LANDAU ASSOCIATES

October 21, 2014

Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue S.E.
Bellevue, WA 98008-5452

Attn: David L. South

RE: 2014 GROUNDWATER MONITORING
UNION STATION
SEATTLE, WASHINGTON
PROSPECTIVE PURCHASER CONSENT DECREE (97-2-18936-5SEA)

Dear Mr. South:

Enclosed are two copies of the report documenting the groundwater monitoring conducted at the Union Station site in June 2014 and evaluating the analytical results for the groundwater samples collected. This report is submitted in accordance with the requirements of the Union Station Prospective Purchaser Consent Decree (Consent Decree) referenced above. As you requested previously, a DVD containing the groundwater database file (EIM format) is included in the report. Also included on a separate DVD is an electronic copy of the report including the text, figures, and tables.

The results of the June 2014 groundwater monitoring are similar to previous results. Evaluation of the groundwater monitoring data indicates that no constituents originating from the property are present in groundwater from property monitoring wells at concentrations that exceed the cleanup levels. Therefore, based on the information presented in the June 2014 monitoring report and in accordance with the Consent Decree, we recommend that the groundwater monitoring frequency remain at every 5 years and that the list of constituents for analysis remain the same for the next groundwater monitoring event.

Please call me if you have questions or you would like to discuss this report.

LANDAU ASSOCIATES, INC.

Timothy L. Syverson, L.G.
Senior Associate Geologist

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Enclosures

cc: K. Daniels, Union Station Associates (1)
B. Marten, Marten Law Group (1)

Report
2014 Groundwater Monitoring
Union Station
Seattle, Washington

October 21, 2014

Prepared for

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1.0 INTRODUCTION

This report describes the groundwater monitoring performed at the Union Station property (property) in June 2014. The groundwater monitoring was performed in accordance with Prospective Purchaser Consent Decree 97-2-18936-5SEA between the Washington State Department of Ecology (Ecology) and Union Station Associates and with the associated cleanup action plan (CAP; Landau Associates 1997). Groundwater monitoring completed prior to June 2014 is described in six previous groundwater monitoring reports (Landau Associates 2000, 2002, 2003a,b, 2004, and 2009). In addition to describing the groundwater monitoring performed in June 2014, this report includes an evaluation of the groundwater analytical results and groundwater flow direction.

1.1 PROPERTY DESCRIPTION

The Union Station property consists of three parcels located in Seattle, Washington. Figure 1-1 provides a vicinity map; Figure 1-2 shows the Union Station property and the north, central, and south parcels. The property spans six city blocks and includes portions of the at-grade level beneath elevated viaduct portions of South Jackson Street, South Airport Way, and 4th Avenue South.

The property was originally part of the South Seattle industrial neighborhood. In 1874, the Seattle Gaslight Company constructed a coal gasification plant at the property on pilings over the mudflats of Duwamish Bay. The area surrounding the pile-supported facility was filled prior to about 1912. Around the turn of the century, Vulcan Iron Works manufactured iron, brass, and steel on the southern portion of the property. In 1911, the Union Station passenger railroad station was constructed at the property. Union Station served passengers until 1971, when Union Pacific discontinued passenger operations at the property. From 1971 until the purchase of the property by Union Station Associates in 1997, the property was essentially dormant. The southernmost terminus of the downtown Seattle transit project bus tunnel was completed in the subsurface of the property along 5th Avenue South in 1990.

In 1991, the property was placed on the Washington Hazardous Sites List. Subsequently, a remedial investigation/feasibility study (RI/FS; Landau Associates and Hart Crowser 1996) was conducted for the property.

The RI included a review of the property's industrial history to identify areas of anticipated contamination for the investigation, evaluation of existing soil and groundwater sampling information, and analysis of new soil and groundwater samples. The RI compared the analytical results for soil and groundwater to screening levels and identified constituents of concern that required additional evaluation. The RI identified carcinogenic polycyclic aromatic hydrocarbons (cPAHs) from the coal gasification process, and metals from the coal gasification process and the foundry in fill that was historically placed

on the former tideflat surface. Concentrations of cPAHs and some metals in some soil samples exceeded screening levels. Groundwater analytical results from the RI and from supplemental monitoring performed after the RI and before the Consent Decree showed that groundwater screening levels for cPAHs, petroleum hydrocarbons, benzene, and arsenic were exceeded in samples from some wells at the property. Arsenic was found in an upgradient well at concentrations exceeding those found in property wells. There were also strong indications that a source or sources of petroleum hydrocarbons existed upgradient of the property. No pesticides, polychlorinated biphenyls (PCBs), herbicides, or evidence of dense non-aqueous phase liquids (DNAPL) were detected.

The RI findings were used to develop alternatives to remediate the property. The evaluation of these alternatives was included in the FS. The FS defined cleanup standards, developed and evaluated four cleanup action alternatives, and identified a preferred cleanup action alternative that would adequately protect human health and the environment. Soil cleanup levels were conservatively based on residential use conditions, although the property was zoned International District Mixed and the property was planned for commercial use with limited potential for direct contact. The point of compliance for soil is throughout the property. Groundwater cleanup levels were based on protection of marine surface water. The point of compliance for groundwater is the property boundary and extends from the uppermost level of the saturated zone vertically to the lowest depth that could potentially be affected by the property. The point of compliance established for groundwater at the property is shown on Figure 1-2. The cleanup action selected by Ecology includes paving, construction soil excavation, groundwater monitoring, contingent groundwater remediation, and institutional controls.

In 1997, Ecology and Union Station Associates entered into a Prospective Purchaser Consent Decree for the property. Since that time, Union Station Associates has implemented the selected remedial action for the property. Paving and construction soil excavation were completed as part of property redevelopment. A restrictive covenant implementing the required institutional controls was recorded on the property deed. Groundwater monitoring began in October 1997 and the results of the monitoring are described in the remainder of this document and in previous groundwater monitoring reports (Landau Associates 2000, 2002, 2003a, b, 2004, and 2009).

Construction at the property is complete. A parking garage was completed on the south parcel in 1999. Construction at the main parcel, including renovation of the Union Station building and construction of a parking garage and four new buildings, was completed in 2001. A new building at the north parcel was completed in 2002.

1.2 CONSENT DECREE REQUIREMENTS FOR GROUNDWATER MONITORING

Groundwater monitoring requirements for the property are described in the CAP and are summarized in Table 3 of the CAP, and are included as Table 1-1 in this report. Monitoring wells originally included in the monitoring program were HC-101, HC-102, HC-103, MW-104, MW-105, MW-106, MW-107, and upgradient background wells B-4 and B-6. As described in the 2000 monitoring report (Landau Associates 2000), between 1997 and 1999 wells HC-101, HC-102, MW-106, MW-107, MW-108, and B-6 were decommissioned and replaced with monitoring wells in similar locations. In 2000, Ecology approved suspension of water quality monitoring at well HC-103 (Ecology 2000). Background well B-4 was replaced in 2009 with well B-4R which was installed approximately 20 ft to the east of the former location of well B-4 in the sidewalk on the east side of 5th Avenue South, as discussed in the 2009 report. Monitoring wells currently included in the groundwater quality and groundwater level monitoring program are as follows: property wells MW-101R, MW-102R, MW-104, MW-105, MW-107R, MW-108R, and upgradient background wells B-4R and B-6R. HC-103 is monitored only for groundwater level.

The CAP required quarterly groundwater monitoring for eight quarters beginning within 3 months of the effective date of the Consent Decree, and again for eight quarters beginning the first quarter after all of the building foundations had been completed. The CAP provided for reduction in the groundwater monitoring frequency to an annual basis if the upper 95 percent confidence limit on the mean (UCL) for results from the compliance monitoring wells was less than or equal to the cleanup levels. Annual monitoring was then required until 3 years after foundation loading (building construction) was complete. Groundwater monitoring frequency was then reduced to every 5 years when the UCL for results from the compliance monitoring wells was less than or equal to the cleanup levels. The CAP also specifies procedures to be implemented if the concentration in any sample exceeds the cleanup levels during monitoring.

A report documenting the eight quarters of groundwater monitoring after the foundation loading was complete was submitted to Ecology in August 2000 (Landau Associates 2000). After review of the report, Ecology required an additional year of quarterly monitoring (Ecology 2000). In March 2002, the results for the additional year of groundwater monitoring were submitted in a report to Ecology with the recommendation to reduce the groundwater monitoring frequency to an annual basis (Landau Associates 2002). In November 2002, Ecology approved reducing the groundwater monitoring frequency to an annual basis (Ecology 2002), and annual groundwater monitoring was subsequently conducted in 2002, 2003, and 2004.

As noted above, construction at the central parcel was completed in 2001, and construction at the south parcel was completed in 1999. The required additional 3 years of groundwater monitoring after foundation loading was then completed after the June 2004 monitoring event. Based on the results of the June 2002, 2003, and 2004 sampling events, Ecology approved reducing the groundwater monitoring frequency to every 5 years (Ecology 2005a). Ecology also issued a Certificate of Completion for the property in 2005 (Ecology 2005a), but did not remove the property from the Hazard Ranking List due to the presence of petroleum hydrocarbons in groundwater at the property and upgradient of the property.

This report presents results for the 2014 groundwater monitoring event, and demonstrates that the concentrations of contaminants originating on the property comply with cleanup levels. The findings presented below are based on statistical evaluation of the groundwater data from the past eight sampling events.

2.0 GROUNDWATER MONITORING

The groundwater monitoring program consists of both water level and water quality monitoring. The Union Station groundwater monitoring network for water quality is currently comprised of eight monitoring wells: upgradient wells B-4R and B-6R, and property wells MW-101R, MW-102R, MW-104, MW-105, MW-107R, and MW-108R. The monitoring network for groundwater levels includes the eight wells monitored for water quality plus one additional monitoring well, HC-103, monitored only for groundwater level. The location of the monitoring wells is shown on Figure 1-2. The recent monitoring was conducted in June 2014. Procedures used for groundwater monitoring, which include water level monitoring, groundwater sampling, and laboratory analysis, were consistent with those described in the CAP, or as subsequently modified with Ecology approval. Prior to the September 2001 monitoring event, modifications to some of the procedures described in the CAP were approved by Ecology. These modifications included changes to the cyanide analysis method; addition of analysis for weak acid dissociable cyanide to the list of analytes; changes to the method of laboratory sample handling for cPAH and semivolatile organic compound (SVOC) samples; and the monitoring of well HC-103 only for groundwater level measurements (Landau Associates 2000, 2002). Since 2004, Ecology acknowledged the completion of all remedial actions specified in the CAP, except the confirmational monitoring, and approved a reduction in the groundwater monitoring frequency to every 5 years (Ecology 2005a) and a reduction in the required constituents for analysis (Ecology 2005b).

2.1 GROUNDWATER LEVEL MONITORING

At each well location, the groundwater level was measured from a surveyed reference point located at the top of the PVC well casing, to the top of the groundwater using a hand-held water level indicator. These measurements were recorded to the nearest 0.01 ft. Table 2-1 provides a summary of information regarding the monitoring well network including the well installation dates, well coordinates, and well elevation information, including top and bottom of screen.

2.2 GROUNDWATER SAMPLING, ANALYSIS PROCEDURES, AND MODIFICATIONS

Groundwater sampling procedures were consistent with those described in the CAP. Prior to sample collection, each well was slowly purged using a combination of a centrifugal pump with dedicated tubing, a peristaltic pump with dedicated tubing, and/or a disposable bailer. Because most of the wells are low-yield and produce groundwater with moderate to high turbidity, each well was purged at a rate of less

than 1 liter per minute to help minimize turbidity. Field parameters such as pH, temperature, and conductivity were measured and recorded about every 5 minutes during purging. Purging continued until at least three well volumes had been removed or, at wells MW-104, MW-105, and B-6R, until the well was purged dry.

Sampling was started when sufficient volume became available in the well. Four replicates of field parameters were collected during sampling, if possible; however, due to low-yield conditions at some locations, sufficient volume for all replicates could not be obtained and priority was given to filling sample bottles. For these locations, field parameters obtained at the end of purging were used for sample quality control purposes. To minimize turbidity during sampling, a target flow rate of less than 0.2 liter per minute was used during sample collection. All purging and sampling information was recorded on a Groundwater Sample Collection Form as specified in the CAP.

Field instruments were calibrated and maintained in accordance with the manufacturer's instructions and the quality assurance/quality control (QA/QC) requirements identified in the CAP. Purge water was stored on site in 55-gallon drums, and was removed from the site for disposal on August 18, 2014.

The June 2014 groundwater samples were analyzed at Analytical Resources, Inc. (ARI) in Tukwila, Washington for diesel-, motor oil-, and gasoline-range petroleum hydrocarbons; PAHs; cPAHs using selected ion monitoring (SIM); benzene, toluene, ethylbenzene, and xylenes (BTEX); dissolved arsenic; total dissolved solids (TDS); and total suspended solids (TSS). Analytical results are discussed in Sections 3.2 and 4.3.

3.0 GROUNDWATER MONITORING RESULTS

As described in Section 2.0, the Union Station groundwater level monitoring network consists of nine monitoring wells that are screened within the shallow fill at or near the property. Eight of the monitoring wells are sampled for groundwater quality monitoring. The following sections describe the results of the groundwater level and water quality monitoring conducted in June 2014.

3.1 GROUNDWATER ELEVATIONS

Groundwater elevations measured at each well during the 2014 annual groundwater monitoring event are listed in Table 3-1. Groundwater elevation contours for the monitoring event (shown on Figure 3-1) indicate that groundwater flow is generally to the west, consistent with the regional groundwater flow toward Elliott Bay (Landau Associates and Hart Crowser 1996). As shown on Figure 3-2, the 2014 groundwater elevations are similar to the groundwater elevations observed in August 2009 and prior to March 2001. The recent data supports the discussion in the previous groundwater monitoring report (Landau Associates 2009) that the anomalous groundwater elevations observed at well B-4 from March 2001 through June 2004 were the result of physical changes to the well caused by the Nisqually earthquake, and that well B-4/B4R has always been hydraulically upgradient of the subject property.

3.2 CHEMICAL ANALYSIS RESULTS

ARI conducted the analyses of the groundwater samples for the constituents identified in Section 2.2. Following receipt of the analytical results, the data were validated as described in Appendix A of the CAP. The results of the data validation performed by Landau Associates and a summary of the data qualifiers are presented in Appendix A.

The 2014 analytical results for the samples from the property wells and background wells are similar to previous results except that most of the PAH concentrations in the samples from the background wells (i.e., B-4R and B-6R) are lower than during previous events. Also, the standard for reporting benzo(b)fluoranthene and benzo(k)fluoranthene has changed since 2009, and the 2014 analytical data report presents the results for these two analytes as "total benzofluoranthenes." A summary of the analytical results (with data qualifiers added as appropriate) for the samples from each well for the June 2014 monitoring event and the seven previous monitoring events is provided in Table 3-2. The associated laboratory data reports are maintained at Landau Associates' office in Edmonds, Washington. The analytical methods, cleanup levels, screening levels, and practical quantitation limits (PQLs) are also shown in Table 3-2.

The PQLs for most of the required constituents are listed in the CAP. For those constituents without a PQL identified in the CAP, a PQL was determined. For diesel-, motor oil-, and gasoline-range petroleum hydrocarbons, the PQL was calculated from ARI's method reporting limit. For other constituents, the PQL was based on the method reporting limit and PQLs listed in the CAP for similar compounds. An evaluation of the analytical results relative to compliance with the cleanup or screening levels is provided in Section 4.3.

Graphs showing concentrations over time at all of the wells were constructed for diesel- and gasoline-range petroleum hydrocarbons, benzene, acenaphthene, and arsenic. These constituents were selected for evaluation of the concentrations relative to time because they have consistently been detected above the PQL in at least several wells and, therefore, can be used for comparisons of concentrations between wells over time. Concentration graphs for these five constituents are shown on Figures 3-3 through 3-7.

In general, the concentrations of these five constituents measured at the property wells in 2014 are similar to the concentrations measured previously at the property wells. Only a few changes in measured concentrations were observed for the 2014 monitoring event, as described below.

- Concentrations of diesel-range petroleum hydrocarbons in property wells were lower compared to concentrations measured at some property wells during past monitoring events. The highest concentrations of diesel-range petroleum hydrocarbons detected in the property wells have historically occurred at monitoring well MW-101R; however, these concentrations have steadily decreased from 4,200 micrograms per liter (µg/L) in June 2002 to 1,500 µg/L in 2014. Diesel-range hydrocarbons were also detected in 2014 at monitoring wells MW-104 and MW-105, where concentrations were below the reporting limits in 2009. The 2014 detections are due to a decrease of the laboratory reporting limit from 250 µg/L in 2009 to 100 µg/L in 2014.
- Concentrations of gasoline-range petroleum hydrocarbons in property wells MW-101R and MW-107R were higher compared to the concentrations measured in 2009, but are within the range of concentrations measured historically at this well or less than than 10% higher than the historical range, respectively. Gasoline-range petroleum hydrocarbons were lower at property well MW-105 in 2014 than in 2009, but still within the historical range at this location.
- The concentration of benzene, a typical gasoline component, was lower at monitoring well MW-105 during the 2014 monitoring event. The benzene concentration was slightly higher at well MW-101R in 2014 than in 2009, but was still within its historical range. The benzene concentration measured at well MW-101R during the 2014 monitoring event and the 2009 monitoring event are the two lowest concentrations measured at this well during the past eight monitoring events.
- The concentration of arsenic at property well MW-105 in 2014 was higher than in 2009, but was within the range detected prior to the 2009 monitoring event. The concentration of arsenic at property well MW-104 in 2014 was lower, and within the range detected prior to the 2009 monitoring event. The concentrations of arsenic detected in 2014 at all of the property wells are less than the concentration detected in off-property well B-6R.

- Concentrations of acenaphthene at wells MW-107R, MW-105 and MW-101R in 2014 were lower than the 2009 concentrations, and remained within the range detected during prior events.
- At the upgradient wells B-4R and B-6R, the concentrations of all five constituents were generally lower than the concentrations measured during previous events, or not detected above the laboratory reporting limits. Concentrations of diesel- and gasoline-range petroleum hydrocarbons, benzene, and acenaphthene at B-4R continue to be below the historical range of concentrations detected at B-4 prior to 2009. As discussed in Section 1.2, well B-4R was constructed in 2009 to replace well B-4.

4.0 EVALUATION OF RESULTS

Consistent with the procedures outlined in the CAP, a statistical evaluation was conducted using the analytical results from the last eight groundwater monitoring events at the property (performed from September 2001 through June 2014) to evaluate compliance with the cleanup levels at each well and, if appropriate, background-based screening levels. The CAP specifies that basic statistical parameters such as mean and median be developed, and that the UCL be calculated, to evaluate the analytical results for compliance with the cleanup levels. In accordance with the CAP, the methodology used for demonstrating statistical compliance followed statistical methods from the Ecology Toxics Cleanup Program guidance document, *Statistical Guidance for Ecology Site Managers* (Ecology 1992), the *Supplement to Statistical Guidance for Ecology Site Managers* (Ecology 1993), and MTCAStat97 compliance module. In general, compliance was determined by calculating the UCL for each detected compound at each property well and comparing it to the cleanup level listed in the CAP. For arsenic, cPAHs, and some petroleum hydrocarbon-related constituents, compliance was determined by comparing the UCL to screening levels that were calculated based on concentrations found in one of the background wells.

4.1 CALCULATION OF SCREENING LEVELS BASED ON BACKGROUND FOR SOME CONSTITUENTS

This section discusses the development of background-based screening levels for arsenic, petroleum hydrocarbons, petroleum hydrocarbon related compounds (benzene and acenaphthene), and selected cPAHs [benzo(a)anthracene and chrysene].

4.1.1 ARSENIC

Arsenic is present in several wells, including background wells B-4R and B-6R, at concentrations above the cleanup level listed in the CAP. For the past eight sampling events, the highest arsenic concentrations have been detected in the samples from background well B-6R. Therefore, a background-based groundwater screening level was calculated for arsenic using the analytical results for background well B-6R. The background-based screening level was calculated in accordance with WAC 173-340-700(4)(d); the Ecology Toxics Cleanup Program guidance document, *Statistical Guidance for Ecology Site Managers* (Ecology 1992) using MTCA Stat97 Background Module; and the concentrations found in background wells B-6 and B-6R from October 1997 to June 2014. The printed report for the background calculations showing the screening level based on the 90^{th} percentile value as well as the data upon which it is based is provided in Appendix B. The background-based screening level was used for comparison

with data from all property monitoring wells because it is considered to represent conditions present upgradient of the property.

4.1.2 PETROLEUM HYDROCARBONS AND RELATED CONSTITUENTS

No cleanup levels are included in the CAP for diesel-, motor oil-, or gasoline-range petroleum hydrocarbons. Therefore, screening levels for diesel- and gasoline-range petroleum hydrocarbons, and also for benzene and acenaphthene, were calculated based on the 90th percentile value, as described previously in Section 4.1.1 for arsenic.

Previous evaluations of monitoring data prior to 2009 have indicated that the source or sources of petroleum hydrocarbons and related constituents was upgradient of the Union Station property (Landau Associates 2000, 2002, 2003a,b, 2004, and 2009). As shown on Figures 3-3, 3-4, 3-5, and 3-6, and in Table 3-2, concentrations of petroleum-related constituents, except benzene, in monitoring well B-4 have typically exceeded or been similar to concentrations found in property wells from 1997 to 2004, and are lower in the groundwater samples collected from replacement well B-4R in 2009 and 2014. This suggests that the offsite source of the petroleum hydrocarbons may no longer be present, that the groundwater plume containing these constituents may no longer be present in the immediate vicinity of well B-4/B-4R, or that the plume does not extend to the location of replacement well B-4R.

90th percentile values for diesel- and gasoline-range petroleum hydrocarbons, benzene, and acenaphthene were calculated using the data sets for monitoring well B-4/B-4R from October 1997 to June 2014. These screening levels, in addition to the cleanup levels specified in the CAP, if any, were used for evaluation of data from the property wells. Motor oil-range petroleum hydrocarbons were not detected above the laboratory reporting limit in the property wells; therefore, a background-based screening level was not calculated.

For other petroleum-related constituents that also appear to be migrating onto the property from upgradient of the property, background-based screening levels were not calculated because the concentrations detected in the samples from the property wells do not exceed the cleanup levels designated in the CAP. The printed reports for background calculations showing the screening level based on the 90th percentile value for diesel- and gasoline-range petroleum hydrocarbons, benzene, and acenaphthene are provided in Appendix B.

4.1.3 cPAHs

In general, the process previously described in Sections 4.1.1 and 4.1.2 for calculating a background-based screening level based on the 90th percentile value was also used for benzo(a)anthracene and chrysene. Background-based groundwater screening levels for benzo(a)anthracene and chrysene

were calculated using the data from October 1997 through June 2014. For each data set, the 90th percentile values were greater than four times the 50th percentile values; therefore, the values for four times the 50th percentile were used as screening levels. The printed reports for the background calculations showing the screening levels based on four times the 50th percentile value, as well as the data upon which it is based, are provided in Appendix B. The background-based screening levels for benzo(a)anthracene and chrysene were used for comparison with the data from the property monitoring wells because they are considered to represent conditions upgradient of the property.

4.2 STATISTICAL METHODOLOGY FOR CALCULATION OF UCL

In accordance with Ecology's guidance documents, the procedure for calculating the UCL was determined based on the percent of nondetect values and detected values less than the PQL (i.e., censored data) within a data set, as follows:

- **Case 1:** If the data set contained up to 15 percent censored data, the UCL was calculated. Prior to performing the calculation, the nondetect values were replaced by a value of half the detection limit and the detected values less than the PQL were replaced by a value of the detection limit. The distribution of the sample data was then determined (i.e., normal or lognormal distribution) and the appropriate UCL calculation was made. Ecology's software package (MTCAStat, Version 3.0) was used to determine the distribution of each data set and to calculate the UCL.
- **Case 2:** If the data set contained between 15 percent and 50 percent censored data, the UCL was calculated directly using MTCAStat, Version 3.0. Censored data was addressed by Cohen's method directly in MTCAStat.
- **Case 3:** If the data set contained more than 50 percent, but less than 100 percent censored data, the UCL was set equal to the maximum concentration in the data set.

No guidance is available for performing statistical evaluation on data sets that contain 100 percent censored data. For evaluation of the 2014 groundwater monitoring data, if a compound was not detected in any of the wells during the eight groundwater monitoring events, then no further evaluation was performed for that compound and the compound was omitted from Table 4-1. If a compound was detected at least once during the eight groundwater monitoring events in at least one of the property wells, the constituent was included in the statistical summary provided in Table 4-1. For those wells where the constituent was not detected, the data was considered as follows:

- **Case 0:** If the data set contained 100 percent censored data, no UCL was calculated and the well was determined to be in compliance.

Table 4-1 lists the statistical procedure (coded by case number) applied to each well data set. Also included in Table 4-1 are the percentages of censored and uncensored data for each well.

The data set used in each statistical evaluation consisted of eight data points (i.e., the eight groundwater sampling events from September 2001 to June 2014).

4.3 COMPLIANCE EVALUATION

In accordance with the CAP, the UCL was compared to the cleanup level for each constituent detected at each well during the 2014 event. If the calculated UCL for a property well was less than or equal to the cleanup level, then that well was considered to be in compliance for that constituent. In some cases, no UCL was calculated because the analyte was not detected or all of the detected values were less than the PQL, as described below. A summary of cleanup and screening levels, the calculated UCLs, and other statistical parameters required by the CAP for each constituent at each well for the 2014 event is provided in Table 4-1. For some petroleum-related constituents and arsenic, the UCL was also compared to a screening level based on the concentrations in background wells B-4/B-4R or B-6/B-6R. The results of the evaluation were similar to those for previous monitoring events. The results of the evaluation including the 2014 data are discussed below by well and a summary of the constituents that exceeded the cleanup or screening levels is presented in Table 4-2.

4.3.1 MONITORING WELL MW-101R

For monitoring well MW-101R, UCLs were calculated for diesel- and gasoline-range petroleum hydrocarbons, several non-carcinogenic PAHs, BTEX, and arsenic. No UCL was calculated for the other constituents because all of the data for these constituents were censored (i.e., below the PQL). As shown in Table 4-2, only the UCLs for acenaphthene, benzene, and arsenic exceed the cleanup levels included in the CAP. However, the UCLs for these constituents were less than the background-based screening levels. There is no cleanup level for diesel- or gasoline-range petroleum hydrocarbons in the CAP; therefore, the UCLs for these constituents were compared to the background-based screening levels. Neither background-based screening level was exceeded.

4.3.2 MONITORING WELL MW-102R

For monitoring well MW-102R, UCLs were calculated for diesel-range petroleum hydrocarbons, naphthalene, acenaphthene, and arsenic. No UCL was calculated for the other constituents because all of the data for these constituents were censored. As shown in Table 4-2, only the UCL for arsenic exceeded the cleanup level included in the CAP, but the UCL was less than the background-based screening level. All other UCLs were less than the respective cleanup levels in the CAP. There is no cleanup level for diesel-range petroleum hydrocarbons in the CAP. The UCL for diesel-range petroleum hydrocarbons was compared to the background-based screening level, and the background-based screening level was not exceeded.

4.3.3 MONITORING WELL MW-104

For monitoring well MW-104, UCLs were calculated for diesel-range petroleum hydrocarbons, 2-methylnapthalene, acenaphthene, fluorene, phenanthrene, and arsenic. No UCL was calculated for the other constituents because all of the data for these constituents were censored. As shown in Table 4-2, only the UCL for arsenic exceeded the cleanup level included in the CAP, but the UCL was less than the background-based screening level. None of the other UCLs exceeded the cleanup levels included in the CAP, or, for diesel-range petroleum hydrocarbons, the background-based screening level.

4.3.4 MONITORING WELL MW-105

For monitoring well MW-105, UCLs were calculated for diesel- and gasoline-range petroleum hydrocarbons, several cPAHs, several non-carcinogenic PAHs, BTEX, and arsenic. No UCL was calculated for the other constituents because all of the data for these constituents were censored. As shown in Table 4-2, the UCL for benzene exceeded the cleanup level included in the CAP and the background-based screening level. The UCLs for arsenic, benzo(a)anthracene, and chrysene also exceeded the cleanup levels included in the CAP, but were less than the background-based screening levels. All other UCLs were less than the respective cleanup levels or, for diesel- and gasoline-range petroleum hydrocarbons, the background-based screening level.

Although reported separately as benzo(b)fluoranthene and benzo(k)fluoranthene prior to 2014, a UCL was also calculated for total benzofluoranthenes. This UCL, calculated using Case 3 procedures, was the sum of the maximum benzo(b) and benzo(k) values, which was the total of the 2009 values. As total benzofluoranthenes were not detected at a concentration above the reporting limit in 2014, and the individual 2009 values were also reported at concentrations below the cleanup levels, the calculated UCL is not an exceedance of the cleanup level.

4.3.5 MONITORING WELL MW-107R

For monitoring well MW-107R, UCLs were calculated for diesel- and gasoline-range petroleum hydrocarbons, several non-carcinogenic PAHs, BTEX, and arsenic. No UCL was calculated for the other constituents because all of the data for these constituents were censored. As shown in Table 4-2, only the UCL for arsenic exceeded the cleanup level included in the CAP, but was less than the background-based screening level. No other UCLs exceeded the respective cleanup levels in the CAP or, for diesel- and gasoline-range petroleum hydrocarbons, the background-based screening levels.

4.3.6 MONITORING WELL MW-108R

For monitoring well MW-108R, UCLs were calculated for naphthalene and arsenic. No UCLs were calculated for the other constituents because all the data for these constituents were censored. As shown in Table 4-2, only the UCL for arsenic exceeded the cleanup level included in the CAP, but was less than the background-based screening level.

4.4 SUMMARY OF EVALUATION RESULTS

As discussed above, acenaphthene, benzene, arsenic, and two cPAHs [benzo(a)anthracene and chrysene] were identified as exceeding cleanup levels included in the CAP in one or more wells during the 2014 event based on the UCLs. Each of these constituents has also been detected in one of the background wells at concentrations exceeding the cleanup level in the CAP during the past eight monitoring events; therefore, a background-based screening level was calculated for each of these constituents. A background-based screening level was also calculated for diesel- and gasoline-range petroleum hydrocarbons.

Benzene at MW-105 is the only constituent with a UCL greater than the background-based screening level during the 2014 event. The UCL for benzene at well MW-105 has been greater than the background-based screening level during each of the past eight rounds. A summary of the constituents that exceeded the cleanup or screening levels is presented summarized in Table 4-2 and the results are discussed by constituent below.

4.4.1 ACENAPHTHENE

Acenaphthene is a typical constituent of diesel as well as of coal tar. Acenaphthene was detected at concentrations above the PQL at all property wells, and has been consistently detected at concentrations above the PQL in samples collected from background well B-4/B-4R, although the concentrations decreased for each monitoring event beginning in December 2001 and have been significantly lower since sampling began at replacement well B-4R. During the 2014 monitoring event, acenaphthene was detected at replacement well B-4R, but at a concentration below the PQL. As described in Section 5.1.2, the background-based screening level is 428 µg/L. During the 2014 event, only the UCL calculated for acenaphthene at well MW-101R (309 µg/L) exceeded the CAP cleanup level (225 µg/L). The calculated UCL for acenaphthene at this well did not exceed the background-based screening level.

The historical presence of acenaphthene in monitoring well B-4 at high concentrations relative to concentrations detected on the property indicates an off-property source or sources of acenaphthene. The decrease in the concentration of acenaphthene at well B-4/B-4R suggests that the offsite source is no

longer present, the groundwater plume from the offsite source is no longer in the immediate vicinity of well B-4/B-4R, or that the plume does not extend to the location of replacement well B-4R. If the source is no longer present or the plume has moved beyond well B-4/B-4R, the concentrations of acenaphthene at the property wells should also decrease over time. Acenapthene has shown a steady decrease at well MW-101R since 2001. Based on the concentrations measured at well B-4/B-4R, the UCL exceedance of the CAP cleanup level in well MW-101R does not represent contamination originating from the property and is not considered evidence of noncompliance of the cleanup level; therefore, it should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

4.4.2 BENZENE

Benzene is a constituent of gasoline and is typically found in groundwater contaminated from relatively recent spills of gasoline. It can also be associated with coal gasification plants; however, groundwater testing prior to and during the RI did not indicate that benzene was present at the property from the coal gasification plant formerly located on the property. In addition, gasoline and other gasoline-related constituents, such as ethylbenzene, toluene, xylenes, and substituted benzenes, are also detected in property monitoring wells, making it likely that the source of the benzene is gasoline. Benzene, along with other petroleum-related constituents, is apparently migrating in groundwater to the property from off-property. Benzene has been detected consistently in the past in samples from monitoring well B-4, but was not detected in well B-4R during the 2009 and 2014 monitoring events. Although the background-based screening level used for comparison (220 μg/L) was calculated based on the data from monitoring well B-4 and B-4R, the data from these wells potentially do not reflect the maximum concentration in groundwater migrating onto the property. Furthermore, the lack of benzene at replacement well B-4R suggests that the offsite source is no longer present, the groundwater plume from the offsite source is no longer in the immediate vicinity of well B-4/B-4R, or that the plume does not extend to the location of replacement well B-4R. The UCLs for wells MW-101R and MW-105 during the 2014 event exceed the CAP cleanup level. The UCL for well MW-105 also exceeds the background-based screening level. These detected concentrations are consistent with the data from previous rounds and do not represent contamination originating from the property and are not considered evidence of noncompliance of cleanup levels; therefore, these detected concentrations should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

4.4.3 ARSENIC

Arsenic is a naturally occurring metal in soil and groundwater. Ecology determined that the 90th percentile value for the background arsenic concentration in soil in the Puget Sound region is

7 milligrams per kilogram (mg/kg; Ecology 1994). Arsenic was detected in groundwater at concentrations at or above the PQL in most of the property wells during the 2014 sampling event. Because the CAP cleanup level is equal to the PQL, the detections resulted in the UCLs exceeding the CAP cleanup level for all of the property wells. Based on the concentrations measured in well B-6R, the background-based screening level is 37 µg/L. None of the concentrations detected in the property wells, or the UCLs, were greater than the background-based screening level. The presence of arsenic in a background well at concentrations greater than those found in property wells indicates that arsenic is present upgradient of the property. The exceedances of the CAP cleanup level do not represent contamination originating from the property and are not considered evidence of noncompliance of cleanup levels; therefore, they should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

4.4.4 cPAHs

cPAHs are constituents often found in motor oil-range petroleum hydrocarbons and asphalt-based products, as well as coal tar. Although the concentrations of two cPAHs, benzo(a)anthracene and chrysene, detected at well MW-105 in 2014 were below the respective PQLs, the UCLs for each of these constituents were calculated to be above the PQL. These cPAHs and other cPAHs have typically been detected in samples from background well B-4; the concentrations measured at replacement well B-4R during the 2014 monitoring event were below the PQL. Because the CAP cleanup level is equal to the PQL, the benzo(a)anthracene and chrysene UCLs at well MW-105 exceeded the CAP cleanup levels. Based on the concentrations measured in well B-4/B-4R, the background-based screening levels for benzo(a)anthracene and chrysene are 6.3 µg/L and 5.5 µg/L, respectively, and none of the UCLs for the property wells were greater than the background-based screening levels at the property wells. Based on the historical data at well B-4/B-4R, the UCL exceedances of the CAP cleanup levels in well MW-105 do not represent contamination originating from the property and are not considered evidence of noncompliance of cleanup levels; therefore, they should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

5.0 CONCLUSIONS

Evaluation of historical and current groundwater analytical results for the property indicates that there are upgradient sources of gasoline- and diesel-range petroleum hydrocarbons and related constituents that have migrated in groundwater onto the property. For this reason, the groundwater concentrations detected at well B-4/B-4R have been used to evaluate compliance for gasoline- and diesel-range petroleum hydrocarbons, acenaphthene, and benzene in property wells. Groundwater elevations measured from March 2001 to June 2005 indicated a change in groundwater flow direction. However, groundwater elevations measured during the 2014 sampling event were consistent with elevations measured in 2009 and prior to March 2001, indicating that anomalous groundwater elevations observed at well B-4 in March 2001 through June 2004 were the result of physical changes to the well caused by the Nisqually earthquake, and well B-4/B4R has always been hydraulically upgradient of the subject property.

Background-based screening levels were calculated for gasoline- and diesel-range petroleum hydrocarbons, benzene, acenaphthene, and cPAHs using data from well B-4/B-4R and for arsenic using data from B-6R. Data from the entire monitoring period, October 1997 through June 2014, were used to calculate screening levels for each constituent.

For each well, UCLs were calculated for the constituents detected during the past eight monitoring events and compared to cleanup levels identified in the CAP. The only exceedances of CAP cleanup levels were for acenaphthene (well MW-101R); benzene (MW-101R and MW-105); arsenic (MW-101R, MW-102R, MW-104, MW-105, MW-107R, MW-108R); benzo(a)anthracene (MW-105); and chrysene (MW-105). These constituents are also present in at least one of the background wells, indicating they have migrated onto the property from off site. Only the UCL for benzene in MW-105 exceeds the background-based screening level. There are no exceedances of screening levels for diesel- or gasoline-range petroleum hydrocarbons in any property well. These results are consistent with the results of previous statistical evaluations. Historical results for groundwater samples at B-4 have consistently demonstrated that petroleum-related constituents were migrating from off-property onto the property (Landau Associates 2000, 2002, 2003a,b, 2004, and 2009). Concentrations of petroleum-related constituents in 2009 and 2014 samples from well B-4R are lower than historical concentrations at B-4, indicating that the offsite source may no be longer present, the groundwater plume from an offsite source may no longer be in the immediate vicinity of well B-4/B-4R, or that the plume does not extend to the location of replacement well B-4R. These exceedances of the CAP cleanup levels and the single exceedance of a background-based screening level do not represent contamination originating on the property and are not considered evidence of noncompliance of the cleanup levels; therefore, they should

not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

Arsenic was detected in all property wells and in both background wells. The concentrations reported for the background wells were significantly higher than the concentrations reported for the property wells, indicating that arsenic is migrating in groundwater onto the property. A background-based screening level was calculated using the well B-6R data and was used to evaluate compliance. There were no exceedances of the background-based screening level in the property wells. The arsenic exceedances of the CAP cleanup levels do not represent contamination originating on the property and are not considered evidence of noncompliance of the cleanup levels; therefore, they should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

The UCLs for two cPAHs [benzo(a)anthracene and chrysene] exceed the CAP cleanup levels at well MW-105, but do not exceed the background-based screening levels. The cPAH exceedances of the CAP cleanup levels do not represent contamination originating on the property and are not considered evidence of noncompliance of the cleanup levels; therefore, they should not trigger implementation of groundwater treatment or an increase in the frequency of groundwater monitoring.

6.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that the groundwater monitoring frequency remain at every 5 years and that the list of constituents remain the same for the next groundwater monitoring event.

7.0 USE OF THIS REPORT

This report has been prepared for the exclusive use of Union Station Associates, and applicable regulatory agencies, for specific application to the Union Station property groundwater monitoring program. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff.

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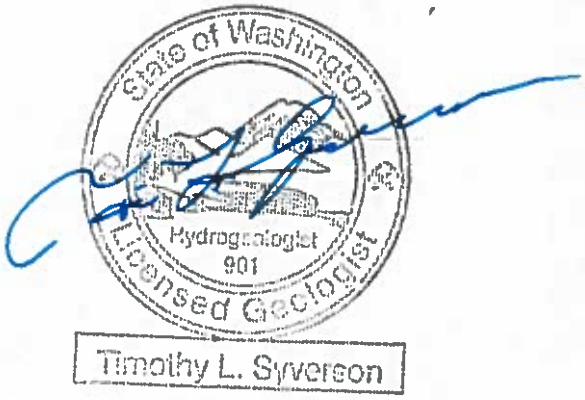


8.0 REFERENCES

Ecology 2005a. Letter to Kristy J. Hendrickson, Landau Associates, Edmonds, Washington, re: Union Station Purchaser Consent Decree N. 97-2-18936-5SEA – Certification of Completion. David L. South, Senior Engineer, Washington State Department of Ecology, Toxics Cleanup Program, Bellevue, Washington. January 20.

Ecology. 2005b. Letter to Kristie J. Hendrickson, Landau Associates, Edmonds, Washington, re: *Union Station Groundwater Monitoring, Union Station Purchaser Consent Decree (97-2-18936-5SEA)*. David L. South, Senior Engineer, Washington State Department of Ecology, Toxics Cleanup Program, Bellevue, Washington. February 24.

Ecology. 2003. Letter to K.J.Hendrickson, Landau Associates, Edmonds, Washington, re: *Union Station Groundwater Monitoring Report, dated February 25, 2003 pursuant to Consent Decree 97-2-18936-5SEA*. D.L. South, Senior Engineer, Toxics Cleanup Program, Washington State Department of Ecology, Bellevue, Washington. March 14.

Ecology. 2002. Letter to K.Hendrickson, Landau Associates, Inc., Edmonds, Washington, re: *Union Station*. D.L.South, Senior Engineer, Toxics Cleanup Program, Washington State Department of Ecology. November 4.

Ecology. 2000. Letter to K. J. Hendrickson, Landau Associates, Edmonds, Washington, re: *Union Station - Report, Groundwater Monitoring, Union Station, Seattle, Washington, dated August 31, 2000*. D.L. South, Senior Engineer, Toxics Cleanup Program, Washington State Department of Ecology, Bellevue, Washington. November 22.

Ecology. 1994. *Natural Background Soil Metals Concentrations in Washington State*. Toxics Cleanup Program, Department of Ecology, October 1994, Publication #94-115.

Ecology. 1993. Memorandum to Interested Parties re: *Supplement to Statistical Guidance for Ecology Site Managers.* C.L.Fleskes, Manager, Toxics Cleanup Program, Washington State Department of Ecology, Olympia, Washington. August 11.

Ecology. 1992. *Statistical Guidance for Ecology Site Managers.* Toxics Cleanup Program, Washington State Department of Ecology. August.

Landau Associates. 2009. *Report, Groundwater Monitoring, Union Station, Seattle, Washington*. Prepared for Union Station Associates. November 5.

Landau Associates. 2004. *Report, Groundwater Monitoring, Union Station, Seattle, Washington*. Prepared for Union Station Associates. October 28.

Landau Associates. 2003a. *Report, Groundwater Monitoring, Union Station, Seattle, Washington.* Prepared for Union Station Associates. October 29.

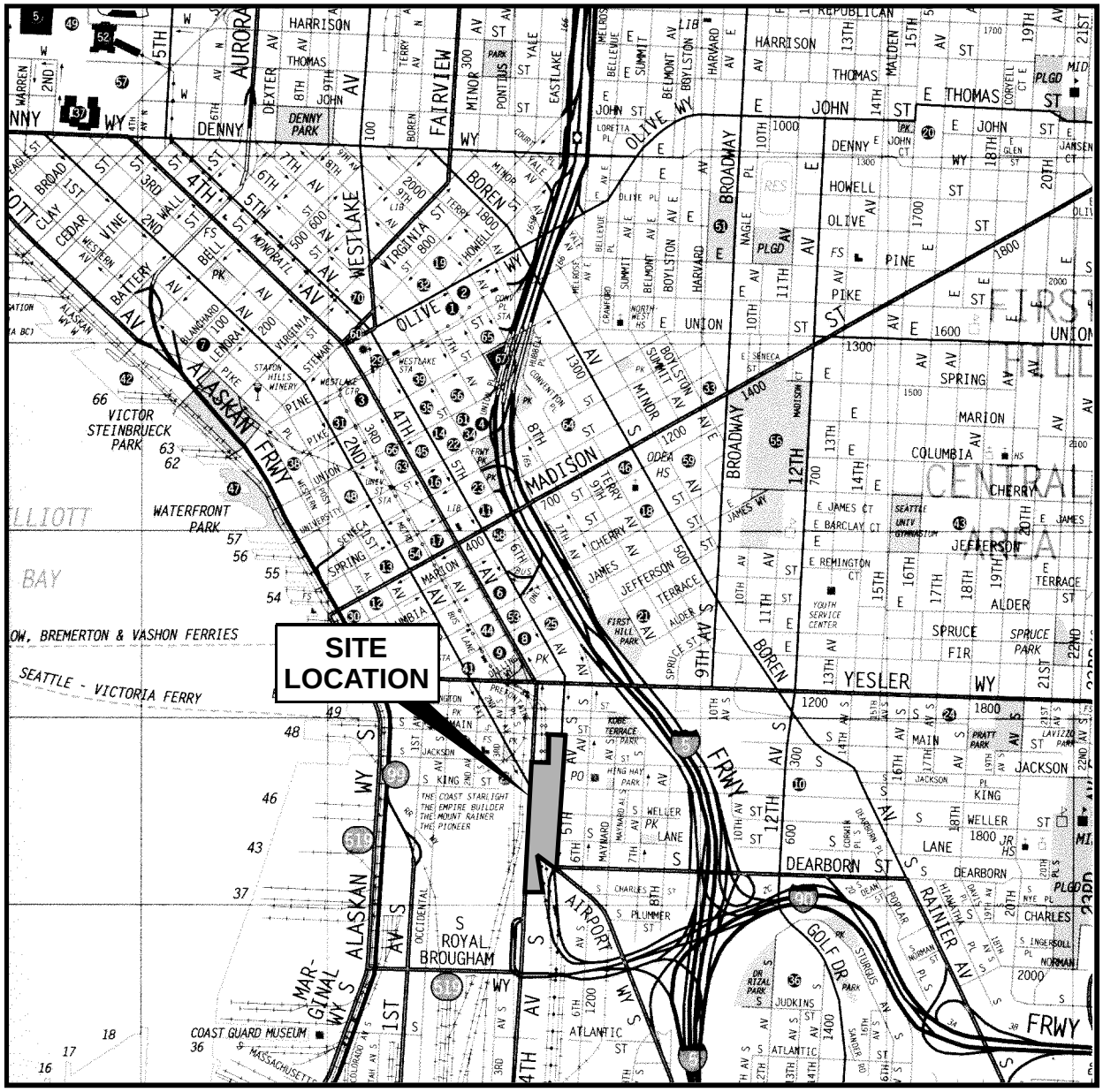
Landau Associates. 2003b. *Report, Groundwater Monitoring, Union Station, Seattle, Washington.* Prepared for Union Station Associates. February 25.

Landau Associates. 2002. *Report, Groundwater Monitoring, Union Station, Seattle, Washington.* Prepared for Union Station Associates. March 4.

Landau Asssociates. 2000. *Report, Groundwater Monitoring, Union Station, Seattle, Washington*. Prepared for Union Station Associates. August 31.

Landau Asssociates. 1997. *Cleanup Action Plan, Union Station Property, Seattle, Washington.* Prepared for Union Station Associates, LLC, Seattle, WA and Marten & Brown, LLP, Seattle, WA. July 28.

Landau Associates and Hart Crowser. 1996. *Report, Focused Remedial Investigation and Feasibility Study, Union Station, Seattle, Washington*. Prepared for Nitze-Stagen, Seattle, WA and Marten & Brown, Seattle, WA. July 1.



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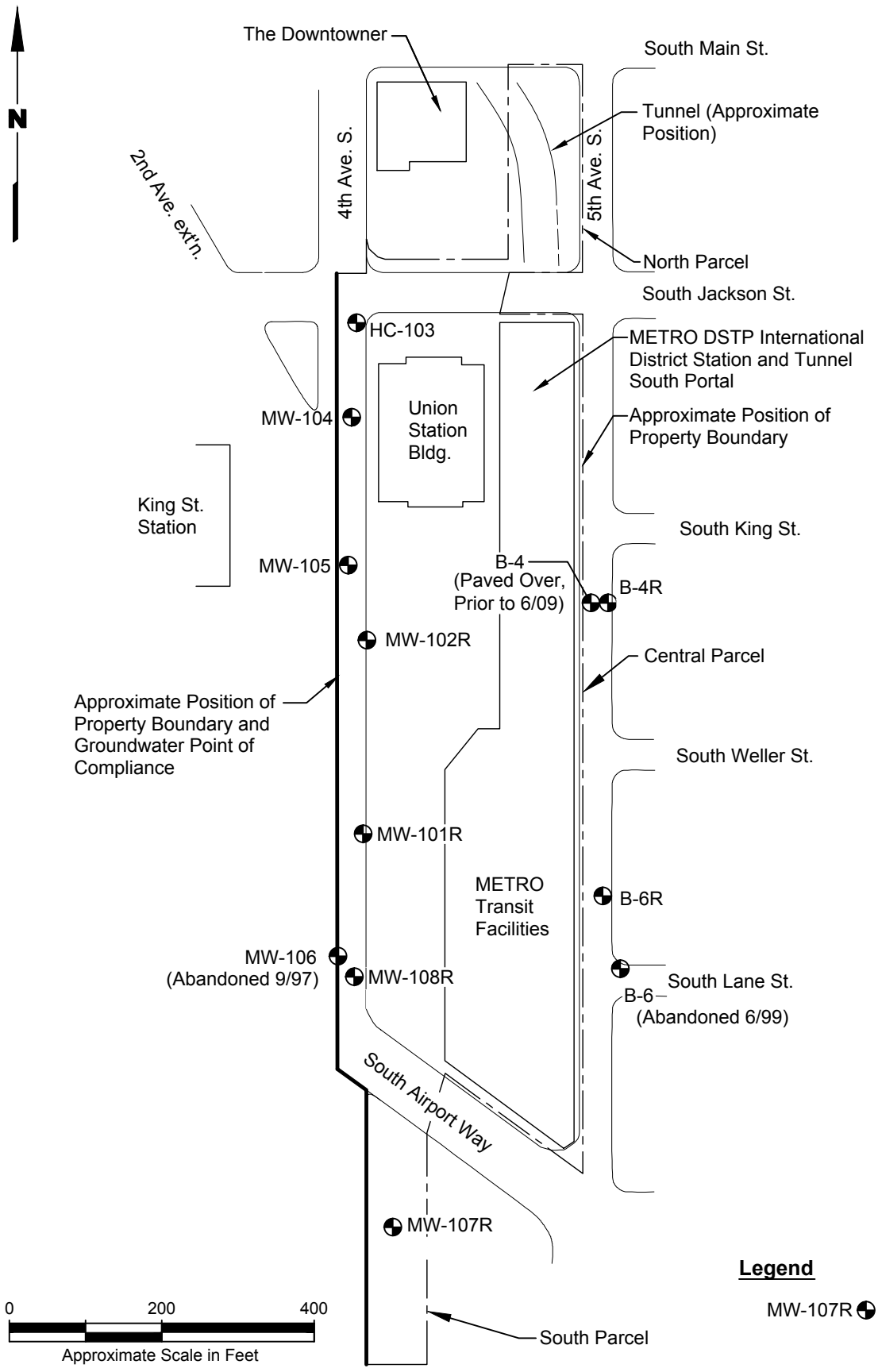
Union Station Seattle, Washington	**Vicinity Map**	Figure 1-1



Union Station Associates | G:\Projects\429\007\010\012\Fig1-2.dwg (A) "Figure 1-2" 9/24/2014

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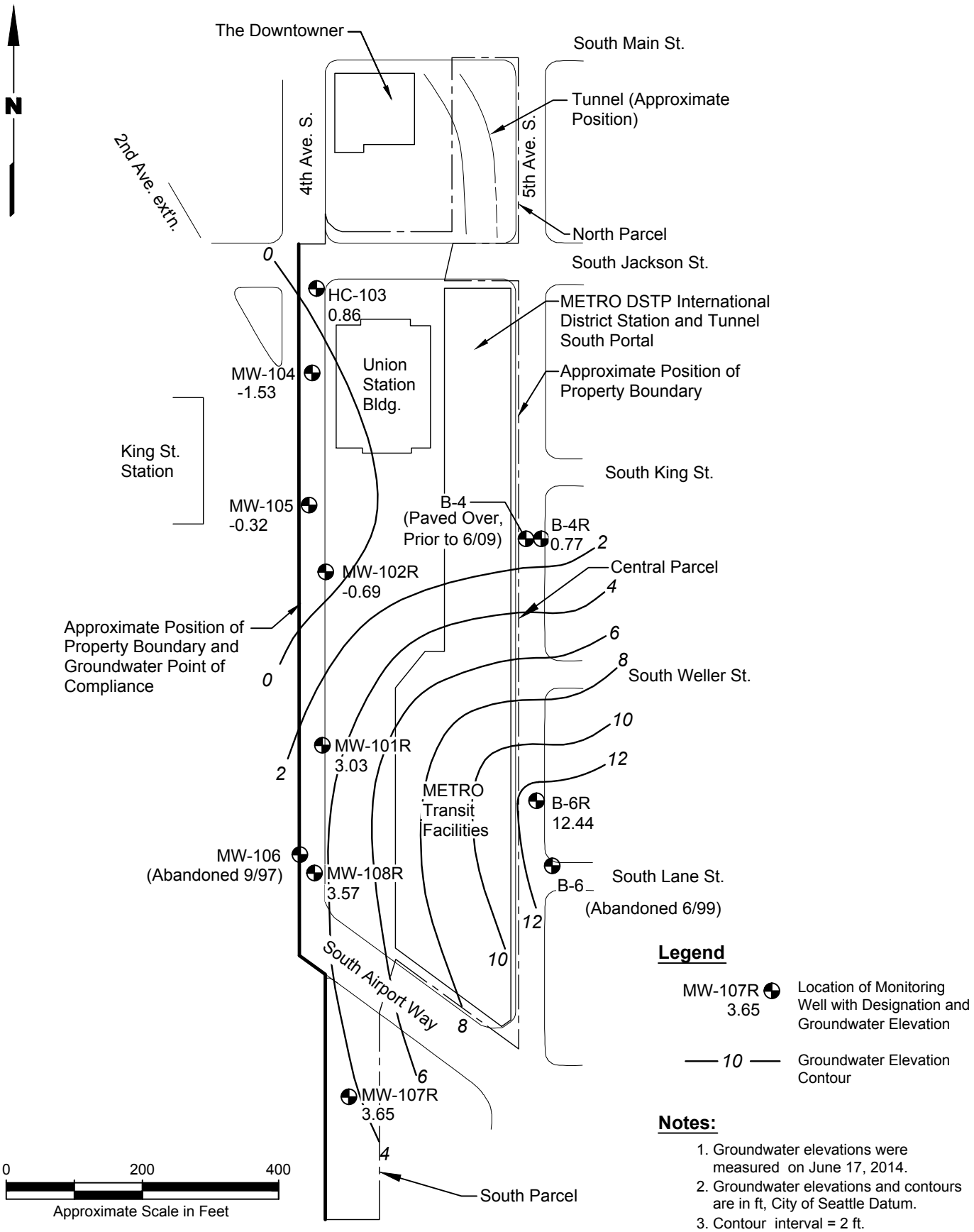
Union Station Seattle, Washington	**Union Station Groundwater Monitoring Well Locations**	Figure 1-2



Union Station/Groundwater Monitoring Report | G:\Projects\429\007\010\012\Fig3-1.dwg (A) "Figure 3-1" 9/24/2014

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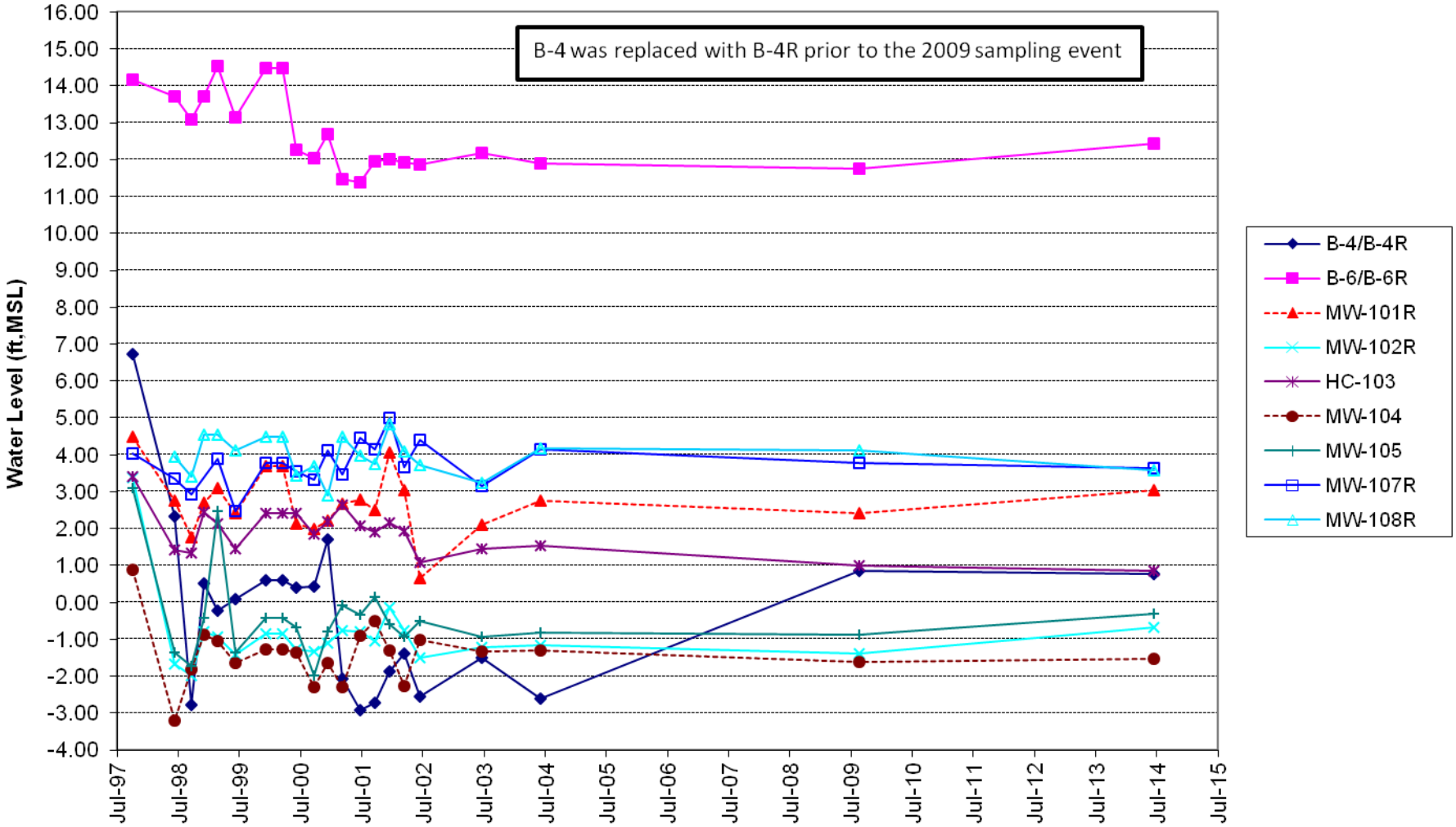
Seattle, Washington

Groundwater Elevation Contours: June 2014

Figure 3-1



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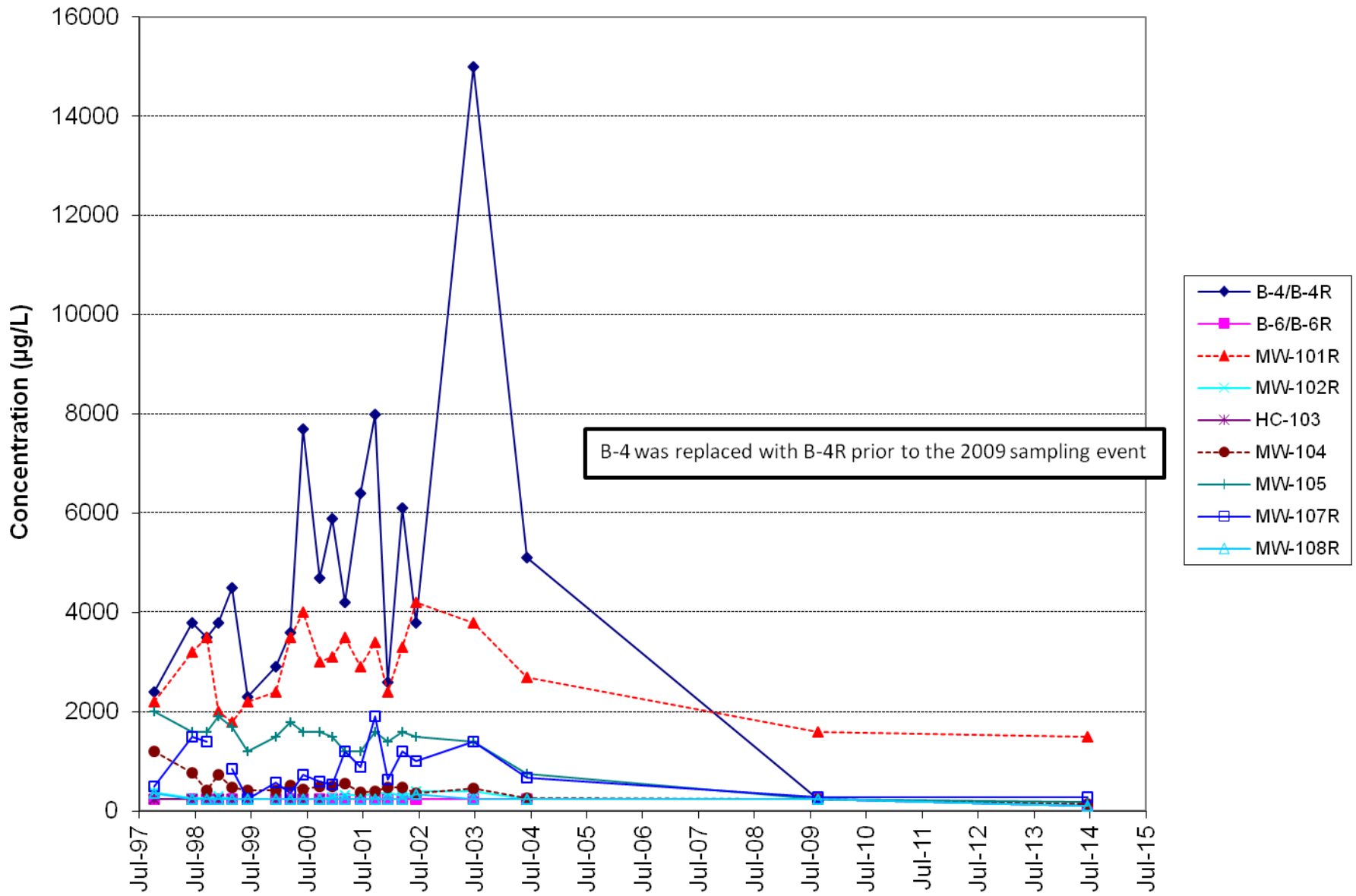
Seattle, Washington

Groundwater Elevations - October 1997 through June 2014

Figure
3-2



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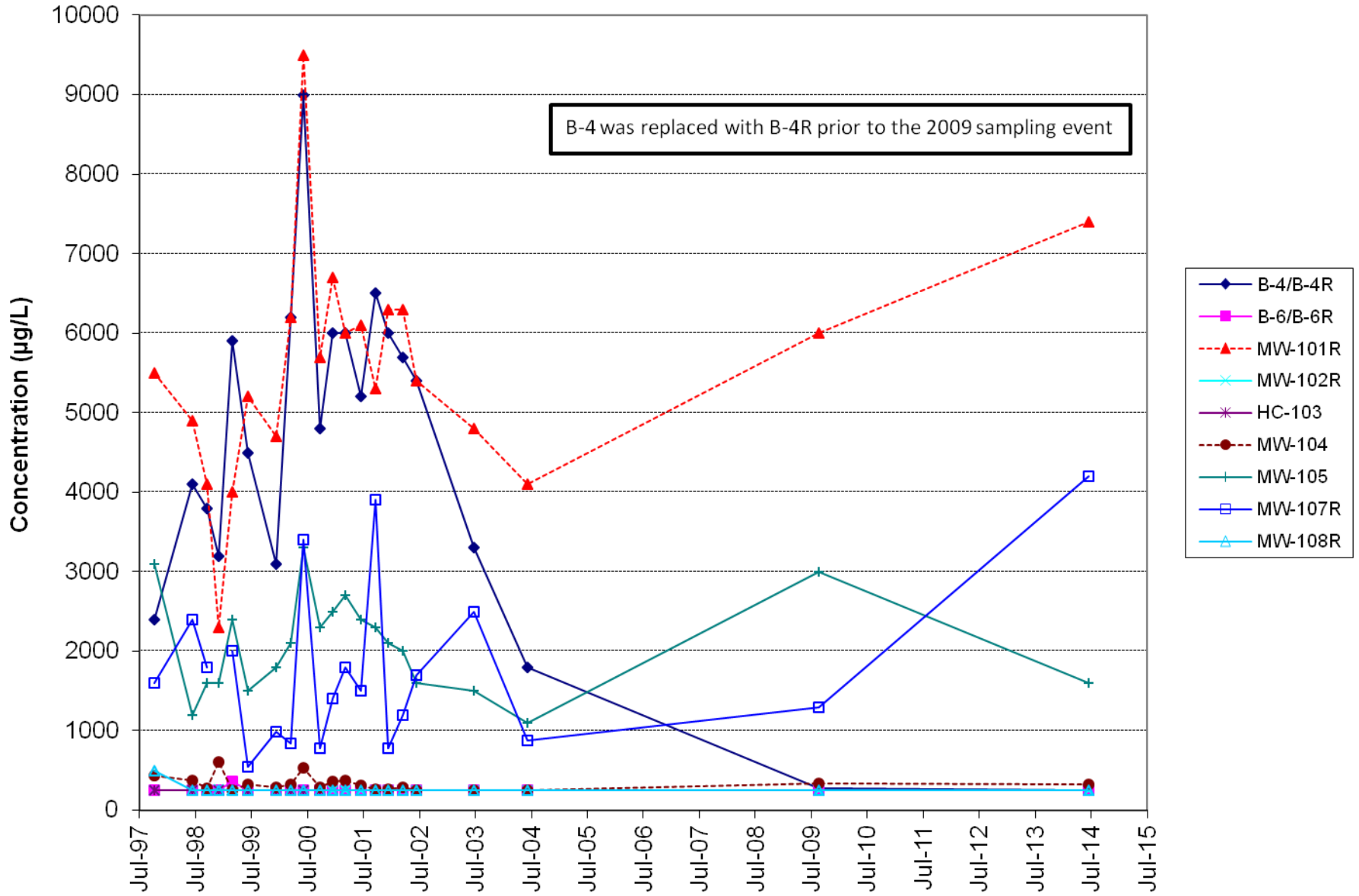
Diesel-Range Petroleum Hydrocarbon Concentrations vs. Time

Figure
3-3



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Gasoline-Range Petroleum Hydrocarbon Concentrations vs. Time

Figure
3-4

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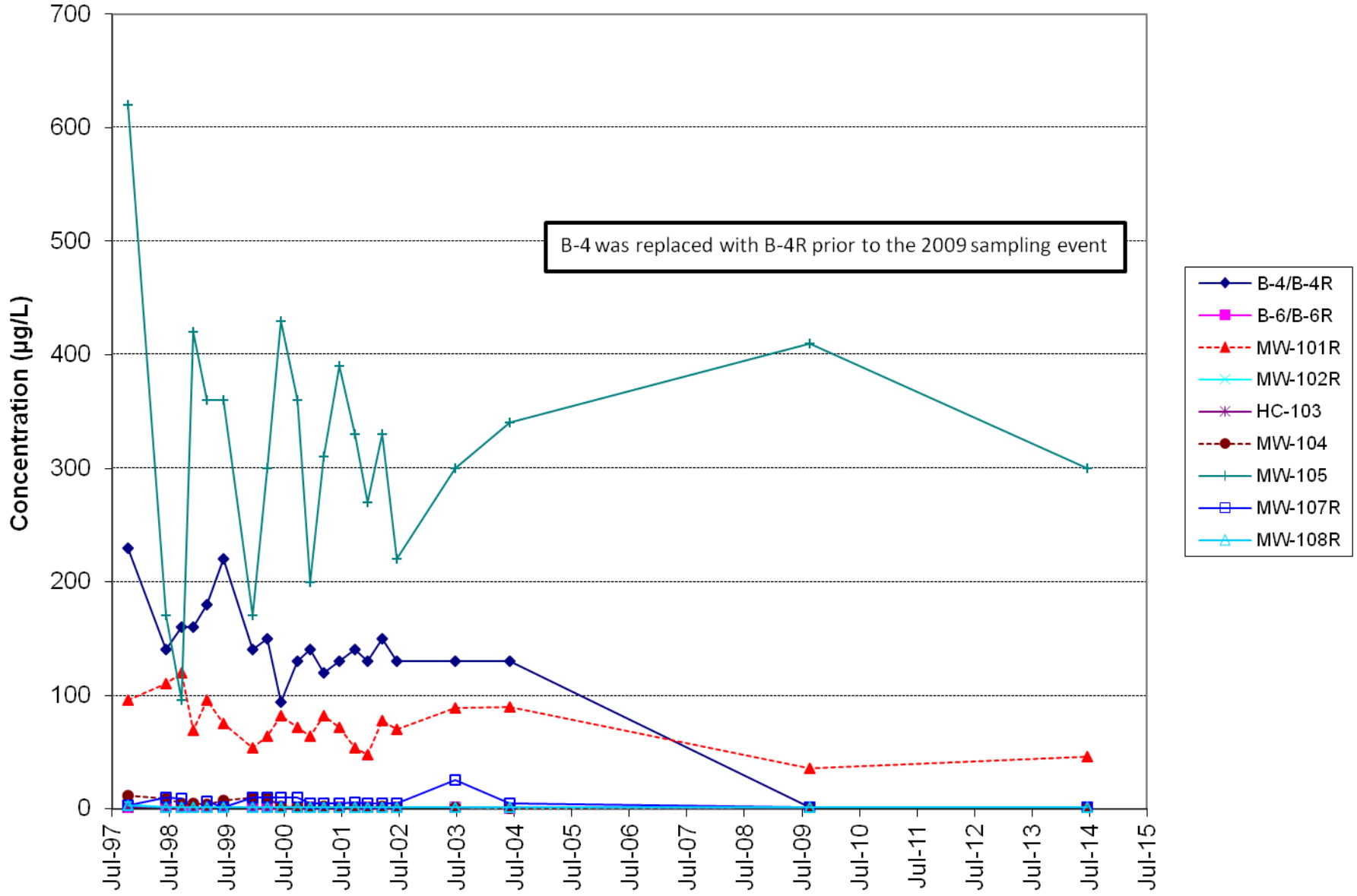

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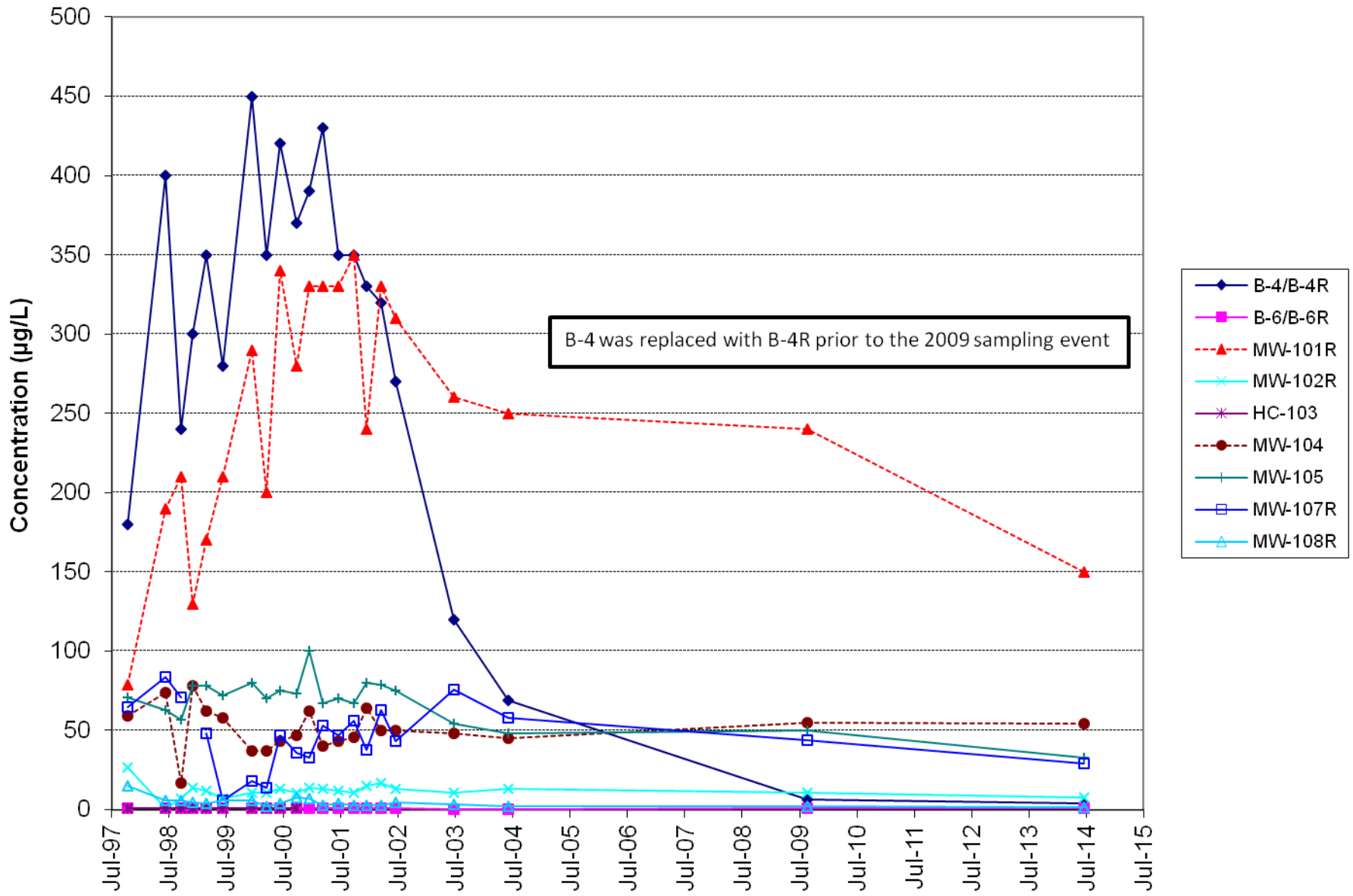
Benzene Concentrations vs. Time

Figure
3-5



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Union Station
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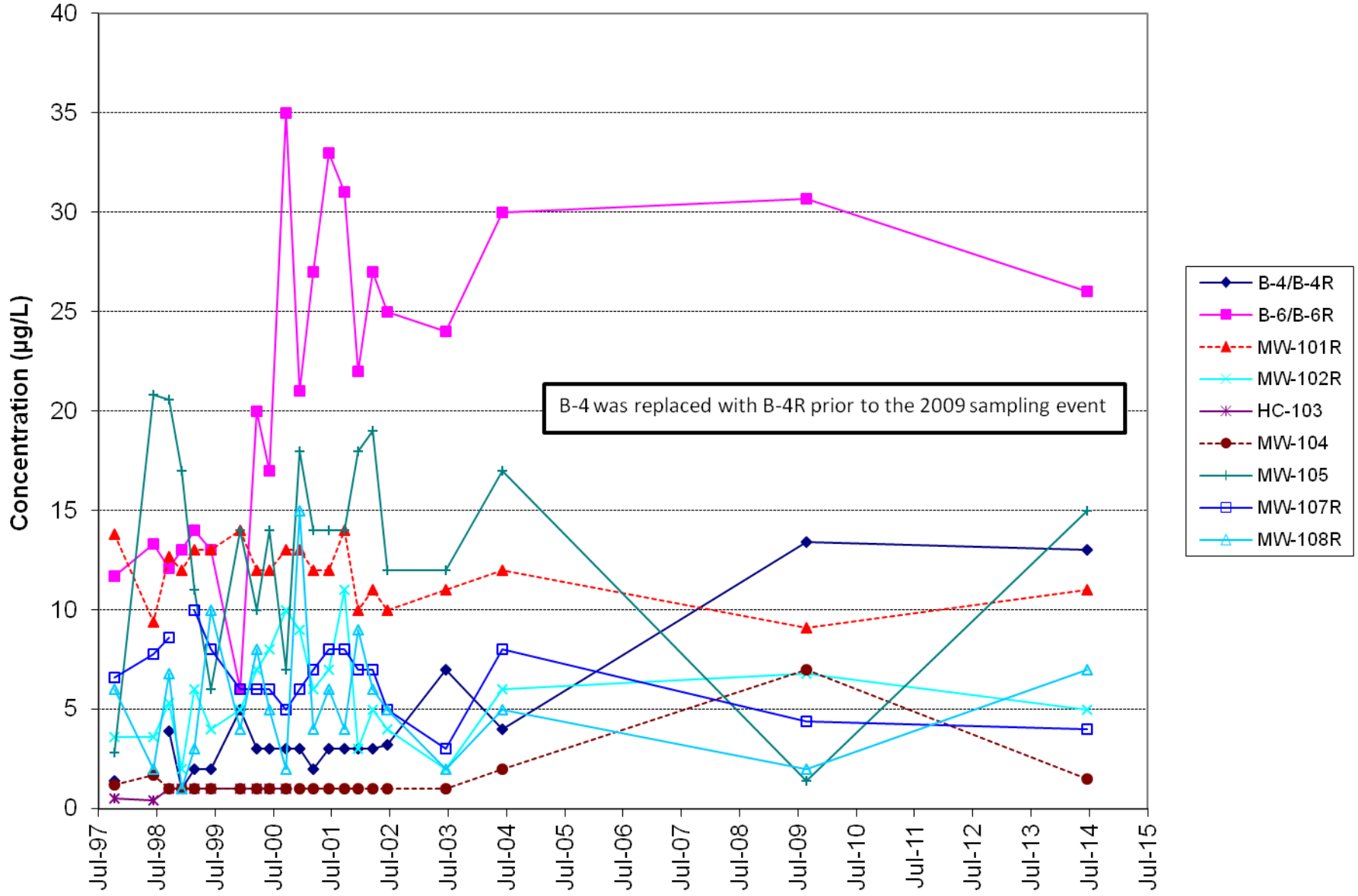
Acenaphthene Concentrations vs. Time

Figure
3-6



LANDAU ASSOCIATES

Union Station
Seattle, Washington

Arsenic Concentrations vs. Time

Figure
3-7

TABLE 1-1
CONSENT DECREE GROUNDWATER MONITORING AND REMEDIATION

Groundwater Monitoring

Quarterly monitoring for 8 quarters beginning within 3 months of the effective date of the consent decree.

Calculate upper 95% confidence limit (UCL) using the eight quarters of data.

If UCL exceeds cleanup levels, implement groundwater treatment if directed by Ecology to prevent contamination from leaving the site. The parties anticipate that Ecology may revise this cleanup action plan to incorporate new cleanup standards if the cleanup standards are revised by an amendment to the regulations and Ecology determines the use of the new standards is appropriate.

If UCL is less than or equal to cleanup levels, commence annual monitoring.

Annual monitoring until all foundations are completed or until two years after any foundation construction is initiated.

Quarterly sampling for 8 quarters beginning the first quarter after all foundations are completed or the first quarter occurring two years after any foundation construction is initiated.

Calculate upper 95% confidence limit (UCL) using the last eight quarters of data.

If UCL exceeds cleanup levels, implement groundwater treatment if directed by Ecology to prevent contamination from leaving the site. The parties anticipate that Ecology may revise this cleanup action plan to incorporate new cleanup standards if the cleanup standards are revised by an amendment to the regulations and Ecology determines the use of the new standards is appropriate.

If UCL is less than or equal to cleanup levels, commence annual monitoring.

Annual monitoring until foundation loading (building construction) is complete plus 3 additional years.

If any sample exceeds cleanup levels, collect another sample 1 quarter later.

If the second sample is less than cleanup levels, return to annual monitoring.

If the second sample exceeds cleanup levels, commence quarterly monitoring for 1 year (see below).

If no exceedance of cleanup levels has occurred after 3 years, commence monitoring every 5 years.

Monitoring every 5 years.

If any sample exceeds cleanup levels, collect another sample 1 quarter later.

If the second sample is less than cleanup levels, return to annual monitoring for 1 year.

If the second sample exceeds cleanup levels commence quarterly monitoring for 1 year (see below).

If UCL is less than or equal to cleanup levels continue monitoring every 5 years so long as residual hazardous substance concentrations contained onsite exceed site cleanup levels [see WAC 173-340-360 (8)(b)].

Quarterly sampling for 1 year

At end of year, if UCL based on four quarters of data is less than cleanup levels, return to annual monitoring for 3 years

At end of year, if UCL based on four quarters of data is greater than cleanup levels and data show increasing trend and last sample exceeds twice the cleanup level, implement groundwater treatment if directed by Ecology to prevent contamination from leaving the site. Otherwise, continue monitoring for another four quarters.

If, after eight quarters of data have been collected, the UCL based on the eight quarters of data exceed the cleanup level, implement groundwater treatment if directed by Ecology to prevent contamination from leaving the site.

If, after eight quarters of data have been collected, the UCL based on the eight quarters of data is less than the cleanup level, continue monitoring for another four quarters.

If, at the end of the last four quarters, the UCL based on the last eight quarters of data exceeds the cleanup level, implement groundwater treatment if directed by Ecology to prevent contamination from leaving the site.

If, at the end of the last four quarters, the UCL based on the last eight quarters of data is less than the cleanup level, return to annual monitoring for 5 years. If there are no exceedances of cleanup levels during that time, return to monitoring every 5 years.

TABLE 1-1
CONSENT DECREE GROUNDWATER MONITORING AND REMEDIATION

Groundwater Treatment

Minimize present worth of capital and O&M costs to determine the size and estimated operating time of the system.

Performance monitoring.

Quarterly monitoring during groundwater treatment.

Plot data and do statistical evaluation as directed by Ecology to determine when to terminate treatment or when cleanup standards are met.

Post-Treatment Monitoring

Quarterly monitoring for 8 quarters.

If UCL exceeds cleanup levels and trend analysis does not indicate decreasing trend, return to groundwater treatment.

If UCL exceeds cleanup levels and trend analysis indicates decreasing trend, continue monitoring quarterly. If UCL calculated using the last 8 quarters of data exceeds cleanup levels after 12 quarters of data have been collected, return to groundwater treatment.

If UCL is less than or equal to cleanup levels, commence annual monitoring for 3 years.

Annual monitoring for 3 years.

If any sample exceeds cleanup levels, collect another sample 1 quarter later.

If the second sample is less than cleanup levels return to annual monitoring.

If the second sample exceeds cleanup levels commence quarterly monitoring for 1 year and use triggers in quarterly monitoring above.

If no exceedance of cleanup levels has occurred after 3 years, commence monitoring every 5 years.

Monitoring every 5 years.

If any sample exceeds cleanup levels, collect another sample 1 quarter later.

If the second sample is less than cleanup levels return to monitoring every 5 years.

If the second sample exceeds cleanup levels commence quarterly monitoring (see above).

If UCL is less than or equal to cleanup levels, continue monitoring every 5 years so long as residual hazardous substance concentrations contained onsite exceed site cleanup levels [see WAC 173-340-360 (8)(b)].

Notes:

1. This table was prepared for and originally presented in the CAP.
2. As described in Appendix A of the CAP, alternate statistical methods may be used upon approval by Ecology.

TABLE 2-1
MONITORING WELL SUMMARY
UNION STATION

Well	Installation Date	Abandonment/ Decommissioning Date	Northing	Easting	Ground Surface Elevation (b)	Reference Elevation (c)	Top of Screen Elevation	Bottom of Screen Elevation	Top of Native Soil Elevation	Notes
HC-101	4-96	3-98	1583.27	1695.87	8.80	9.09	3.8	-6.2	NA	Well was damaged during construction activities and abandoned
MW-101R	3-98	N/A	1583.24	1695.87	9.77	9.06	2.8	-7.2	NA	Replacement well for HC-101; Boring could not be advanced beyond 16 ft BGS.
HC-102	4-96	3-98	1837.46	1700.69	9.30	8.64	4.3	-5.7	NA	Well was damaged during construction activities and abandoned
MW-102R	3-98	N/A	1837.26	1700.58	9.97	8.60	-3.7	-13.7	-14.7	Replacement well for HC-102.
HC-103	4-96	N/A	2253.49	1687.23	10.30	8.99	5.5	-4.5	NA	
MW-104	11-96	N/A	2129.50	1680.99	10.65	9.59	-0.1	-10.1	-12.6	
MW-105	11-96	N/A	1935.82	1676.45	10.07	8.92	-4.5	-14.0	-15.5	
MW-106	11-96	9-97	1422.63	1662.65	9.50	9.07	-1.0	-11.0	-13.5	Well was abandoned to accommodate construction.
MW-107	11-96	10-98	1048.59	1728.86	13.30	12.59	-1.7	-11.7	-12.7	Well was abandoned to accommodate construction.
MW-107R	2-99	N/A	1067.59	1734.64	12.99	12.43	-1.5	-7.0	-10.0	Replacement well for MW-107
MW-108	9-97	4-98	NA	NA	NA	NA	NA	NA	NA	Replacement well for MW-106; well was later damaged during construction activities and abandoned.
MW108R	4-98	N/A	1395.75	1684.25	9.56	8.78	-3.4	-13.4	-14.4	Replacement well for MW-108.
B-4	12-85	Paved over between 6/04 and 8/09	1886.32	1994.74	36.80	36.36	-4.6	-9.6	-12.1	Well was paved over by Seattle DOT
B-4R	08-09	N/A	221730.54 (d)	1271778.6 (d)	36.74	36.35	5.74	-4.26	NA	Replacement well for B-4.
B-6	12-85	6-99	1406.35	2033.29	34.30	34.08	-0.9	-5.7	NA	Well was abandoned to accommodate construction.
B-6R	11-99	N/A	1501.99	2010.27	34.38	34.38	10.4	-9.6	-17.1	Replacement well for B-6.

NA = Not available
N/A = Not applicable.

(a) Wells were abandoned/decommissioned in accordance with applicable regulations in place at the time
(b) Ground surface elevation at time of well installation.
(c) Reference elevation is used for measuring groundwater levels and represents most current survey information.
(d) Elevations are in NAVD 88 Datum

Note: All elevations are in feet, City of Seattle Datum.

TABLE 3-1
GROUNDWATER ELEVATION SUMMARY
JUNE 2014
UNION STATION

Well	Measuring Point Elevation	Measured Depth to Groundwater	Groundwater Elevation
B-4R	36.35	35.58	0.77
B-6R	34.38	21.94	12.44
MW-101R	9.06	6.03	3.03
MW-102R	8.60	9.29	-0.69
HC-103	8.99	8.13	0.86
MW-104	9.59	11.12	-1.53
MW-105	8.92	9.24	-0.32
MW-107R	12.43	8.78	3.65
MW-108R	8.78	5.21	3.57

Note: All elevations are in feet, City of Seattle Datum.

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	B-4 DQ61G 9/26/2001	B-4 DY69A 12/19/2001	B-4 EE79H 3/20/2002	B-4 EM41H 6/19/2002	B-4 FP47G/P 6/25/2003	B-4 GS18I 6/9/2004	B-4R PL85B 8/25/2009	B-4R YO99D 06/19/2014
TPH (µg/L)												
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	8,000 J	2,600	6,100	3,800	15,000	5,100	250 U	100 U
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	2,900 J	570	2,500 U	620	6,800	2,000	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	6,500	6,000 J	5,700	5,400	3,300	1,800	280	250 UJ
cPAH (µg/L)												
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	8.3	1.7	1.4	0.41	2.1	2.0	0.37	0.12 U
Chrysene	8270 (c)	1.0	5.5	1.0	7.4	1.5	1.3 J	0.36	2.0	1.7	0.45	0.12 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	4.3	0.61	0.46	0.10 U	0.77	1.1	0.17	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	5.6	1.2	1.0	0.10 U	0.86	1.1	0.26	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	7.2	1.3	1.0	0.12	1.1	1.2	0.36	0.12 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	3.6	0.57	0.53	0.10 U	0.55	0.44	0.17	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.98	0.20 U	0.20 M	0.10 U	0.16	0.28	0.10 U	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	0.12 U
ncPAH (µg/L)												
Naphthalene	8270 (c)	9880		10	2,600 J	2,700 J	2,400 J	1,200	710 J	0.41	4.6	1.1 U
2-Methylnaphthalene	8270 (c)			10	450	480	510	260	160	0.46	1.0 U	1.1 U
Acenaphthylene	8270 (c)			10	6.5	3.2	3.0	10	1.6	2.9	1.0 U	1.1 U
Acenaphthene	8270 (c)	225	428	10	350	330 J	320	270	120	69	6.6	4.2
Fluorene	8270 (c)	2422		10	120	88	96	78	45	18	1.0 U	1.1 U
Phenanthrene	8270 (c)			10	130	110	110	69	46	7.8	1.7	1.1 U
Anthracene	8270 (c)	25900		10	22	16	15	10	9.1	4.6	1.0 U	1.1 U
Fluoranthene	8270 (c)	27.1		10	23	14	11	9.1	8.3	9.0	1.0 U	1.1 U
Pyrene	8270 (c)	777		10	32	14	11	9.1	12	12	1.0 U	1.1 U
Benzo(g,h,i)perylene	8270 (c)			10	3.6	1.0 U	1.0 U	1.0 U	0.53	0.45	1.0 U	1.1 U
BTEX (µg/L)												
Benzene	8260/8021MOD	71	220	5	140	130	150	130	130	130	1.0 U	1.0 UJ
Toluene	8260/8021MOD	485		5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 UJ
Ethylbenzene	8260/8021MOD	276		5	230	190	230	190	160	110	1.0 U	1.0 UJ
m,p-Xylene	8260/8021MOD			5 (d)	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 UJ
o-Xylene	8260/8021MOD				6.0	5.0 U	5.6	5.0 U	5.0 U	5.0 U	1.0 U	1.0 UJ
DISSOLVED METALS (µg/L)												
Arsenic	200.8	4	37	4	3	3 J	3	3.2	7	4	13	13
CONVENTIONALS												
Total Dissolved Solids (µg/L)	160.1/SM2540D				780,000 J	770,000	740,000	790,000	790,000	751,000	538,000	498,000
Total Suspended Solids (µg/L)	160.2				400,000	1,400,000 J	920,000	680,000	270,000	938,000	8,300,000	4,130,000
pH	Field				NM	NM	NM	NM	NM	NM	7.36	6.68
Specific Conductance (µmhos)	Field				NM	NM	NM	NM	NM	NM	1398	763
Temperature (°C)	Field				NM	NM	NM	NM	NM	NM	15.0	15.5

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	B-6R DQ61H 9/26/2001	B-6R DY69B 12/19/2001	B-6R EE79I 3/20/2002	Dup of B-6R MW-109R EE79G 3/20/2002	B-6R EM41I 6/19/2002	B-6R FP47H/Q 6/25/2003	B-6R GS18J 6/9/2004	B6R PL85A 8/25/2009	B6R YO99E 06/19/2014
TPH (µg/L)													
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	250 U	250 U	250 U	250 U	250	250 U	250 U	250 U	100 U
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	250 U	250 U
cPAH (µg/L)													
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.26	0.10 U	0.10 U	0.10 U	0.10 U	0.020	0.035	0.19	0.12 U
Chrysene	8270 (c)	1.0	5.5	1.0	0.23	0.10 U	0.10 U	0.10 U	0.10 U	0.020	0.030	0.21	0.12 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.15	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.016	0.15	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.16	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.016	0.11	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.21	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.023	0.19	0.12 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.11	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.016	0.11	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	NA	0.12 U
ncPAH (µg/L)													
Naphthalene	8270 (c)	9880		10	7.1 J	4.9 J	4.0 J	2.9 J	1.0 U	0.14	0.13 U	2.6	1.2 U
2-Methylnaphthalene	8270 (c)			10	1.4	1.0 U	1.0 U	1.0 U	1.0 U	0.090	0.030 U	1.0 U	1.2 U
Acenaphthylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 J	1.0 U	1.2 U
Acenaphthene	8270 (c)	225	428	10	1.1	1.0 U	1.0 U	1.0 U	1.0 U	0.050	0.14 U	1.0 U	1.2 U
Fluorene	8270 (c)	2422		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.020	0.053	1.0 U	1.2 U
Phenanthrene	8270 (c)			10	1.3	1.0 U	1.0 U	1.0 U	1.0 U	0.080	0.16	1.0 U	1.2 U
Anthracene	8270 (c)	25900		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.040	0.065	1.0 U	1.2 U
Fluoranthene	8270 (c)	27.1		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.060	0.081	1.0 U	1.2 U
Pyrene	8270 (c)	777		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.080	0.11	1.0 U	1.2 U
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.019	1.0 U	1.2 U
BTEX (µg/L)													
Benzene	8260/8021MOD	71	220	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
Toluene	8260/8021MOD	485		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
Ethylbenzene	8260/8021MOD	276		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
m,p-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.4 U	1.0 U	2.0 U
o-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2	1.0 U	1.0 U
DISSOLVED METALS (µg/L)													
Arsenic	200.8	4	37	4	31	22 J	27 J	38 J	25	24	30	31	26
CONVENTIONALS													
Total Dissolved Solids (µg/L)	160.1/SM2540D				1,100,000 J	780,000	780,000 J	1,100,000 J	890,000	790,000	923,000	891,000	518,000
Total Suspended Solids (µg/L)	160.2				500,000	1,400,000 J	360,000 J	790,000 J	1,100,000	430,000	940,000	1,040,000	927,000
pH	Field				6.75	NM	6.65	6.90	6.95	7.06	6.89	7.39	6.87
Specific Conductance (µmhos)	Field				2,370	NM	1,340	1,733	1,348	1,708	1,570	2,392	995
Temperature (°C)	Field				16.1	NM	15.0	14.1	16.1	16.8	16.6	15.5	16.4

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-101R DQ61A 9/26/2001	MW-101R DY69C 12/19/2001	MW-101R EE79A 3/20/2002	MW-101R EM41A 6/19/2002	Dup of MW-101R MW-109 EM41B 6/19/2002	MW-101R FP47A/J 6/25/2003	Dup of MW-101R MW-109 FP47F/O 6/25/2003
TPH (µg/L)											
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	3,400	2,400	3,300	4,200	3,800	3,800	3,900
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	5,300	6,300 J	6,300	5,400	5,400	4,800	4,800
cPAH (µg/L)											
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.37	0.16	0.25	0.17	0.17	0.20	0.20
Chrysene	8270 (c)	1.0	5.5	1.0	0.27	0.15	0.14 J	0.14	0.13	0.15	0.13
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.030	0.020
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.030	0.040
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.040	0.040
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA
ncPAH (µg/L)											
Naphthalene	8270 (c)	9880		10	4,900 J	2,000 J	3,400 J	3,200	3,400	2,900 J	2,000 J
2-Methylnaphthalene	8270 (c)			10	700	350	570	530	530	490 J	600 J
Acenaphthylene	8270 (c)			10	2.4	1.0 J	1.5	2.4	2.1	0.58 J	0.53 J
Acenaphthene	8270 (c)	225	428	10	350	240 J	330	310	310	260	280
Fluorene	8270 (c)	2422		10	70	72	75	83	88	79	90
Phenanthrene	8270 (c)			10	73	97	77	92	99	63	68
Anthracene	8270 (c)	25900		10	6.0	6.9	7.4	6.5	6.4	7.2	8.2
Fluoranthene	8270 (c)	27.1		10	5.4	5.4	4.7	5.4	5.2	5.4	5.3
Pyrene	8270 (c)	777		10	5.2	5.1	4.2	5.0	5.2	6.1	6.1
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U
BTEX (µg/L)											
Benzene	8260/8021MOD	71	220	5	54	48 J	78	70	69	89	96
Toluene	8260/8021MOD	485		5	8.4	5.0 UJ	7.6	5.7	5.5	5.0 U	4.1
Ethylbenzene	8260/8021MOD	276		5	170	130 J	260	250	240	300	260
m,p-Xylene	8260/8021MOD			5 (d)	60	46 J	92	46	43	45	48
o-Xylene	8260/8021MOD			5 (d)	27	18 J	37	23	22	17	19
DISSOLVED METALS (µg/L)											
Arsenic	200.8	4	37	4	14	10 J	11	10	11	11	11
CONVENTIONALS											
Total Dissolved Solids (µg/L)	160.1/SM2540D				1,000,000 J	1,100,000	970,000	1,000,000	1,000,000	960,000	950,000
Total Suspended Solids (µg/L)	160.2				79,000	65,000 J	71,000	72,000	72,000	79,000	78,000
pH	Field				7.25	NM	6.70	6.92	6.98	6.96	6.96
Specific Conductance (µmhos)	Field				2,310	NM	2,540	1,860	2,418	1,510	1,510
Temperature (°C)	Field				16.4	NM	14.2	12.8	13.6	14.8	14.8

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-101R GS18F 6/9/2004	Dup of MW-101R MW-109 GS18G 6/9/2004	MW-101R PL72A 8/24/2009	Dup of MW-101R MW-109R PL72E 8/24/2009	MW-101R YO69E 06/18/2014
TPH (µg/L)									
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	2,700	2,600	1,600	1,500	1,500
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	4,100	4,100	6,000	6,000	7,400
cPAH (µg/L)									
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.23	0.25	0.28 J	0.43 J	0.24
Chrysene	8270 (c)	1.0	5.5	1.0	0.16	0.17	0.20 J	0.33 J	0.18
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.048 J	0.048 J	0.10 U	0.10 U	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.048 J	0.071	0.10 U	0.10	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.052	0.060	0.10 U	0.14	0.11 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.050 U	0.050 U	0.10 U	0.10 U	0.11 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.050 U	0.050 U	0.10 U	0.10 U	0.11 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	0.13
ncPAH (µg/L)									
Naphthalene	8270 (c)	9880		10	1,800	1,800	1,500	1,400	1,200
2-Methylnaphthalene	8270 (c)			10	280	290	440	400	300
Acenaphthylene	8270 (c)			10	2.0	2.3	1.0 U	1.0 U	1.5
Acenaphthene	8270 (c)	225	428	10	250	260	240	220	150
Fluorene	8270 (c)	2422		10	72	79	85	76	54
Phenanthrene	8270 (c)			10	66	75	93	86	63
Anthracene	8270 (c)	25900		10	6.5	7.6	7.6	7.1	3.9
Fluoranthene	8270 (c)	27.1		10	5.0	5.6	6.8	6.0	3.4
Pyrene	8270 (c)	777		10	4.6	5.3	6.2	5.3	3.4
Benzo(g,h,i)perylene	8270 (c)			10	0.050 U	0.050 U	1.0 U	1.0 U	1.2 U
BTEX (µg/L)									
Benzene	8260/8021MOD	71	220	5	90	92	36	36	46
Toluene	8260/8021MOD	485		5	5.5	6.0	2.2	2.3	5.9
Ethylbenzene	8260/8021MOD	276		5	210	230	150	150	200
m,p-Xylene	8260/8021MOD			5 (d)	38	43	25	25	42
o-Xylene	8260/8021MOD			5 (d)	17	19	18 J	1.0 UJ	34
DISSOLVED METALS (µg/L)									
Arsenic	200.8	4	37	4	12	12	9.1	9.5	11
CONVENTIONALS									
Total Dissolved Solids (µg/L)	160.1/SM2540D				1,250,000	1,390,000	1,130,000	1,080,000	1,610,000
Total Suspended Solids (µg/L)	160.2				284,000 J	90,100 J	60,400	59,300	357,000
pH	Field				6.67	6.67	6.88	6.88	8.15
Specific Conductance (µmhos)	Field				2,012	2,012	2,899	2,899	2,405
Temperature (°C)	Field				15.3	15.3	15.0	15.0	14.3

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-102R DQ61B 9/26/2001	Dup of MW102R MW-109 DQ61I 9/26/2001	MW-102R DY69D 12/19/2001	MW-102R EE79B 3/20/2002	MW-102R EM41C 6/19/2002	MW-102R FP47B/K 6/25/2003	MW-102R GS18E 6/9/2004	MW-102R PL72B 8/24/2009	MW-102R YO69D 06/18/2014
TPH (µg/L)													
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	340	320	370	300	400	400	250 U	250 U	100 U
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	250 U	250 UJ	250 UJ	250 U	250 U	250 U	250 U	250 U	250 U
cPAH (µg/L)													
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.030 J	0.12	0.10 U	0.12 U
Chrysene	8270 (c)	1.0	5.5	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.020 J	0.098	0.10 U	0.12 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.064	0.10 U	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.068	0.10 U	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.064	0.10 U	0.12 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.069	0.10 U	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.074	0.10 U	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	NA	0.12 U
ncPAH (µg/L)													
Naphthalene	8270 (c)	9880		10	8.4 J	1.0 J	12 J	22 J	1.5	0.060 UJ	0.24 U	3.1	2.4
2-Methylnaphthalene	8270 (c)			10	1.8	1.0 U	2.1	2.6	1.0 U	0.12 J	0.67	1.0 U	1.2 U
Acenaphthylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.16 J	0.28	1.0 U	1.2 U
Acenaphthene	8270 (c)	225	428	10	11	12	15 J	17	13	11	13	11	7.6
Fluorene	8270 (c)	2422		10	2.9	3.0	3.4	3.7	2.6	2.9	3.2	2.8	1.8
Phenanthrene	8270 (c)			10	4.3	4.3	3.3	3.8	1.0 U	2.7	3.8	3.5	1.6
Anthracene	8270 (c)	25900		10	1.0 U	1.1	1.0 U	1.1	1.0 U	0.84 J	0.98	1.0 U	1.2 U
Fluoranthene	8270 (c)	27.1		10	1.0	1.1	1.0 U	1.0 U	1.0 U	0.48 J	1.0	1.0 U	1.2 U
Pyrene	8270 (c)	777		10	1.0 U	1.0	1.0 U	1.0 U	1.0 U	0.40 J	0.85	1.0 U	1.2 U
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 UJ	0.059	1.0 U	1.2 U
BTEX (µg/L)													
Benzene	8260/8021MOD	71	220	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
Toluene	8260/8021MOD	485		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
Ethylbenzene	8260/8021MOD	276		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
m,p-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.4 U	1.0 U	2.0 U
o-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
DISSOLVED METALS (µg/L)													
Arsenic	200.8	4	37	4	11	11	3 J	5	4	2 U	6	6.8	5
CONVENTIONALS													
Total Dissolved Solids (µg/L)	160.1/SM2540				2,100,000 J	2,000,000 J	1,900,000	1,800,000	1,900,000	1,500,000	1,590,000	1,700,000	1,530,000
Total Suspended Solids (µg/L)	160.2				72,000	83,000	61,000 J	51,000	41,000	51,000	40,600	45,500	53,400
pH	Field				6.53	6.53	6.47	6.64	6.70	6.80	6.65	6.43	8.33
Specific Conductance (µmhos)	Field				3,750	3,750	3,740	3,090	3,753	2,710	2,415	3,262	2,391
Temperature (°C)	Field				16.2	16.1	15.1	14.2	15.0	15.6	15.9	16.2	15.3

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-104 DQ61C 9/26/2001	MW-104 DY69E 12/19/2001	MW-104 EE79C 3/20/2002	MW-104 EM41D 6/19/2002	MW-104 FP47C/L 6/25/2003	MW-104 GS18B 6/9/2004	MW-104 PL72D 8/24/2009	MW-104 YO69B 06/18/2014
TPH (µg/L)												
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	390	470	480	360	460	260	250 U	150
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	260	260 J	290	250 U	250 U	250 U	340	320
cPAH (µg/L)												
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.090	0.070	0.14	0.18
Chrysene	8270 (c)	1.0	5.5	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.060	0.047	0.13	0.23
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	0.14
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.10 U	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	0.24
ncPAH (µg/L)												
Naphthalene	8270 (c)	9880		10	1.0 UJ	1.0 U	1.0 UJ	1.0 U	0.40	0.75 U	4.5	1.9
2-Methylnaphthalene	8270 (c)			10	4.9	1.0 U	2.0	1.0 U	9.3	1.5	7.8	11
Acenaphthylene	8270 (c)			10	1.4	1.0 U	1.0 U	2.3	0.47	0.70	1.0 U	1.2 U
Acenaphthene	8270 (c)	225	428	10	46	64 J	50	50	48	45	55	54
Fluorene	8270 (c)	2422		10	10	11	10	6.8	8.5	4.0	15	15
Phenanthrene	8270 (c)			10	1.6	1.0 U	1.2	1.0 U	0.010 U	0.36	15	12
Anthracene	8270 (c)	25900		10	1.0	1.1	1.2	1.0 U	0.77	0.010 U	1.7	2.1
Fluoranthene	8270 (c)	27.1		10	1.5	1.7	1.4	1.4	1.4	1.4	1.8	1.6
Pyrene	8270 (c)	777		10	1.1	1.4	1.0	1.1	1.3	1.1	1.3	1.6
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	1.0 U	1.2 U
BTEX (µg/L)												
Benzene	8260/8021MOD	71	220	5	1.0	1.6	2.1	1.1	1.5	0.7	1.0	1.5
Toluene	8260/8021MOD	485		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
Ethylbenzene	8260/8021MOD	276		5	1.0 U	1.0 U	1.4	1.0 U	1.1	0.6	1.0 U	1.0 U
m,p-Xylene	8260/8021MOD			5 (d)	1.8	1.9	2.7	1.9	1.6	1.5	1.0 U	2.0 U
o-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2 U	1.0 U	1.0 U
DISSOLVED METALS (µg/L)												
Arsenic	200.8	4	37	4	1	1 J	1	1.0	1	2	7.0	1.5
CONVENTIONALS												
Total Dissolved Solids (µg/L)	160.1/SM2540D				530,000 J	550,000	530,000	530,000	510,000	500,000	502,000	455,000
Total Suspended Solids (µg/L)	160.2				5,100	11,000 J	19,000	4,900	6,200	7,900	14,800	4,630,000
pH	Field				7.26	6.82	7.27	7.32	7.26	6.86	7.88	8.13
Specific Conductance (µmhos)	Field				1,020	1,270	920	1,088	641	930	1,314	724
Temperature (°C)	Field				16.5	13.2	11.4	14.6	15.4	15.2	16.6	15.9

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-105 DQ61D 9/26/2001	MW-105 DY69F 12/19/2001	MW-105 EE79D 3/20/2002	MW-105 EM41E 6/19/2002	MW-105 FP47D/M 6/25/2003	MW-105 GS18D 6/9/2004	MW-105 PL85D 8/25/2009	MW-105 YO69C 06/18/2014
TPH (µg/L)												
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	1,600	1,400	1,600	1,500	1,400	760	250 U	180
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	2,300 J	2,100 J	2,000	1,600 J	1,500	1,100	3,000	1,600
cPAH (µg/L)												
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.41	0.77 J	0.85	0.24	0.24	0.46	1.2	0.35
Chrysene	8270 (c)	1.0	5.5	1.0	0.27	0.56 J	0.66 J	0.16	0.15	0.28	1.1	0.28
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.20 J	0.17	0.10 U	0.030	0.10	0.55	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.32 J	0.36	0.10 U	0.040	0.12	0.74	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.40 J	0.41	0.10 U	0.040	0.14	1.0	0.19
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.19 J	0.15	0.10 U	0.010 U	0.068	0.48	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 UJ	0.10 U	0.10 U	0.010 U	0.053	0.17	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	0.29
ncPAH (µg/L)												
Naphthalene	8270 (c)	9880		10	610 J	860 J	940 J	410	480 J	540	240	180
2-Methylnaphthalene	8270 (c)			10	89	74	96	76	71	62	29	19
Acenaphthylene	8270 (c)			10	1.7	1.2	1.0 U	1.1	0.29 J	0.98	1.0 U	1.2 U
Acenaphthene	8270 (c)	225	428	10	67	80 J	79	75	54	48	50	33
Fluorene	8270 (c)	2422		10	29	35	30	32	24	20	19	12
Phenanthrene	8270 (c)			10	60	73	65	57	40	34	30	23
Anthracene	8270 (c)	25900		10	6.4	9.6	8.1	5.8	5.6	4.8	4.3	3.1
Fluoranthene	8270 (c)	27.1		10	8.1	11	11	7.4	5.9	6.5	6.0	4.7
Pyrene	8270 (c)	777		10	6.6	9.8	8.2	6.8	6.1	5.7	4.8	4.6
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.062	1.0 U	1.2 U
BTEX (µg/L)												
Benzene	8260/8021MOD	71	220	5	330	270 J	330	220	310	340	410	300
Toluene	8260/8021MOD	485		5	33	18 J	29	22	32	41	92	63
Ethylbenzene	8260/8021MOD	276		5	69	56 J	68	50	52	49	66	43
m,p-Xylene	8260/8021MOD			5 (d)	56	38 J	47	36	37	39	66	38
o-Xylene	8260/8021MOD			5 (d)	37	29 J	29	21	19	15	24	16
DISSOLVED METALS (µg/L)												
Arsenic	200.8	4	37	4	14	18 J	19	12	12	17	1.4	15
CONVENTIONALS												
Total Dissolved Solids (µg/L)	160.1/SM2540D				3,400,000 J	2,700,000	2,700,000	3,300,000	2,400,000	3,510,000	3,100,000	2,800,000
Total Suspended Solids (µg/L)	160.2				100,000	110,000 J	97,000	88,000	98,000	44,900	91,100	996,000
pH	Field				6.72	6.73	6.87	6.94	7.08	7	NM	8.34
Specific Conductance (µmhos)	Field				6,230	5,850	5,460	6,830	6,610	5,262	NM	4,239
Temperature (°C)	Field				18.9	16.6	15.8	17.0	17.3	17.2	NM	17.7

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-107R DQ61E 9/26/2001	MW-107R DY69G 12/19/2001	MW-107R EE79E 3/20/2002	MW-107R EM41F 6/19/2002	MW-107R FP47E/N 6/25/2003	MW-107R GS18C 6/9/2004	MW-107R PL85C 8/25/2009	MW-107R YO99C 06/19/2014
TPH (µg/L)												
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	1,900	630	1,200	1,000	1,400	680	290	290
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	3,900	780 J	1,200	1,700	2,500	880	1,300	4,200
cPAH (µg/L)												
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.053	0.10 U	0.12 U
Chrysene	8270 (c)	1.0	5.5	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.051	0.10 U	0.12 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.050 U	0.10 U	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.050 U	0.10 U	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.050 U	0.10 U	0.12 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.050 U	0.10 U	0.12 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.050 U	0.10 U	0.12 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	0.12 U
ncPAH (µg/L)												
Naphthalene	8270 (c)	9880		10	1,400 J	990 J	2,200 J	1,000	1,400 J	1,200	480	160
2-Methylnaphthalene	8270 (c)			10	150	66	150	77	220	140	100	57
Acenaphthylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	0.30 J	0.47	1.0 U	3.4 U
Acenaphthene	8270 (c)	225	428	10	56	38 J	63	43	76	58	44	29
Fluorene	8270 (c)	2422		10	15	10	17	13	27	19	12	8.5
Phenanthrene	8270 (c)			10	12	7.6	14	8.8	18	14	8.7	8.4
Anthracene	8270 (c)	25900		10	1.0	1.0 U	1.0	1.0 U	1.4	1.0	1.0 U	3.4 U
Fluoranthene	8270 (c)	27.1		10	1.0 U	1.0 U	1.0 U	1.0 U	0.49	0.47	1.0 U	3.4 U
Pyrene	8270 (c)	777		10	1.0 U	1.0 U	1.0 U	1.0 U	0.44	0.49	1.0 U	3.4 U
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.050 U	1.0 U	3.4 U
BTEX (µg/L)												
Benzene	8260/8021MOD	71	220	5	5.7	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.4
Toluene	8260/8021MOD	485		5	22	5.0 UJ	5.0 U	5.0 U	9.0	5.0 U	1.0 U	1.1
Ethylbenzene	8260/8021MOD	276		5	110	21 J	33	32	72	24	15	32
m,p-Xylene	8260/8021MOD			5 (d)	89	15 J	23	23	45	15	7.8	16
o-Xylene	8260/8021MOD			5 (d)	66	11 J	15	13	30	11	5.9	11
DISSOLVED METALS (µg/L)												
Arsenic	200.8	4	37	4	8	7 J	7	5	3	8	4.4	4
CONVENTIONALS												
Total Dissolved Solids (µg/L)	160.1/SM2540D				1,300,000 J	1,700,000	1,500,000	1,800,000	1,500,000	1,550,000	1,250,000	917,000
Total Suspended Solids (µg/L)	160.2				63,000	53,000 J	46,000	48,000	53,000	45,800	38,400	28,600
pH	Field				7.31	6.79	6.85	6.90	6.94	6.85	7.36	6.67
Specific Conductance (µmhos)	Field				2,900	3,710	2,780	3,303	2,630	2,792	3,107	1,208
Temperature (°C)	Field				14.6	12.4	11.9	13.0	14.0	14.0	13.1	13.0

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-108R DQ61F 9/26/2001	MW-108R DY69H 12/19/2001	Dup of MW108R MW-109R DY69I 12/19/2001	MW-108R EE79F 3/20/2002	MW-108R EM41G 6/19/2002	MW-108R FP47I/R 6/25/2003	MW-108R GS18H 6/9/2004	MW-108R PL72C 8/24/2009
TPH (µg/L)												
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	250 U	250 U	250 U	250 U	330	250 U	250 U	250 U
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	250 J	250 UJ	250 UJ	250 U	250 UJ	250 U	250 U	250 U
cPAH (µg/L)												
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.030	0.10	0.10 U
Chrysene	8270 (c)	1.0	5.5	1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.020	0.099	0.10 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.055	0.10 U
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.074	0.10 U
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.066	0.10 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.070	0.10 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.070	0.10 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	NA	NA	NA	NA	NA	NA	NA	NA
ncPAH (µg/L)												
Naphthalene	8270 (c)	9880		10	22 J	31 J	20 J	27 J	49	33 J	11	12
2-Methylnaphthalene	8270 (c)			10	3.9	4.7	3.7	5.0	7.9	6.2	2.8	1.6
Acenaphthylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.040	0.050 U	1.0 U
Acenaphthene	8270 (c)	225	428	10	2.6	3.0 J	2.3 J	3.0	4.6	3.3	2.1	2.1
Fluorene	8270 (c)	2422		10	1.0	1.1	1.0 U	1.0	1.4	1.1	1.0	1.0 U
Phenanthrene	8270 (c)			10	1.8	2.0	1.7	1.6	1.7	1.5	1.9	1.0
Anthracene	8270 (c)	25900		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22	0.29	1.0 U
Fluoranthene	8270 (c)	27.1		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.16	0.28	1.0 U
Pyrene	8270 (c)	777		10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.21	0.30	1.0 U
Benzo(g,h,i)perylene	8270 (c)			10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	0.058	1.0 U
BTEX (µg/L)												
Benzene	8260/8021MOD	71	220	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	8260/8021MOD	485		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	8260/8021MOD	276		5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5	1.0 U	1.0 U
m,p-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DISSOLVED METALS (µg/L)												
Arsenic	200.8	4	37	4	4	9 J	14 J	6	5	2 U	5 U	2 U
CONVENTIONALS												
Total Dissolved Solids (µg/L)	160.1/SM2540D				11,000,000 J	9,900,000	9,800,000	10,000,000	10,000,000	11,000,000	8,970,000	9,040,000
Total Suspended Solids (µg/L)	160.2				99,000	130,000 J	94,000 J	87,000	84,000	86,000	79,100	60,100
pH	Field				7.39	6.76	6.77	6.72	6.73	6.71	6.76	6.45
Specific Conductance (µmhos)	Field				18,800	19,300	19,300	1,800	2,548	21,100	11,900	16,760
Temperature (°C)	Field				16.2	13.6	13.4	13.1	14.4	15.2	15.4	15.5

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (µg/L)	Background-based Screening Level (a) (µg/L)	Practical Quantitation Limits (µg/L)	MW-108R YO99B 06/19/2014	Dup of MW108R DUP-1 YO99A 06/19/2014
TPH (µg/L)						
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx		7,940	400 (b)	100 U	100 U
Motor Oil-Range Petroleum Hydrocarbons	NWTPH-Dx			1100 (b)	200 U	200 U
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G		7,382	600 (b)	250 U	250 U
cPAH (µg/L)						
Benzo(a)anthracene	8270 (c)	1.0	6.3	1.0	0.12 U	0.11 U
Chrysene	8270 (c)	1.0	5.5	1.0	0.12 U	0.11 U
Benzo(b)fluoranthene	8270 (c)	1.0		1.0	NA	NA
Benzo(k)fluoranthene	8270 (c)	1.0		1.0	NA	NA
Benzo(a)pyrene	8270 (c)	1.0		1.0	0.12 U	0.11 U
Indeno(1,2,3-cd)pyrene	8270 (c)	1.0		1.0	0.12 U	0.11 U
Dibenzo(a,h)anthracene	8270 (c)	1.0		1.0	0.12 U	0.11 U
Total Benzofluoranthenes	8270 (c)	1.0		1.0	0.12 U	0.11 U
ncPAH (µg/L)						
Naphthalene	8270 (c)	9880		10	1.4	1.7
2-Methylnaphthalene	8270 (c)			10	1.1 U	1.2 U
Acenaphthylene	8270 (c)			10	1.1 U	1.2 U
Acenaphthene	8270 (c)	225	428	10	1.3	1.2
Fluorene	8270 (c)	2422		10	1.1 U	1.2 U
Phenanthrene	8270 (c)			10	1.1 U	1.2 U
Anthracene	8270 (c)	25900		10	1.1 U	1.2 U
Fluoranthene	8270 (c)	27.1		10	1.1 U	1.2 U
Pyrene	8270 (c)	777		10	1.1 U	1.2 U
Benzo(g,h,i)perylene	8270 (c)			10	1.1 U	1.2 U
BTEX (µg/L)						
Benzene	8260/8021MOD	71	220	5	1.0 U	1.0 U
Toluene	8260/8021MOD	485		5	1.0 U	1.0 U
Ethylbenzene	8260/8021MOD	276		5	1.0 U	1.0 U
m,p-Xylene	8260/8021MOD			5 (d)	2.0 U	2.0 U
o-Xylene	8260/8021MOD			5 (d)	1.0 U	1.0 U
DISSOLVED METALS (µg/L)						
Arsenic	200.8	4	37	4	7	7
CONVENTIONALS						
Total Dissolved Solids (µg/L)	160.1/SM2540D				5,760,000	6,400,000
Total Suspended Solids (µg/L)	160.2				135,000	136,000
pH	Field				6.62	6.62
Specific Conductance (µmhos)	Field				12,780	12,748
Temperature (°C)	Field				16.1	16.1

TABLE 3-2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
09/01 TO 06/14
UNION STATION

cPAH =Carcinogenic polycyclic aromatic hydrocarbons
ncPAH = Noncarcinogenic polycyclic aromatic hydrocarbons
NA = Not analyzed for this constituent.
NM = Not measured due to insufficient volume.
U = Indicates the compound was undetected at the listed concentration
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
M = Indicates an estimated value of analyte detected and confirmed by analyst with low spectral match parameters.
R = The sample results were rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
Note: All metals samples were field filtered.

(a) Screening level is based on the 90th percentile (petroleum hydrocarbons and related constituents) or four times the 50th percentile (cPAHs) of the background data obtained from well B4/B-4R or the 90th percentile of the background data obtained from well B6/B6R. The 90th percentile was calculated using MTCA stat Background Module V2.0.
(b) PQL calculated from method detection limit.
(c) Analytical results reported from analyses using EPA Method 8270 or EPA Method 8270-SIM
(d) PQL identified for total xylenes in CAP.

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - BACKGROUND WELL B4/B4R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	6	2	25	---	---	2600	15000	6767	4443	5600
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	3	5	63	---	---	2000	6800	3900	2551	2900
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	6	2	25	---	---	1800	6500	4783	1830	5550
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	5	3	38	---	---	1.4	8.3	3.1	2.9	2.0
Chrysene	8270 (i)	1.0	5.5	1.0	8	5	3	38	---	---	1.3	7.4	2.8	2.6	1.7
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	5	3	38	---	---	1.0	7.2	2.4	2.7	1.2
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	1	7	88	---	---	3.6	3.6	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	---	---	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	5	3	38	---	---	1.5	9.9	3.4	3.64	1.81
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	5	3	38	---	---	710	2700	1922	906	2400
2-Methylnaphthalene	8270 (i)			10	8	5	3	38	---	---	160	510	372	154	450
Acenaphthylene	8270 (i)			10	8	1	7	88	---	---	10	10	--	--	--
Acenaphthene	8270 (i)	225	428.0	10	8	6	2	25	---	---	69	350	243	119	295
Fluorene	8270 (i)	2422		10	8	6	2	25	---	---	18	120	74	37	83
Phenanthrene	8270 (i)			10	8	5	3	38	---	---	46	130	93	34	110
Anthracene	8270 (i)	25900		10	8	4	4	50	---	---	10	22	16	5	16
Fluoranthene	8270 (i)	27.1		10	8	3	5	63	---	---	11	23	16	6	14
Pyrene	8270 (i)	777		10	8	5	3	38	---	---	11	32	16	9	12
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	---	---	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	6	2	25	---	---	130	150	135	8	130
Toluene	8260	485		5	8	0	8	100	---	---	--	--	--	--	--
Ethylbenzene	8260	276		5	8	6	2	25	---	---	110	230	185	46	190
m,p-Xylene	8260			5 (j)	8	0	8	100	---	---	--	--	--	--	--
o-Xylene	8260			5 (j)	8	2	6	75	---	---	6	6	6	0	6
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	4	4	50	---	---	4	13	9	5	10

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - BACKGROUND WELL B6R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	0	8	100	---	---	--	--	--	--	--
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	---	---	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	0	8	100	---	---	--	--	--	--	--
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	---	---	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	---	---	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	---	---	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	---	---	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	---	---	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	---	---					
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	0	8	100	---	---	--	--	--	--	--
2-Methylnaphthalene	8270 (i)			10	8	0	8	100	---	---	--	--	--	--	--
Acenaphthylene	8270 (i)			10	8	0	8	100	---	---	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	0	8	100	---	---	--	--	--	--	--
Fluorene	8270 (i)	2422		10	8	0	8	100	---	---	--	--	--	--	--
Phenanthrene	8270 (i)			10	8	0	8	100	---	---	--	--	--	--	--
Anthracene	8270 (i)	25900		10	8	0	8	100	---	---	--	--	--	--	--
Fluoranthene	8270 (i)	27		10.0	8	0	8	100	---	---	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	---	---	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	---	---	---	---	---	---	---
BTEX (µg/L)															
Benzene	8260	71	220	5	8	0	8	100	---	---	--	--	--	--	--
Toluene	8260	485		5	8	0	8	100	---	---	--	--	--	--	--
Ethylbenzene	8260	276		5	8	0	8	100	---	---	--	--	--	--	--
m,p-Xylene	8260			5 (j)	8	0	8	100	---	---	--	--	--	--	--
o-Xylene	8260			5 (j)	8	0	8	100	---	---	--	--	--	--	--
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	8	0	0	---	---	22	31	27	3	27

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW101R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	8	0	0	1	3984 (k)	1500	4200	2863	988	3000
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	8	0	0	1	6530 (k)	4100	7400	5700	1023	5700
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	0	NC	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	0	NC	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	8	0	0	1	4009 (k)	1200	4900	2613	1228	2450
2-Methylnaphthalene	8270 (i)			10	8	8	0	0	1	595 (k)	280	700	458	144	465
Acenaphthylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	8	0	0	1	309 (l)	150	350	266	63	255
Fluorene	8270 (i)	2422		10	8	8	0	0	1	85 (m)	54	85	74	10	74
Phenanthrene	8270 (i)			10	8	8	0	0	1	89 (k)	63	97	78	14	75
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10	8	0	8	100	0	NC	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	8	0	0	1	84 (k)	36	90	64	21	62
Toluene	8260	485		5	8	5	3	38	2	7.1 (l)	6	8	7	1	6
Ethylbenzene	8260	276		5	8	8	0	0	1	262 (k)	130	300	209	58	205
m,p-Xylene	8260			5 (j)	8	8	0	0	1	67 (k)	25	92	49	20	46
o-Xylene	8260			5 (j)	8	8	0	0	1	37 (m)	17	37	24	8.0	21
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	8	0	0	1	12 (k)	9	14	11	1.5	11

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW102R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	2	6	75	3	400 (n)	400	400	400	0	400
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	0	8	100	0	NC	--	--	--	--	--
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	0	NC	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	0	NC	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	2	6	75	3	22 (n)	12	22	17	7	17
2-Methylnaphthalene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthylene	8270 (i)				8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428		8	7	1	13	1	14 (l)	10	17	13	2	12
Fluorene	8270 (i)	2422		10	8	0	8	100	0	NC	--	--	--	--	--
Phenanthrene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10	8	0	8	100	0	NC	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	0	8	100	0	NC	--	--	--	--	--
Toluene	8260	485		5	8	0	8	100	0	NC	--	--	--	--	--
Ethylbenzene	8260	276		5	8	0	8	100	0	NC	--	--	--	--	--
m,p-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
o-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	6	2	25	2	8 (l)	5	11	7	2	6

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW104
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	3	5	62.5	3	480 (n)	460	480	470	10	470
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	0	8	100	0	NC	--	--	--	--	--
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	0	NC	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	0	NC	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	0	8	100	0	NC	--	--	--	--	--
2-Methylnaphthalene	8270 (i)			10	8	1	7	88	3	11 (n)	11	11	--	--	--
Acenaphthylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	8	0	0	1	56 (m)	45	64	52	6.1	50
Fluorene	8270 (i)	2422		10	8	5	3	38	2	15 (m)	10	15	12	2.6	11
Phenanthrene	8270 (i)			10	8	2	6	75	3	15 (n)	15	15	--	--	--
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10	8	0	8	100	0	NC	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	0	8	100	0	NC	--	--	--	--	--
Toluene	8260	485		5	8	0	8	100	0	NC	--	--	--	--	--
Ethylbenzene	8260	276		5	8	0	8	100	0	NC	--	--	--	--	--
m,p-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
o-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	1	7	88	3	7 (n)	7	7	--	--	--

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW105
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	6	2	25	2	1600 (m)	760	1600	1377	315	1450
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	8	0	0	1	2429 (k)	1100	3000	1900	586	1800
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	1	7	88	3	1.2 (n)	1.2	1.2	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	1	7	88	3	1.1 (n)	1.1	1.1	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	1	7	88	3	1.0 (n)	1.0	1.0	--		
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	1	7	88	3	1.3* (n)	1.3	1.3	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	8	0	0	1	949 (k)	180	940	533	269	510
2-Methylnaphthalene	8270 (i)			10	8	8	0	0	1	83 (k)	19	96	65	27	73
Acenaphthylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	8	0	0	1	78 (k)	33	80	61	17	61
Fluorene	8270 (i)	2422		10	8	8	0	0	1	34 (k)	12	35	25	8	27
Phenanthrene	8270 (i)			10	8	8	0	0	1	69 (k)	23	73	48	18	49
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10.0	8	2	6	75	3	11 (n)	11	11	11	0	11
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	8	0	0	1	359 (k)	220	410	314	55	320
Toluene	8260	485		5	8	8	0	0	1	22 (k)	9	22	16	9	16
Ethylbenzene	8260	276		5	8	8	0	0	1	64 (k)	43	69	57	9.9	54
m,p-Xylene	8260			5 (j)	8	8	0	0	1	66 (m)	36	66	45	11	39
o-Xylene	8260			5 (j)	8	8	0	0	1	31 (k)	15	37	24	7.5	23
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	7	1	13	1	19 (m)	4	19	14	4.8	15

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW107R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	6	2	25	2	2042 (k)	630	1900	1135	477	1100
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	8	0	0	1	3980 (k)	780	4200	2058	1344	1500
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	0	NC	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	0	NC	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	8	0	0	1	1519 (k)	160	2200	1104	620	1100
2-Methylnaphthalene	8270 (i)			10	8	8	0	0	1	184 (k)	57	220	120	55	120
Acenaphthylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	8	0	0	1	65 (k)	29	76	51	15	50
Fluorene	8270 (i)	2422		10	8	7	1	13	1	20 (k)	10	27	15	5.7	14
Phenanthrene	8270 (i)			10	8	4	4	50	2	15 (l)	12	18	15	2.5	14
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10	8	0	8	100	0	NC	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	1	7	88	3	5.7 (n)	5.7	5.7	5.7	0	5.7
Toluene	8260	485		5	8	2	6	75	3	22 (n)	22	22	22	0	22
Ethylbenzene	8260	276		5	8	8	0	0	1	82 (k)	15	110	42	32	32
m,p-Xylene	8260			5 (j)	8	8	0	0	1	66 (k)	8	89	29	27	20
o-Xylene	8260			5 (j)	8	8	0	0	1	66 (m)	6	66	20	20	12
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	7	1	13	1	8 (m)	4	8	6	1.7	7

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - WELL MW108R
09/01 TO 06/14
UNION STATION

Analyte	Method	CAP Cleanup Level (a) (µg/L)	Background-based Screening Level (b) (µg/L)	Practical Quantitation Limits (c) (µg/L)	Number of Samples (d)	Number of Detects (>= PQL)	Number of Censored Data (e)	Percent Censored Data	Statistical Case No. (f)	UCL (g)	Minimum Uncensored Data	Maximum Uncensored Data	Mean of Uncensored Data (g)	Std. Dev. of Uncensored Data (g)	Median of Uncensored Data (g)
TPH (µg/L)															
Diesel-Range Petroleum Hydrocarbons	WTPH-Dx		7,940	400 (h)	8	0	8	100	0	NC	--	--	--	--	--
Motor Oil-Range Petroleum Hydrocarbons	WTPH-Dx			1100 (h)	8	0	8	100	0	NC	--	--	--	--	--
Gasoline-Range Petroleum Hydrocarbons	WTPH-G		7,382	600 (h)	8	0	8	100	0	NC	--	--	--	--	--
cPAH (µg/L)															
Benzo(a)anthracene	8270 (i)	1.0	6.3	1.0	8	0	8	100	0	NC	--	--	--	--	--
Chrysene	8270 (i)	1.0	5.5	1.0	8	0	8	100	0	NC	--	--	--	--	--
Benzo(a)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Dibenzo(a,h)anthracene	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
Total Benzofluoranthenes	8270 (i)	1.0		1.0	8	0	8	100	0	NC	--	--	--	--	--
ncPAH (µg/L)															
Naphthalene	8270 (i)	9880		10	8	7	1	13	1	44 (k)	10	49	24	14	25
2-Methylnaphthalene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Acenaphthene	8270 (i)	225	428	10	8	0	8	100	0	NC	--	--	--	--	--
Fluorene	8270 (i)	2422		10	8	0	8	100	0	NC	--	--	--	--	--
Phenanthrene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
Anthracene	8270 (i)	25900		10	8	0	8	100	0	NC	--	--	--	--	--
Fluoranthene	8270 (i)	27		10	8	0	8	100	0	NC	--	--	--	--	--
Pyrene	8270 (i)	777		10	8	0	8	100	0	NC	--	--	--	--	--
Benzo(g,h,i)perylene	8270 (i)			10	8	0	8	100	0	NC	--	--	--	--	--
BTEX (µg/L)															
Benzene	8260	71	220	5	8	0	8	100	0	NC	--	--	--	--	--
Toluene	8260	485		5	8	0	8	100	0	NC	--	--	--	--	--
Ethylbenzene	8260	276		5	8	0	8	100	0	NC	--	--	--	--	--
m,p-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
o-Xylene	8260			5 (j)	8	0	8	100	0	NC	--	--	--	--	--
DISSOLVED METALS (µg/L)															
Arsenic	200.8	4	37	4	8	5	3	38	2	7.4 (l)	4	9	6.2	1.9	6

TABLE 4-1
STATISTICAL SUMMARY OF GROUNDWATER DATA - FOOTNOTES
UNION STATION

-- = Not Applicable.

J = Data qualifier indicating that the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UCL = Upper confidence limit.

NC = Not calculated.

= UCL exceeds the cleanup level.

(a) Cleanup levels are from Table 1 of the Cleanup Action Plan, unless otherwise indicated.

(b) Screening level is based on the 90th percentile (petroleum hydrocarbons and related constituents) or four times the 50th percentile (cPAHs) of the background data obtained from well B4/B-4R or the 90th percentile of the background data obtained from well B6/B6R. The 90th percentile was calculated using MTCA stat Background Module V2.0.

(c) Practical quantitation limits are from Table 1 of the Cleanup Action Plan, unless otherwise indicated.

(d) The number of samples is equal to the number of samples analyzed.

(e) Censored data consists of nondetected results and detected values less than the PQL.

(f) Statistical Case Nos:

0 = Data set consists of 100% censored data

1 = Data set consists of not more than 15 % censored data.

2 = Data set consists of more than 15 % censored data but less than or equal to 50% censored data.

3 = Data set consists of more than 50 % censored data but less than 100 % censored data.

(g) No UCL, mean, standard deviation, or median were calculated for data sets with 100% censored data. Also, no UCL was calculated for background wells B-4 and B-6/B-6R.

(h) Practical quantitation limit is equal to approximately 10 times the laboratory method detection limit.

(i) Analytical results reported from analyses using EPA Method 8270 or EPA Method 8270-SIM

(j) Practical quantitation limit identified for total xylenes in Cleanup Action Plan.

(k) The data set consists of less than or equal to 15 % censored data (Case No. 1): therefore, in accordance with the Supplement to Statistical Guidance for Ecology Site Managers (Ecology 1993), all nondetected values were replaced with 1/2 the detection limit and all detected values less than the PQL were replaced with the detection limit. Statistics were then performed on the adjusted data.

(l) Upper confidence limit calculated using MTCAStat 97 Site Module.

(m) The data set was determined to be neither lognormally nor normally distributed by MTCAstat; therefore, in accordance with the Supplement to Statistical Guidance for Ecology Site Managers (Ecology 1993), the upper confidence level was set equal to the maximum concentration in the data set.

(n) Greater than 50% of the data are censored; therefore, in accordance with the Supplement to Statistical Guidance for Ecology Site Managers (Ecology 1993), the upper 95% confidence limit was set equal to the maximum concentration in the data set.

(*) Beginning with the 2014 groundwater monitoring report, benzo(b) and benzo(k) fluoranthenes are reported by the laboratory as Total Benzofluoranthenes. The value for Total Benzofluoranthenes on Table 4-1 for well MW105R is the UCL calculated using the Case 3 procedure, which selects the maximum concentration in the data set, which is the sum of (b) and (k) from 2009. Total Benzofluoranthenes were reported in 2009 separately as benzo(b) at 0.55 ug/L and benzo(k) at 0.74 ug/L. Both of these individual data results are less than the PQL of 1.0 ug/L and the CAP Cleanup Level of 1.0 ug/L. Therefore, there is no exceedance of Total Benzofluoranthenes.

TABLE 4-2
SUMMARY OF CLEANUP AND SCREENING LEVEL EXCEEDANCES
(CONCENTRATIONS IN µg/L)

Constituent	Location	CAP CUL	Background-based Screening Level	9/2001-6/2014 UCL	6/2001 - 8/2009 UCL	3/2001 - 6/2004 UCL	12/2000 - 6/2003 UCL	9/2000 - 6/2002 UCL	9/1999 - 6/2001 UCL	6/1998 - 6/2000 UCL	Comments
Acenaphthene											Apparent off-property sources
	MW-101R	225	428	309	350	350	350	350	340	276	
Benzene											Apparent off-property sources
	MW-101R	71	220	84	87	87	82	77	78	104	
	MW-105	71	220	359	337	346	350	361	376	373	
Arsenic											Apparent off-property sources
	MW-101R	4	37	12	12	12	13	13	14	14	
	MW-102R	4	37	8	9	8	9	9	9	7	
	MW-104	4	37	7	7	--	--	--	--	--	
	MW-105	4	37	19	19	17	19	19	18	21	
	MW-107R	4	37	8	8	8	8	8	8	10	
	MW-108R	4	37	7	7	9	15	15	12	8	
Benzo(a)anthracene											Apparent off-property sources
	MW-105	1.0	6.3	1.2	1.2	--	--	--	--	--	
Chrysene											Apparent off-property sources
	MW-105	1.0	5.5	1.1	1.1	--	--	--	--	--	

CAP CUL = Cleanup level listed in the Cleanup Action Plan.

UCL = Upper Confidence Limit.

-- = Indicates a UCL was not calculated because all concentrations were below the PQL during the respective period.

APPENDIX A

Data Validation Technical Memorandum

TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Tim Syverson, Project Manager

FROM: Kristi Schultz and Anne Halvorsen

DATE: July 23, 2014

RE: UNION STATION
ANNUAL 2014 GROUNDWATER SAMPLING
LABORATORY DATA QUALITY EVALUATION

This memorandum provides the results of verification and validation checks of analytical data for 9 groundwater samples, 1 field duplicate, and 2 trip blanks collected during the 5-year groundwater sampling event at the Union Station property on June 18-19, 2014. All sample analyses were conducted at Analytical Resources, Inc. (ARI) laboratory, located in Tukwila, Washington. This data quality evaluation covers ARI data packages YO69 and YO99.

Sediment samples were analyzed for some or all of the following: Polycyclic aromatic hydrocarbons [PAHs; U.S. Environmental Protection Agency (EPA) Method 8270D]; carcinogenic polycyclic aromatic hydrocarbons [cPAHs; EPA Method 8270D with selected ion monitoring (SIM)]; total petroleum hydrocarbons (TPH) [Washington State Department of Ecology (Ecology) Methods NWTPH-Gx and NWTPH-Dx]; benzene, toluene, ethylbenzene, and xylenes (BTEX) (EPA Method SW8021BMod); dissolved arsenic (EPA Method 200.8); and total dissolved solids and total suspended solids (EPA Method 160.1 and SM2540D, respectively).

The verification and validation checks were conducted in accordance with Appendix A of the *Union Station Property Cleanup Action Plan* (CAP; Landau Associates 1997), and with guidance from applicable portions of the *National Functional Guidelines for Organic Data Review* (EPA 1999, 2008) and the *National Functional Guidelines for Inorganic Data Review* (EPA 2004, 2010). The verification and validation check for each laboratory data package included the following:

- Verification that the laboratory data package contained all necessary documentation (including chain-of-custody records; identification of samples received by the laboratory; date and time of receipt of the samples at the laboratory; sample conditions upon receipt at the laboratory; date and time of sample analysis; explanation of any significant corrective actions taken by the laboratory during the analytical process; and, if applicable, date of extraction, definition of laboratory data qualifiers, all sample-related quality control data, and quality control acceptance criteria).
- Verification that all requested analyses, special cleanups, and special handling methods were performed.
- Evaluation of sample holding times.

- Evaluation of quality control data compared to acceptance criteria, including method blanks, surrogate recoveries, laboratory duplicate and/or replicate results, and laboratory control sample results.
- Evaluation of overall data quality and completeness of analytical data.

Data validation qualifiers are added to the sample results, as appropriate, based on the verification and validation check. The absence of a data qualifier indicates that the reported result is acceptable without qualification. The data quality evaluation is summarized below.

LABORATORY DATA PACKAGE COMPLETENESS

Each laboratory data package contained a signed chain-of-custody, a cooler receipt form documenting the condition of the samples upon receipt at the laboratory, a cooler temperature compliance form, sample analytical results, and quality control results (method blanks, surrogate recoveries, laboratory control sample results, and replicate sample results). A case narrative identifying any complications was also provided with each laboratory data package. Definitions of laboratory qualifiers and quality control acceptance criteria were provided, as appropriate.

SAMPLE CONDITIONS AND ANALYSIS

The laboratory received the samples in good condition and all analyses were performed as requested. Preservation of samples, as specified by the analytical method, was verified by the laboratory and adjusted as appropriate. Per Landau Associates, Inc., the samples were allowed to settle and sample aliquots were collected from the clear portion.

Upon receipt by ARI, the sample container information was compared to the associated chain-of-custody and the cooler temperatures were recorded. One cooler was received with a temperature of 6.8°C, which is slightly above the EPA-recommended upper limit of 6°C. All other cooler temperatures were acceptable. No qualification of the data was determined necessary due to the higher cooler temperature.

HOLDING TIMES

For all analyses and all samples, the time between sample collection, extraction (if applicable), and analysis was determined to be within EPA- and project-specified holding times. No qualification of the data was necessary.

METHOD BLANKS

At least one method blank was analyzed with each batch of samples. No contamination was detected in the method blanks. No qualification of the data is necessary.

FIELD TRIP BLANKS

One trip blank was submitted to the laboratory for both the NWTPH-G and BTEX analyses for both data packages. No contamination was detected in the trip blanks. No qualification of the data was necessary.

SURROGATE SPIKE RECOVERIES

Appropriate compounds were used as surrogate spikes for each analysis. Recovery values for the surrogate spikes were within the current laboratory-specified control limits with the following exceptions:

- Recovery of the surrogate 2-fluorobiphenyl associated with the PAHs analysis for sample MW101R and for the method blank in data package YO69 was below the laboratory-specified control limit. EPA National Functional Guidelines for SVOC sample surrogate qualification require two or more surrogates of the same fraction to be outside laboratory-specified control limits; therefore, no qualification of the data was necessary.
- Recoveries of the surrogates 2-fluorobiphenyl and d14-p-terphenyl associated with the PAHs analysis for the dilution of sample MW101R in data package YO69 were outside laboratory-specified control limits due to dilution; no qualification of the data was necessary.
- Recovery of the surrogate 2-fluorobiphenyl associated with the PAHs analysis for sample B-4R and the method blank in data package YO99 was below the laboratory-specified control limit. EPA National Functional Guidelines for SVOC sample surrogate qualification require two or more surrogates of the same fraction to be outside laboratory-specified control limits; therefore, no qualification of the data was necessary.
- Recovery of the surrogate bromobenzene associated with the TPH and BTEX analyses for sample B-4R in data package YO99 was below the laboratory-specified control limit. The associated sample results were qualified as estimated (J,UJ), as indicated in Table 1.

MATRIX SPIKE (MS)/MATRIX SPIKE DUPLICATES (MSDS) AND LABORATORY DUPLICATES

No matrix spikes or matrix spike duplicates were performed by the analytical laboratory for this sampling event. A laboratory duplicate sample was analyzed with the conventional parameters in data packages YO69 and YO99; no laboratory duplicates were performed for SVOCs, TPH, or metals. The relative percent differences (RPDs) between the laboratory duplicate results were within the laboratory-specified control limits for all project samples. No qualification of the data was necessary.

LABORATORY CONTROL SAMPLE (BLANK SPIKE) RESULTS

At least one laboratory control sample and/or laboratory control sample duplicate (LCS/LSCD) was analyzed with each batch of samples. Recoveries and relative percent differences (RPDs) for the laboratory control samples and associated duplicates were within the current laboratory control limits. No qualification of the data was necessary.

FIELD DUPLICATE RESULTS

One blind field duplicate sample pair (MW-108R/DUP-1) was collected, meeting the requirement specified in Appendix A of the Cleanup Action Plan of one duplicate per 20 samples, but no less than one field duplicate per sampling round. RPDs between the blind field duplicate sample results were within the project-specified control limit of 20 percent. No qualification of the data was necessary.

INITIAL AND CONTINUING CALIBRATION

Laboratory-specified calibration limits for initial and continuing calibrations were met for all analyses. No qualification of the data was necessary.

REPORTING LIMITS

Method and/or project-specified reporting limits were met. No qualification of data was necessary.

COMPLETENESS AND OVERALL DATA QUALITY

The completeness for this data set is 100 percent, which exceeds the project-specified goal of 90 percent.

Data precision was evaluated through laboratory control sample duplicates, laboratory duplicates, and blind field duplicates. Data accuracy was evaluated through laboratory control samples and surrogate spikes. Based on this data quality verification and validation, the data were determined to be acceptable. No data were rejected

REFERENCES

EPA. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.* USEPA-540-R-10-011. U.S. Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. Washington, D.C. January.

EPA. 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.* USEPA-540-R-08-01. U.S. Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. Washington, D.C. June.

EPA. 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.* EPA 540-R-04-004. U.S. Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. October.

EPA. 1999. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review.* EPA-540/R-99-008. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Washington, D.C. October.

Landau Associates. 1997. *Cleanup Action Plan, Union Station Property, Seattle, Washington.*

TABLE 1
SUMMARY OF DATA QUALIFIERS
2014 GROUNDWATER SAMPLING
UNION STATION
SEATTLE, WASHINGTON

Data Package	Analyte	Result	Qualifier	Sample Number	Reason
YO99	Gasoline	0.25 U	UJ	B-4R	Low surrogate recovery
YO99	Benzene	1.0 U	UJ	B-4R	Low surrogate recovery
YO99	Toluene	1.0 U	UJ	B-4R	Low surrogate recovery
YO99	Ethylbenzene	1.0 U	UJ	B-4R	Low surrogate recovery
YO99	m,p-Xylene	2.0 U	UJ	B-4R	Low surrogate recovery
YO99	o-Xylene	1.0 U	UJ	B-4R	Low surrogate recovery

Notes
U = Indicates the compound was not detected at the reported concentration.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

APPENDIX B

Screening Levels Based on Background

4.2 UNION STATION

6.6 B-4 Acenaphthene

69 Screening Levels Based on Background 10/97 to 06/14

120 MTCA*Stat* 3.0

180 Number of samples		Uncensored values	
240 Uncensored	21	Mean	284.75
270 Censored	0	Lognormal mean	453.60
280 TOTAL	21	Std. devn.	134.51
300		Median	330
320		Min.	4.2
330		Max.	450

350 Lognormal distribution? Normal distribution?

350 r-squared is: 0.59 r-squared is: 0.89

370 Recommendations:

390 Use nonparametric method.

Distribution selection	Enter percentile	Value corresponding to that percentile is:
3	90	428.00
1 = Lognormal	50th	330.00
2 = Normal	4 X 50th	1320.00
3 = Nonparametric method	Coefficient of Variation = N/A	

0.06 UNION STATION
0.27 B-4R Benzo(a)anthracene
0.37 Screening Levels Based on Background 10/97 to 06/14

0.39 MTCA*Stat* 3.0

0.41 Number of samples		Uncensored values	
0.44 Uncensored	21	Mean	4.55
0.53 Censored	0	Lognormal mean	5.29
0.91 TOTAL	21	Std. devn.	7.57
1		Median	1.4
1.1		Min.	0.06
1.4		Max.	32

1.7

2 Lognormal distribution?	Normal distribution?
2.1	
4 r-squared is: 0.98	r-squared is: 0.60

5.8 Recommendations:

6 Use lognormal distribution.

8.3
9.8
17
32

Distribution selection	Enter percentile	Value corresponding to that percentile is:
1	90	12.72
1 = Lognormal	50th	1.57
2 = Normal	4 X 50th	6.30
3 = Nonparametric method	Coefficient of Variation = 3.64	

0.5 UNION STATION

0.5 B-4 Benzene

94 Screening Levels Based on Background 10/97 to 06/14

120 MTCA*Stat* 3.0

130 Number of samples		Uncensored values	
130 Uncensored	21	Mean	135.48
130 Censored	0	Lognormal mean	373.21
130 TOTAL	21	Std. devn.	57.75
130		Median	140
130		Min.	0.5
140		Max.	260

140

140 Lognormal distribution?	Normal distribution?
140	
150 r-squared is: 0.44	r-squared is: 0.82

150

160 Recommendations:

160

180

230

260 Use nonparametric method.

Distribution selection	Enter percentile	Value corresponding to that percentile is:
3	90	220.00
1 = Lognormal	50th	140.00
2 = Normal	4 X 50th	560.00
3 = Nonparametric method	Coefficient of Variation = N/A	

0.06 UNION STATION

0.24 B-4 Chrysene

0.34 Screening Levels Based on Background 10/97 to 06/14

0.36 MTCA*Stat* 3.0

0.37 Number of samples		Uncensored values	
0.43 Uncensored	21	Mean	4.12
0.45 Censored	0	Lognormal mean	4.61
0.68 TOTAL	21	Std. devn.	7.10
0.76		Median	1.3
0.83		Min.	0.06
1.3		Max.	30

1.5

1.7 Lognormal distribution?	Normal distribution?
2	
3.3 r-squared is: 0.98	r-squared is: 0.58

4.5

5.4 Recommendations:

7.4

9

16

30 Use lognormal distribution.

Distribution selection		Value corresponding
	Enter percentile	to that percentile is:
1	90	11.12
1 = Lognormal	50th	1.38
2 = Normal	4 X 50th	5.54
3 = Nonparametric method	Coefficient of Variation = 3.62	

50 UNION STATION

125 B-4R Diesel Range Hydrocarbons

2300 Screening Levels Based on Background 10/97 to 06/14

MTCA*Stat* 3.0

Number of samples		Uncensored values	
Uncensored	21	Mean	4594.05
Censored	0	Lognormal mean	7181.84
TOTAL	21	Std. devn.	3152.91
		Median	3800
		Min.	50
		Max.	15000

Lognormal distribution?	Normal distribution?
r-squared is: 0.66	r-squared is: 0.83

Recommendations:

Use nonparametric method.

Distribution selection	Enter percentile	Value corresponding to that percentile is:
3	90	7940.00
1 = Lognormal	50th	3800.00
2 = Normal	4 X 50th	15200.00
3 = Nonparametric method	Coefficient of Variation = N/A	

125 UNION STATION
280 B-4R Gasoline Range Hydrocarbons
1800 Screening Level Based on Background 10/97 to 06/14

MTCA*Stat* 3.0

Number of samples		Uncensored values	
Uncensored	21	Mean	4443.10
Censored	0	Lognormal mean	5788.03
TOTAL	21	Std. devn.	2156.40
		Median	4800
		Min.	125
		Max.	9000

Lognormal distribution?	Normal distribution?
r-squared is: 0.66	r-squared is: 0.95

Recommendations:

Use normal distribution.

Distribution selection	Enter percentile	Value corresponding to that percentile is:
2	90	7381.75
1 = Lognormal	50th	4443.10
2 = Normal	4 X 50th	17772.38
3 = Nonparametric method	Coefficient of Variation = 0.52	

UNION STATION

B-6R Arsenic

Screening Level Based on Background 10/97 to 06/14

MTCA*Stat* 3.0

Number of samples		Uncensored values	
Uncensored	21	Mean	21.52
Censored	0	Lognormal mean	21.88
TOTAL	21	Std. devn.	8.32
		Median	22
		Min.	6
		Max.	35

Lognormal distribution?	Normal distribution?
r-squared is: 0.91	r-squared is: 0.96

Recommendations:

Use lognormal distribution.

Distribution selection	Enter percentile	Value corresponding to that percentile is:
1	90	37.16
1 = Lognormal	50th	19.73
2 = Normal	4 X 50th	78.92
3 = Nonparametric method	Coefficient of Variation = 0.53	