	None
GM-12S	6/19/2002	None
GM-12S	7/15/2002	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-12S	8/20/2002	None
GM-12S	9/20/2002	None
GM-12S	10/15/2002	None
GM-12S	11/27/2002	None
GM-12S	12/18/2002	None
GM-12S	1/16/2003	None
GM-12S	2/11/2003	None
GM-12S	3/11/2003	None
GM-12S	4/15/2003	None
GM-12S	5/15/2003	None
GM-12S	6/17/2003	None
GM-12S	7/15/2003	None
GM-12S	8/13/2003	None
GM-12S	9/16/2003	None
GM-12S	10/14/2003	None
GM-12S	11/19/2003	None
GM-12S	12/17/2003	None
GM-12S	1/13/2004	None
GM-12S	2/10/2004	None
GM-12S	3/17/2004	None
GM-12S	4/15/2004	None
GM-12S	5/25/2004	None
GM-12S	6/13/2004	None
GM-12S	7/13/2004	None
GM-12S	8/12/2004	None
GM-12S	9/16/2004	None
GM-12S	10/13/2004	None
GM-12S	11/18/2004	None
GM-12S	12/16/2004	None
GM-12S	1/13/2005	None
GM-12S	2/15/2005	None
GM-12S	3/15/2005	None
GM-12S	4/15/2005	None
GM-12S	5/20/2005	None
GM-12S	6/10/2005	None
GM-12S	7/15/2005	None
GM-12S	8/12/2005	None
GM-12S	9/14/2005	None
GM-12S	10/14/2005	None
GM-12S	11/23/2005	None
GM-12S	12/19/2005	None
GM-12S	1/25/2006	None
GM-12S	2/14/2006	None
GM-12S	3/15/2006	None
GM-12S	4/14/2006	None
GM-12S	5/17/2006	None
GM-12S	6/14/2006	None
GM-12S	7/12/2006	None
GM-12S	8/16/2006	None
GM-12S	9/13/2006	None
GM-12S	10/12/2006	None
GM-12S	11/17/2006	None
GM-12S	12/19/2006	None
GM-12S	1/19/2007	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-12S	2/16/2007	None
GM-12S	3/19/2007	None
GM-12S	4/19/2007	None
GM-12S	5/17/2007	None
GM-12S	6/14/2007	None
GM-12S	7/13/2007	None
GM-12S	8/16/2007	None
GM-12S	9/10/2007	None
GM-12S	10/17/2007	None
GM-12S	11/16/2007	None
GM-12S	12/14/2007	None
GM-12S	1/22/2008	None
GM-12S	2/14/2008	None
GM-12S	3/14/2008	None
GM-12S	4/18/2008	None
GM-12S	5/16/2008	None
GM-12S	6/18/2008	None
GM-12S	7/16/2008	None
GM-12S	8/18/2008	None
GM-12S	9/16/2008	None
GM-12S	10/15/2008	None
GM-12S	11/14/2008	None
GM-12S	12/11/2008	None
GM-12S	1/14/2009	None
GM-12S	2/18/2009	None
GM-12S	3/17/2009	None
GM-12S	4/16/2009	None
GM-12S	5/14/2009	None
GM-12S	6/16/2009	None
GM-12S	7/22/2009	None
GM-12S	8/18/2009	None
GM-12S	9/14/2009	None
GM-12S	10/20/2009	None
GM-12S	11/18/2009	None
GM-12S	12/15/2009	None
GM-12S	1/21/2010	None
GM-12S	2/17/2010	None
GM-12S	3/16/2010	None
GM-12S	4/15/2010	None
GM-12S	5/18/2010	None
GM-12S	6/17/2010	None
GM-12S	7/29/2010	None
GM-12S	8/19/2010	None
GM-12S	9/22/2010	None
GM-12S	10/20/2010	None
GM-12S	11/30/2010	None
GM-12S	12/23/2010	None
GM-12S	1/19/2011	None
GM-12S	2/16/2011	None
GM-12S	3/29/2011	None
GM-12S	4/21/2011	None
GM-12S	5/19/2011	None
GM-12S	6/15/2011	None
GM-12S	7/20/2011	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-12S	8/17/2011	None
GM-12S	9/14/2011	None
GM-12S	10/12/2011	None
GM-12S	11/23/2011	None
GM-12S	12/14/2011	None
GM-12S	1/24/2012	None
GM-12S	2/15/2012	None
GM-12S	3/16/2012	None
GM-12S	4/18/2012	None
GM-12S	5/16/2012	None
GM-12S	6/13/2012	None
GM-12S	7/20/2012	None
GM-12S	8/15/2012	None
GM-12S	9/6/2012	None
GM-12S	10/24/2012	None
GM-12S	11/28/2012	None
GM-12S	12/18/2012	None
GM-12S	1/23/2012	None
GM-12S	2/21/2013	None
GM-12S	3/13/2013	None
GM-12S	4/17/2013	None
GM-12S	5/22/2013	None
GM-12S	6/12/2013	None
GM-12S	7/24/2013	None
GM-12S	8/21/2013	None
GM-12S	9/25/2013	None
GM-12S	10/15/2013	None
GM-12S	11/20/2013	None
GM-12S	12/18/2013	None
GM-12S	1/15/2014	None
GM-12S	2/12/2014	None
GM-12S	3/20/2014	None
GM-12S	4/16/2014	None
GM-12S	5/21/2014	None
GM-12S	6/18/2014	None
GM-12S	7/25/2014	None
GM-12S	8/13/2014	None
GM-12S	9/17/2014	None
GM-12S	10/15/2014	None
GM-12S	11/18/2014	None
GM-12S	12/17/2014	None
GM-12S	1/14/2015	None
GM-12S	2/11/2015	None
GM-12S	3/18/2015	None
GM-13S	7/6/1998	**Yes***
GM-13S	10/20/1998	**~0.08 foot**
GM-13S	11/18/1998	**~0.08 foot**
GM-13S	12/15/1998	**~0.01 foot**
GM-13S	2/17/1999	**~0.08 foot**
GM-13S	3/15/1999	**~0.34 foot**
GM-13S	4/14/1999	**~0.20 foot**
GM-13S	5/13/1999	**~0.44 foot**
GM-13S	6/15/1999	**~0.35 foot**
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-13S	7/15/1999	**~0.31 foot**
GM-13S	8/17/1999	**~0.19 foot**
GM-13S	9/16/1999	**~0.09 foot**
GM-13S	10/19/1999	**~0.10 foot**
GM-13S	11/19/1999	**~0.11 foot**
GM-13S	12/28/1999	**~0.12 foot**
GM-13S	1/21/2000	**~0.11 foot**
GM-13S	2/16/2000	
GM-13S	3/21/2000	**~0.11 foot**
GM-13S	4/14/2000	**~0.13 foot**
GM-13S	5/15/2000	**~0.10 foot**
GM-13S	6/16/2000	**Sheen**
GM-13S	7/19/2000	**Sheen**
GM-13S	8/15/2000	**Sheen**
GM-13S	9/29/2000	None
GM-13S	10/12/2000	**Sheen**
GM-13S	11/14/2000	**~0.01 foot**
GM-13S	12/14/2000	NM
GM-13S	1/11/2001	NM
GM-13S	2/15/2001	NM
GM-13S	3/15/2001	NM
GM-13S	4/13/2001	NM
GM-13S	5/16/2001	None
GM-13S	6/11/2001	None
GM-13S	7/24/2001	None
GM-13S	8/21/2001	None
GM-13S	9/6/2001	**Sheen**
GM-13S	10/19/2001	None
GM-13S	11/15/2001	None
GM-13S	12/10/2001	**Sheen**
GM-13S	1/16/2002	**Sheen**
GM-13S	2/21/2002	NM
GM-13S	3/18/2002	None
GM-13S	4/18/2002	None
GM-13S	5/20/2002	None
GM-13S	6/19/2002	None
GM-13S	7/15/2002	None
GM-13S	8/20/2002	None
GM-13S	9/20/2002	None
GM-13S	10/15/2002	None
GM-13S	11/27/2002	None
GM-13S	12/18/2002	None
GM-13S	1/16/2003	None
GM-13S	2/11/2003	None
GM-13S	3/11/2003	**Sheen**
GM-13S	4/15/2003	**Sheen**
GM-13S	5/15/2003	**Sheen**
GM-13S	6/17/2003	None
GM-13S	7/15/2003	None
GM-13S	8/13/2003	None
GM-13S	9/16/2003	None
GM-13S	10/14/2003	None
GM-13S	11/19/2003	None
GM-13S	12/17/2003	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-13S	1/13/2004	None
GM-13S	2/10/2004	None
GM-13S	3/17/2004	None
GM-13S	4/15/2004	None
GM-13S	5/25/2004	**Sheen**
GM-13S	6/13/2004	**Sheen**
GM-13S	7/13/2004	**Sheen**
GM-13S	8/12/2004	None
GM-13S	9/16/2004	None
GM-13S	10/13/2004	None
GM-13S	11/18/2004	None
GM-13S	12/16/2004	None
GM-13S	1/13/2005	None
GM-13S	2/15/2005	None
GM-13S	3/15/2005	None
GM-13S	4/15/2005	None
GM-13S	5/20/2005	None
GM-13S	6/10/2005	None
GM-13S	7/15/2005	None
GM-13S	8/12/2005	None
GM-13S	9/14/2005	None
GM-13S	10/14/2005	None
GM-13S	11/23/2005	None
GM-13S	12/19/2005	None
GM-13S	1/25/2006	None
GM-13S	2/14/2006	None
GM-13S	3/15/2006	None
GM-13S	4/14/2006	None
GM-13S	5/17/2006	None
GM-13S	6/14/2006	None
GM-13S	7/12/2006	None
GM-13S	8/16/2006	**Sheen**
GM-13S	9/13/2006	**Sheen**
GM-13S	10/12/2006	None
GM-13S	11/17/2006	None
GM-13S	12/19/2006	None
GM-13S	1/19/2007	None
GM-13S	2/16/2007	None
GM-13S	3/19/2007	**Sheen**
GM-13S	4/19/2007	None
GM-13S	5/17/2007	None
GM-13S	6/14/2007	None
GM-13S	7/13/2007	None
GM-13S	8/16/2007	None
GM-13S	9/10/2007	None
GM-13S	10/17/2007	None
GM-13S	11/16/2007	None
GM-13S	12/14/2007	None
GM-13S	1/22/2008	None
GM-13S	2/14/2008	None
GM-13S	3/14/2008	None
GM-13S	4/18/2008	None
GM-13S	5/16/2008	None
GM-13S	6/18/2008	None
Cleanup Level		No Sheen

Well	Date	Free Product
Plant 1, continued		
GM-13S	7/16/2008	None
GM-13S	8/18/2008	None
GM-13S	9/16/2008	None
GM-13S	10/15/2008	None
GM-13S	11/14/2008	None
GM-13S	12/11/2008	None
GM-13S	1/14/2009	None
GM-13S	2/18/2009	None
GM-13S	3/17/2009	None
GM-13S	4/16/2009	None
GM-13S	5/14/2009	None
GM-13S	6/16/2009	None
GM-13S	7/22/2009	None
GM-13S	8/18/2009	None
GM-13S	9/14/2009	None
GM-13S	10/20/2009	None
GM-13S	11/18/2009	None
GM-13S	12/15/2009	None
GM-13S	1/21/2010	None
GM-13S	2/17/2010	**Sheen**
GM-13S	3/16/2010	**Film**
GM-13S	4/15/2010	**Film**
GM-13S	5/18/2010	**Film**
GM-13S	6/17/2010	**Film**
GM-13S	7/29/2010	**Sheen**
GM-13S	8/19/2010	None
GM-13S	9/22/2010	**Film**
GM-13S	10/20/2010	None
GM-13S	11/30/2010	None
GM-13S	12/23/2010	None
GM-13S	1/19/2011	None
GM-13S	2/16/2011	None
GM-13S	3/29/2011	**Film**
GM-13S	4/21/2011	**~0.01 foot**
GM-13S	5/19/2011	**Film**
GM-13S	6/15/2011	None
GM-13S	7/20/2011	**Film**
GM-13S	8/17/2011	None
GM-13S	9/14/2011	None
GM-13S	10/12/2011	None
GM-13S	11/23/2011	None
GM-13S	12/14/2011	None
GM-13S	1/24/2012	None
GM-13S	2/15/2012	None
GM-13S	3/16/2012	None
GM-13S	4/18/2012	None
GM-13S	5/16/2012	None
GM-13S	6/13/2012	None
GM-13S	7/20/2012	**Film**
GM-13S	8/15/2012	**Film**
GM-13S	9/6/2012	**Film**
GM-13S	10/24/2012	**Film**
GM-13S	11/28/2012	**Film**
GM-13S	12/18/2012	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-13S	1/23/2013	None
GM-13S	2/21/2013	None
GM-13S	3/13/2013	None
GM-13S	4/17/2013	None
GM-13S	5/22/2013	None
GM-13S	6/13/2013	None
GM-13S	7/24/2013	None
GM-13S	8/21/2013	None
GM-13S	9/25/213	None
GM-13S	10/15/2013	None
GM-13S	11/20/2013	None
GM-13S	12/18/2013	None
GM-13S	1/15/2014	None
GM-13S	2/12/2014	None
GM-13S	3/20/2014	None
GM-13S	4/16/2014	None
GM-13S	5/21/2014	None
GM-13S	6/18/2014	None
GM-13S	7/25/2014	None
GM-13S	8/13/2014	None
GM-13S	9/17/2014	None
GM-13S	10/15/2014	None
GM-13S	11/18/2014	None
GM-13S	12/17/2014	None
GM-13S	1/14/2015	None
GM-13S	2/11/2015	None
GM-13S	3/18/2015	None
GM-14S	4/9/1997	**Sheen**
GM-14S	7/9/1997	**Sheen**
GM-14S	10/22/1997	**Sheen**
GM-14S	1/22/1998	**Sheen**
GM-14S	3/12/1998	**Sheen**
GM-14S	7/6/1998	**Sheen**
GM-14S	10/20/1998	**Sheen**
GM-14S	12/15/1998	**Sheen**
GM-14S	3/26/1999	**Sheen**
GM-14S	6/28/1999	**Sheen**
GM-14S	9/28/1999	None
GM-14S	8/15/2000	None
GM-14S	9/29/2000	None
GM-14S	10/12/2000	None
GM-14S	11/14/2000	None
GM-14S	12/14/2000	None
GM-14S	1/11/2001	None
GM-14S	2/15/2001	None
GM-14S	3/15/2001	None
GM-14S	4/13/2001	None
GM-14S	5/16/2001	None
GM-14S	6/11/2001	None
GM-14S	7/24/2001	None
GM-14S	8/21/2001	None
GM-14S	9/6/2001	None
GM-14S	10/19/2001	None
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 1, continued		
GM-14S	11/15/2001	None
GM-14S	12/10/2001	None
GM-14S	1/16/2002	None
GM-14S	2/21/2002	None
GM-14S	3/18/2002	None
GM-14S	4/18/2002	None
GM-14S	5/20/2002	None
GM-14S	6/19/2002	None
GM-14S	7/15/2002	None
GM-14S	8/20/2002	None
GM-14S	9/20/2002	None
GM-14S	10/15/2002	None
GM-14S	11/27/2002	None
GM-14S	12/18/2002	None
GM-14S	1/16/2003	None
GM-14S	2/11/2003	None
GM-14S	3/11/2003	None
GM-14S	4/15/2003	None
GM-14S	5/15/2003	None
GM-14S	6/17/2003	None
GM-14S	7/15/2003	None
GM-14S	8/13/2003	None
GM-14S	9/16/2003	None
GM-14S	10/14/2003	None
GM-14S	11/19/2003	None
GM-14S	12/17/2003	None
GM-14S	1/13/2004	None
GM-14S	2/10/2004	None
GM-14S	3/17/2004	None
GM-14S	4/15/2004	None
GM-14S	5/25/2004	None
	Deleted from Monitoring	
Plant 2		
MW-03	1/25/1999	NM
MW-03	2/17/1999	None
MW-03	3/15/1999	None
MW-03	4/15/1999	NM
MW-03	5/13/1999	None
MW-03	6/15/1999	NM
MW-03	7/15/1999	NM
MW-03	8/17/1999	**~0.43 foot**
MW-03	9/16/1999	**~0.50 foot**
MW-03	10/19/1999	**~0.42 foot**
MW-03	11/19/1999	**~0.49 foot**
MW-03	12/28/1999	**~0.34 foot**
MW-03	1/21/2000	**~0.02 foot**
MW-03	2/16/2000	**~0.02 foot**
MW-03	3/27/2000	**~0.03 foot**
MW-03	4/14/2000	**~0.04 foot**
	Abandoned	
MW-03R	8/21/2001	None
MW-03R	9/16/2001	NM
Cleanup Level		No Sheen

Table 8. Monthly Groundwater LNAPL and Sheen Monitoring
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	Free Product
Plant 2, continued		
MW-03R	10/19/2001	NM
MW-03R	11/15/2001	NM
MW-03R	12/10/2001	NM
MW-03R	1/16/2002	NM
MW-03R	2/21/2002	NM
MW-03R	3/18/2002	None
MW-03R	4/18/2002	None
MW-03R	5/20/2002	None
MW-03R	6/19/2002	None
MW-03R	7/15/2002	None
MW-03R	8/20/2002	None
MW-03R	9/20/2002	None
MW-03R	10/15/2002	None
MW-03R	11/27/2002	None
MW-03R	12/18/2002	NM
MW-03R	1/16/2003	NM
MW-03R	2/11/2003	NM
MW-03R	3/11/2003	NM
MW-03R	3/25/2003	None
MW-03R	4/15/2003	None
MW-03R	5/15/2003	None
MW-03R	6/17/2003	None
MW-03R	7/15/2003	None
MW-03R	8/13/2003	None
MW-03R	9/16/2003	None
MW-03R	10/14/2003	None
MW-03R	11/19/2003	None
MW-03R	12/17/2003	None
MW-03R	1/13/2004	None
MW-03R	2/10/2004	None
MW-03R	3/17/2004	None
MW-03R	4/15/2004	None
MW-03R	5/25/2004	None
MW-03R	6/13/2004	None
MW-03R	7/13/2004	None
MW-03R	8/12/2004	Deleted from Monitoring
Cleanup Level		No Sheen

Notes: Values in **bold** exceed the cleanup level.

Due to maintenance of a sorbent "sock" placed in GM-13S and MW-03, these measurements do not necessarily reflect actual product thicknesses in the wells.

Active product recovery from GM-11S began in April 2000. Product thickness recorded in GM-11S after that date is not representative of static conditions.

MW-03 was destroyed during Island redevelopment activities and was replaced by MW-03R.

* Free product present, thickness not measured.

~ Approximately.

NM Not measured due to inaccessibility.

Table 9. 2014 Quarterly Performance Monitoring Groundwater Elevations
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

Well	Date	TOC Elevation (ft msl)	Depth to Water (ft below TOC)	Groundwater Elevation (ft msl)
Plant 1				
GM-14S	3/12/2014	8.57	3.24	5.33
GM-14S	6/11/2014		4.51	4.06
GM-14S	9/10/2014		5.25	3.32
GM-14S	12/10/2014		3.52	5.05
GM-15S	3/12/2014	8.92	4.23	4.69
GM-15S	6/11/2014		5.31	3.61
GM-15S	9/9/2014		5.56	3.36
GM-15S	12/9/2014		4.67	4.25
GM-16S	3/12/2014	8.53	3.65	4.88
GM-16S	6/11/2014		4.82	3.71
GM-16S	9/10/2014		5.64	2.89
GM-16S	12/10/2014		3.92	4.61
GM-17S	3/12/2014	9.19	3.35	5.84
GM-17S	6/11/2014		4.77	4.42
GM-17S	9/10/2014		5.81	3.38
GM-17S	12/10/2014		3.73	5.46
GM-24S	3/12/2014	7.62	1.96	5.66
GM-24S	6/11/2014		3.53	4.09
GM-24S	9/10/2014		4.46	3.16
GM-24S	12/10/2014		2.12	5.50
AR-03	3/12/2014	9.35	4.90	4.45
AR-03	6/10/2014		5.96	3.39
AR-03	9/9/2014		6.67	2.68
AR-03	12/10/2014		5.21	4.14
AMW-01	3/11/2014	8.88	7.28	1.60
AMW-01	6/10/2014		11.86	-2.98
AMW-01	9/9/2014		7.34	1.54
AMW-01	12/9/2014		2.76	6.12
AMW-02	3/11/2014	12.14	10.14	2.00
AMW-02	6/10/2014		14.17	-2.03
AMW-02	9/9/2014		8.25	3.89
AMW-02	12/9/2014		5.90	6.24
AMW-03	3/11/2014	12.07	9.98	2.09
AMW-03	6/10/2014		13.41	-1.34
AMW-03	9/9/2014		8.70	3.37
AMW-03	12/9/2014		5.87	6.20
AMW-04	3/11/2014	8.00	6.55	1.45
AMW-04	6/10/2014		9.99	-1.99
AMW-04	9/9/2014		10.11	-2.11
AMW-04	12/9/2014		3.46	4.54

Table 9. 2014 Quarterly Performance Monitoring Groundwater Elevations
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

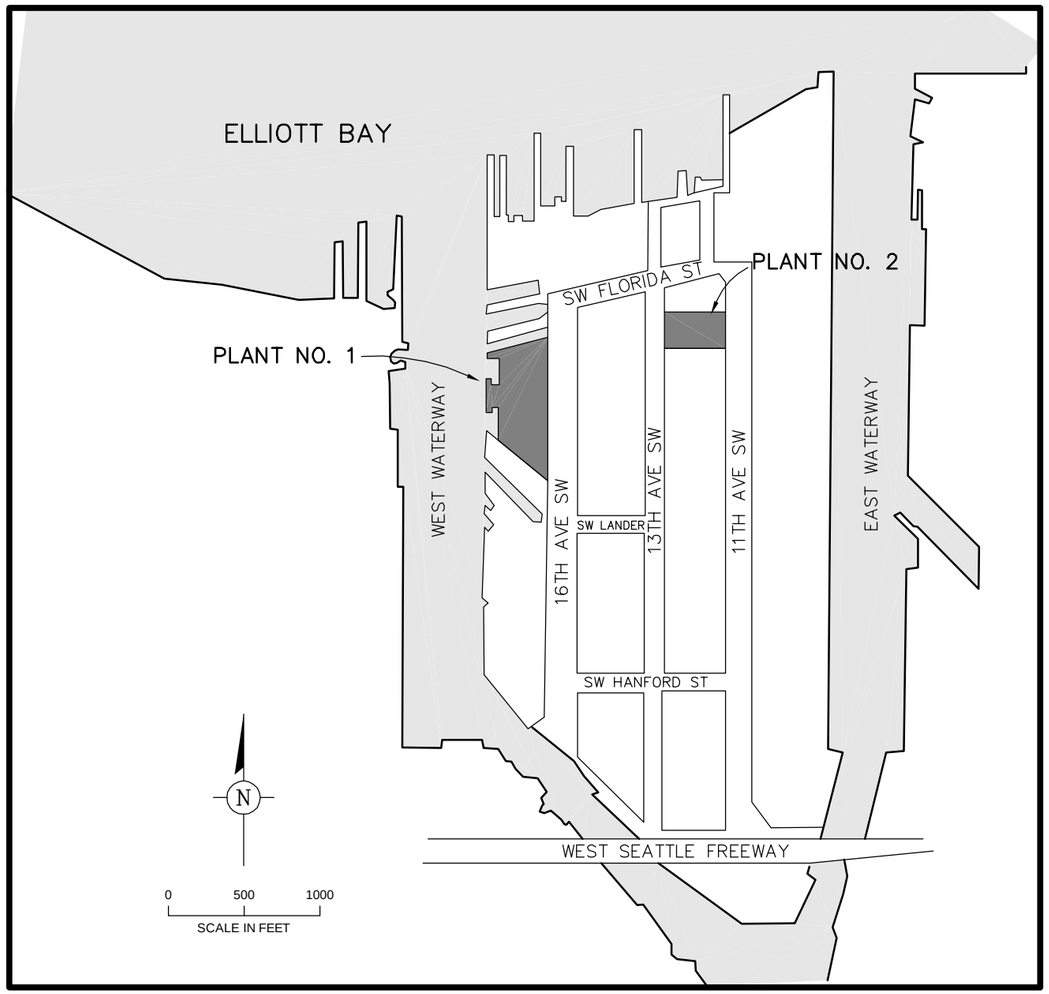
Well	Date	TOC Elevation (ft msl)	Depth to Water (ft below TOC)	Groundwater Elevation (ft msl)
Plant 1 Continued				
AMW-05	3/11/2014	8.14	6.68	1.46
AMW-05	6/10/2014		8.74	-0.60
AMW-05	9/9/2014		9.47	-1.33
AMW-05	12/9/2014		2.77	5.37
GM-13S	3/13/2013	11.90	8.26	3.64
GM-13S	6/12/2013		8.71	3.19
GM-13S	9/25/2013		8.54	3.36
GM-13S				11.90
GM-12S	3/13/2013	8.32	4.70	3.62
GM-12S	6/12/2013		5.00	3.32
GM-12S	9/25/2013		5.09	3.23
GM-12S				8.32
MW-06	3/11/2014	8.03	3.98	4.05
MW-06	6/11/2014		5.06	2.97
MW-06	9/9/2014		5.29	2.74
MW-06	12/9/2014		4.07	3.96
MW-1-T9	3/12/2014	9.07	4.76	4.31
MW-1-T9	6/11/2014		5.71	3.36
MW-1-T9	9/10/2014		6.43	2.64
MW-1-T9	12/10/2014		5.05	4.02
MW-2-T9	3/12/2014	9.23	4.44	4.79
MW-2-T9	6/11/2014		5.33	3.90
MW-2-T9	9/10/2014		6.07	3.16
MW-2-T9	12/10/2014		4.80	4.43
MW-3-T9	3/12/2014	8.73	4.15	4.58
MW-3-T9	6/11/2014		5.12	3.61
MW-3-T9	9/10/2014		5.79	2.94
MW-3-T9	12/10/2014		4.38	4.35
MW-4-T9	3/12/2014	10.65	6.46	4.19
MW-4-T9	6/11/2014		7.34	3.31
MW-4-T9	9/9/2014		7.98	2.67
MW-4-T9	12/10/2014		6.56	4.09
Plant 2				
GM-19S	3/12/2014	7.68	2.12	5.56
GM-19S	9/10/2014		4.56	3.12

ft	Feet
msl	Mean sea level in National Geodetic Vertical Datum of 1929 (NGVD29).
TOC	Top of casing

FIGURES

1. Site Location Map
2. Areas of Remediation - Plant 1
3. Areas of Remediation - Plant 2
4. Plant 1 Remediation System
5. Final System Influent vs. Effluent Gasoline Concentrations
6. Final System Influent vs. Effluent Benzene Concentrations
7. Final System Influent vs. Effluent Diesel Concentrations
8. Groundwater Recovery Rates vs. Tidal Stage
9. Cumulative Waterfront LNAPL Recovery Through December 2014
10. 2014 Sheen Observations - Loading Rack Area
11. 2014 Sheen Observations - Warehouse Area
12. Areas of Restriction - Plant 2
13. Areas of Restriction - Plant 1
14. Plant 1 Monitoring Well Network
15. Inland SVE System Remediation System Layout
16. Inland SVE System Cumulative Hydrocarbon Recovery
17. Inland SVE System Gasoline History
18. Inland SVE System Benzene History
19. Inland SVE Biodegradation and Vapor Recovery
20. Inland SVE System Capture Zone Area Hydrograph
21. Benzene History from AMW-01 and AMW-02
22. Benzene History from Wells Within Inland SVE System Capture Zone
23. Gasoline History from Wells Within Inland SVE System Capture Zone
24. Plant 1 Water Table Elevation Map March 2014
25. Plant 1 Water Table Elevation Map September 2014
26. Plant 1 Waterfront Hydrograph
27. Plant 2 Monitoring Well Network

AREA PLAN



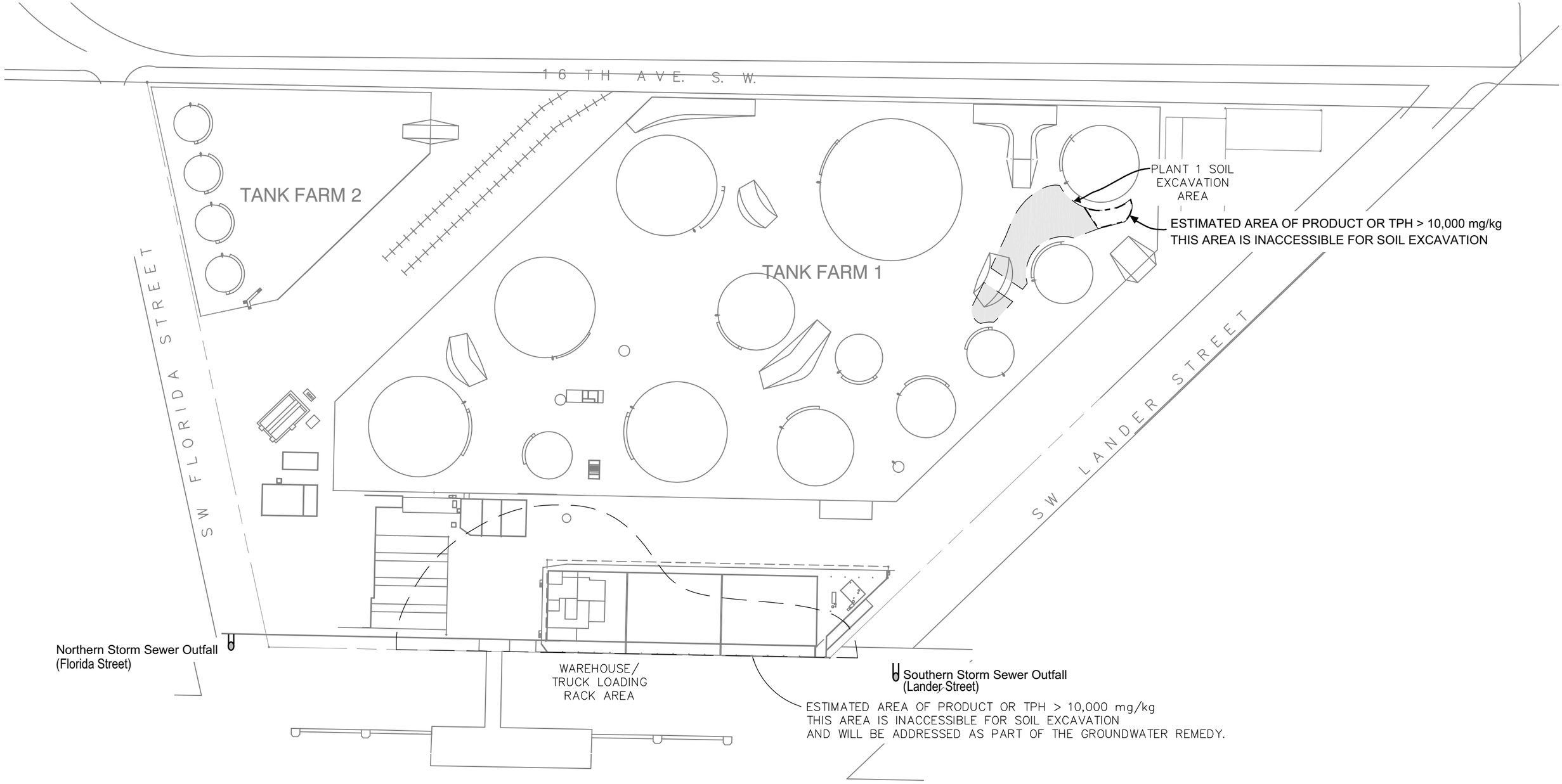
SITE PLAN

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore WA 98028
(425) 402-8277 FAX (425) 402-7917

Site Location Map

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

FIGURE
1



LEGEND

ESTIMATED AREA WITH PRODUCT OR TPH > 20,000 ppm

EXCAVATED REMEDIATION AREAS

N

0 50 100

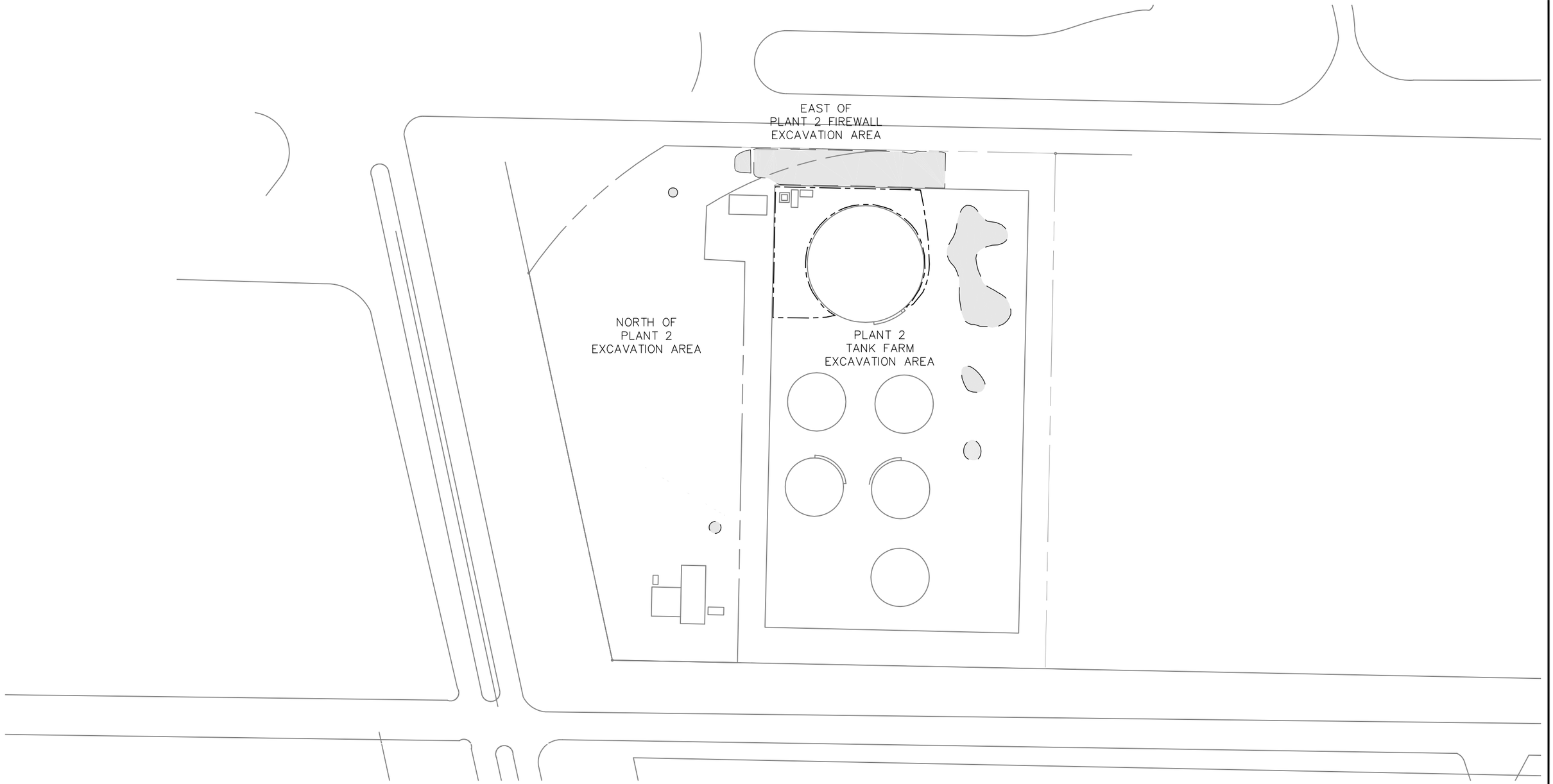
SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore, WA
(425)402-8277 Fax:(425)402-7917

Areas of Remediation - Plant 1

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

FIGURE
2



LEGEND

ESTIMATED AREA WITH PRODUCT OR TPH > 20,000 ppm

EXCAVATED REMEDIATION AREAS

N

0 50 100

SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore, WA 98028
(425)402-8277 Fax:(425)402-7917

Areas of Remediation - Plant 2

BP West Coast Products Terminal 21T
2406 13th Avenue SW
Seattle, WA 98134

FIGURE
3

C:\Data\CAD\LDB2 Projects\TechSolv - ARCO 21T.dwg\ARCO21a.dwg << Plant 1 Remediation System >> DEC 10 2003 00:03:06 (bCAD)

TANK 20

ARCO 21T PLANT 1 TANK FARM

RECOVERED LNAPL LINE

ASPHALT

LIFT STATION

SVEH-2

PUMPS

LOADING RACKS

GM-11S

SVEH-2

REMEDIATION SYSTEM TREATMENT AREA

ARCO OFFICE

OFFICES

WAREHOUSE

CONCRETE

ASPHALT

AMW-05

RW-2

RW-4

AS-3

AMW-04

AS-4

RW-5

AS-5

RW-6

RW-1

AS-6

AMW-03

AS-7

RW-7

AS-8

AS-9

RW-8

AMW-02

AS-10

AS-11

RW-9

AS-12

GM-13D

GM-13S

AS-14

AS-1

AS-2

AS-13

RW-10

AMW-01

PRIMARY PIPE RACK

WALKWAY

SECONDARY PIPE RACK

RIP RAP

Northern Boom

PIER

SEAWALL/BULKHEAD

Duwamish Waterway

Southern Boom

RIP RAP

LEGEND

RW-5	GROUNDWATER RECOVERY WELL
	HORIZONTAL SOIL VAPOR EXTRACTION WELL SCREEN
MW-2	GROUNDWATER MONITORING WELL
AS-1	AIR SPARGE WELL
AMW-04	PERFORMANCE/CONFIRMATION WELL
	LNAPL LINE TO TANK 20
	AIR SPARE LINES

0 20 40

SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore, WA 98028
(425) 402-8277 FAX (425) 402-7917

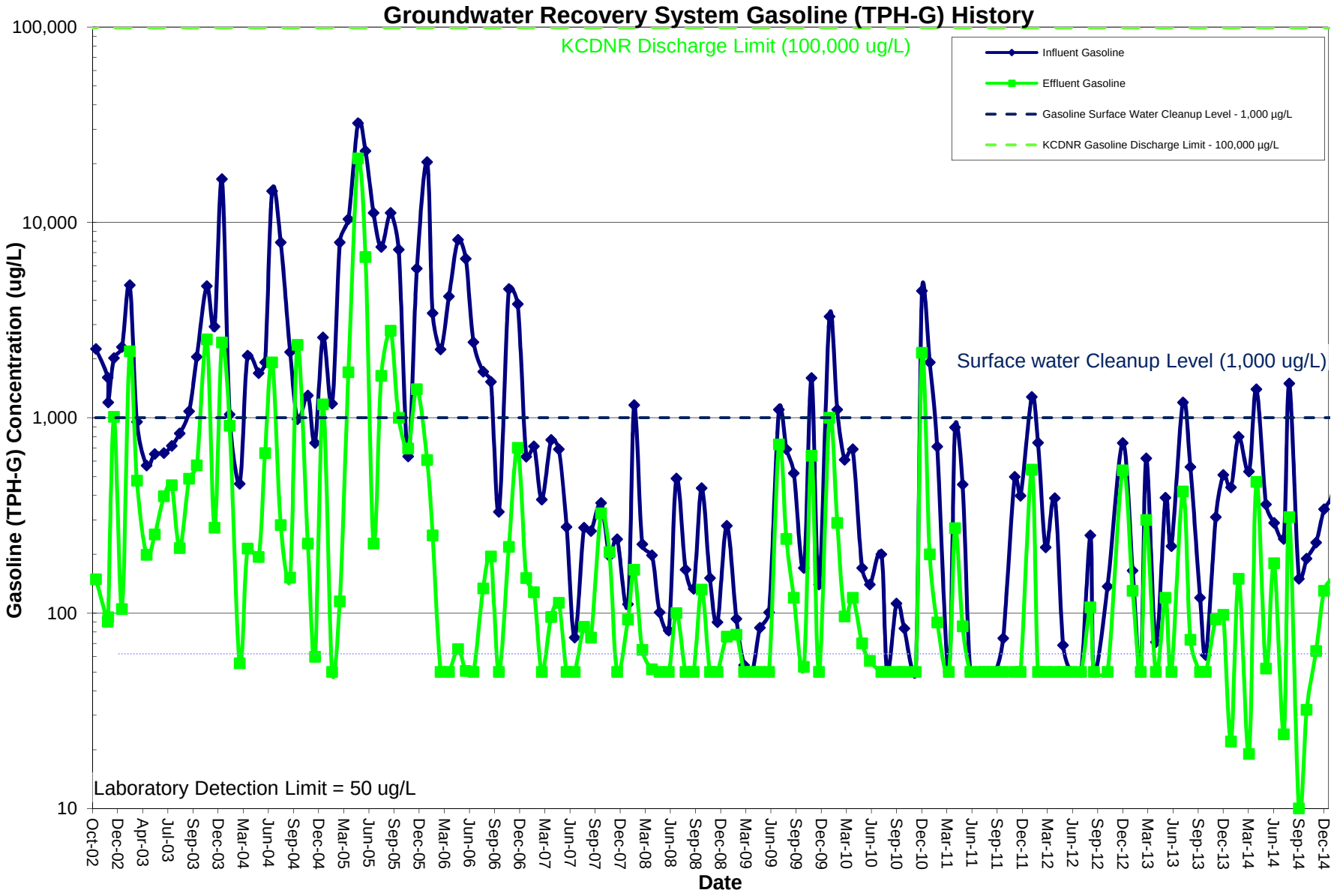
Plant 1 Remediation System

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

FIGURE

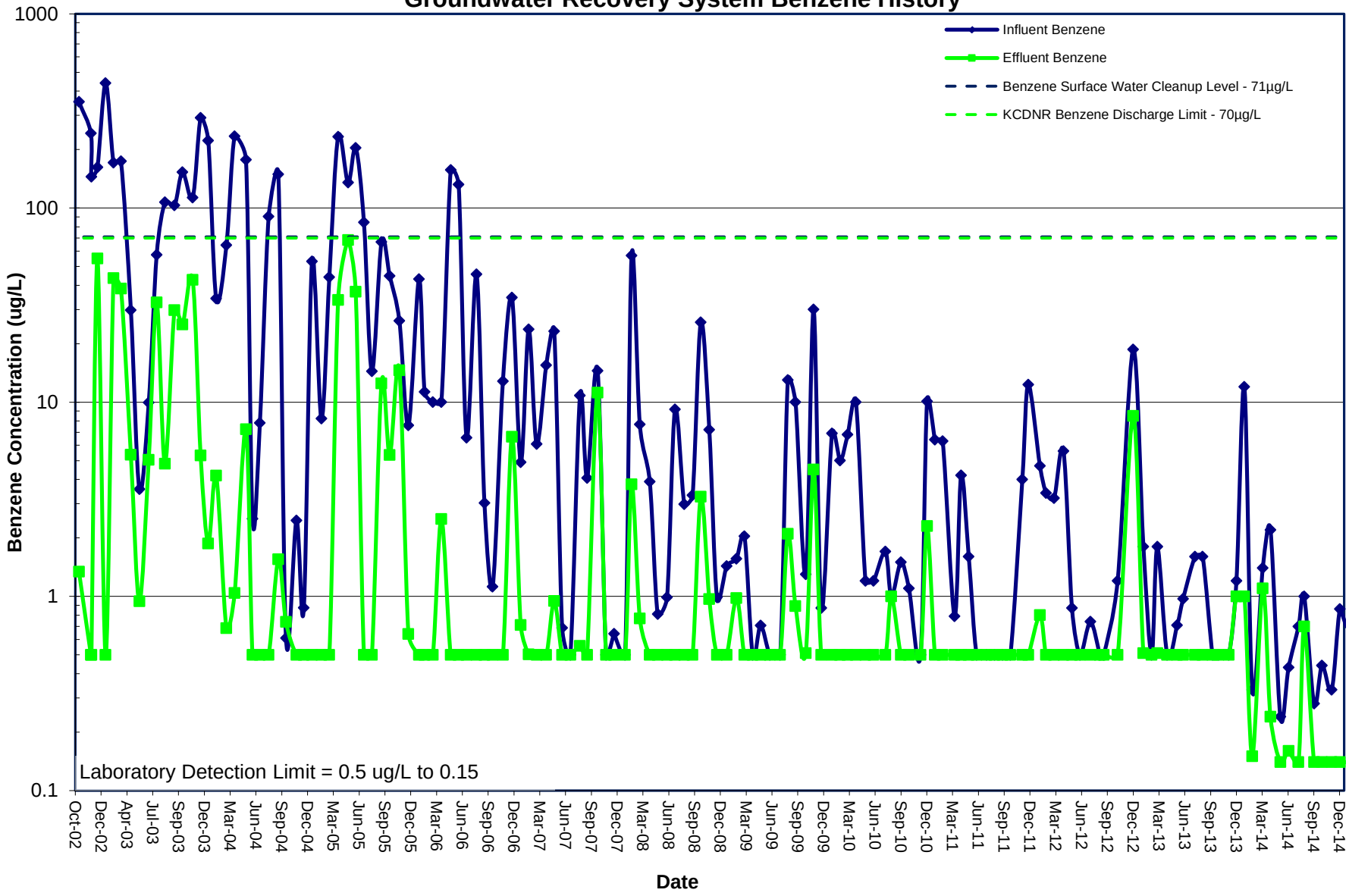
4

Figure 5. Final System Influent vs. Effluent Groundwater Gasoline Concentrations
October 2002 through December 2014
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



Note: Data is included since the startup of the final groundwater/product recovery system in October 2002.

Figure 6. Final System Influent vs. Effluent Groundwater Benzene Concentrations
October 2002 through December 2014
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington
Groundwater Recovery System Benzene History



Note: Data is included since the startup of the final groundwater/product recovery system in October 2002.

Figure 7. System Influent vs. Effluent Diesel Groundwater Concentrations
October 2002 through December 2014
BP West Coast Products Terminal 21T, Seattle, Washington

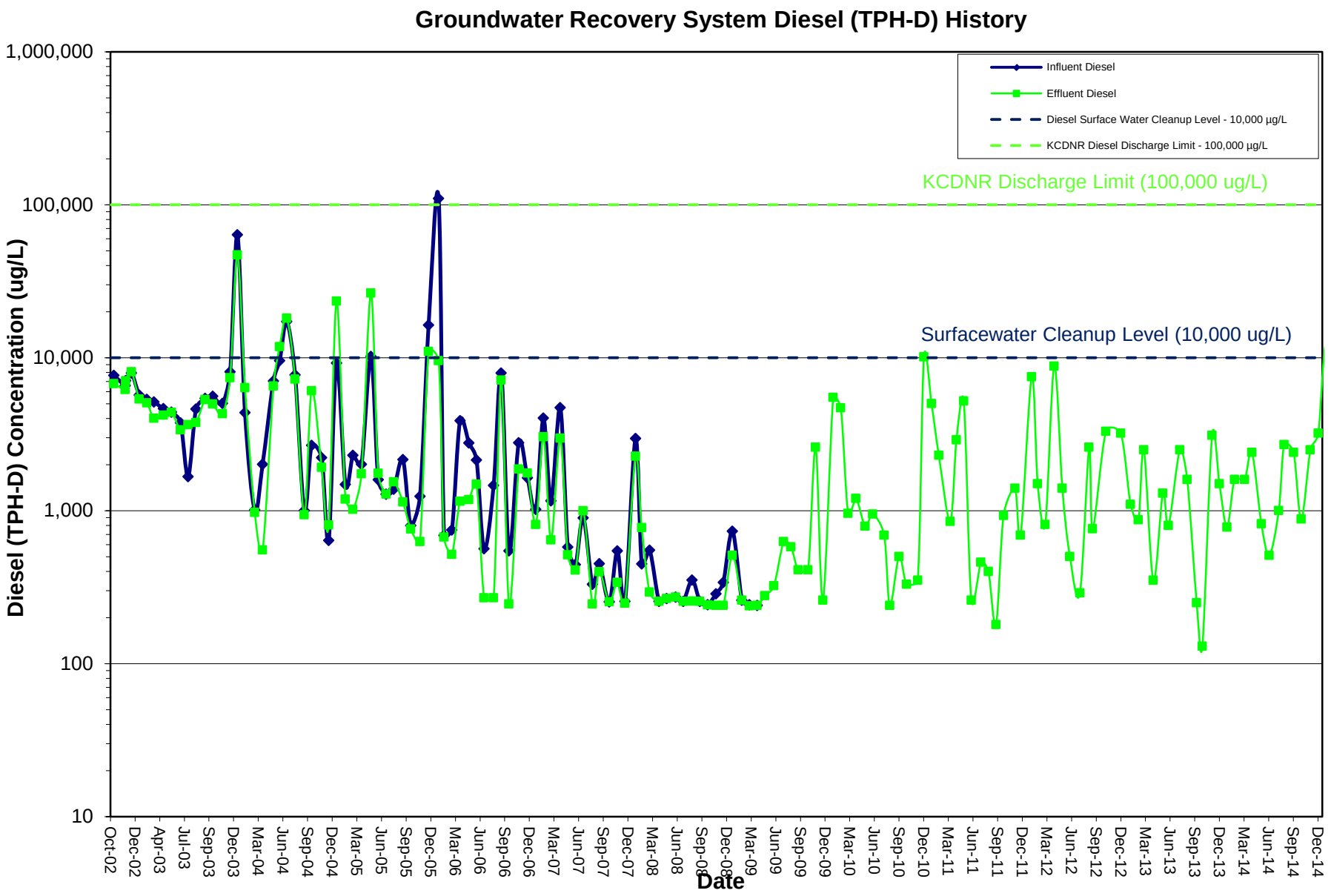
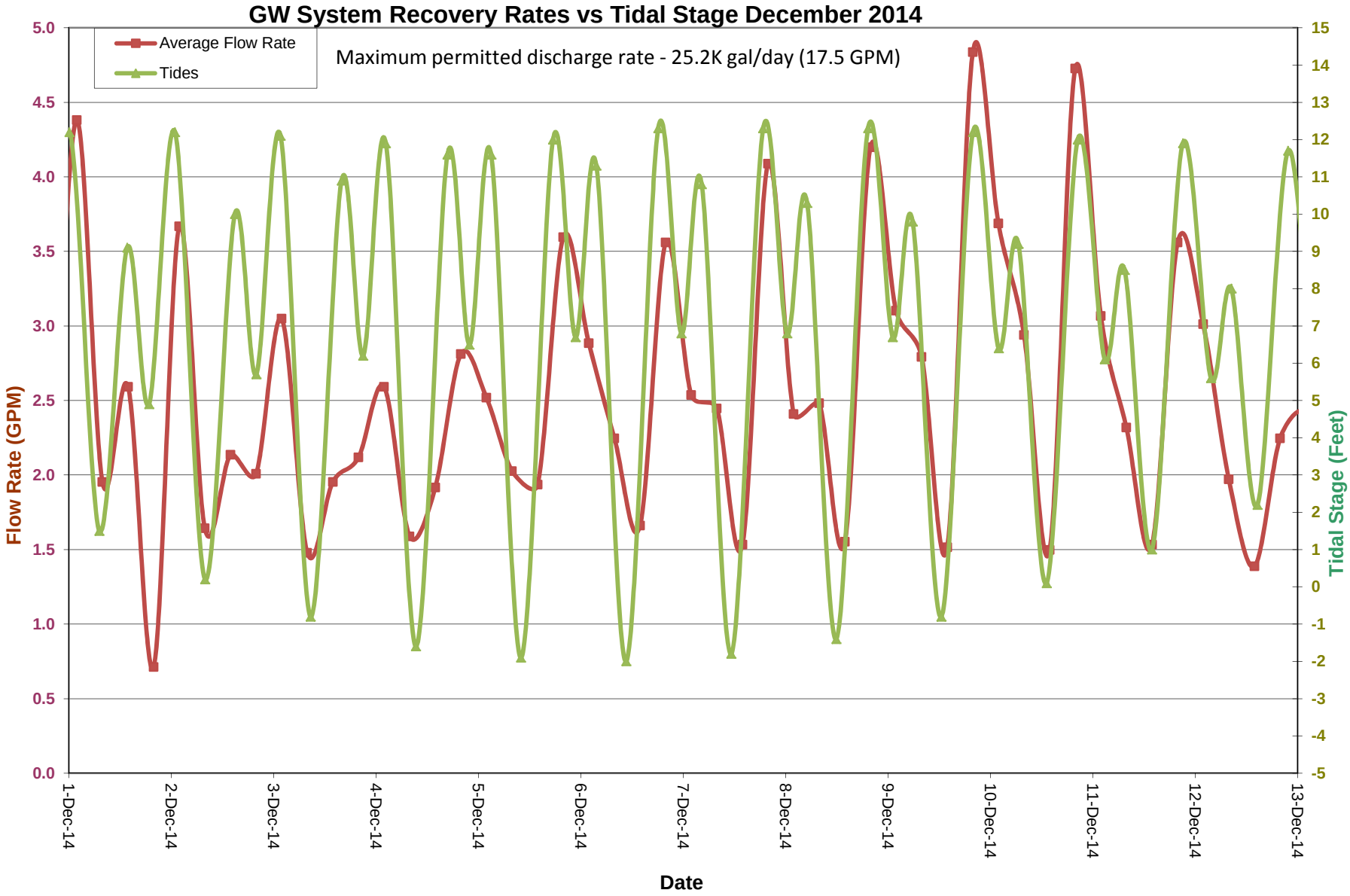
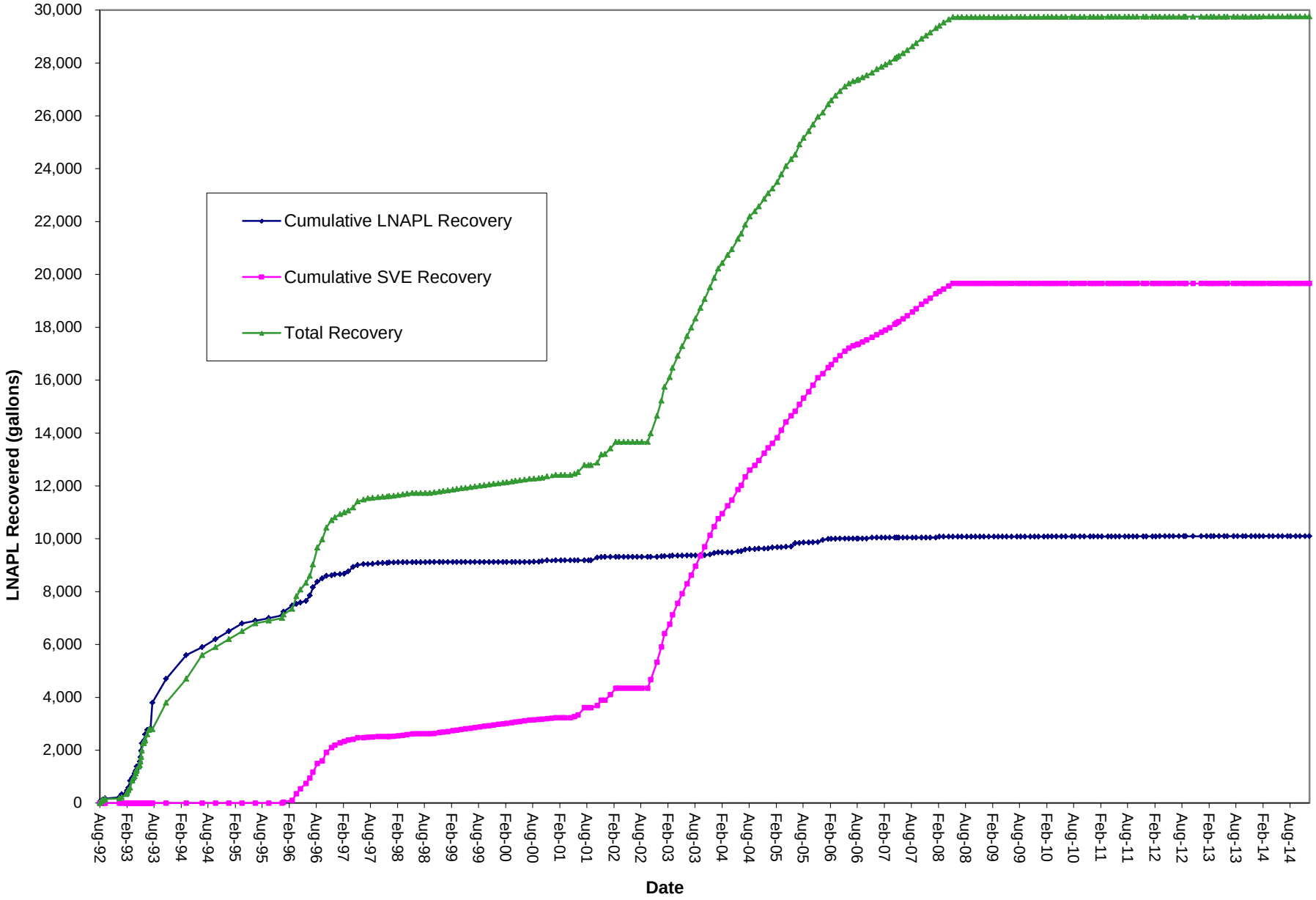


Figure 8. Groundwater Recovery Rates vs. Tidal Stage
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



Note: Tidal elevations are from NOAA tidal predictions for Lockheed Shipyard, Harbor Island, WA Station 9447110
Presented data shows the effect of tidal fluctuations on pumping rates. It represents a portion of data collected to date.

Figure 9. **Cumulative LNAPL Recovery Through December 2014**
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington



Note: Soil Vapor Extraction recovery began in January, 1996

Figure 10. **2014 Sheen Observations - Loading Rack**
BP West Coast Products Terminal 21T, Harbor Island, Seattle

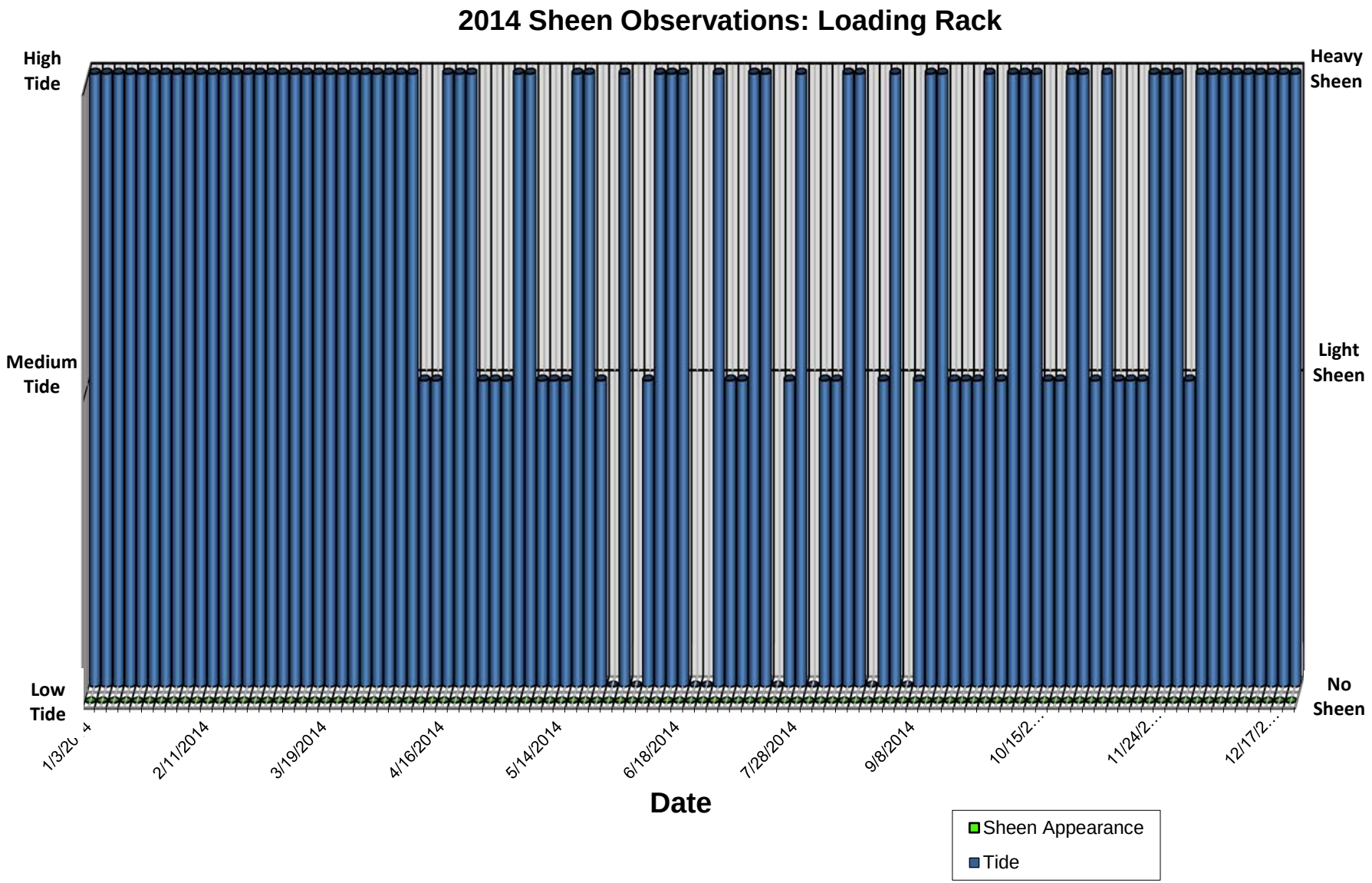
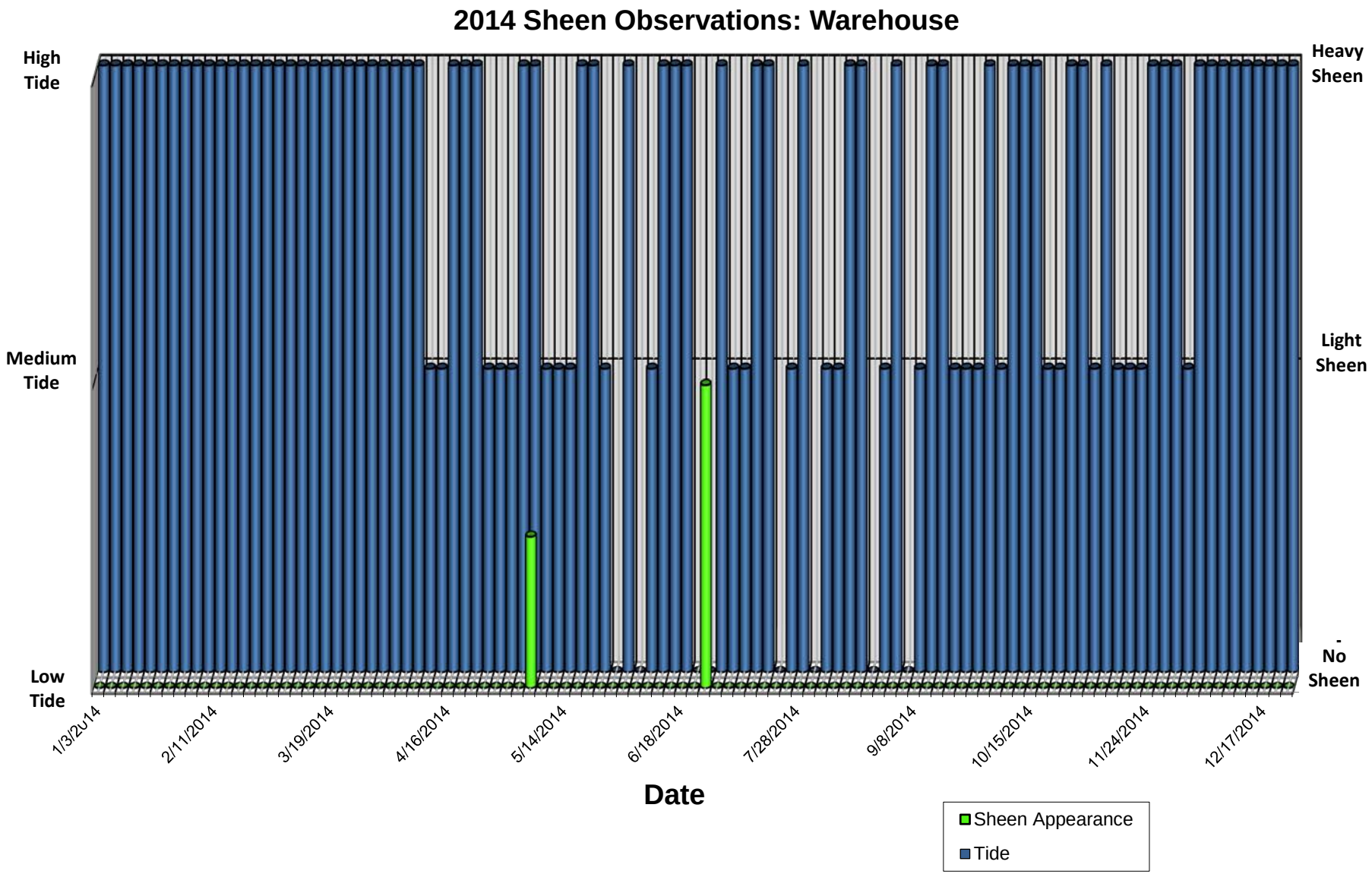
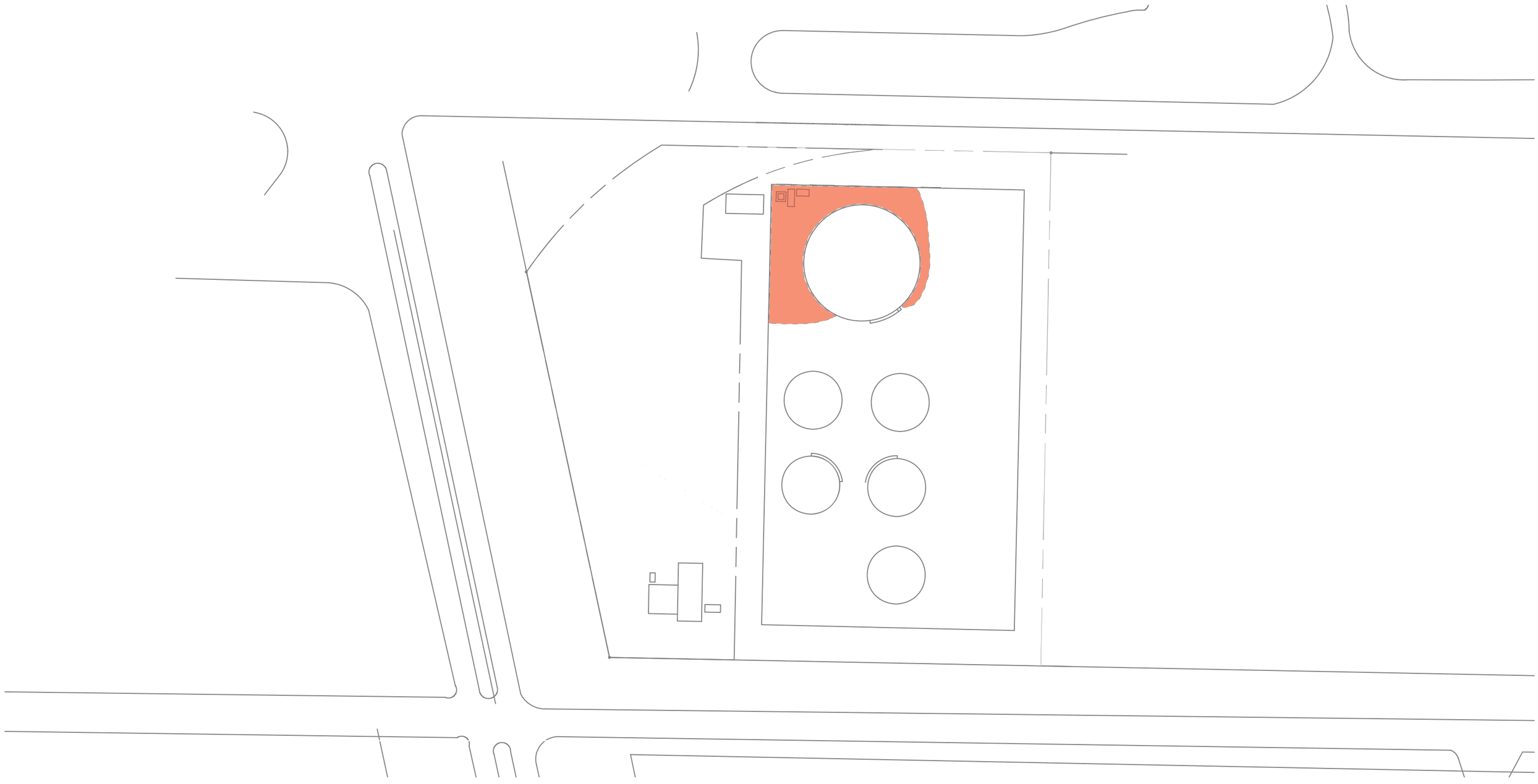


Figure 11. **2014 Sheen Observations - Warehouse**
BP West Coast Products Terminal 21T, Harbor Island, Seattle





LEGEND

Areas where construction or soil excavation activities are regulated by the Restrictive Covenant of the Consent Decree due to total petroleum hydrocarbons potentially above cleanup levels.

N

0 50 100

SCALE IN FEET

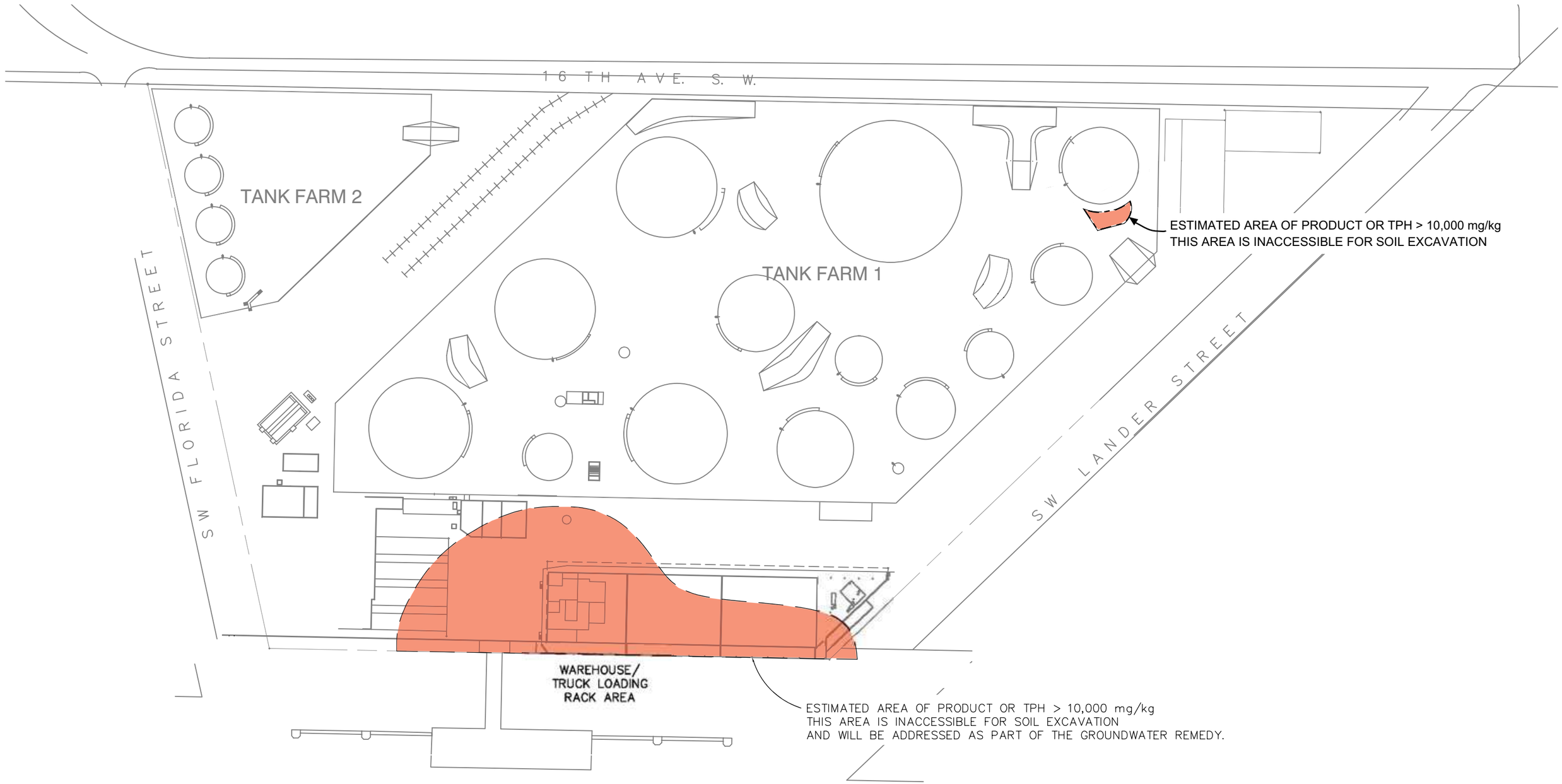
TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore, WA 98028
(425) 402-8277 FAX: (425) 402-7917

Areas of Restriction - Plant 2

BP West Coast Products Terminal 21T
2406 13th Avenue SW
Seattle, WA 98134

FIGURE
12

C:\Data\CAD\LDD2 Projects\TechSolv - ARCO 21T\dwg\ARCO21T.dwg MAR 24 2003 17:07:02 (kCAD)



LEGEND

Areas where construction or soil excavation activities are regulated by the Restrictive Covenant of the Consent Decree due to total petroleum hydrocarbons potentially above cleanup levels.

N

0 50 100

SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
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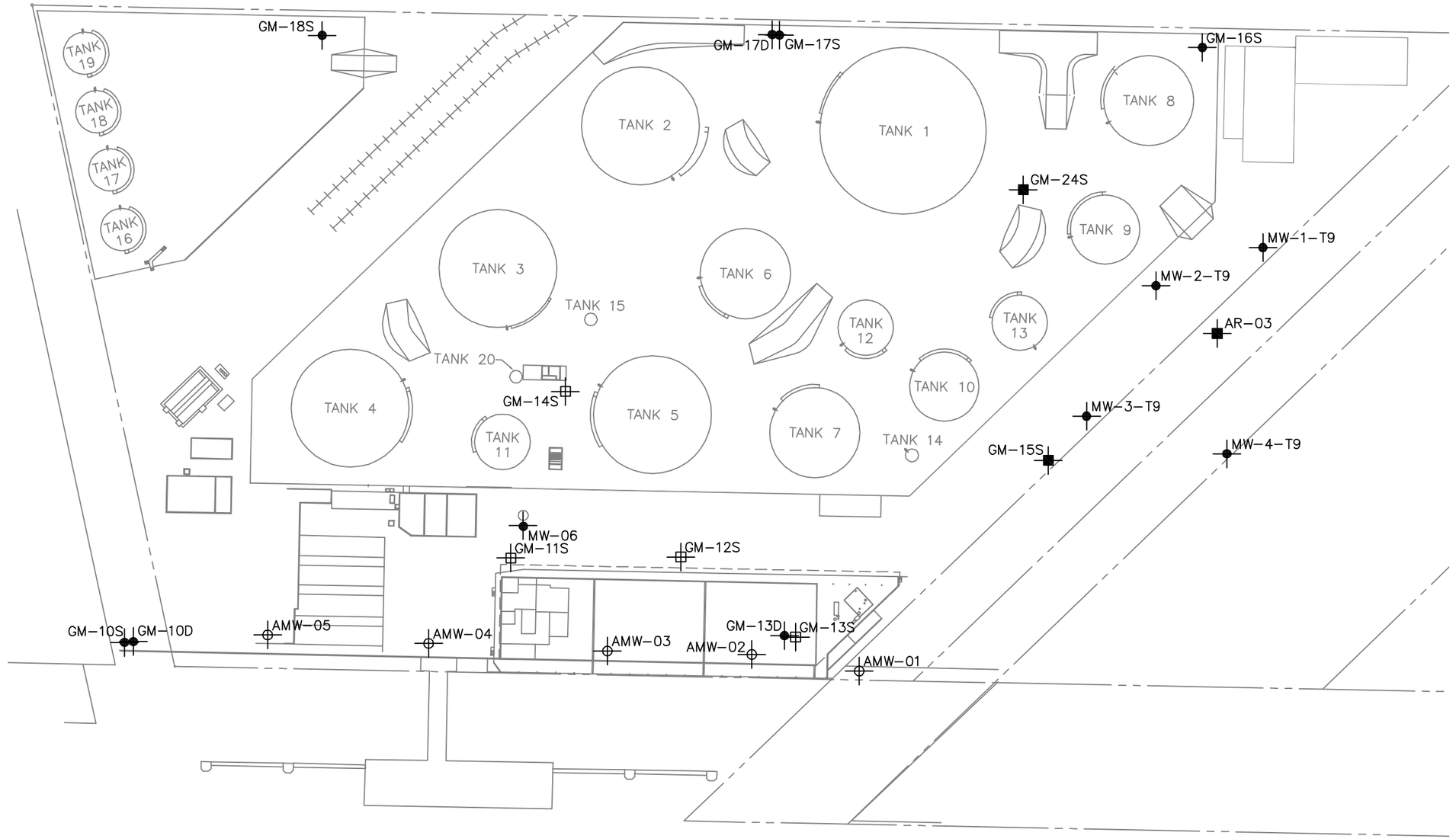
(425) 402-8277 FAX (425) 402-7917

Areas of Restriction - Plant 1

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

FIGURE
13



LEGEND

GM-16S	MONITORING WELL
AMW-01	PERFORMANCE/CONFIRMATION WELL
GM-13D	PERFORMANCE WELL
GM-13S	PRODUCT PERFORMANCE WELL

N

0 50 100

SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
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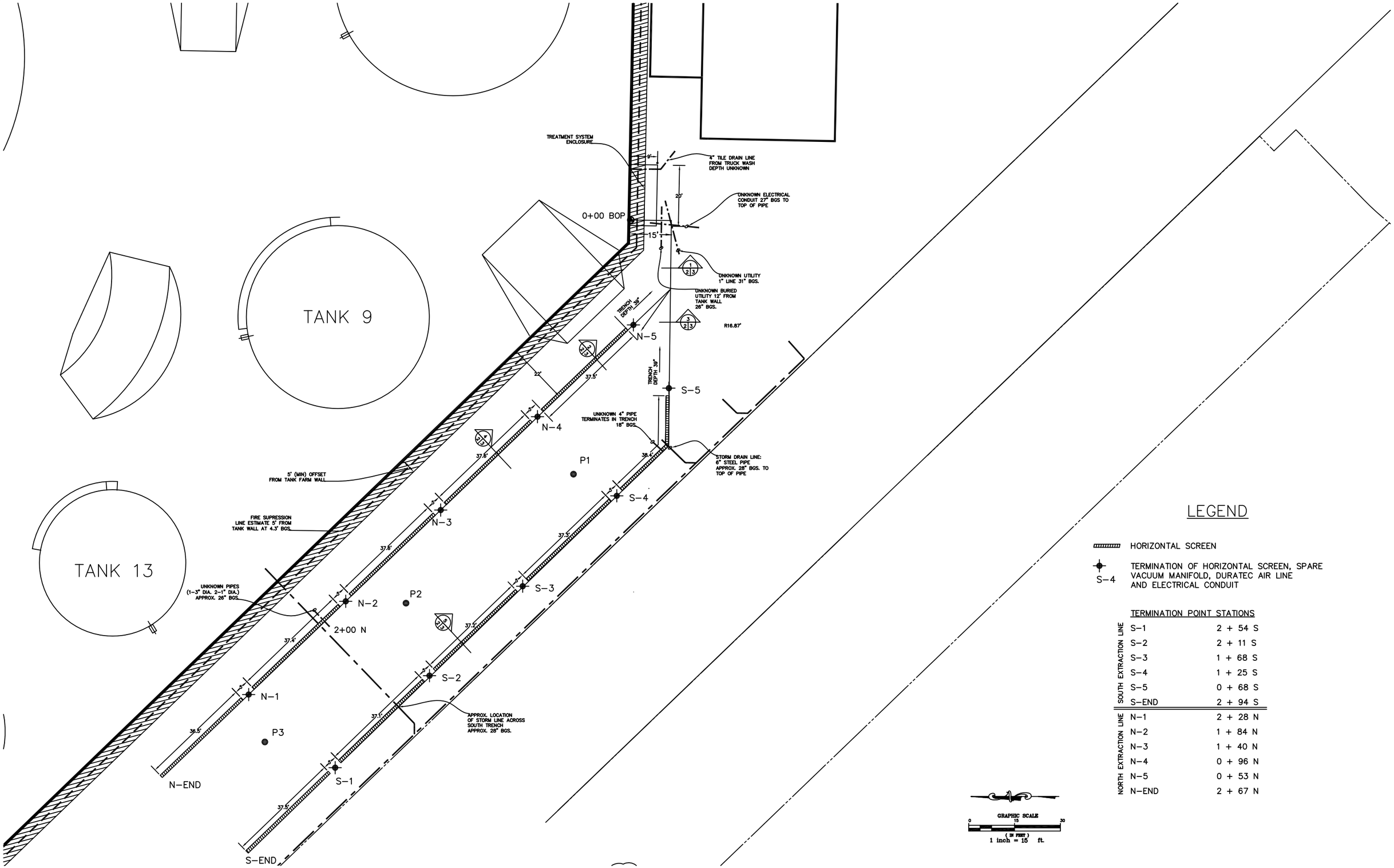
(425) 402-8277 FAX (425) 402-7917

Plant 1 Monitoring Well Network

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

FIGURE
14



LEGEND

HORIZONTAL SCREEN

S-4 — TERMINATION OF HORIZONTAL SCREEN, SPARE VACUUM MANIFOLD, DURATEC AIR LINE AND ELECTRICAL CONDUIT

TERMINATION POINT STATIONS

SOUTH EXTRACTION LINE	S-1	2 + 54 S
	S-2	2 + 11 S
	S-3	1 + 68 S
	S-4	1 + 25 S
	S-5	0 + 68 S
	S-END	2 + 94 S
NORTH EXTRACTION LINE	N-1	2 + 28 N
	N-2	1 + 84 N
	N-3	1 + 40 N
	N-4	0 + 96 N
	N-5	0 + 53 N
	N-END	2 + 67 N

GRAPHIC SCALE
0 15 30
(IN FEET)
1 inch = 15 ft.

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street
Kenmore, WA 98028
(425) 402-8277 FAX (425) 402-7917

SCALE VERIFICATION
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING
USE TO VERIFY FIGURE REPRODUCTION SCALE

REV. NO.	DATE	DESCRIPTION	BY	APPR.
1	MAR.07	ADDED ELECTRICAL CONDUITS FOR FUTURE USE	DK	LR
2	SEPT.07	RELOCATED NORTH TRENCH AND REDUCED TRENCH DEPTH	DK	LR
3	SEPT.08	AS-BUILT	DK	LR

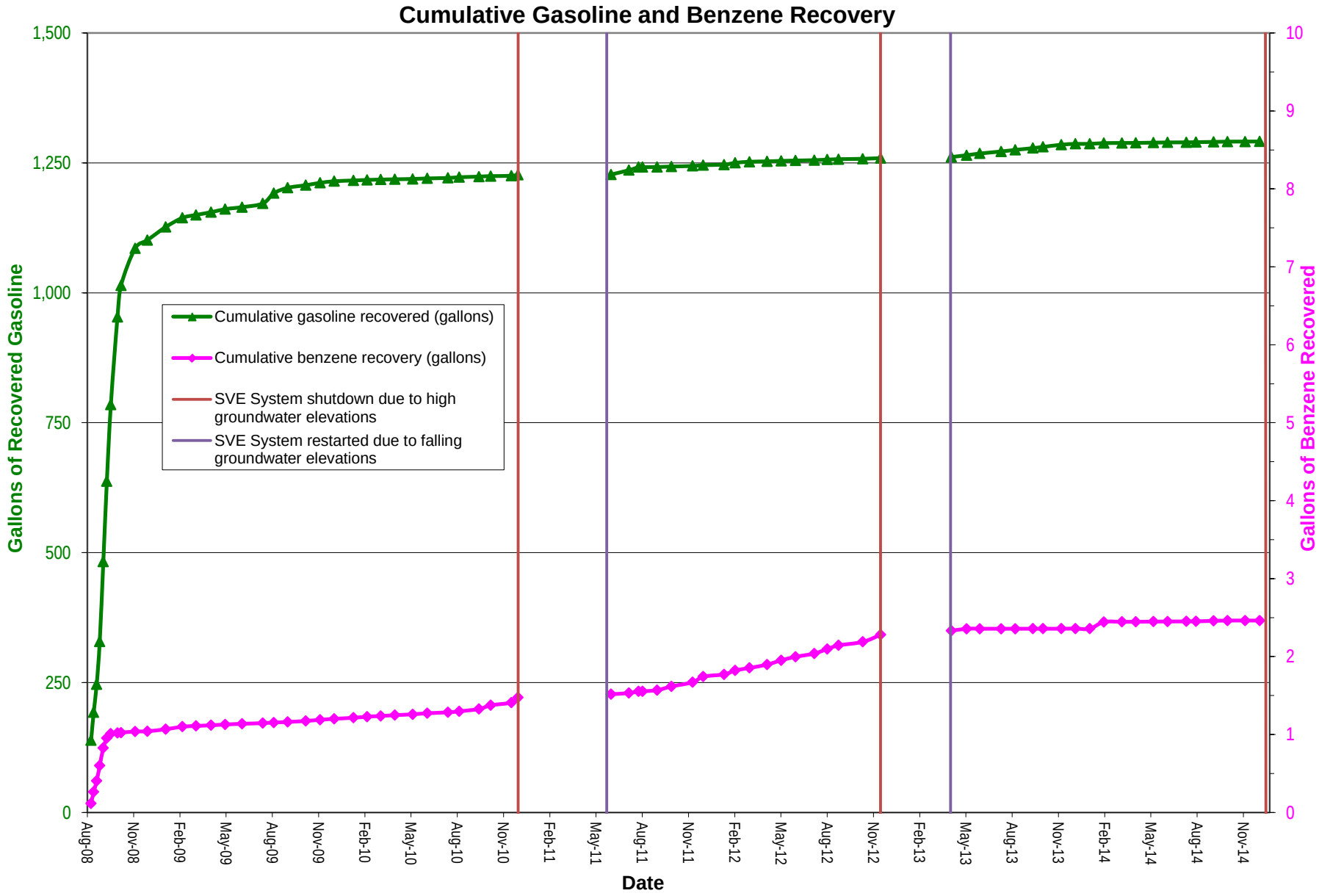
DWG DATE: 4/24/08
PROJCT NO.: ATR10066.02.G
DRAWING: SVEDESIGN-AS-BUILT.DWG
CHECKED: ROBERTS
APPROVED: D.WHITE/J.KIRKPATRICK
DESIGNER: KIDD

Inland SVE System Remediation System Layout

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

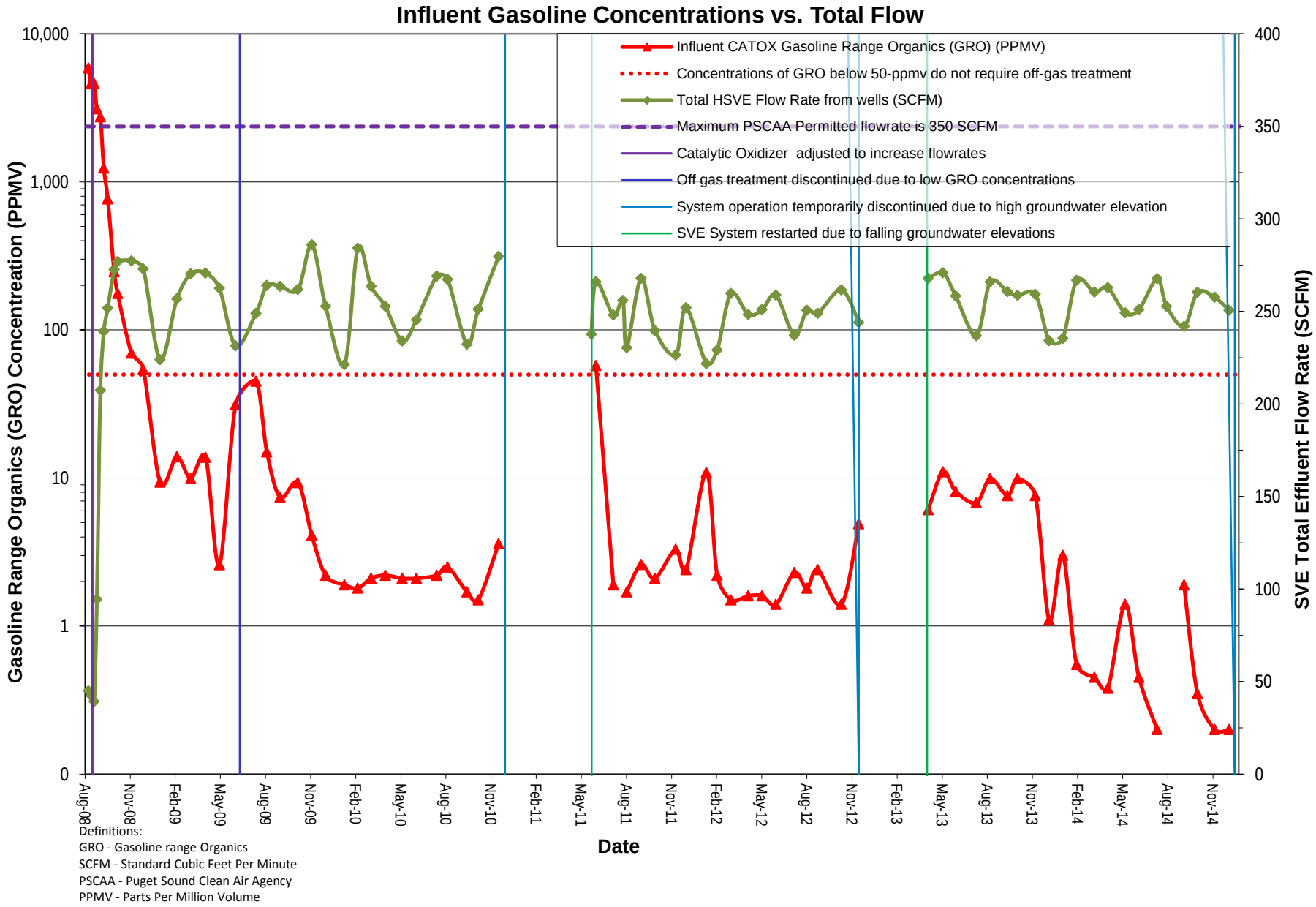
FIGURE
15

Figure 16. Inland SVE System Cumulative Hydrocarbon Recovery
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



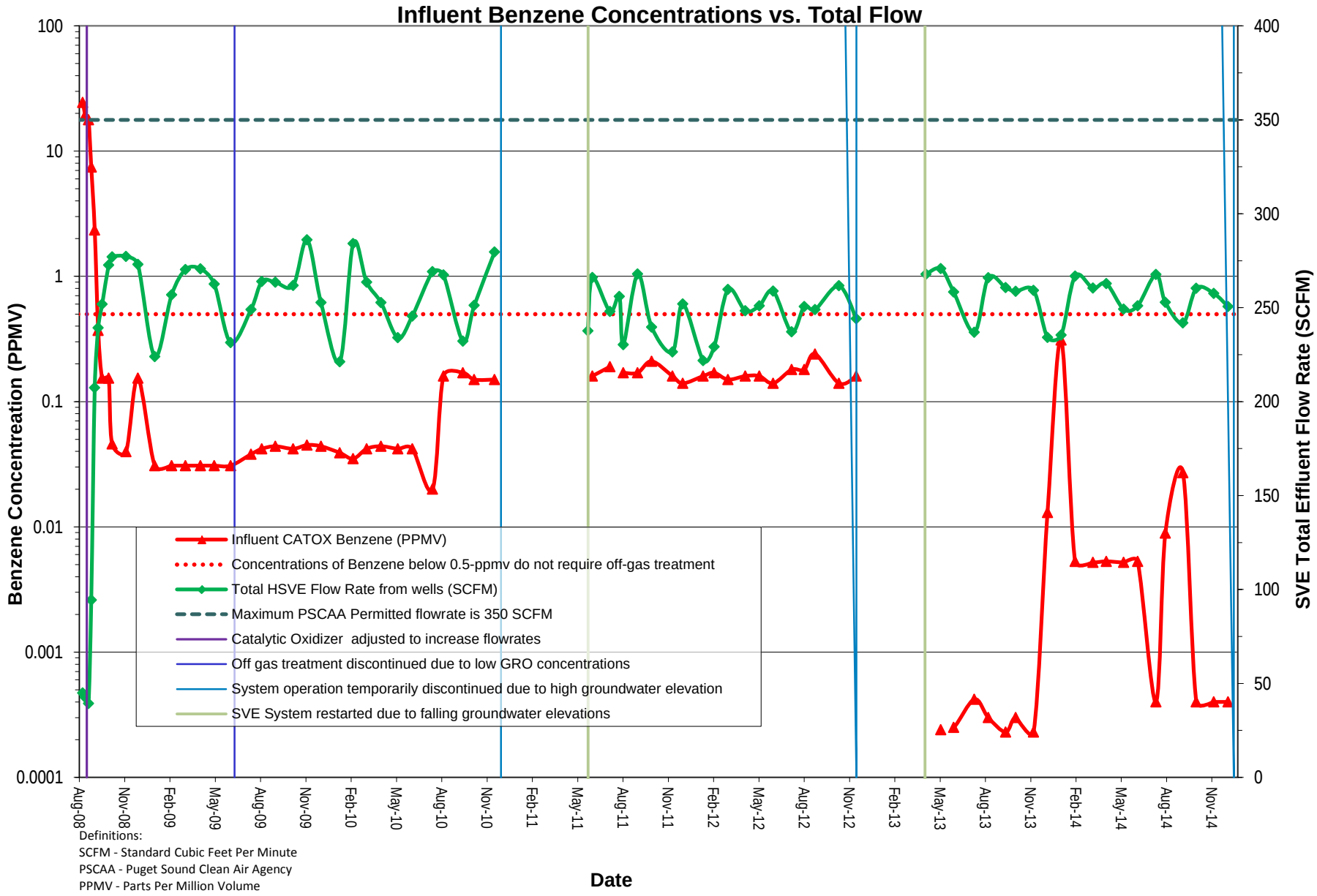
Note: Benzene and gasoline recovery are biased high as recovery is calculated assuming that benzene and gasoline are present at the laboratory decection limit for all samples reported as non detections from the laboratory.

Figure 17. Inland SVE System Gasoline History
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



Note: Laboratory non-detects are reported at associated detection levels to provide conservative concentration estimates. Variability in concentrations below 10ppm are due to changes in lab detection limits and not actual gasoline concentrations.

Figure 18. Inland SVE System Benzene History
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



Note: Laboratory non-detects are reported at associated detection levels to provide conservative concentration estimates. Variability in concentrations below 0.2 ppm are due to changes in lab detection limits and not actual benzene concentrations.

Figure 19. Inland SVE Biodegradation and Vapor Recovery
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington

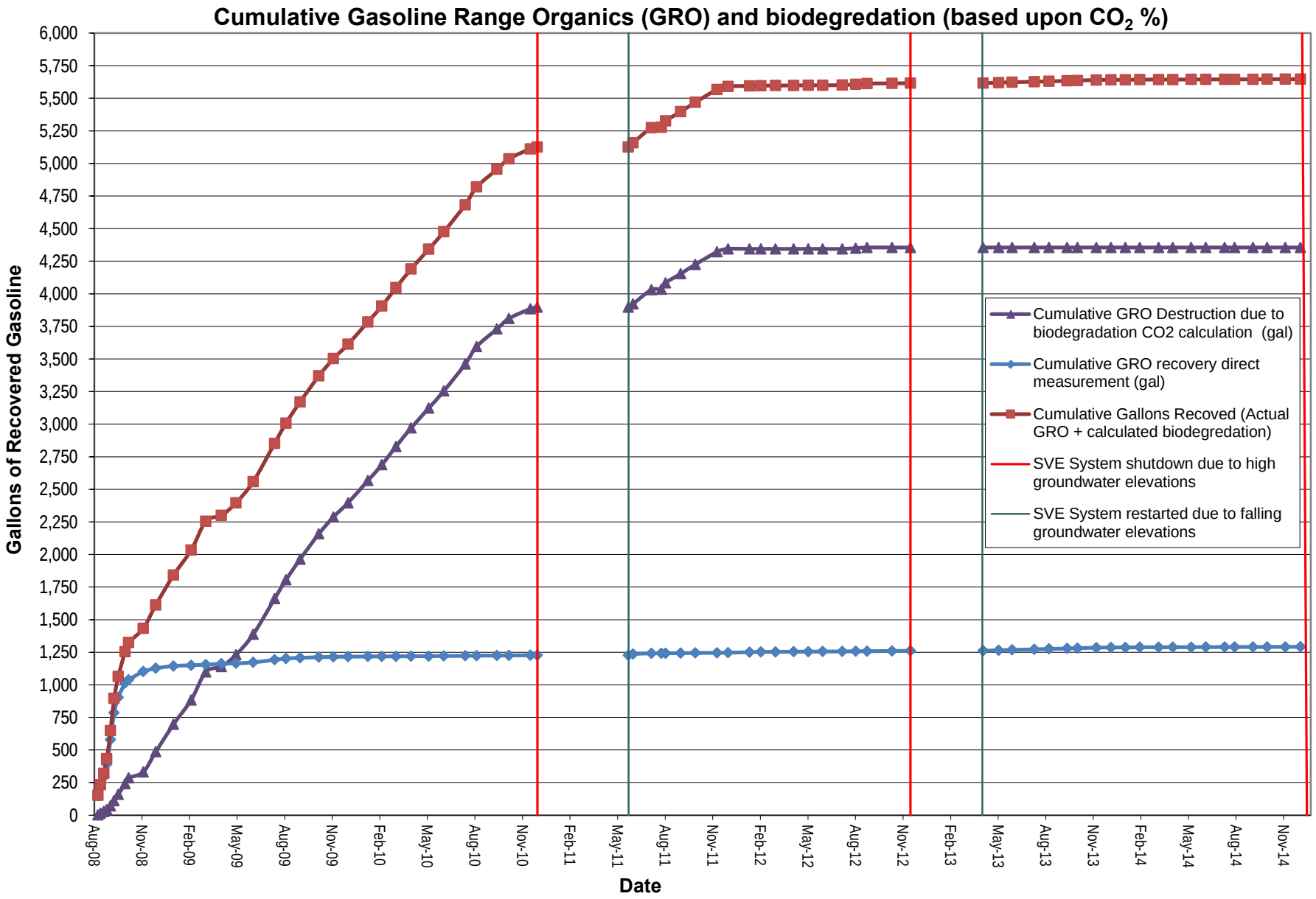


Figure 20. Inland SVE System Capture Zone Area Hydrograph
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

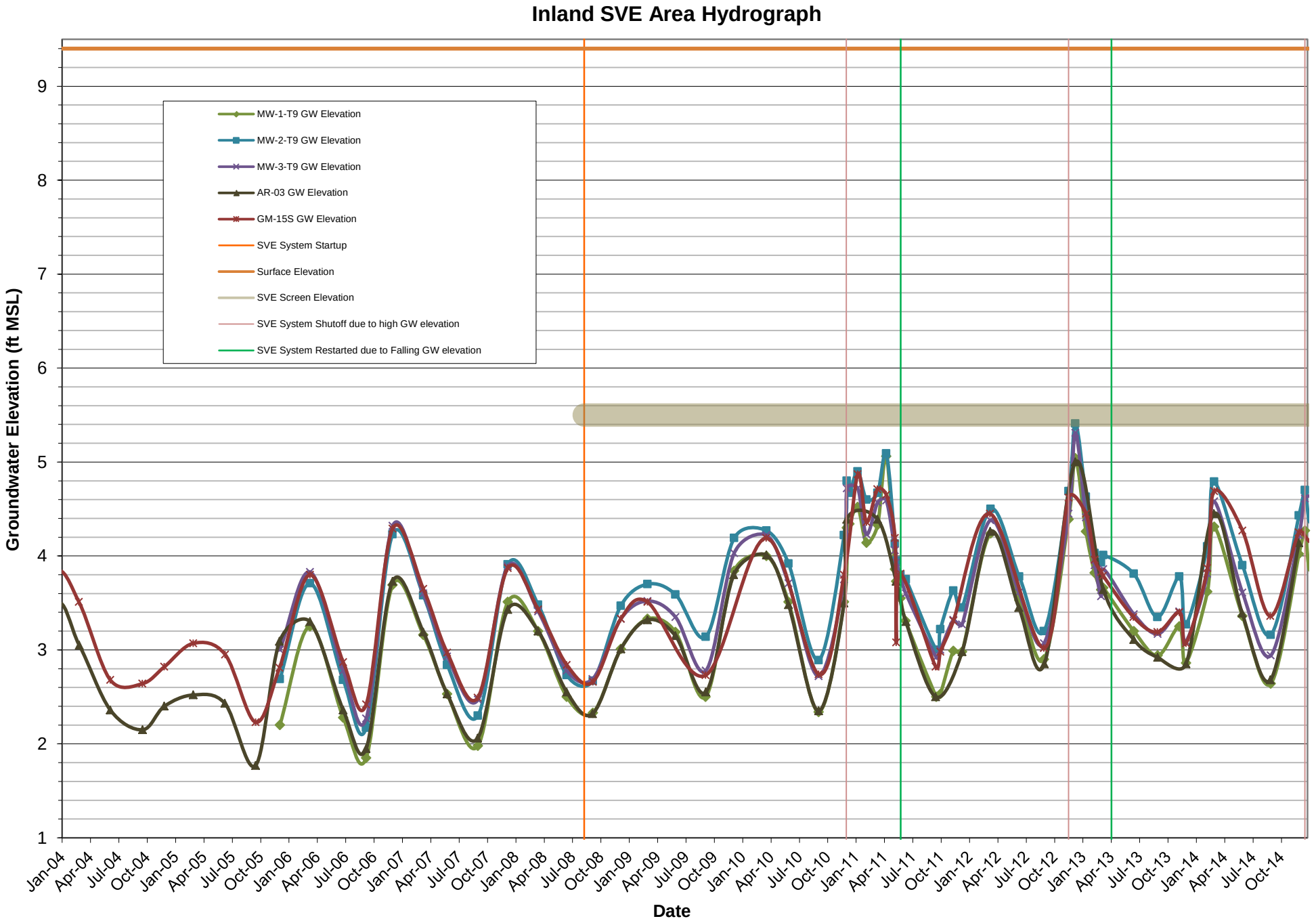


Figure 21. Benzene History from AMW-01 and AMW-02
BP West Coast Products Terminal 21T, Seattle, Washington

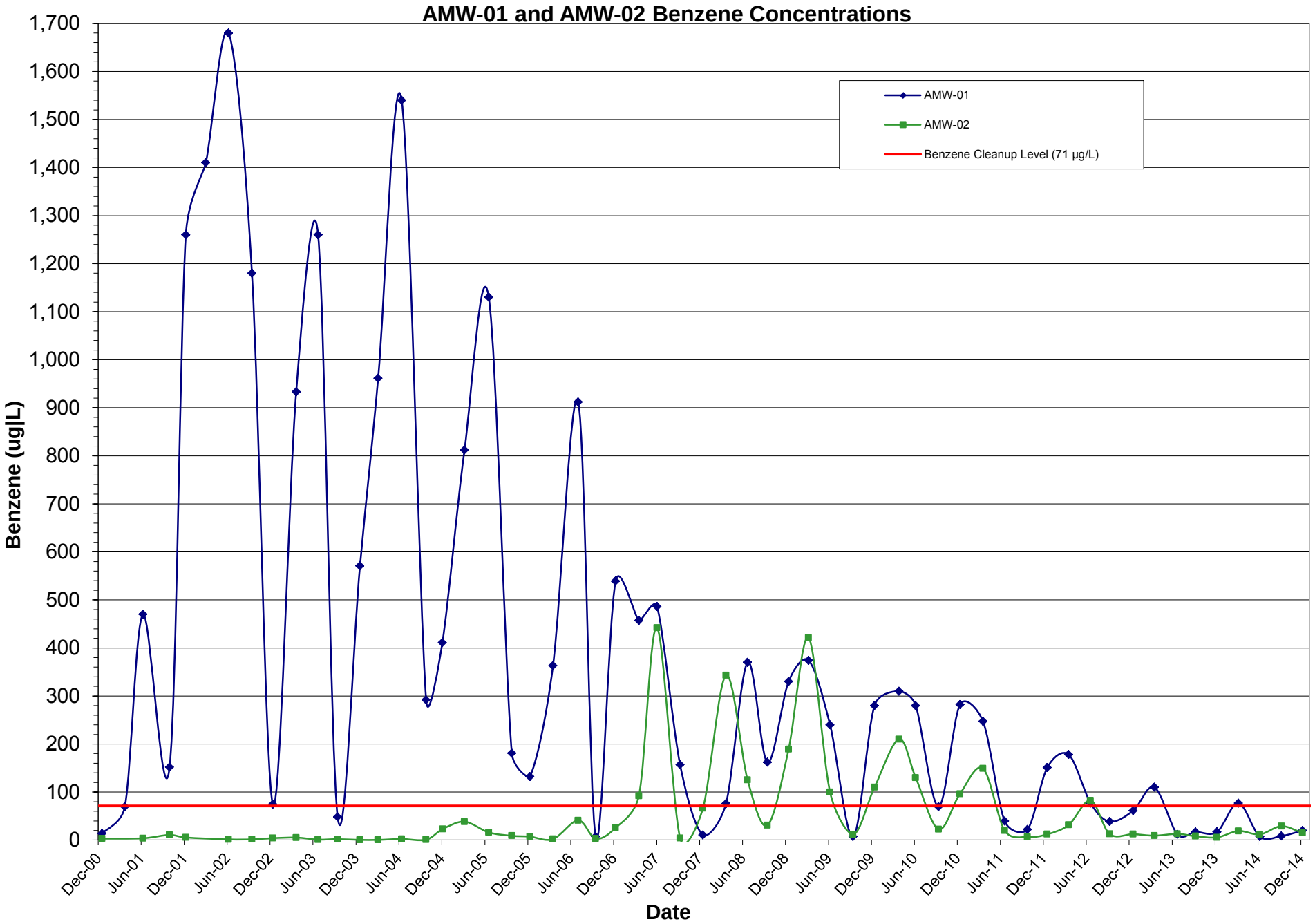


Figure 22. Benzene History from Wells Within Inland SVE System Capture Zone
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington

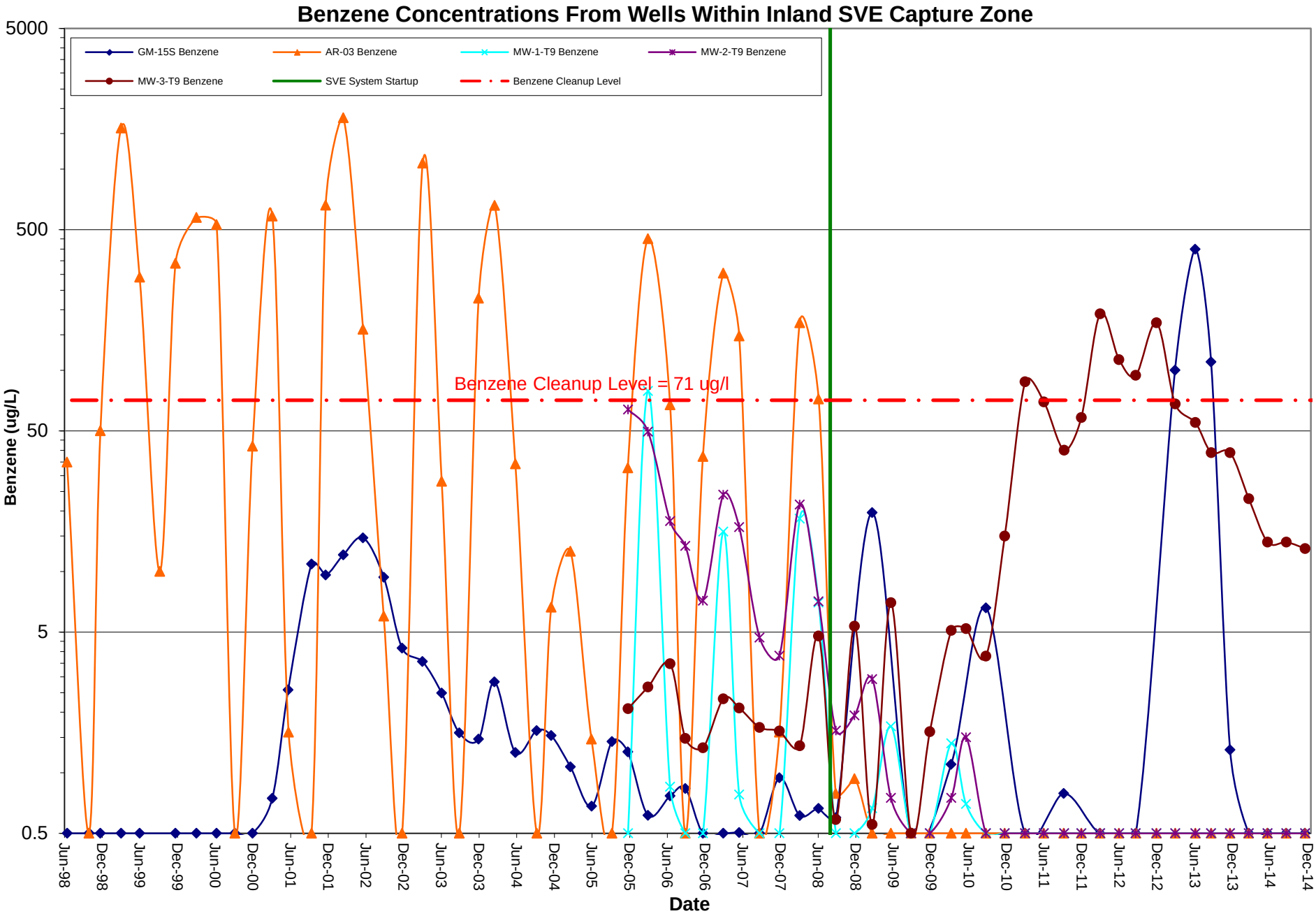
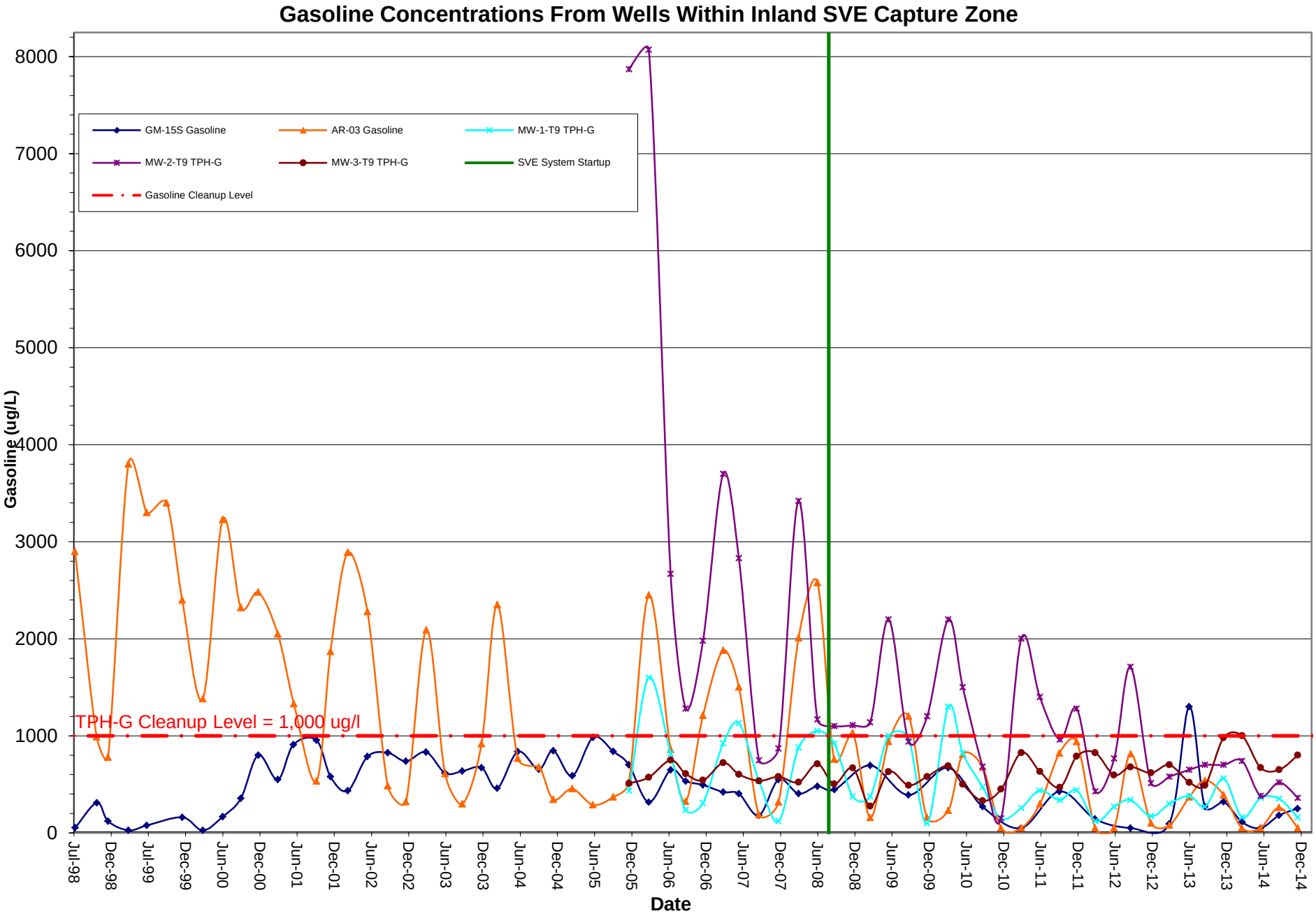
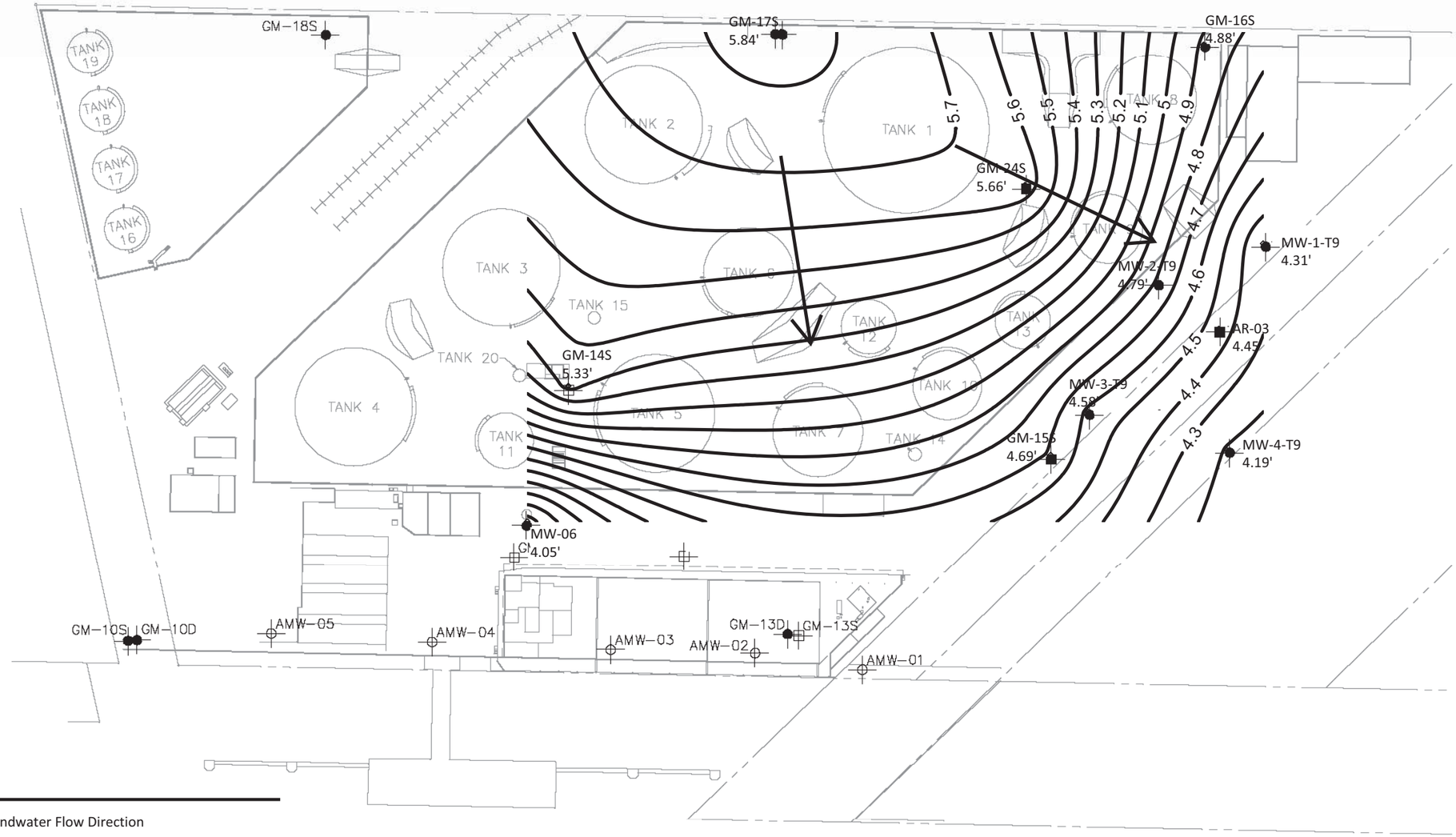


Figure 23. Gasoline History from Wells Within Inland SVE System Capture Zone
BP West Coast Products, Terminal 21T, Harbor Island, Seattle, Washington





LEGEND

- Groundwater Flow Direction
- 3.2' — Groundwater Contour Interval (Feet Above Mean Sea Level)
- GM-16S — Monitoring Well
- AMW-01 — Performance/Confirmation Well
- GM-13D — Performance Well
- GM-13S — Product Performance Well

N

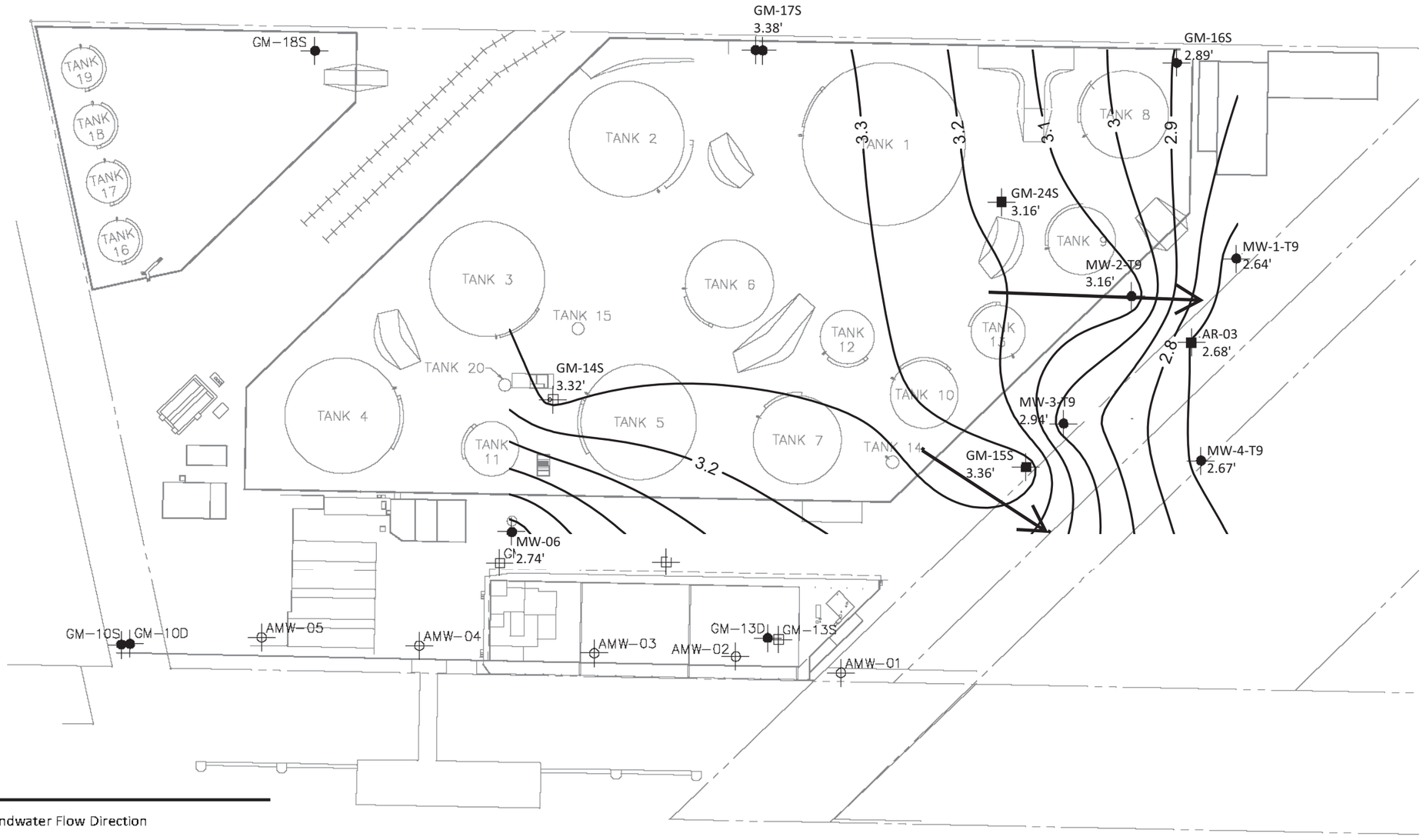
0 50 100
SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore WA 98028
(425) 402-8277 FAX (425) 402-7917

Groundwater Elevation Map First Quarter 2014

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

Figure
24



LEGEND

- Groundwater Flow Direction
- 3.2' Groundwater Contour Interval (Feet Above Mean Sea Level)
- GM-16S Monitoring Well
- AMW-01 Performance/Confirmation Well
- GM-13D Performance Well
- GM-13S Product Performance Well

N

0 50 100
SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore WA 98028
(425) 402-8277 FAX (425) 402-7917

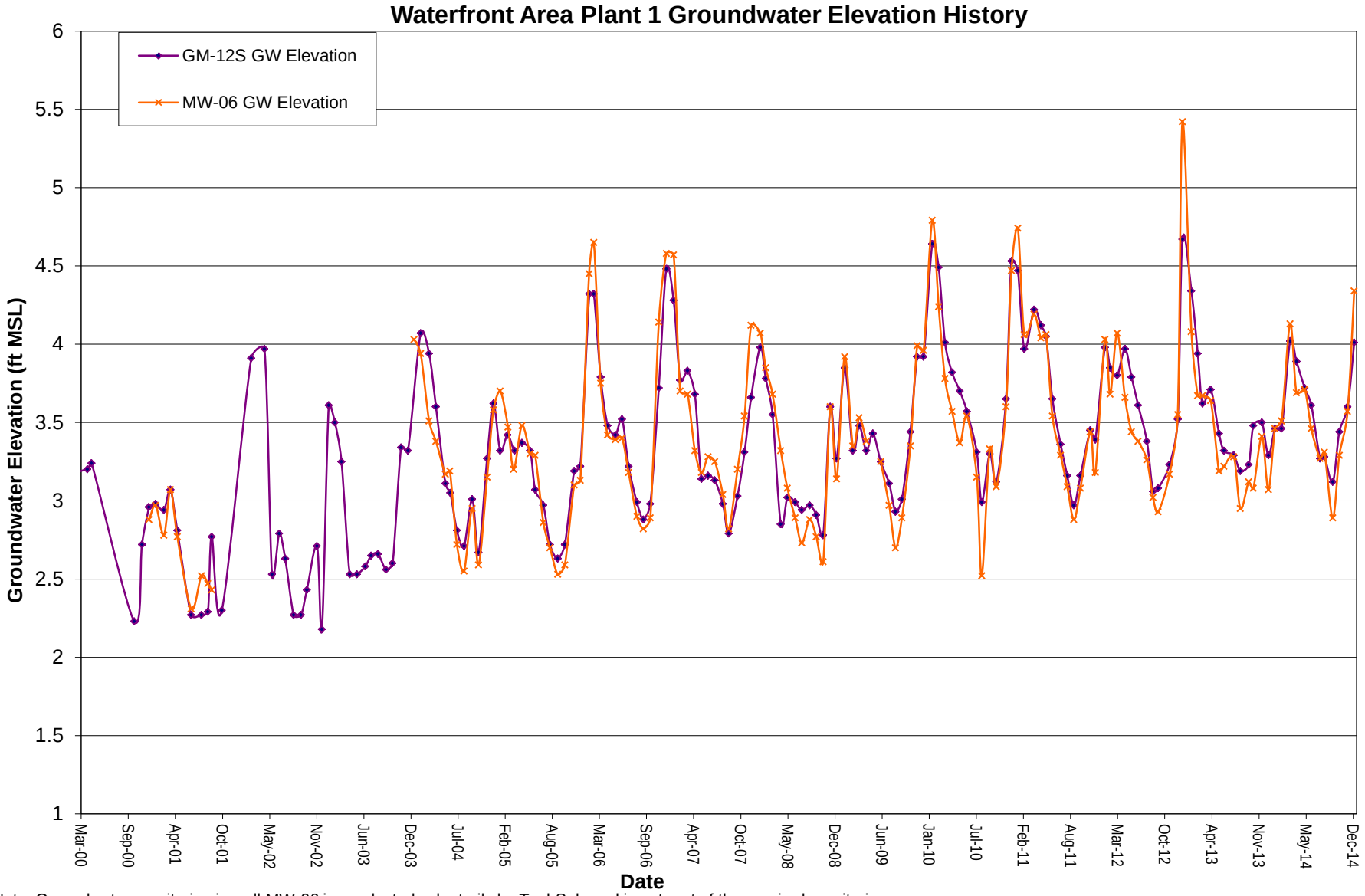
Groundwater Elevation Map, Third Quarter 2014

BP West Coast Products Terminal 21T
1652 Southwest Lander Street
Seattle, WA 98134

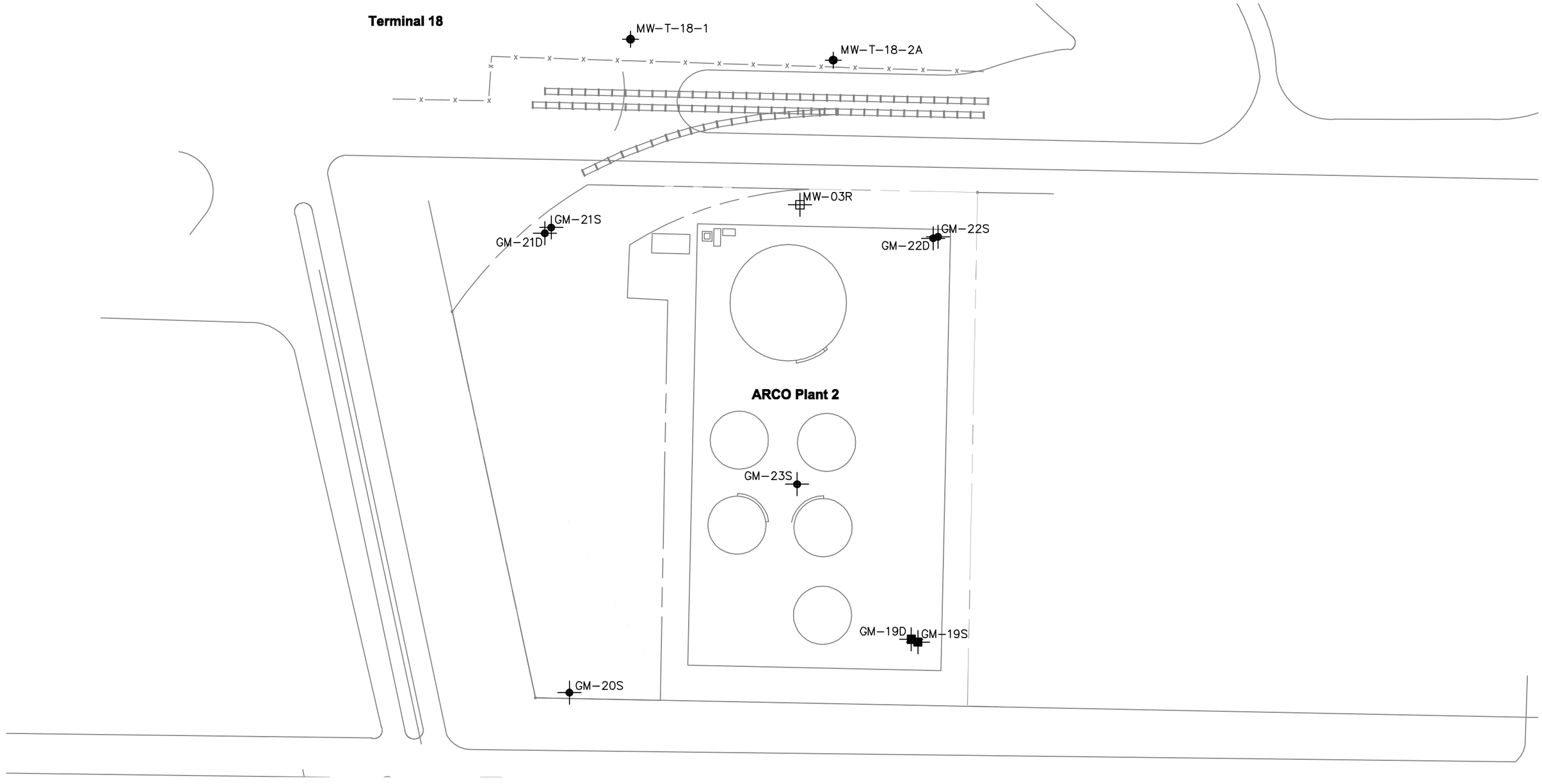
Figure
25

C:\DGS_PROJECTS\TechSolve PROJECTS\BP21T\ARCD 21T\dwg\11433a02.dwg JAN 13 2011 12:06:07

Figure 26. Plant 1 Waterfront Hydrograph
March 2000 through December 2014
BP West Coast Products Terminal 21T, Harbor Island, Seattle, Washington



Note: Groundwater monitoring in well MW-06 is conducted voluntarily by TechSolv and is not part of the required monitoring program.



LEGEND

- GROUNDWATER MONITORING WELL
- PRODUCT PERFORMANCE WELL
- PERFORMANCE WELL

N

0 50 100

SCALE IN FEET

TECHSOLVE ENVIRONMENTAL
7518 NE 169th Street, Kenmore WA 98028
(425) 402-8277 FAX (425) 402-7917

Plant 2 Monitoring Well Network

BP West Coast Products Terminal 21T
2406 13th Avenue SW
Seattle, WA 98134

FIGURE
27

C:\DOCS_PROJECTS\TechSolve PROJECTS\BP21T\ARCO 21T\dwg\ARCO21T.dwg JAN 13 2011 12:34:56

APPENDIX A

Discharge Monitoring Reports and Data

Industrial Waste Semi-Annual Self-Monitoring Report

King County

Mail or FAX to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001

Company Name: BP West Coast Products LLC (co TechSolve)

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2014** **Semi-Annual Report for Semester 1** **Sample Site No.:** A43262 **Permit/DA No.:** 7592-04

All units are mg/l unless otherwise noted. Note: Write in self-monitoring parameters, if not provided, e.g. Silver (Ag) or settleable solids (ml/L).

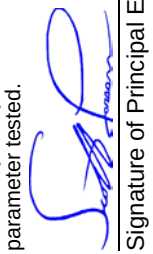
	Sample Date month/day	Sample Type C (Composite) G (Grab) BC (Batch)	Benzene	Toluene	Ethyl-benzene	Silver	Arsenic	Cadmium	Non-polar fats, oils & grease (FOG) (Record average of 3 grabs only)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
Semester 1	Jan/14	G	<0.001	<0.001	<0.001				TPH-D – 0.78 TPH-O – <0.25	1,040	64,520
	Feb/12	G	<0.001	<0.001	<0.001				TPH-D – 1.6 TPH-O – <0.25	1,200	49,470
	Mar/20	G	<0.005	<0.005	<0.005				TPH-D – 1.6 TPH-O – 0.28	2,290	90,820
	Apr/16	G & C for FOG	<0.001	<0.001	<0.001	<0.05	<0.06	<0.02	<3.5 [TPH (1664A)]	2,290	49,920
	May/21	G	<0.001	<0.001	<0.001				TPH-D – 0.82 TPH-O – 0.23	1,960	69,150
	Jun/19	G	<0.001	<0.001	<0.001				TPH-D – 0.51 TPH-O – 0.065	2,140	65,510

—► Total Volume Semester 1: 389,390 gallons

—► Maximum daily flow from Semester 1: **3,510 gallons.** Date on which maximum daily flow occurred: **1/23/2014**

NOTES: **Page 1 of 2. Daily discharge volumes reported based upon flowmeter readings sent from telemetry unit. All analyses referenced in this report were performed by TestAmerica Laboratories, Inc. in Tacoma Washington. All laboratory reports are retained by TechSolve Environmental, Inc.**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested.



Signature of Principal Executive or Authorized Agent — Date: 7/8/2014

Due Date: Semi-annual report for Semester 1 is due by July 15 of each year. **Please Note:** Do not include original laboratory reports with this form unless otherwise requested. Keep the original laboratory reports on file and available for inspection for at least 3 years.

Industrial Waste Semi-Annual Self-Monitoring Report

King County

Mail or FAX to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001

Company Name: BP West Coast Products LLC (co TechSolve)

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2014** **Semi-Annual Report for Semester 1** **Sample Site No.:** A43262 **Permit/DA No.:** 7592-04

All units are mg/l unless otherwise noted. Note: Write in self-monitoring parameters, if not provided, e.g. Silver (Ag) or settleable solids (ml/L).

	Sample Date month/day	Sample Type C (Composite) G (Grab) BC (Batch)	Chromium	Copper	Mercury	Nickel	Lead	Zinc	Cyanide	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
Semester 1	Jan/14	G								1,040	64,520
	Feb/12	G								1,200	49,470
	Mar/20	G								2,290	90,820
	Apr/16	G & C for FOG	<0.025	<0.03	<0.0002	<0.02	<0.03	0.041	<0.06	2,290	49,920
	May/21	G								1,960	69,150
	Jun/	G								2,140	65,510

—► Total Volume Semester 1: 389,390 gallons

—► Maximum daily flow from Semester 1: **3,510 gallons.** Date on which maximum daily flow occurred: **1/23/2014**

NOTES: **Page 2 of 2. Daily discharge volumes reported based upon flowmeter readings sent from telemetry unit. All analyses referenced in this report were performed by TestAmerica Laboratories, Inc. in Tacoma Washington. All laboratory reports are retained by TechSolve Environmental, Inc.**

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7/8/2014
Date

Signature of Principal Executive or Authorized Agent

Due Date: Semi-annual report for Semester 1 is due by July 15 of each year. **Please Note:** Do not include original laboratory reports with this form unless otherwise requested. Keep the original laboratory reports on file and available for inspection for at least 3 years.

Industrial Waste Semi-Annual Self-Monitoring Report

King County

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130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001

Company Name: BP West Coast Products LLC (co TechSolve)

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2014** **Semi-Annual Report for Semester 2** **Sample Site No.:** A43262 **Permit/DA No.:** 7592-04

All units are mg/l unless otherwise noted. Note: Write in self-monitoring parameters, if not provided, e.g. Silver (Ag) or settleable solids (ml/L).

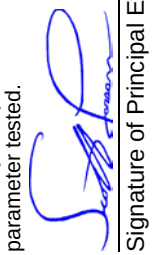
	Sample Date month/day	Sample Type C (Composite) G (Grab) BC (Batch)	Benzene	Toluene	Ethyl-benzene	Silver	Arsenic	Cadmium	Non-polar fats, oils & grease (FOG) (Record average of 3 grabs only)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
Semester 2	Jul/24	G	<0.001	<0.001	<0.001				TPH-D – 1.0 TPH-O – 0.18	2,580	18,220
	Aug/13	G	<0.005	<0.005	<0.005				TPH-D – 2.7 TPH-O – 0.36	2,660	43,850
	Sep/17	G	<0.001	<0.001	<0.001				TPH-D – 2.4 TPH-O – 0.34	2,380	77,300
	Oct/15	G & C for FOG	<0.001	<0.001	<0.001	<0.05	<0.06	<0.02	<3.4 [TPH (1664A)]	2,460	68,190
	Nov/19	G	<0.001	<0.001	<0.001				TPH-D – 2.5 TPH-O – 0.35	2,180	80,090
	Dec/17	G	<0.001	<0.001	<0.001				TPH-D – 3.2 TPH-O – 0.33	3,110	84,440

—► Total Volume Semester 2: 372,090 gallons

—► Maximum daily flow from Semester 2: **4,910 gallons.** Date on which maximum daily flow occurred: **12/10/2014**

NOTES: **Page 1 of 2. Daily discharge volumes reported based upon flowmeter readings sent from telemetry unit. All analyses referenced in this report were performed by TestAmerica Laboratories, Inc. in Tacoma Washington. All laboratory reports are retained by TechSolve Environmental, Inc. Reported TPH-D and TPH-O data are from NWTPH-Dx analyses for remediation recovery calculations and are voluntarily reported in addition to required Semi-Annual FOG to provide additional discharge data.**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested.



Signature of Principal Executive or Authorized Agent

1/02/2015
Date

Due Date: Semi-annual report for Semester 2 is due by January 15 of each year. **Please Note:** Do not include original laboratory reports with this form unless otherwise requested. Keep the original laboratory reports on file and available for inspection for at least 3 years.

King County

Industrial Waste Semi-Annual Self-Monitoring Report

Mail or FAX to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001

Company Name: BP West Coast Products LLC (co TechSolve)

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2014** **Semi-Annual Report for Semester 2** **Sample Site No.:** A43262 **Permit/DA No.:** 7592-04

All units are mg/l unless otherwise noted. Note: Write in self-monitoring parameters, if not provided, e.g. Silver (Ag) or settleable solids (ml/L).

	Sample Date month/day	Sample Type C (Composite) G (Grab) BC (Batch)	Chromium	Copper	Mercury	Nickel	Lead	Zinc	Cyanide	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
Semester 2	Jul/24	G								2,580	18,220
	Aug/13	G								2,660	43,850
	Sep/17	G								2,380	77,300
	Oct/15	G & C for FOG	<0.025	<0.03	0.00028	<0.02	<0.03	0.060	<0.06	2,460	68,190
	Nov/19	G								2,180	80,090
	Dec/17	G								3,110	84,440

—► Total Volume Semester 2: 372,090 gallons

—► Maximum daily flow from Semester 2: **4,910 gallons.** Date on which maximum daily flow occurred: **12/10/2014**

NOTES: **Page 2 of 2. Daily discharge volumes reported based upon flowmeter readings sent from telemetry unit. All analyses referenced in this report were performed by TestAmerica Laboratories, Inc. in Tacoma Washington. All laboratory reports are retained by TechSolve Environmental, Inc.**

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1/02/2015
Date

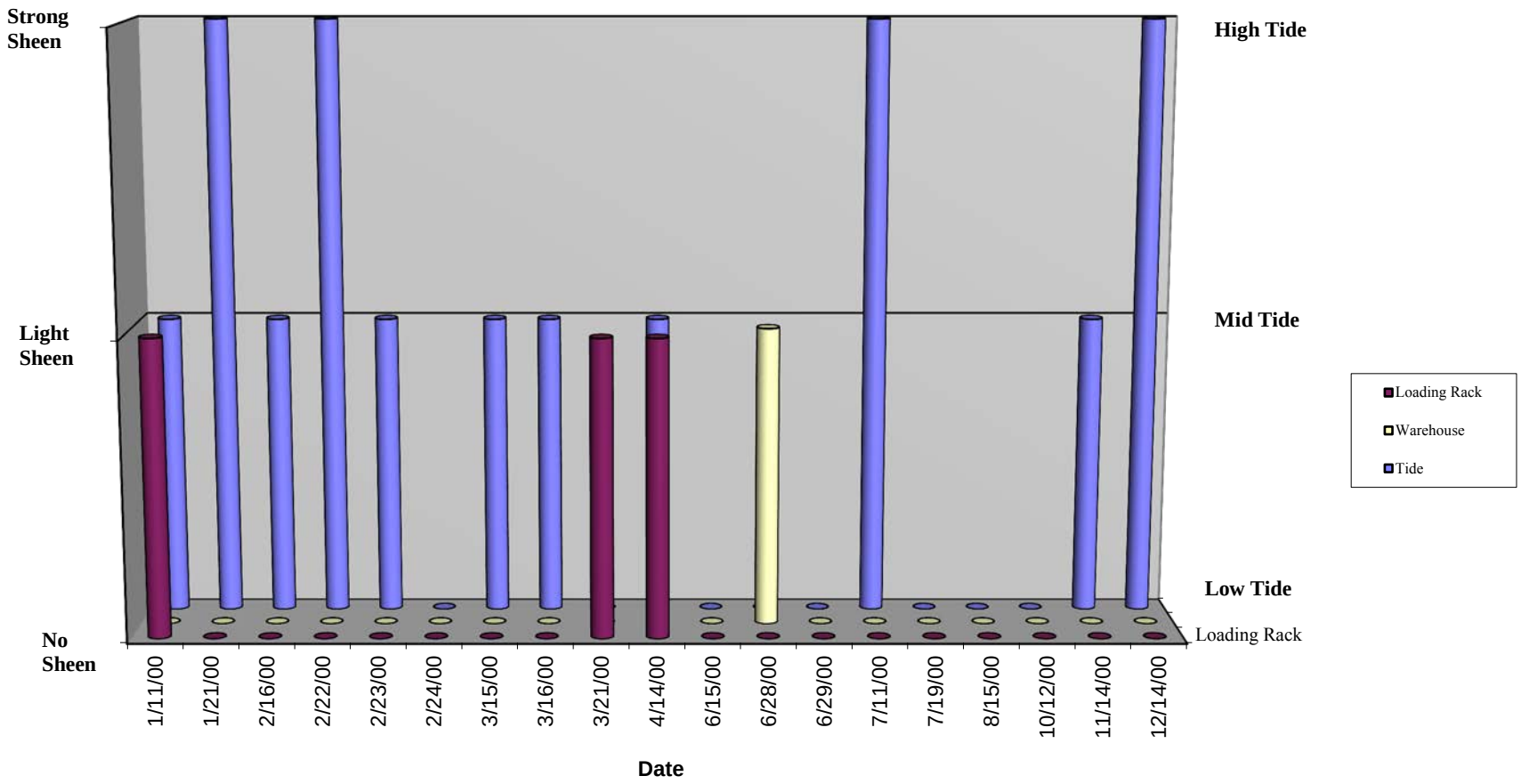
Signature of Principal Executive or Authorized Agent

Due Date: Semi-annual report for Semester 2 is due by January 15 of each year. **Please Note:** Do not include original laboratory reports with this form unless otherwise requested. Keep the original laboratory reports on file and available for inspection for at least 3 years.

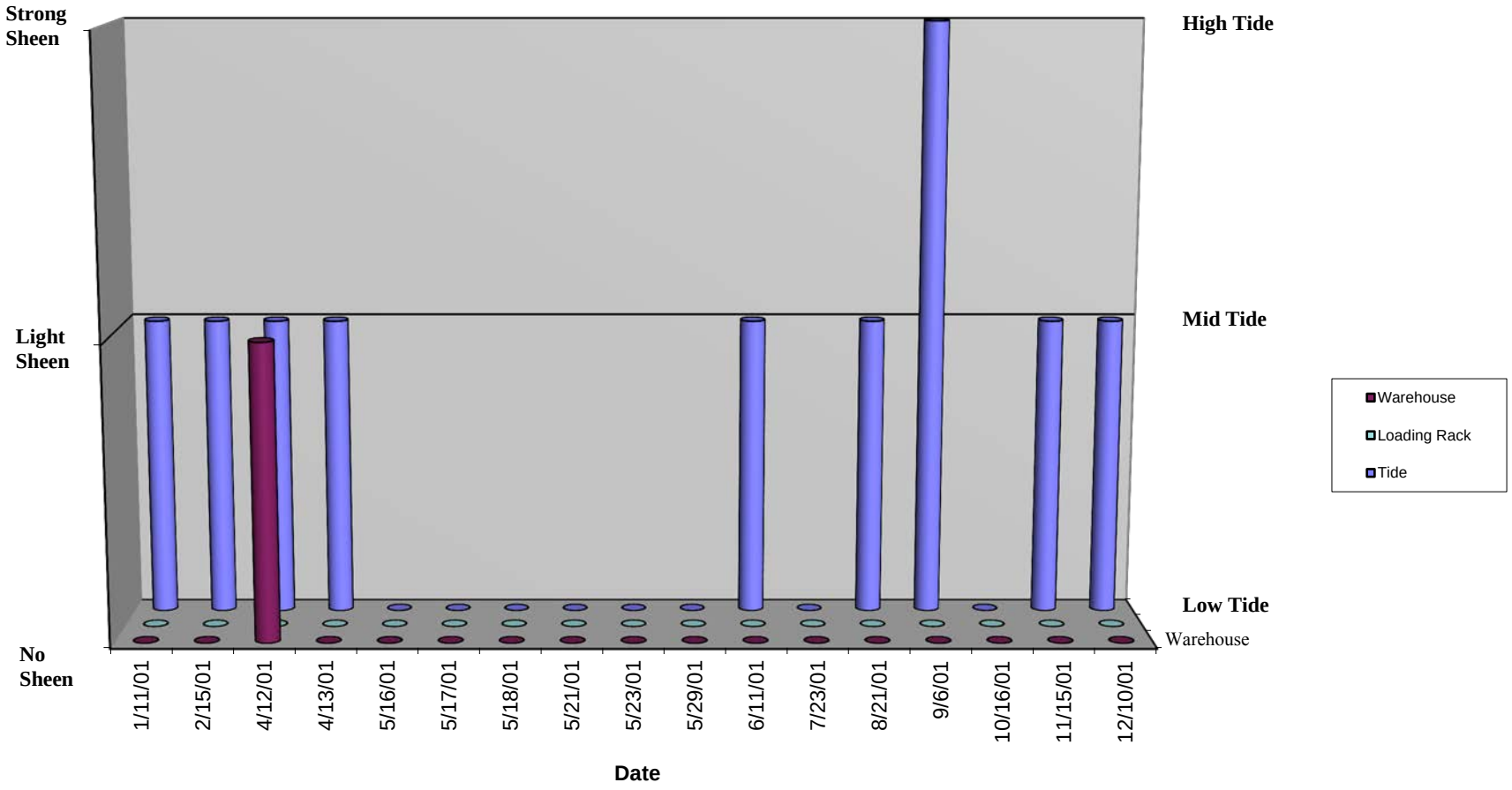
APPENDIX B

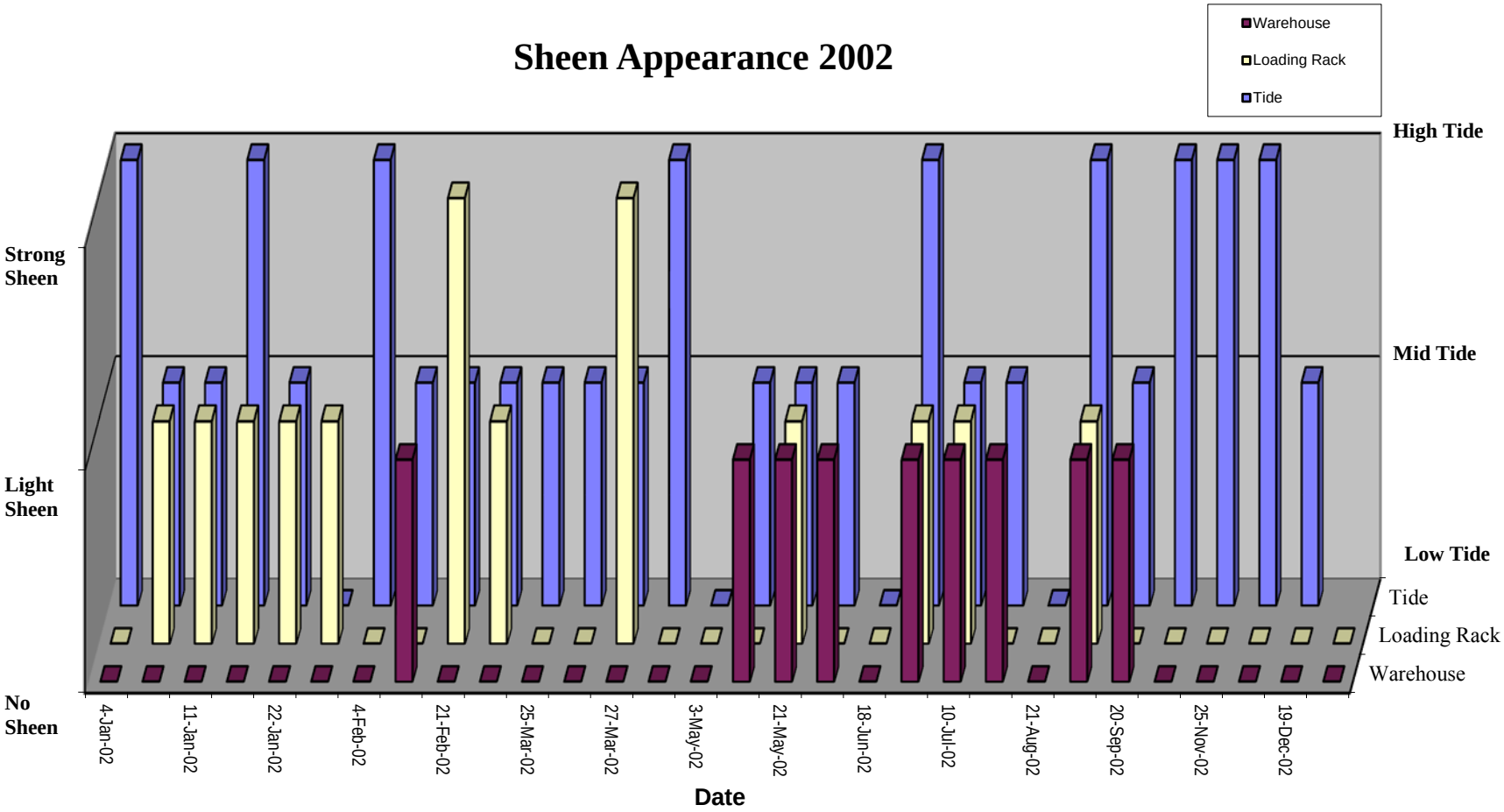
Sheen Observations 2002 Through 2013

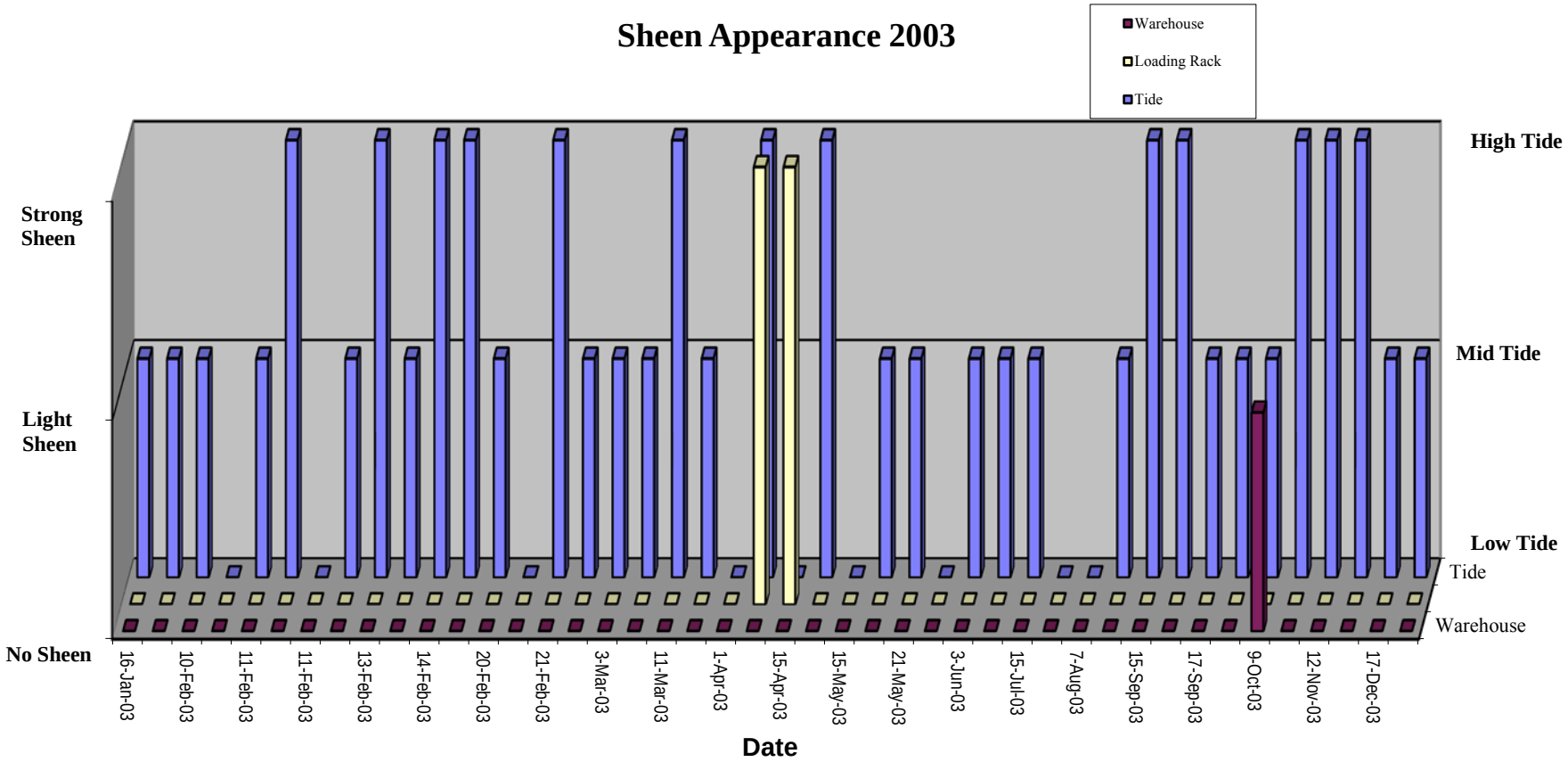
Sheen Appearance 2000



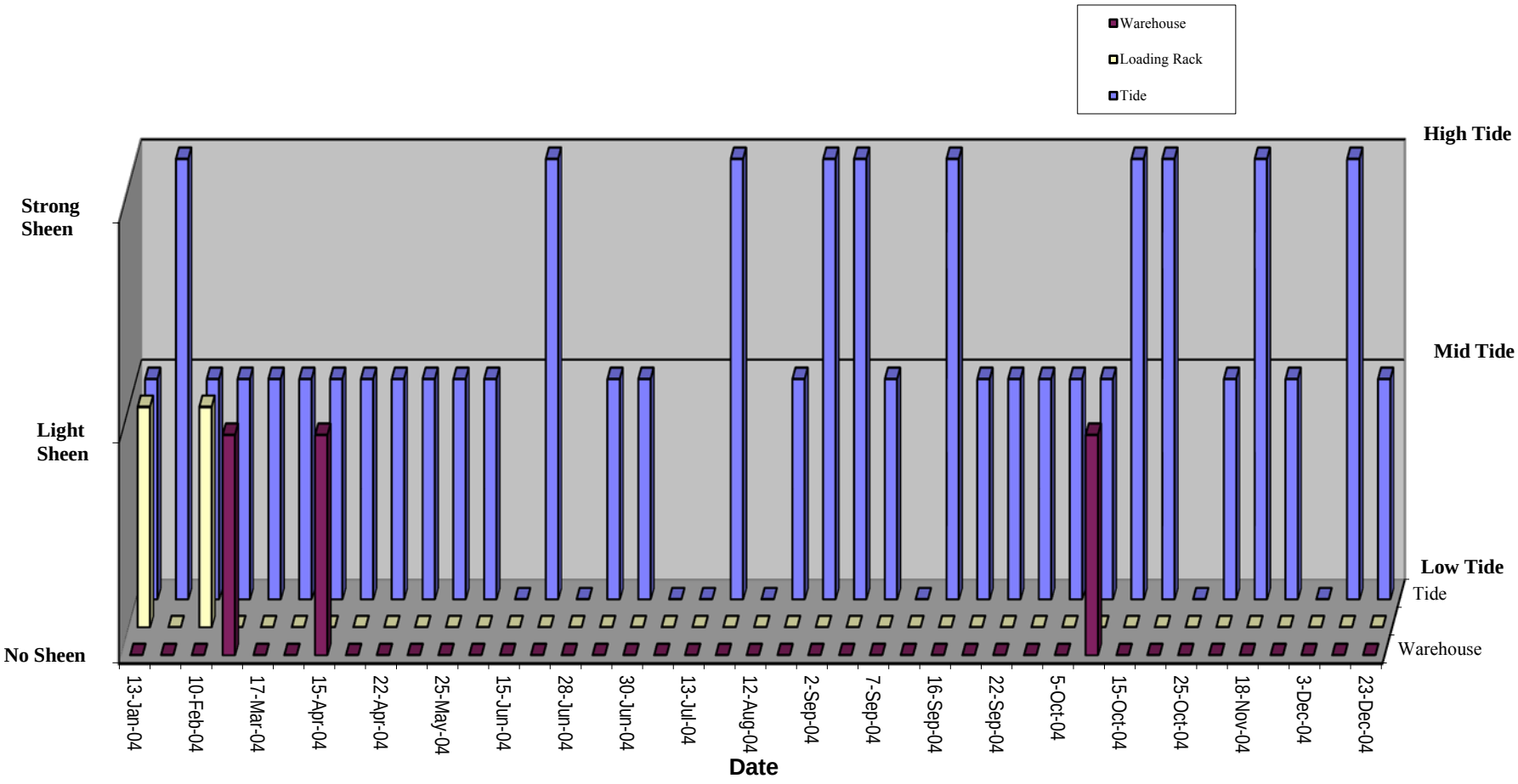
Sheen Appearance 2001

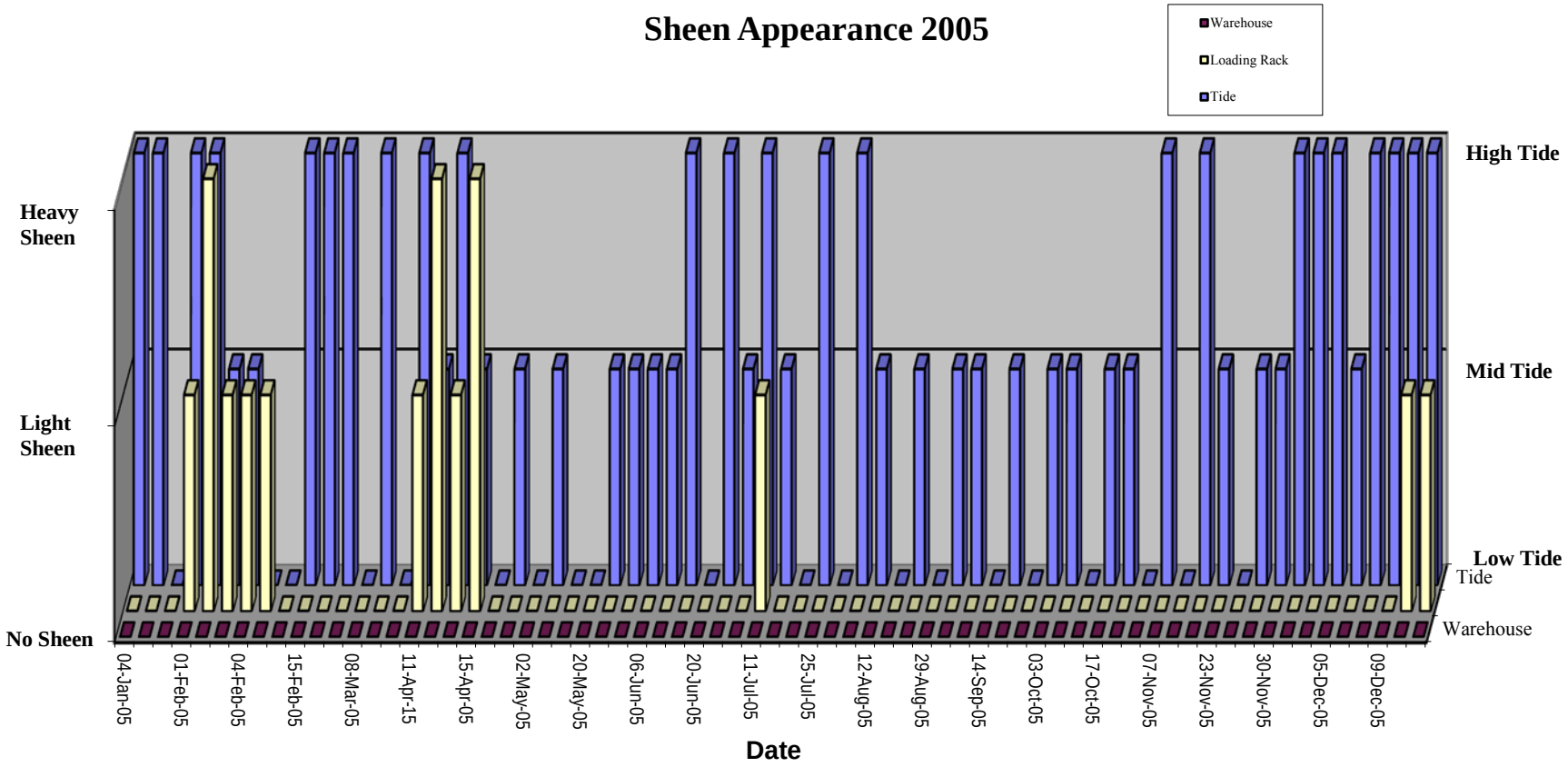



Sheen Appearance 2002
Warehouse
Loading Rack
Tide
High Tide
Mid Tide
Low Tide
Strong Sheen
Light Sheen
No Sheen
Tide
Loading Rack
Warehouse
4-Jan-02
11-Jan-02
22-Jan-02
4-Feb-02
21-Feb-02
25-Mar-02
27-Mar-02
3-May-02
21-May-02
18-Jun-02
10-Jul-02
21-Aug-02
20-Sep-02
25-Nov-02
19-Dec-02
Date

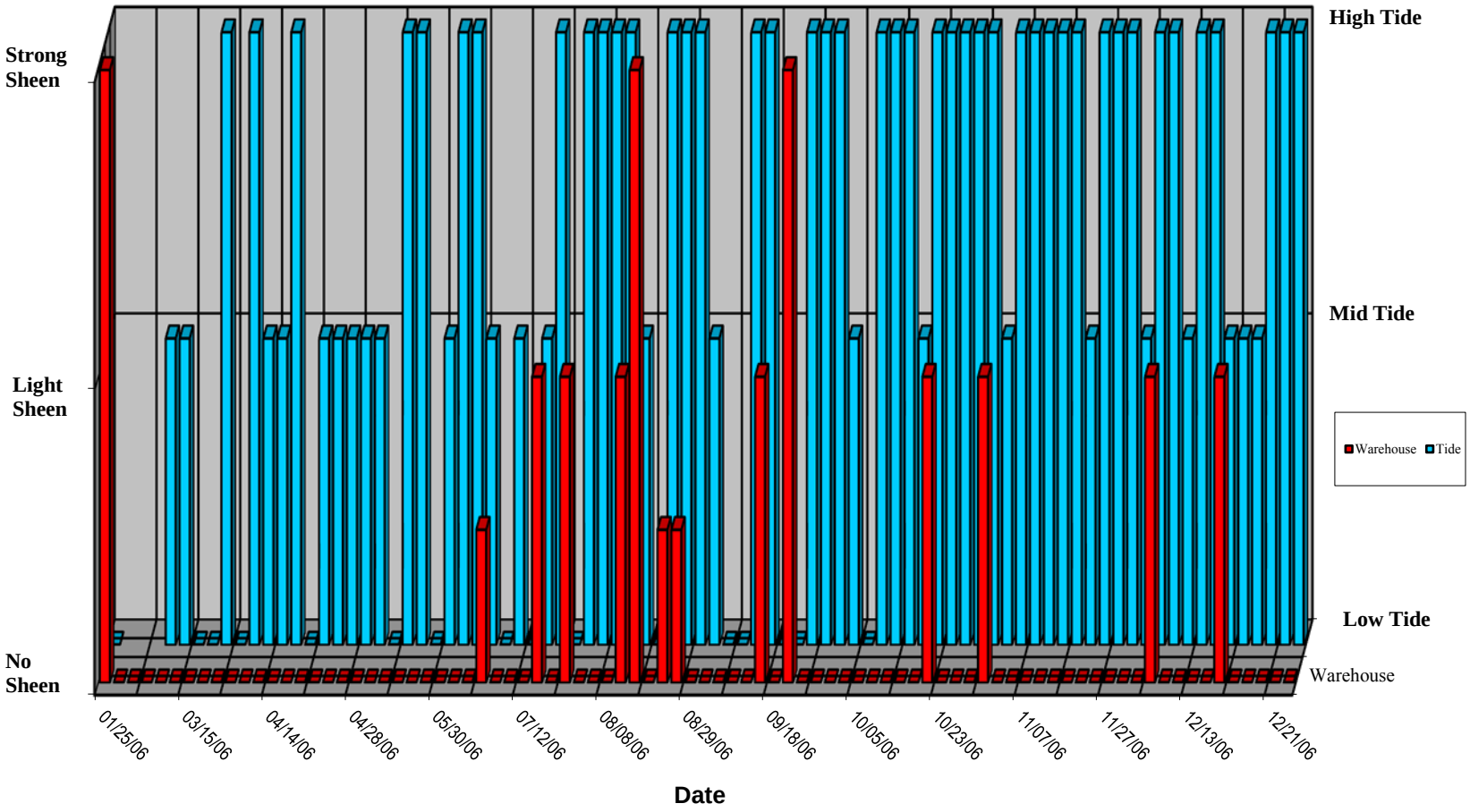

Sheen Appearance 2003
Warehouse
Loading Rack
Tide
High Tide
Mid Tide
Low Tide
Strong Sheen
Light Sheen
No Sheen
Tide
Warehouse
16-Jan-03
10-Feb-03
11-Feb-03
11-Feb-03
13-Feb-03
14-Feb-03
20-Feb-03
21-Feb-03
3-Mar-03
11-Mar-03
1-Apr-03
15-Apr-03
15-May-03
21-May-03
3-Jun-03
15-Jul-03
7-Aug-03
15-Sep-03
17-Sep-03
9-Oct-03
12-Nov-03
17-Dec-03
Date

Sheen Appearance 2004

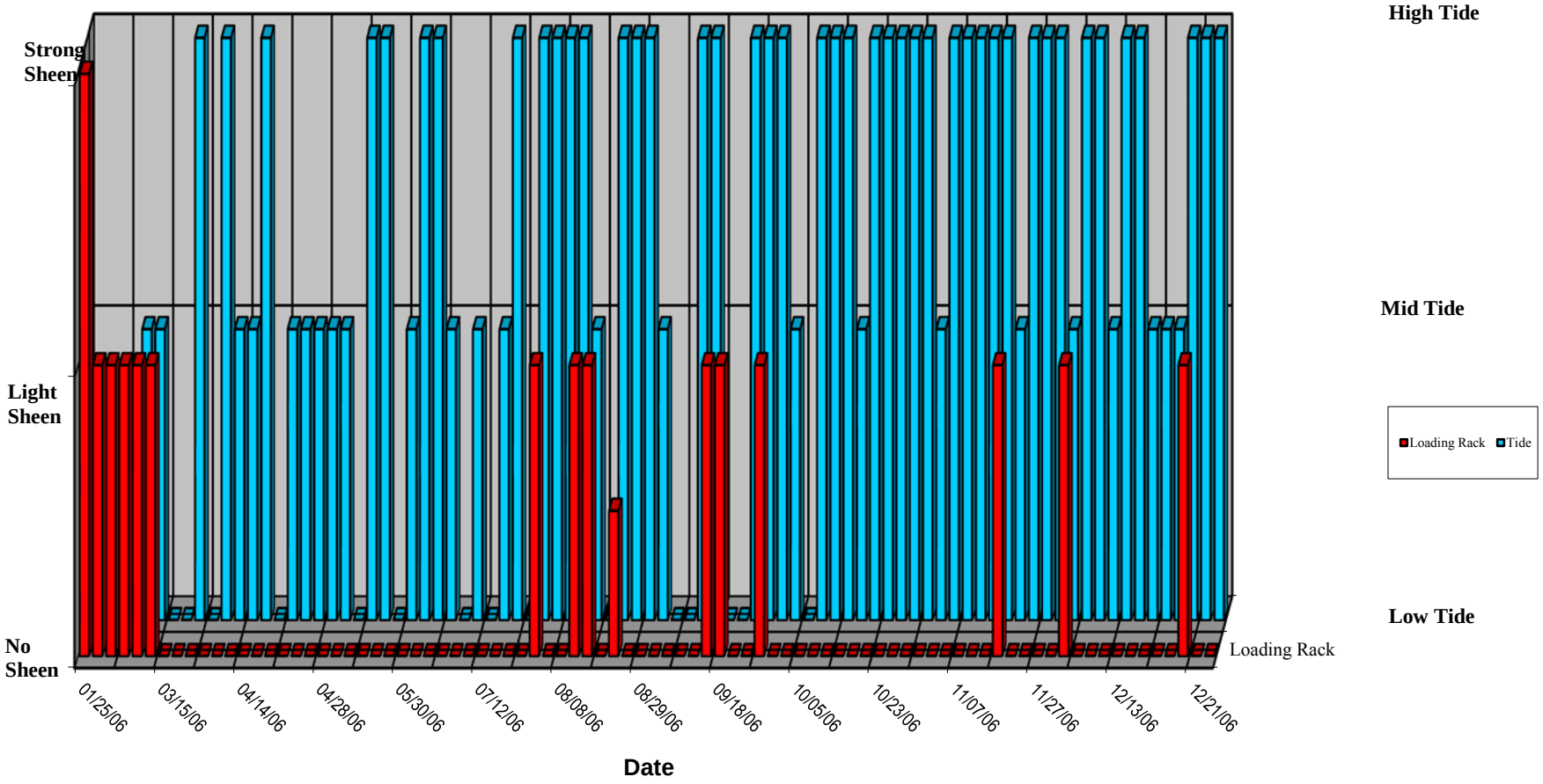


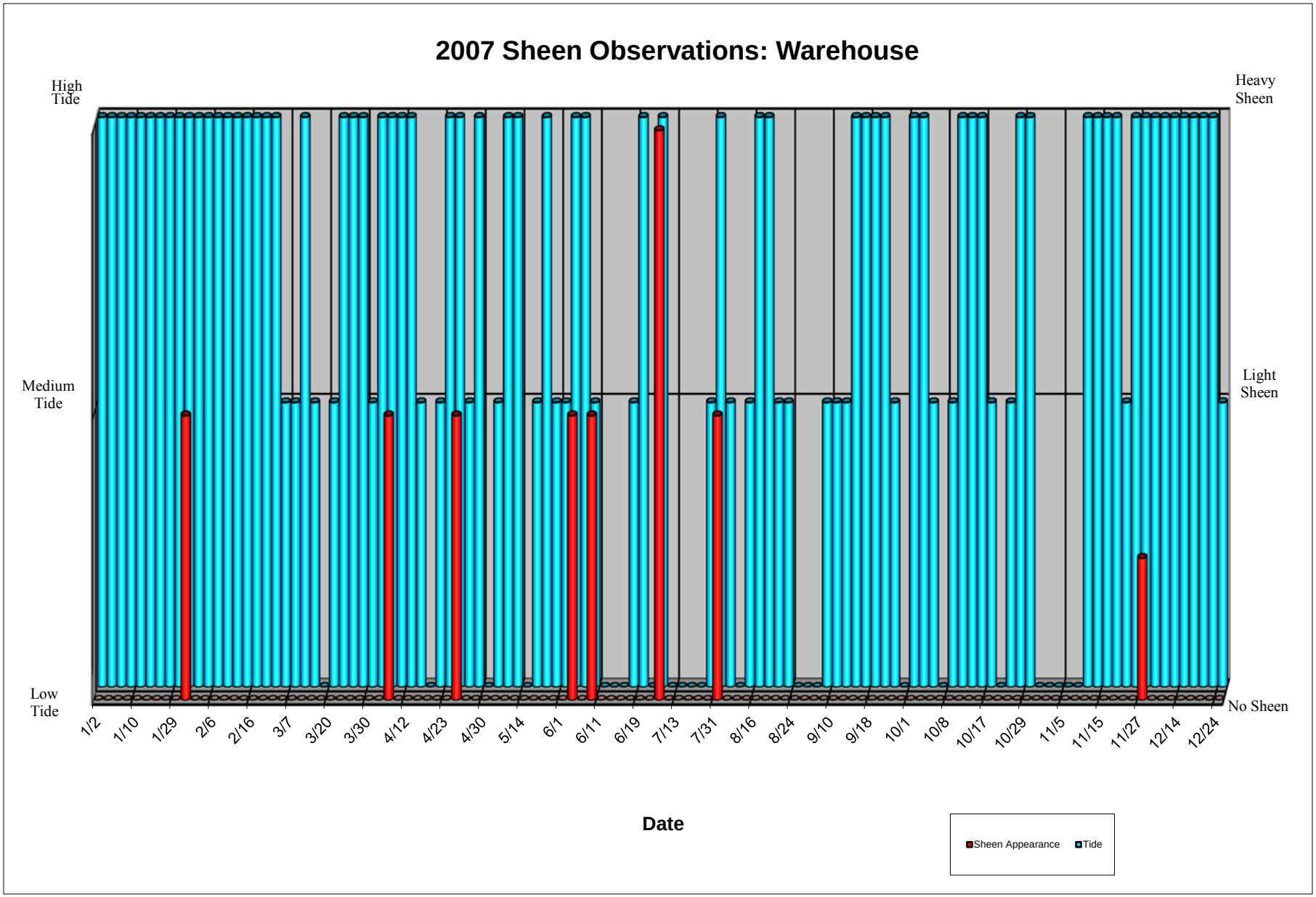

Sheen Appearance 2005
Warehouse
Loading Rack
Tide
High Tide
Mid Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
Tide
Warehouse
04-Jan-05
01-Feb-05
04-Feb-05
15-Feb-05
08-Mar-05
11-Apr-15
15-Apr-05
02-May-05
20-May-05
06-Jun-05
20-Jun-05
11-Jul-05
25-Jul-05
12-Aug-05
29-Aug-05
14-Sep-05
03-Oct-05
17-Oct-05
07-Nov-05
23-Nov-05
30-Nov-05
05-Dec-05
09-Dec-05
Date

Sheen Appearance 2006

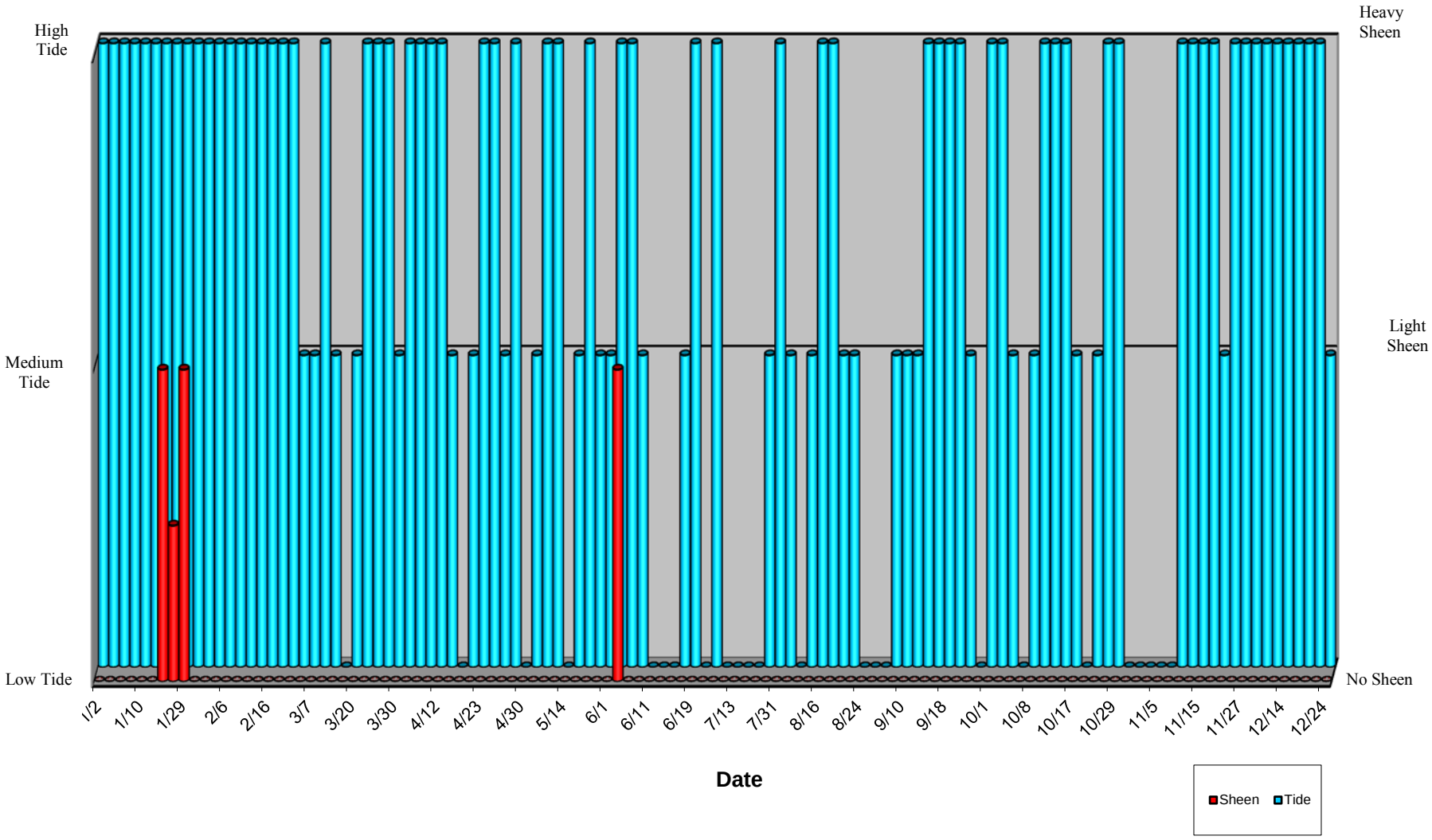


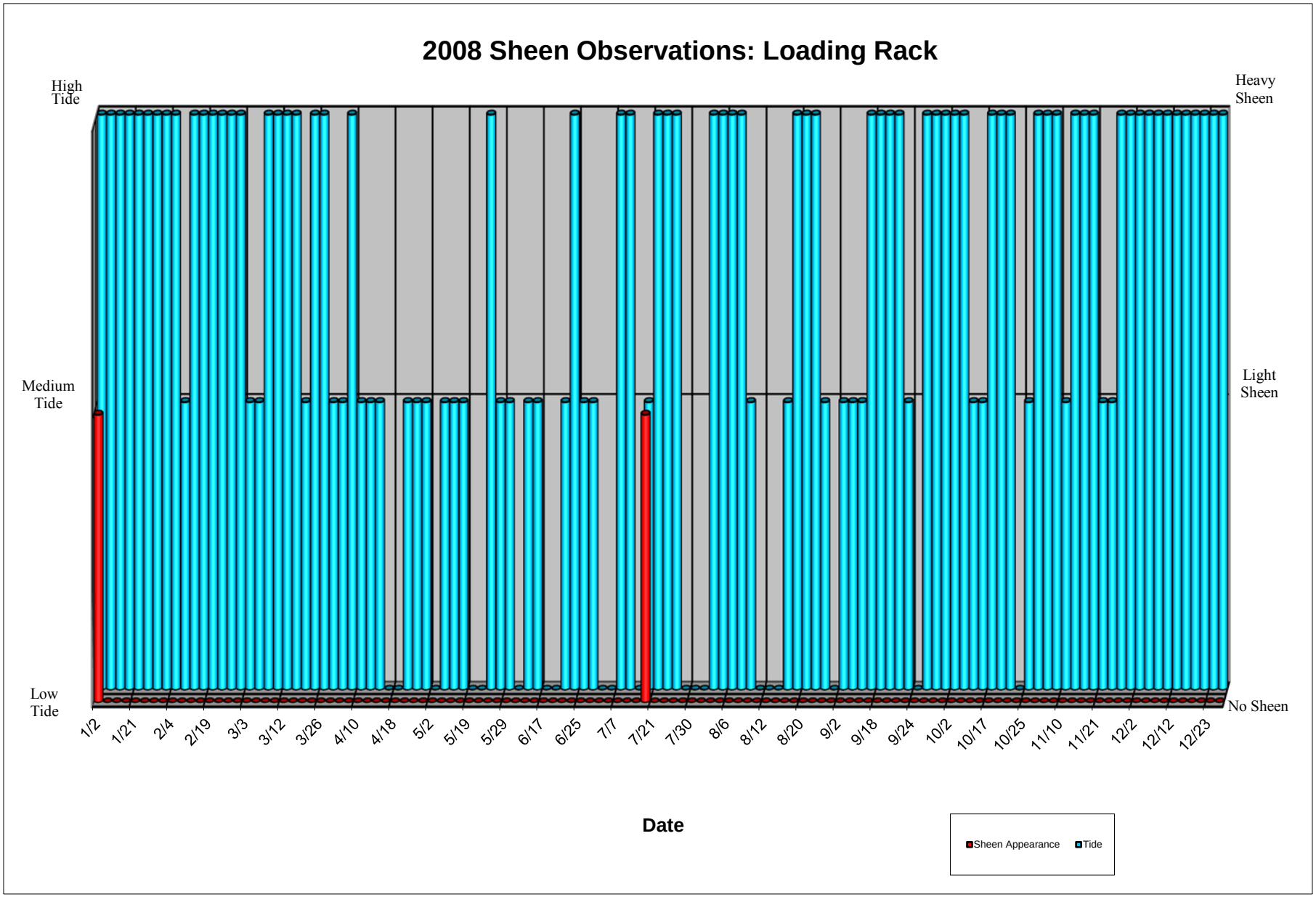
Sheen Appearance 2006

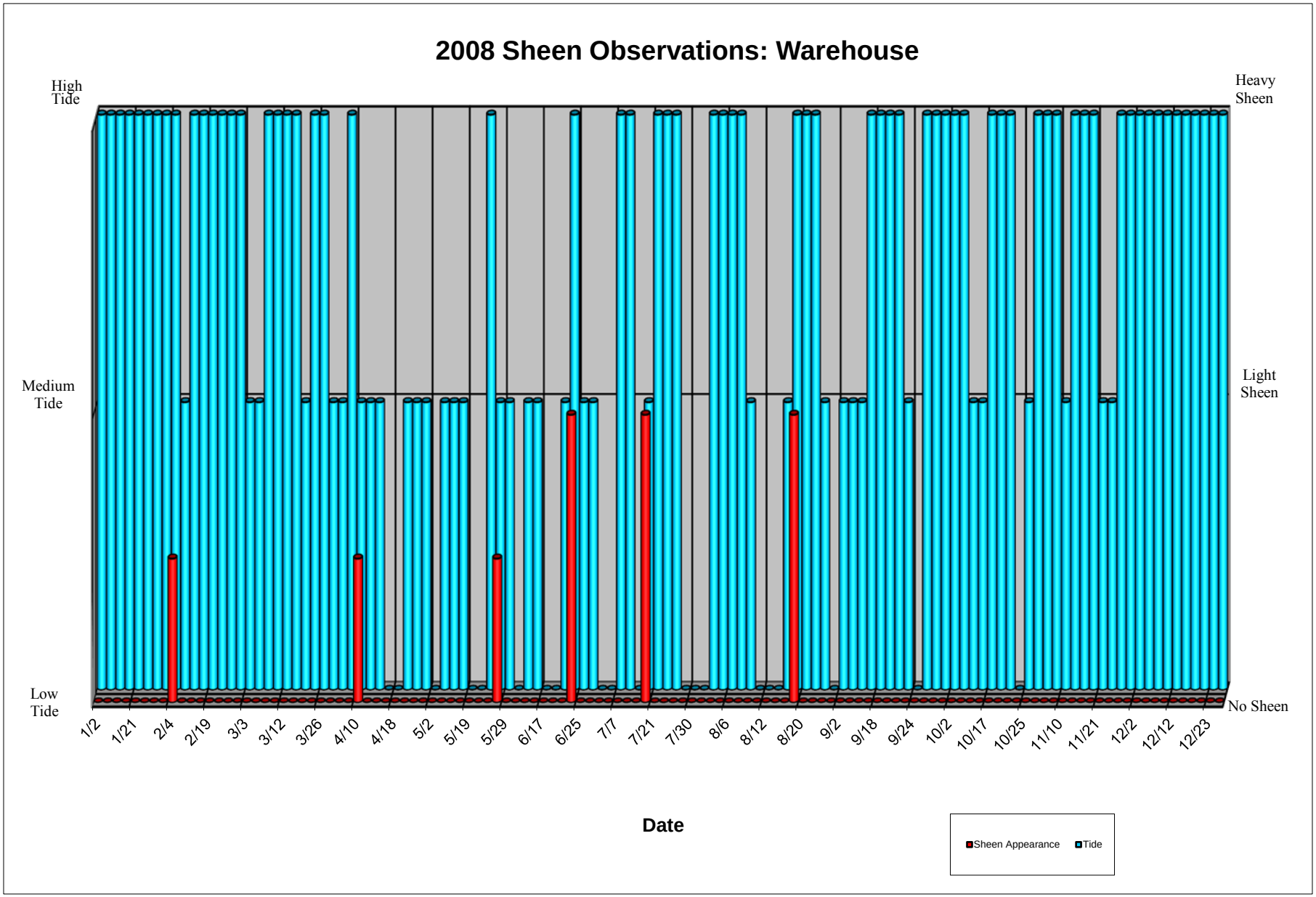


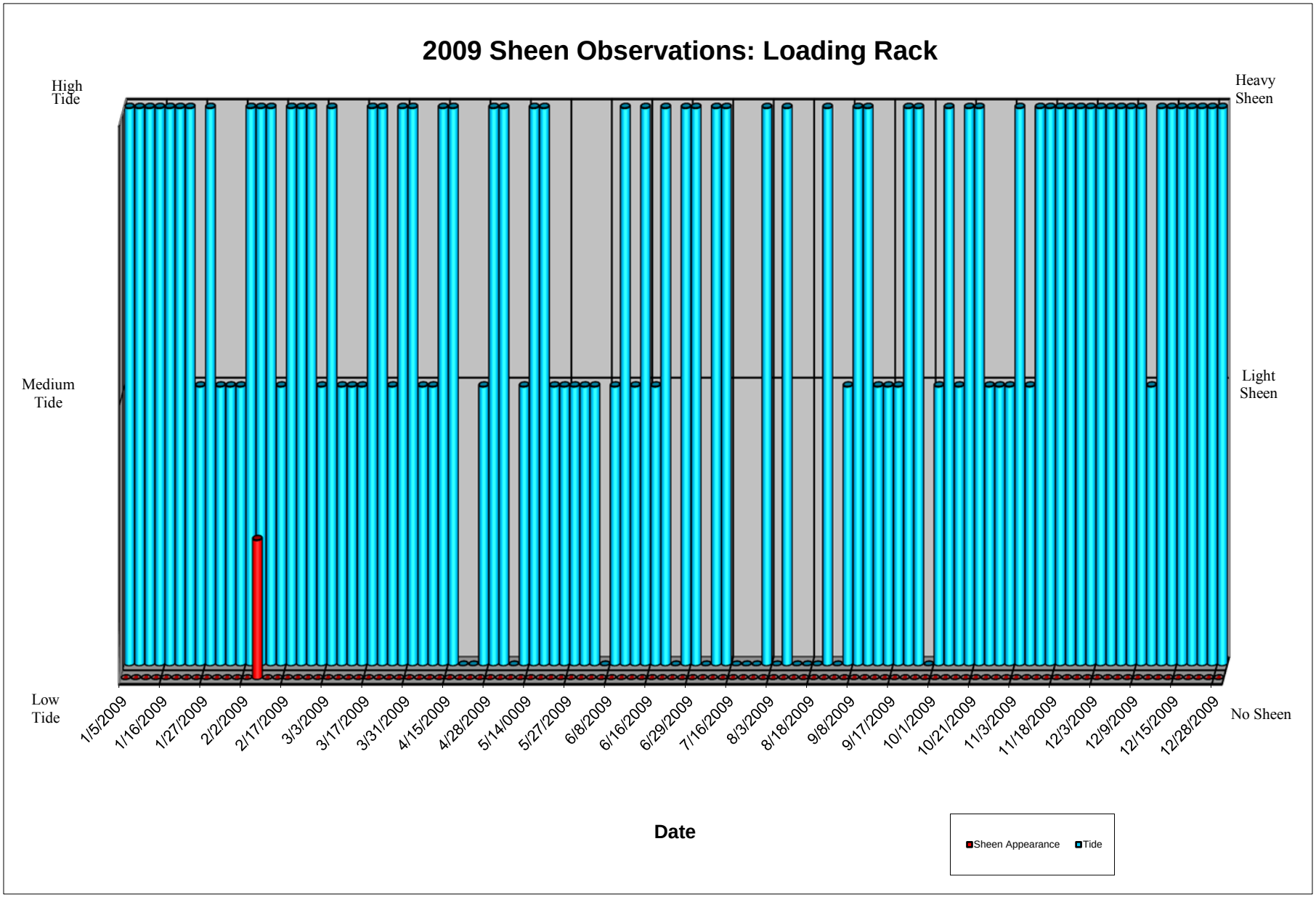

2007 Sheen Observations: Warehouse
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/2
1/10
1/29
2/6
2/16
3/7
3/20
3/30
4/12
4/23
4/30
5/14
6/1
6/11
6/19
7/13
7/31
8/16
8/24
9/10
9/18
10/1
10/8
10/17
10/29
11/5
11/15
11/27
12/14
12/24
Date
Sheen Appearance
Tide

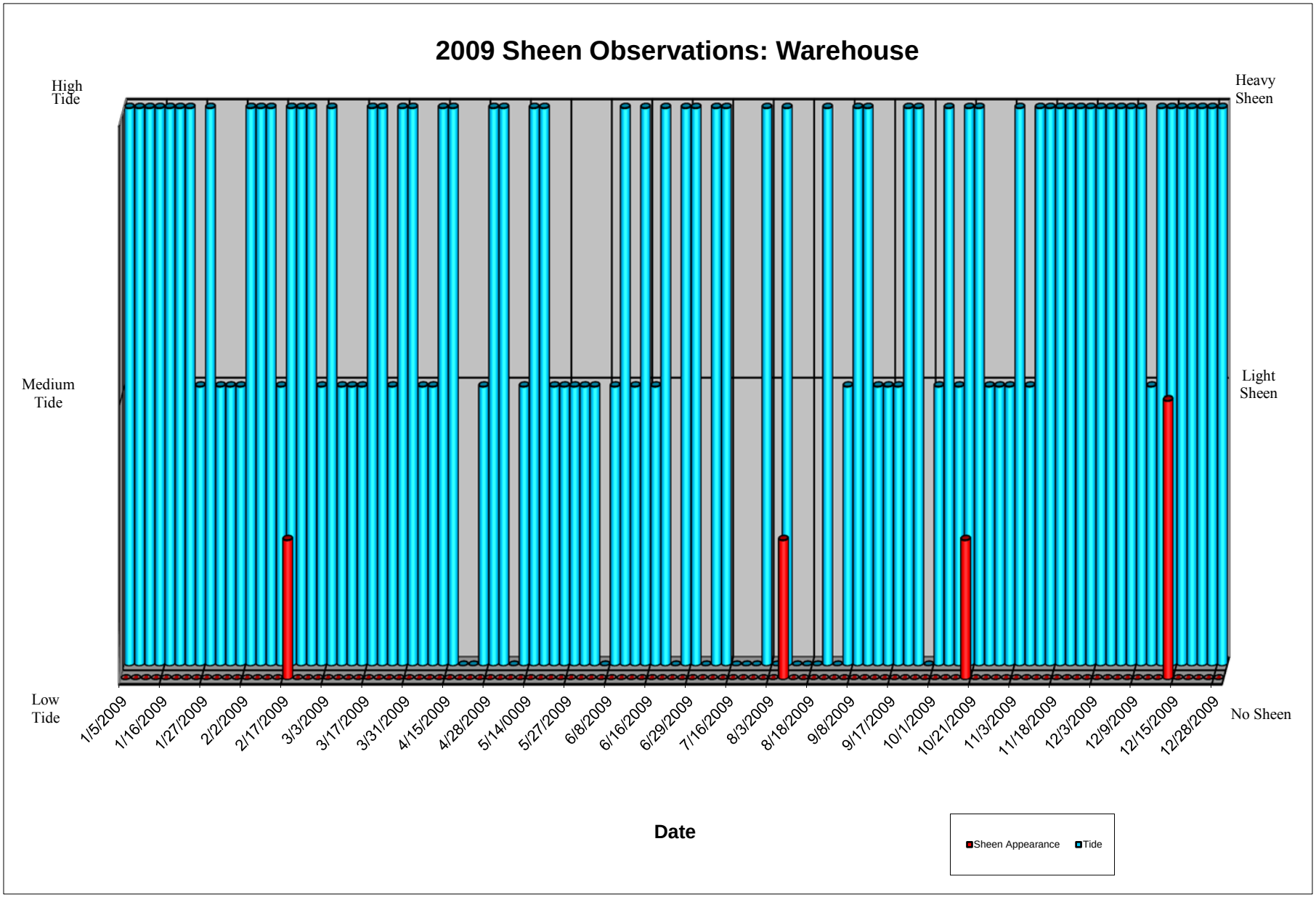
2007 Sheen Observations: Loading Rack



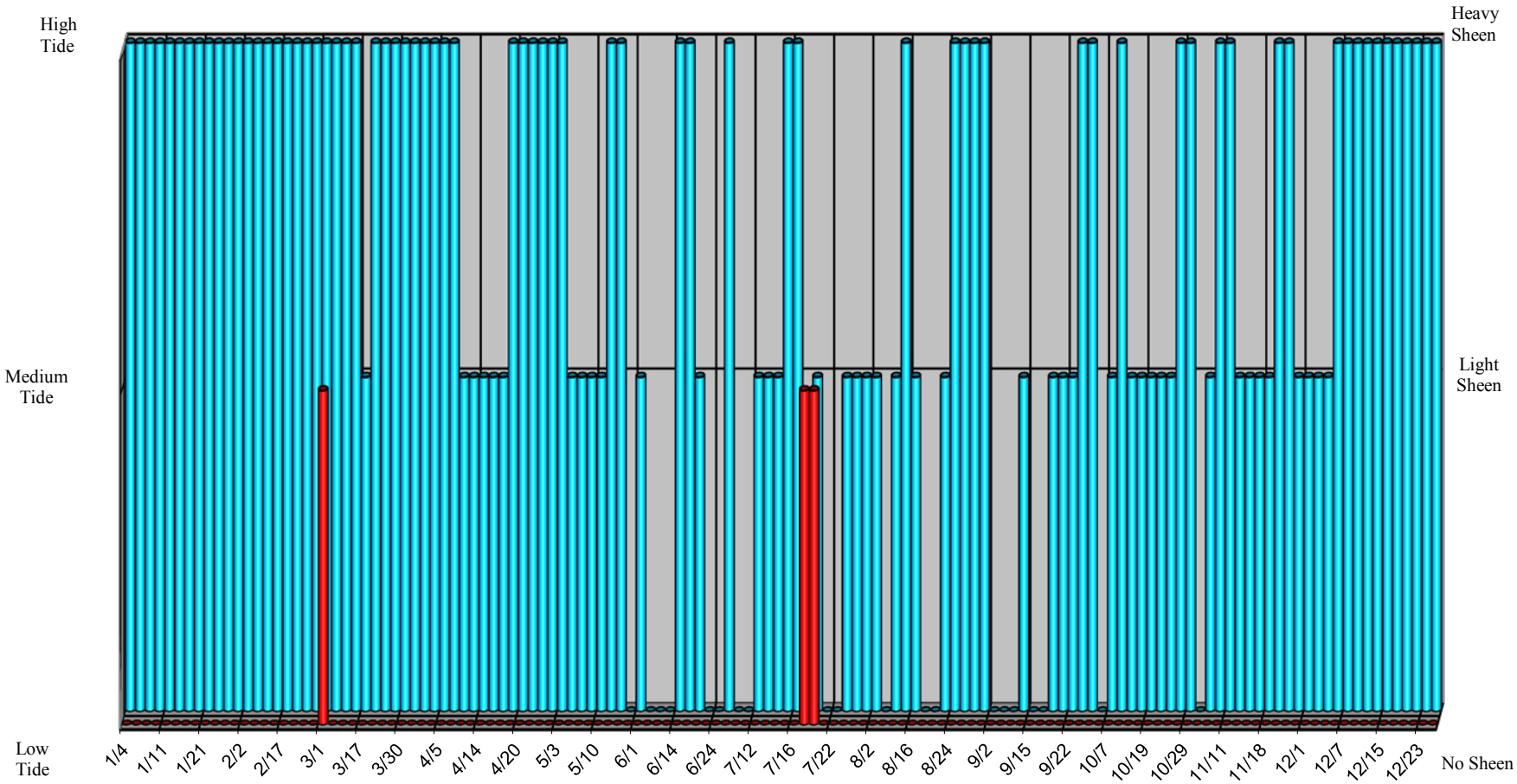

2008 Sheen Observations: Loading Rack
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/2
1/21
2/4
2/19
3/3
3/12
3/26
4/10
4/18
5/2
5/19
5/29
6/17
6/25
7/7
7/21
7/30
8/6
8/12
8/20
9/2
9/18
9/24
10/2
10/17
10/25
11/10
11/21
12/2
12/12
12/23
Date
Sheen Appearance
Tide


2008 Sheen Observations: Warehouse
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/2
1/21
2/4
2/19
3/3
3/12
3/26
4/10
4/18
5/2
5/19
5/29
6/17
6/25
7/7
7/21
7/30
8/6
8/12
8/20
9/2
9/18
9/24
10/2
10/17
10/25
11/10
11/21
12/2
12/12
12/23
Date
Sheen Appearance
Tide

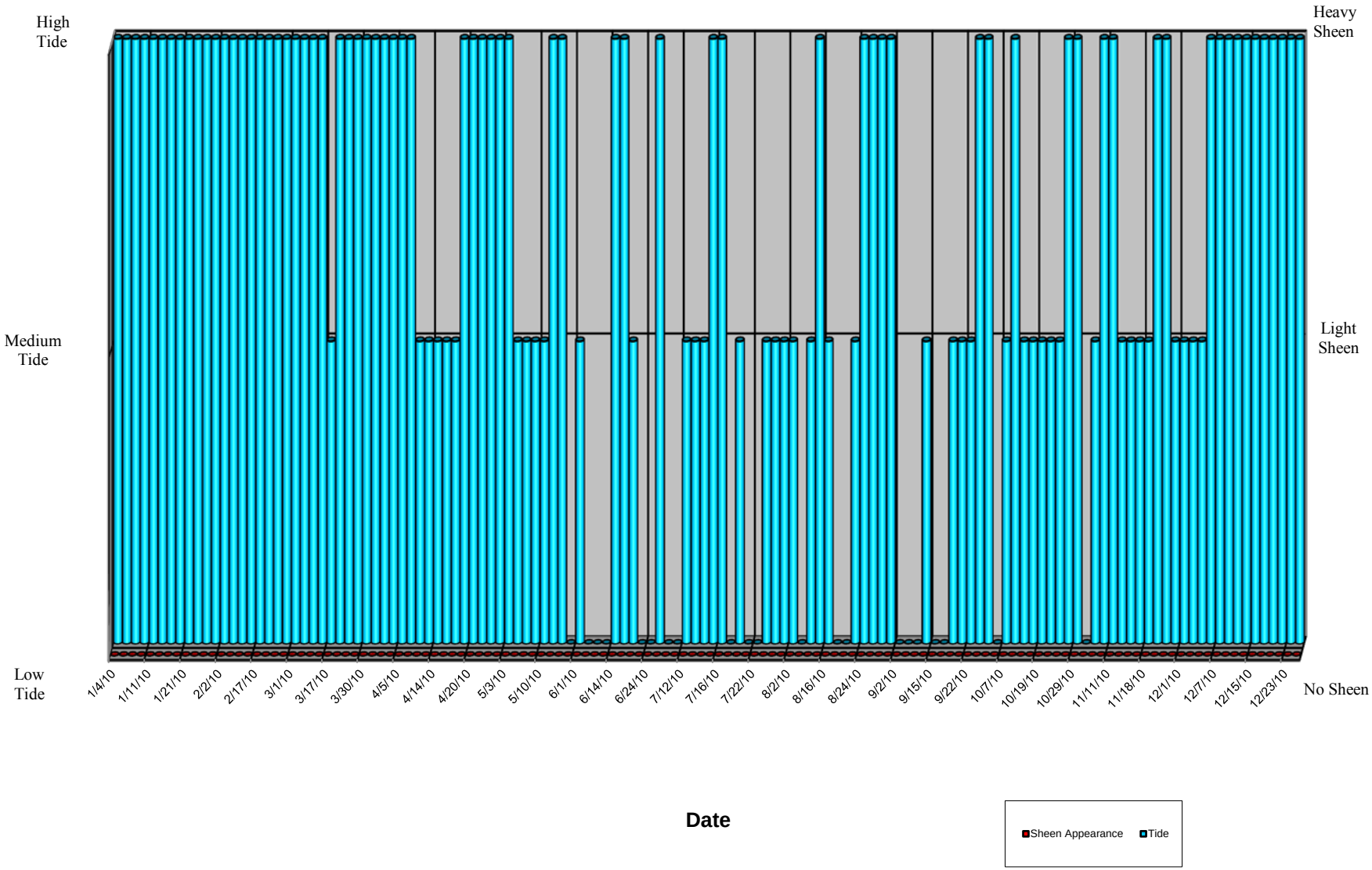

2009 Sheen Observations: Loading Rack
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/5/2009
1/16/2009
1/27/2009
2/2/2009
2/17/2009
3/3/2009
3/17/2009
3/31/2009
4/15/2009
4/28/2009
5/14/0009
5/27/2009
6/8/2009
6/16/2009
6/29/2009
7/16/2009
8/3/2009
8/18/2009
9/8/2009
9/17/2009
10/1/2009
10/21/2009
11/3/2009
11/18/2009
12/3/2009
12/9/2009
12/15/2009
12/28/2009
Date
Sheen Appearance
Tide


2009 Sheen Observations: Warehouse
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/5/2009
1/16/2009
1/27/2009
2/2/2009
2/17/2009
3/3/2009
3/17/2009
3/31/2009
4/15/2009
4/28/2009
5/14/0009
5/27/2009
6/8/2009
6/16/2009
6/29/2009
7/16/2009
8/3/2009
8/18/2009
9/8/2009
9/17/2009
10/1/2009
10/21/2009
11/3/2009
11/18/2009
12/3/2009
12/9/2009
12/15/2009
12/28/2009
Date
Sheen Appearance
Tide

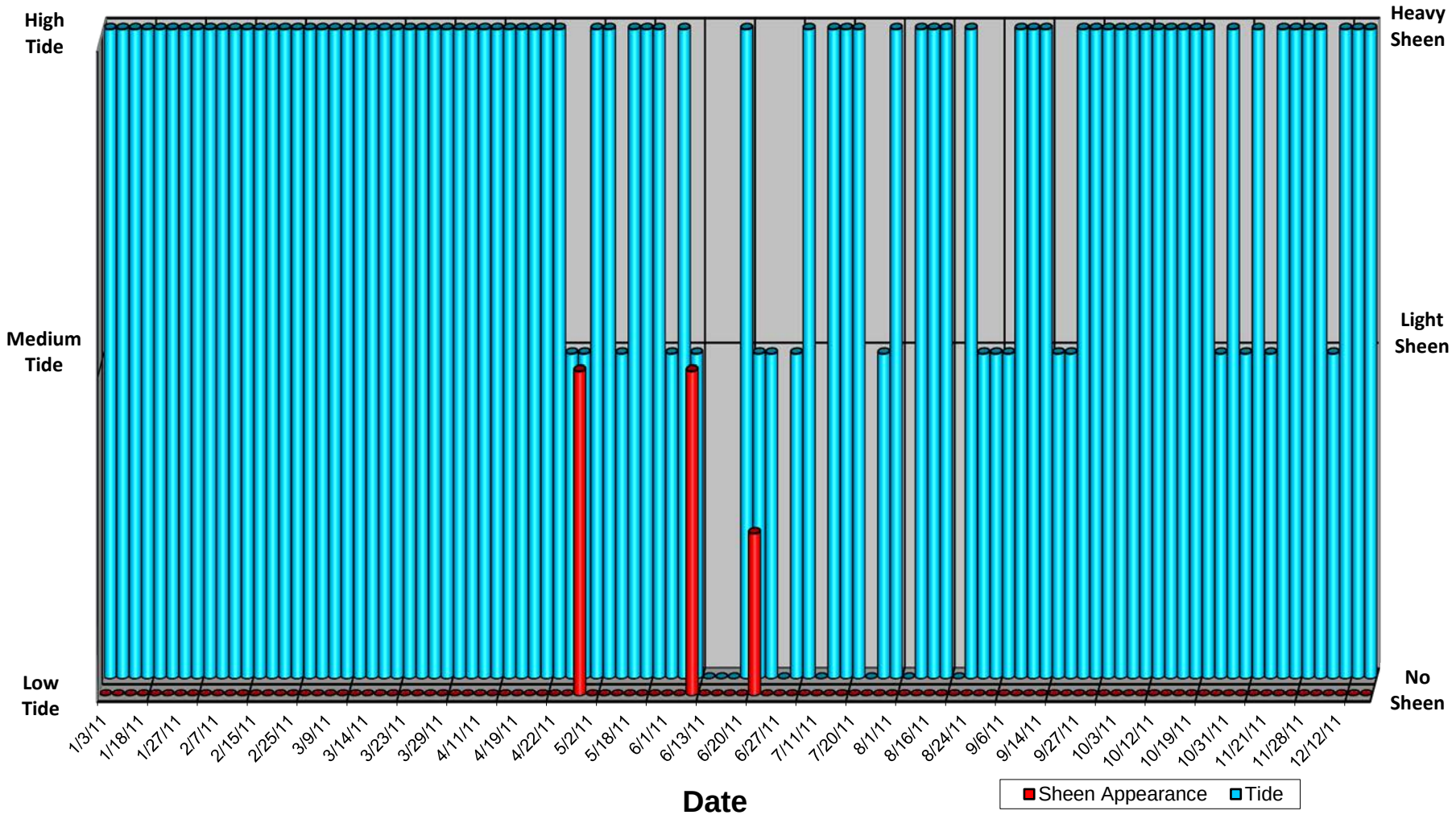
2010 Sheen Observations: Warehouse



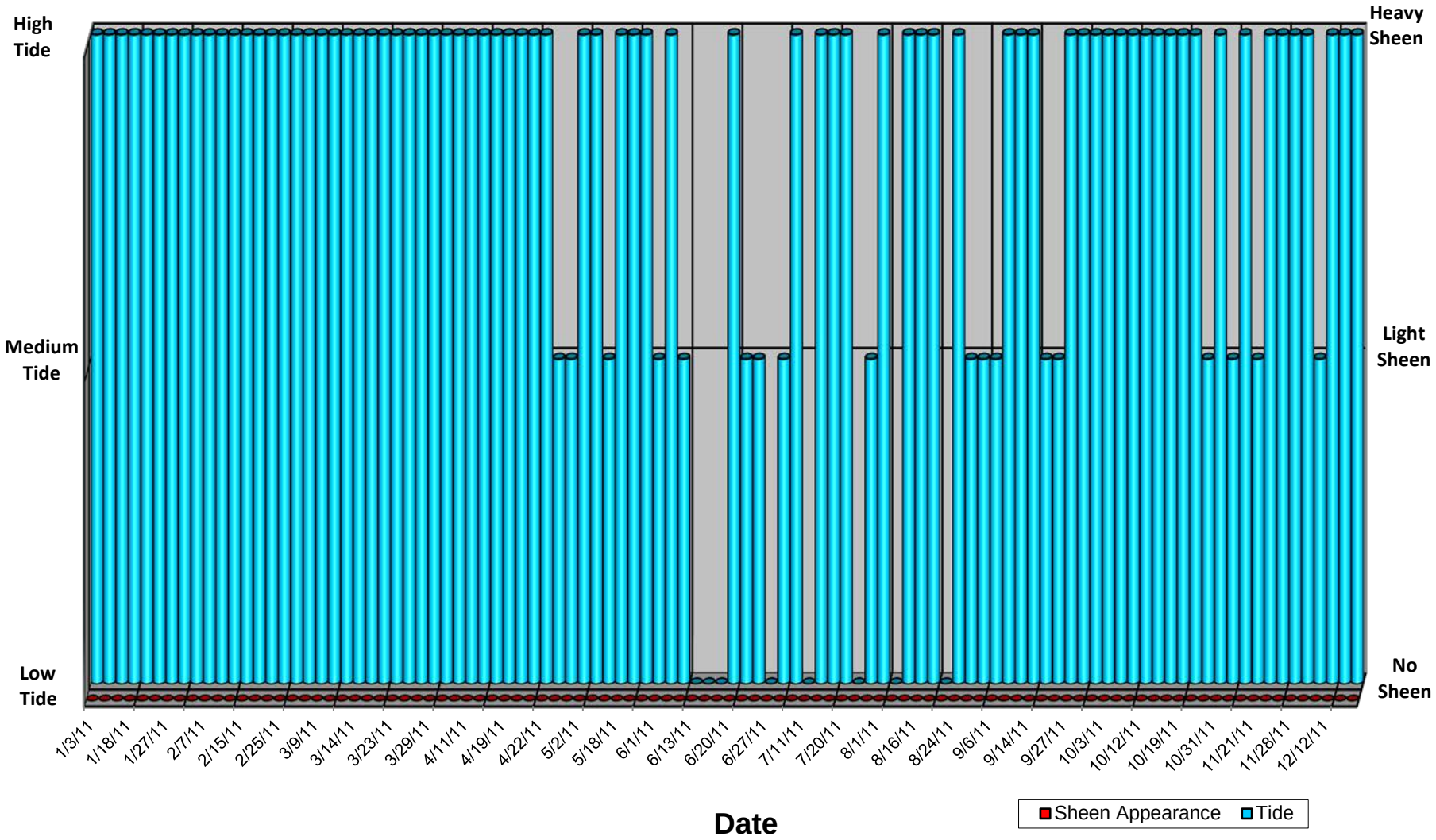
2010 Sheen Observations: Loading Rack

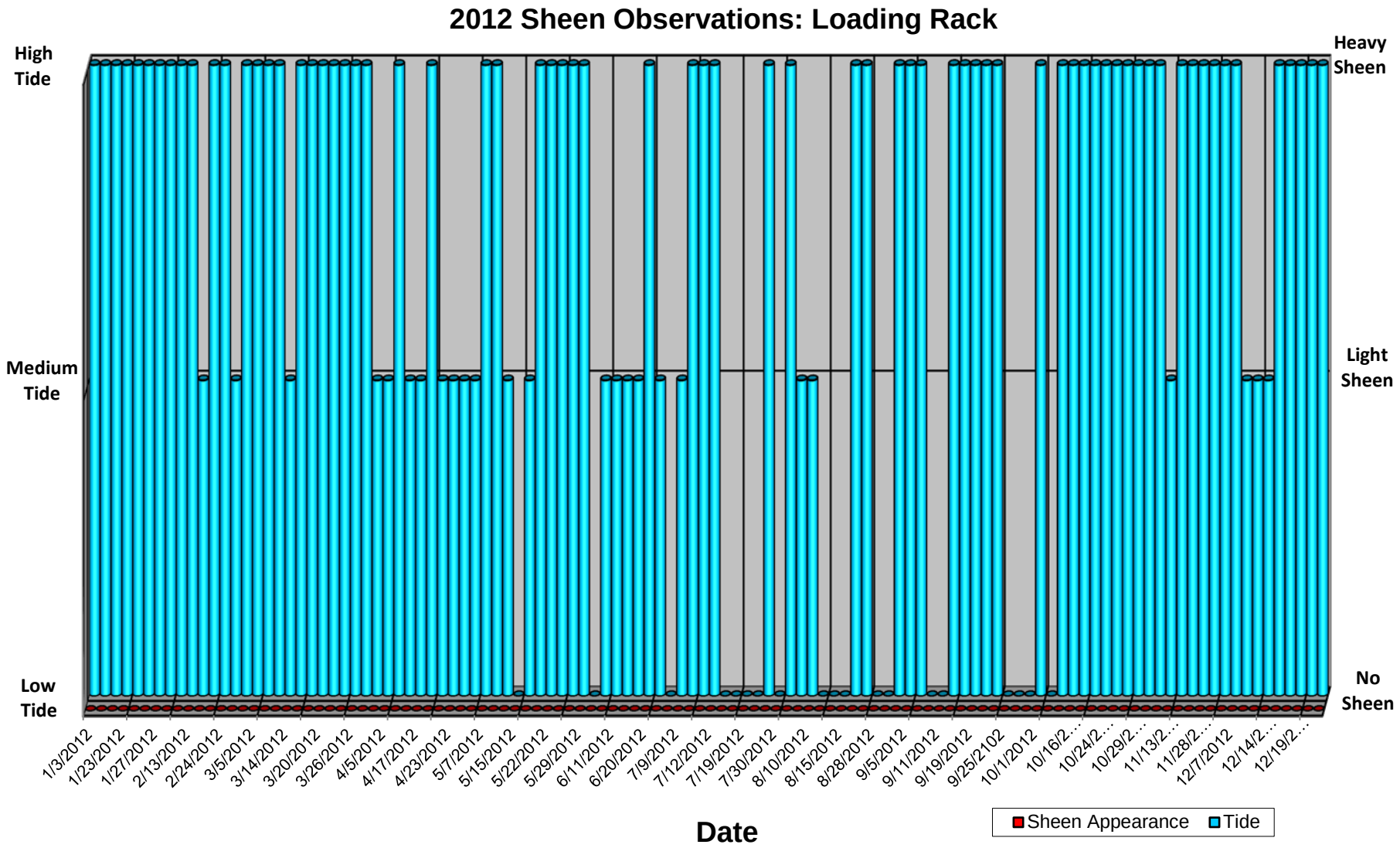


2011 Sheen Observations: Warehouse



2011 Sheen Observations: Loading Rack




2012 Sheen Observations: Loading Rack
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/3/2012
1/23/2012
1/27/2012
2/13/2012
2/24/2012
3/5/2012
3/14/2012
3/20/2012
3/26/2012
4/5/2012
4/17/2012
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10/24/2…
10/29/2…
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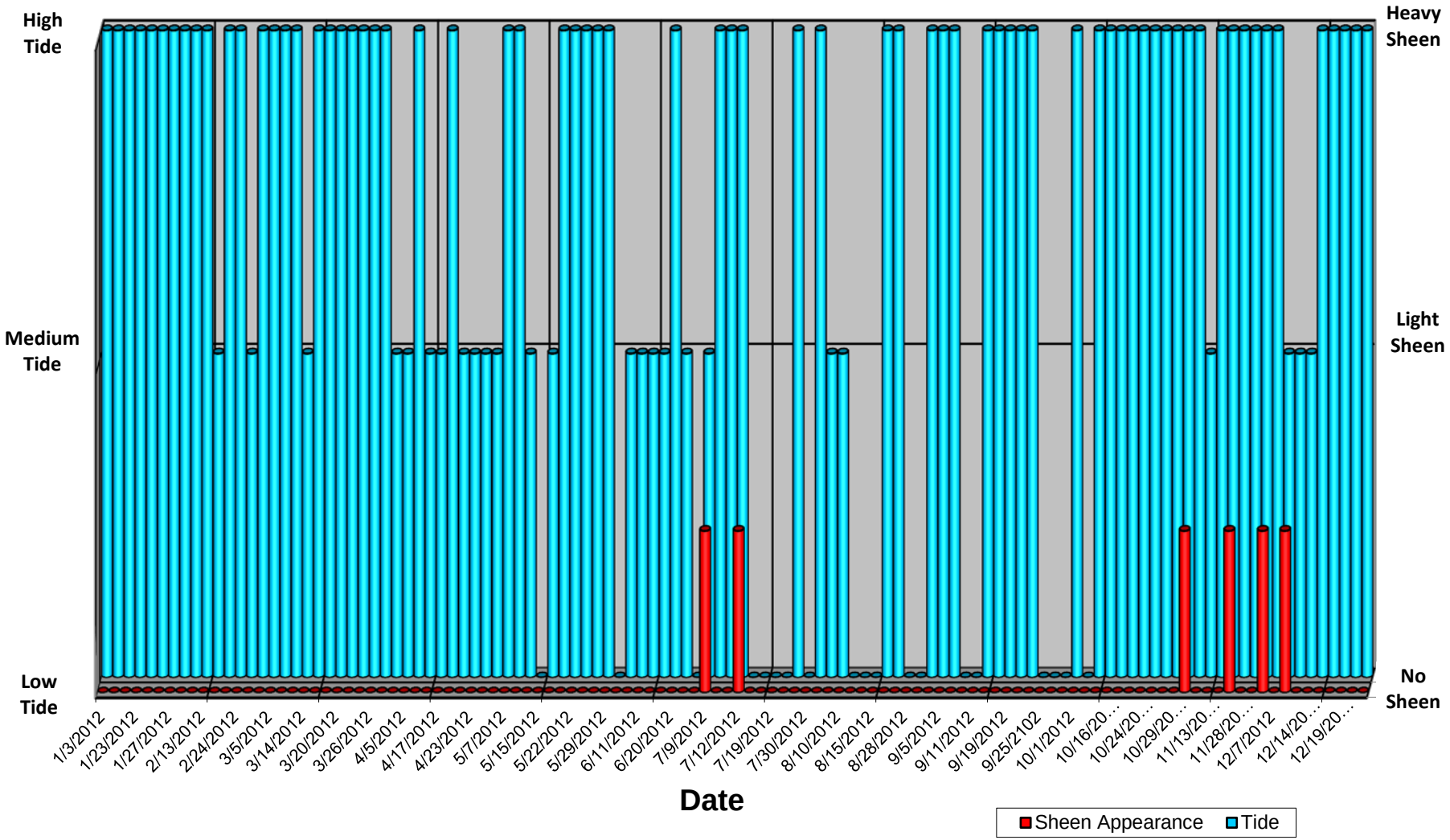
11/28/2…
12/7/2012
12/14/2…
12/19/2…
Date
Sheen Appearance
Tide


2012 Sheen Observations: Warehouse
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/3/2012
1/23/2012
1/27/2012
2/13/2012
2/24/2012
3/5/2012
3/14/2012
3/20/2012
3/26/2012
4/5/2012
4/17/2012
4/23/2012
5/7/2012
5/15/2012
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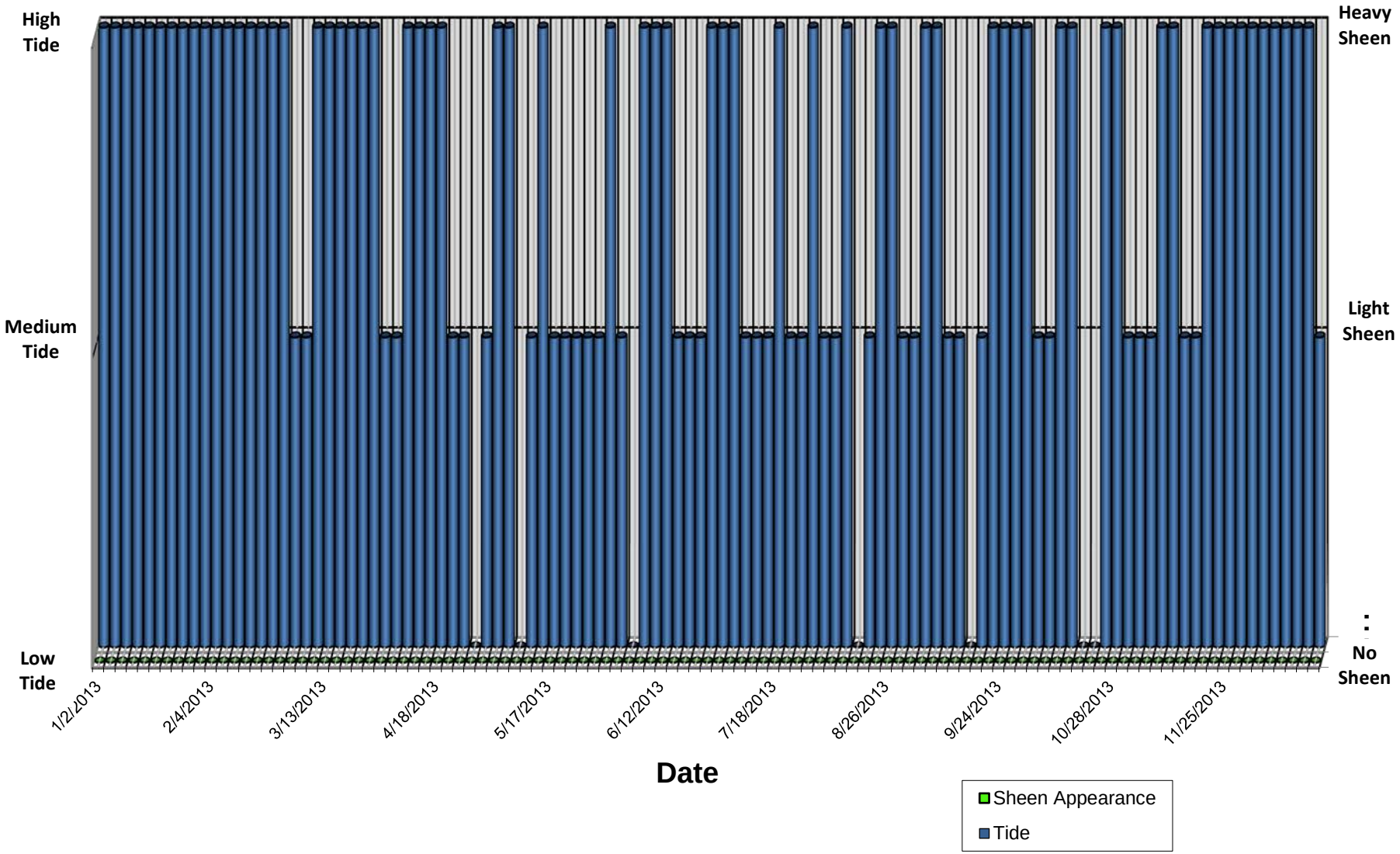
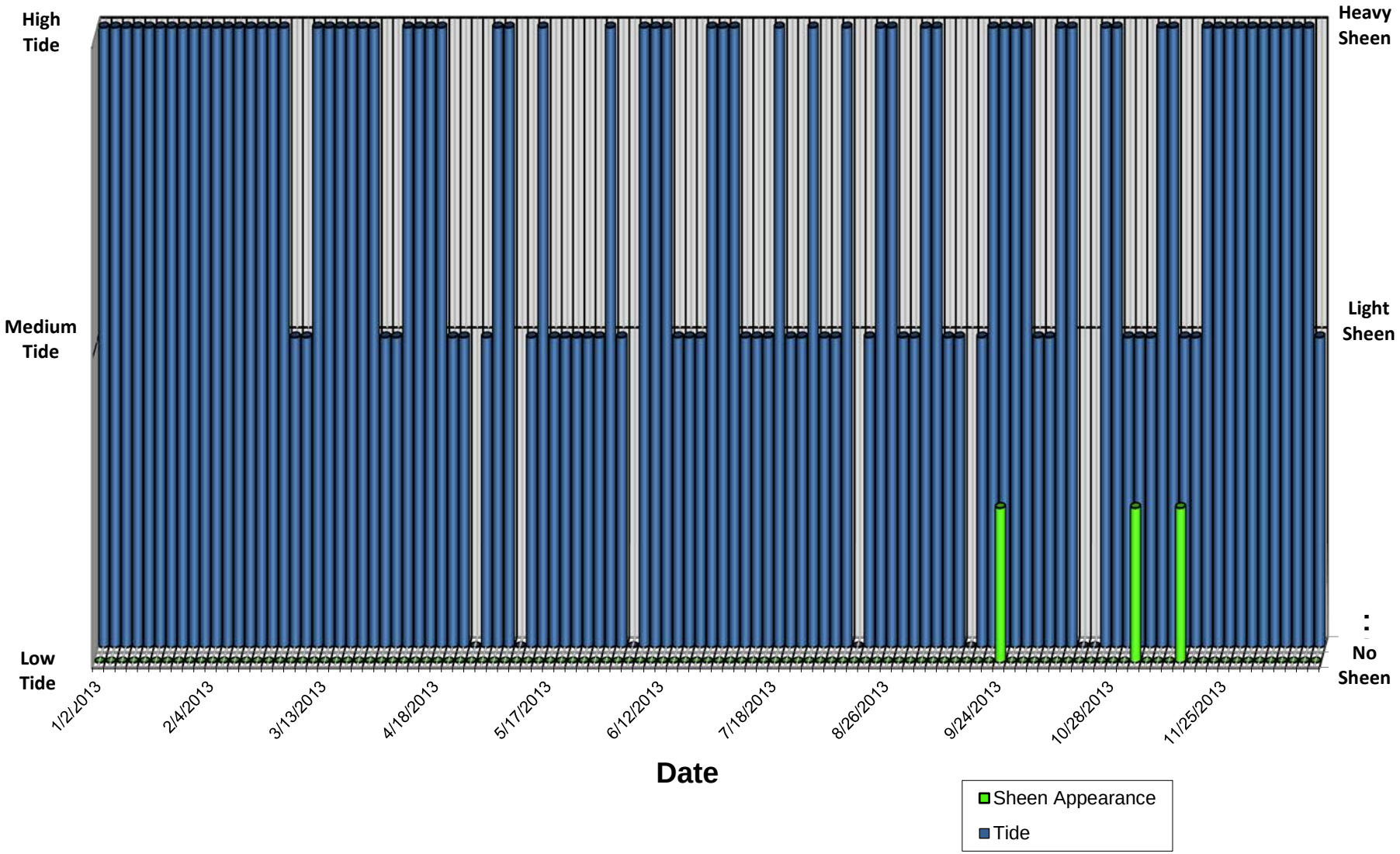
12/14/20…
12/19/20…
Date
Sheen Appearance
Tide


2013 Sheen Observations: Loading Rack
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/2/2013
2/4/2013
3/13/2013
4/18/2013
5/17/2013
6/12/2013
7/18/2013
8/26/2013
9/24/2013
10/28/2013
11/25/2013
Date
Sheen Appearance
Tide


2013 Sheen Observations: Warehouse
High Tide
Medium Tide
Low Tide
Heavy Sheen
Light Sheen
No Sheen
1/2/2013
2/4/2013
3/13/2013
4/18/2013
5/17/2013
6/12/2013
7/18/2013
8/26/2013
9/24/2013
10/28/2013
11/25/2013
Date
Sheen Appearance
Tide