UST CLOSURE AND SITE CLEANUP REPORT

Washington Mutual Bank
Kenmore, WA

Prepared for:
Washington Mutual Bank
1191 Second Avenue
SAS 0904
Seattle, WA 98101

Prepared by:
Environmental Management Resources, Inc.
2509 152nd Avenue NE, Suite B
Redmond, WA 98052

August 28, 1996

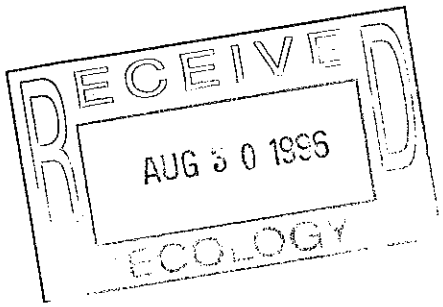


TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

On May 7, 1996, one 1,000-gallon and one 1,100 gallon underground storage tank (UST) were removed from the property located near the Harbour Village Marina at 6155 NE 175th Street, Seattle, Washington. A site assessment was performed to check for the presence of petroleum hydrocarbons in the soil adjacent to the USTs.

The USTs were located in two distinct areas referred to in this report as Area A and Area B. Area A is located just north of the Harbour Village Marina office building. The UST in this area was installed in 1983 and contained primarily used oil and bilge water. The UST in Area B was operated by a former lumber yard on the site and is believed to have contained diesel fuel. Visual inspection of the soils in the excavated tank pit in Area A and analytical results of soil samples indicated the presence of residual petroleum hydrocarbons in the soil. This UST did not have any visible corrosion holes or cracks. Analytical results from the initial sampling round ranged from 981 ppm in the gasoline range to 6,050 ppm in the heavy oil range. Visual inspection of the soils in the excavated tank pit in Area B and analytical results of soil samples did not indicate the presence of residual petroleum hydrocarbons in the soil. The UST from Area B did not have any visible corrosion holes or cracks. The tanks were recycled for scrap metal by Basin Oil of Seattle. The contaminated soil that was removed from the excavation was transported to the Holnam facility in Seattle for incineration and disposal.

Two composite soil samples were collected from the two stockpiles of excavated soil. Total petroleum hydrocarbons (TPH) in the gasoline range were not detected in either of these soil samples. TPH as diesel and heavy oil were detected at levels above MTCA cleanup standards in Area A.

Additional soil sampling indicated that there was TPH in the shallow soil in a small, 15 foot long swale extending south from the west end of the UST in Area A. This area was excavated to remove soil containing TPH above the MTCA Method A cleanup level of 200 ppm. Post-excavation soil samples indicated complete removal of the TPH contaminated soil. No further action is recommended for soil at this site.

Strataprobe groundwater sampling indicated the possibility of TPH in the groundwater off the west end of the former UST in Area A. A groundwater monitoring well was installed to determine the impact to groundwater from the former UST. The groundwater sample contained 1,300 ppb TPH as diesel fuel, above the 1,000 ppb MTCA Method A cleanup level.

No further action is recommended for groundwater at this site. The groundwater TPH concentration is only slightly above the cleanup level. The UST and contaminated soil, which were the sources of TPH, have been removed. The groundwater in the area of the UST is not used. The groundwater is at a depth of 5 feet bgs and does not pose a potential risk for surface exposures. Because the sources of TPH have been removed, natural degradation of the TPH in the groundwater has begun and will continue to decrease the TPH concentrations with time.

1.0 INTRODUCTION

On behalf of Washington Mutual Bank, Environmental Management Resources, Inc. (EMR) has prepared this UST Closure and Site Cleanup Report discussing activities undertaken to remove two underground storage tanks from property located near the Harbour Village Marina facility at 6155 NE 175th Street in Seattle. One tank was used by the marina for storage of used oil (UST Area A) and bilge water; the other UST previously contained diesel oil (UST Area B). The USTs were identified during a Phase I Environmental Site Assessment of the property performed by Applied Earth Sciences, Inc. This report details the activities associated with the closure of the USTs, site assessment and soil remediation activities that were performed at the site by EMR. The site assessment checklist is provided as Appendix E.

1.1 Site Location and Description

The site is located at 6155 NE 175th Street, Seattle, Washington (Figure 1). The site is in the SW ¼ of the NE ¼ of Section 11, Township 26 North, Range 4 East. The site area is located at the northern end of Lake Washington in the Kenmore area of Seattle (Figure 1). The site is adjacent to a commercial marina development with marina office, restaurant and condominium complex. Based on information obtained from the client, the UST in Area A was used by the marina for storage of used oil and bilge water and the UST in Area B was associated with a lumber company which used to occupy the site. There were no observed building foundations, debris or other evidence of this development on the day of the assessment.

Area A is located just north of the Harbour Village Marina office building at the corner of a asphalt-paved parking lot (Figure 2). The area above the tank had been landscaped with two trees and small shrubs. Several PVC water sprinkler pipes, wire conduits and a street lamp were located in the immediate UST area. A chain link security fence separates the marina property from the condominium development to the west. This chain link fence is located above the western end of the UST and runs north to a concrete block wall. Area B is located approximately 200 feet north of Area A, just west of the chain link fence (Figure 2). This area was open and clear of excavation hazards on the day of the assessment.

1.2 Surrounding Land Use

The site area is currently developed with both commercial and residential properties. The Harbour Village Marina complex consists of a condominium building to the west of the UST areas, marina office building to the south of the tank areas, a restaurant to the southeast of the tank areas and a parking lot to the east of the tank areas. The development is bound on the north by a concrete block wall with a development of residential homes beyond. Lake Union lies approximately 200 feet from the edge of Area A.

1.3 Geology

The soil underlying the site generally consists of a surface layer of dark brown organic silt with roots and some mottles. This layer is underlain by a medium, dense, brown, silty, fine-grained sand to a depth 10 to 12 feet below grade (Appendix C).

2.0 UST REMOVAL ACTIVITIES

2.1 UST Closure Activities

Tank excavation was subcontracted to Ace Contractors of Seattle. Mr. Mike Ankney (License No. 82652) with Ace was responsible for obtaining tank removal permits from King County and for operation of the backhoe during removal of the tanks. Neither of the tanks were located beneath pavement, so it was not necessary to remove any overlying paving material. The tanks were pumped and rinsed prior to excavation. The soil above the tanks was removed to reveal the top of the tanks, fill port, vent line and product lines. Dry ice was placed in each tank to displace any possible hazardous vapors. The tanks were inspected by a Mr. Dave Maulding, Deputy Fire Marshal with the King County Fire Marshal's office and both were approved for removal. The fill pipes and dispensing pipes were located directly over the tanks. Excavation activities in each tank area are described in detail below.

2.1.1 UST Area A

Area A is a landscaped area at the corner of the marina parking lot (Figures 2 and 4). A PVC water sprinkler system pipe and wire conduit were broken during excavation of the tank with the backhoe. The water supply had been turned off and only a minor amount of water was deposited into the bottom of the excavation. The top of the tank was uncovered at approximately 3 feet below ground surface (bgs). The soil from the sides of the tank was removed and stockpiled on plastic sheeting next to the excavation. UST A was approximately 1,000 gallons in size.

The fill port was located on the eastern side of the tank and the vent port was located on the west end. The aboveground portion of the vent pipe was missing. This resulted in an open port allowing periodic discharge of tank contents to the ground surface off the west end of the tank.

During excavation, the soil in the area surrounding the vent pipe on the western end of the tank and the fill pipe on the south side of the tank, was observed to be visibly stained. Samples of this soil were field screened for hydrocarbons with an Organic Vapor Monitor (OVM). Soils from these areas were placed into clean, plastic bags and allowed to volatilize in order to obtain a representative concentration level. Soils from both areas were screened at over 100 parts per million (ppm). OVM readings are subject to inaccuracy during periods of high moisture content of the air and these concentrations should be considered as approximate.

After soil from all sides of the tank was removed and placed on the plastic sheeting, the tank was lifted from the excavation and secured on the ground adjacent to the soil stockpile (Photograph 1). The outside of the tank was scraped to remove excess soil and debris. The tank seemed to be in good shape with no cracks or holes. The tank pit was approximately 6 feet deep upon removal of the tank with approximately 6-to-8 inches of water at the bottom (Photograph 2). This water was not able to be removed with the backhoe and appeared to be groundwater at this depth. One foot of soil from underneath the tank was removed and stockpiled to achieve a total excavation depth of approximately 7 feet.

2.1.2 UST Area B

Area B is located approximately 200 feet north of Area A inside the fence enclosed between the marina parking lot and the condominium development pond (Figures 2 and 3). The area is open and vegetated with native gasses and weeds. Two pipes used as markers with orange flags were observed sticking out of the ground in the tank area. A test pit was dug in the tank area to locate the tank. The top of the tank was located at a depth of approximately 3 feet bgs. Soil was removed from the top of the tank to locate the fill port and vent pipes. The fill port was located during excavation of the north end of the tank and it was apparent that the tank was full of water. A pump truck was called to pump the water from the tank before excavation was resumed. The soil from the sides of the tank was removed and stockpiled on plastic sheeting next to the excavation. The soil removed from the tank pit was visually free of contamination. No discoloration was noted in the areas surrounding the fill port or vent pipe. UST B was approximately 1,100 gallons in size.

After soil from all sides of the tank was removed and placed on the plastic sheeting, the tank was lifted from the excavation and secured on the ground adjacent to the soil stockpile. The outside of the tank was scraped to remove excess soil and debris. The tank seemed to be in good shape with no cracks or holes (Photograph 4). The tank pit was approximately 6 feet deep upon removal of the tank with no water observed in the excavation (Photograph 5). A minor amount of water was observed at the bottom of the tank pit several hours later as work was being completed at the site.

2.2 UST Inspection

The USTs and piping were constructed of bare steel. Information obtained from the Department of Ecology indicates that the used oil UST in Area A was installed in 1983. The age of the UST in Area B is unknown but is likely to be much older since the former lumber yard predates the marina development. The outside of the tanks were scraped to remove clinging soil prior to removal from the tank pit. The integrity of the tanks was visually inspected. There were no corrosion holes, cracks or other discrete leak points observed in either of the tanks.

2.3 UST Disposal

The USTs were loaded onto a flat bed truck, labeled as scrap and sent to Basin Oil of Seattle recycling as scrap metal (Photograph 6, Appendix D). The disposal certification from Ace Contractors is provided in Appendix D.

2.4 Soil Inspection

The soil underlying the site around the USTs consists of poorly graded, brown silty sand. The color of the native soil in both tank areas is uniform down to a depth of about 7 feet. Soil from around the vent pipe and fill port of Area A was visibly grayer than the soil in the other areas of the tank pit. An OVM was used to screen soil in the walls of the excavations. Some of the soil in the Area A excavation emitted volatile gases detectable to the OVM in the range of 30 to 100 ppm.

2.5 Soil Sampling

Four (4) post-excavation soil samples were collected from the excavation in Area A (Figure 4). These samples are referred to as PX-I, PX-2, PX-3 and PX-4. PX-1 was collected from the west end of the tank near the vent pipe. Samples PX-2 and PX-4 were collected from the south wall of the tank pit near the fill port. Sample PX-3 was collected from the east end of the tank. The water in-filling at the bottom of the tank pit prevented collection of a soil sample from the base of the excavation. In addition, the walls of the pit were sloughing off in places making sample collection difficult. Two samples of the water were collected for possible analysis of petroleum hydrocarbons. These water samples were not submitted for laboratory analysis because they would not have been representative of actual groundwater contamination levels. The water collecting in the bottom of the pit was contaminated from TPH-containing soil sloughing off the sides of the excavation.

Three (3) post-excavation soil samples were collected from the base and sidewalls of Area B (Figure 3). These samples are referred to as PX-5, PX-6 and PX-7. PX-5 was collected from the north end of the tank pit. Sample PX-6 was collected from the base of the tank pit directly under the tank and PX-7 was collected from the south end of the tank. These areas appeared to be uncontaminated either visually or olfactorily (Photograph 5).

All of the samples were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline with benzene, toluene, ethylbenzene and xylene by method WTPH-G +BTEX and TPH quantified as diesel fuel (WTPH-D). Sample PX-4 and PX-6 were also analyzed for selected metals, volatile organic compounds, semivolatile organic compounds and PCBs/pesticides. Soil samples were collected in accordance with the Quality Assurance/Quality Control Procedures detailed in Section 5.0 of this report.

2.6 Soil Sampling Results

2.6.1 UST Area A

Soil sample PX-4 contained a concentration of 981 ppm of TPH as gasoline, greater than the 100 ppm MTCA Method A cleanup level (Table 1). None of the other soil samples contained TPH as gasoline above 100 ppm. No BTEX compounds were detected in Area A soil samples above the MTCA Method A cleanup levels. Laboratory reports are provided in Appendix H.

Soil samples PX-1, PX-2 and PX-4 contained 484 ppm, 318 ppm and 4100 ppm TPH as diesel fuel respectively. Samples PX-1, PX-2 and PX-4 contained 1110 ppm, 976 ppm and 6050 ppm TPH as heavy oil respectively. These concentrations are above the MTCA Method A cleanup level of 200 ppm. Sample PX-3 did not contain TPH constituents above 200 ppm.

Sample PX-4 was analyzed for chromium, copper, lead, zinc, pesticides, PCBs, volatile organic compounds and semi-volatile organic compounds. None of these compounds were detected above their respective MTCA cleanup levels.

2.6.2 UST Area B

None of the soil samples collected from the tank pit in Area B contained detectable levels of hydrocarbon contamination in either the gasoline or diesel range (Table 1). Sample PX-5 contained 39.5 ppm TPH as heavy oil, well below the 200 ppm MTCA Method cleanup level of 200 ppm.

Sample PX-6 was analyzed for chromium, copper, lead, zinc, pesticides, PCBs, volatile organic compounds and semi-volatile organic compounds. None of these compounds were detected above their respective MTCA cleanup levels.

3.0 EXCAVATION OF CONTAMINATED SOIL

Contaminated soil from Area A was excavated and disposed of as described below. No contaminated soil was detected in Area B; therefore the excavated soil was used as backfill.

3.1 Soil Excavation During UST Removal

During excavation of the tank in Area A, two areas of contaminated soil were identified. One area was located at the west end of the tank and the other on the south sidewall of the tank. An effort was made to segregate the contaminated soils from the non-contaminated soils and to place them on two separate areas of plastic sheeting. Prior to backfilling the excavation in Area A, additional soil was removed from the two contaminated areas to remove any residual soil contamination.

There was no visible or olfactory evidence of contamination in Area B and the excavated soil from this tank pit was placed in a single stockpile.

3.2 Disposal Soil Sampling Results

Three samples of the soil from the contaminated stockpile in Area A were collected and composited for analysis for TPH and BTEX. These samples are referred to as STP-1, STP-2 and STP-3 and were composited into sample Composite-1. No detectable concentrations of hydrocarbons in the gasoline-range or BTEX were detected in the composite sample. The diesel-range concentration was 337 ppm and the heavy oil concentration was 1,040 ppm. Both of these levels were in excess of the MTCA Method A cleanup level of 200 ppm. One additional sample, STP-4, was collected from the segregated soil from Area A. This soil contained a TPH-diesel concentration of 630 ppm and a TPH-heavy oil concentration of 1,780 ppm.

Three samples of the soil from the soil stockpile in Area B were collected and composited for analysis for TPH and BETX. These samples are referred to as STP-5, STP-6 and STP-7 and were composited into sample Composite-2. This sample was not shown to contain detectable levels of hydrocarbon contamination in either the gasoline or diesel range. The concentration for heavy oil was 38.6 ppm, below the MTCA cleanup level. The laboratory analytical results are summarized in Table 1. Laboratory reports are provided in Appendix H.

3.3 Contaminated Soil Disposal

The petroleum contaminated soil that was excavated from around the USTs was left on site pending receipt of soil sample results. The contaminated soil stockpiled in Area A was loaded into a dump truck and taken to the Holnam, Inc. facility for thermal destruction in their cement kiln. Soil disposal documentation is provided in Appendix D.

3.4 Site Restoration

Following completion of the excavation activities, inspection and sampling, the excavation was backfilled and compacted to the existing grade with imported clean fill material.

3.5 Additional Soil Investigation

Additional soil samples were collected from Area A to determine the extent of TPH occurrence on June 6, 1996. A Strataprobe soil sampling unit under contract with TEG, Inc. was employed to collect soil samples off of the west end and south side of the former UST. In addition, soil samples were collected in a small, 3 foot wide swale extending 15 feet south from the west end of the UST. All of these soil samples were analyzed for TPH as gasoline plus BTEX, TPH as diesel fuel and TPH as heavy oil.

Soil sample G1-5 was collected south of the former UST at a depth of 5 feet bgs. This sample contained no detectable concentrations of gasoline-range TPH or BTEX. It contained 39.6 ppm diesel-range TPH and 196 ppm heavy oil-range TPH. Both of these concentrations are below the MTCA Method A cleanup level of 200 ppm.

Samples G3-3 and G3-6 were collected off the west end of the former UST at depths of 3 feet and 6 feet bgs respectively. Neither sample contained detectable concentrations of gasoline-range TPH, BTEX or diesel-range TPH. Sample G3-3 and G3-6 contained only 31.1 ppm and 42.1 ppm heavy oil range TPH respectively.

Samples G4-1.5 and G4-4 were collected in the swale south of the west end of the former UST at depths of 1.5 and 4 feet bgs respectively. Sample G4-1.5 did not contain gasoline-range TPH or BTEX above the MTCA Method A cleanup levels. It did contain a diesel-range TPH concentration of 314 ppm and a heavy oil-range TPH concentration of 658 ppm. Sample G4-4 did not contain detectable concentrations of any TPH or BTEX.

Sample G5-1 was collected at the south end of the swale at a depth of 1 foot bgs. This sample contained 1-,400 ppm diesel-range TPH and 28,800 ppm heavy oil-range TPH.

These soil sampling results indicated that TPH contamination still existed in Area A in the shallow soil (<3 feet bgs) in the 15 foot long swale extending south of the west end of the UST. It became apparent that oil and water periodically leaked from the UST through the vent port to the ground surface. The oil and water then soaked into the ground around the vent port and traveled down the swale on the ground surface where it penetrated the shallow soil.

3.6 Additional Soil Excavation

The contaminated soil in the swale in Area A was excavated on July 12, 1996. Soil was excavated down to approximately 3 feet bgs to remove all of the TPH-impacted soil. Five post-excavation soil samples, PX-8 through PX-12, were collected from the excavation to confirm removal of the TPH-

containing soil. These samplers were analyzed for TPH as gasoline, BTEX, TPH as diesel and TPH as heavy oil.

None of the post-excavation soil samples PX-8 through PX-12 contained detectable concentrations of TPH as gasoline or BTEX compounds. Diesel-range TPH was detected at concentrations ranging from 10.6 to 18.7 ppm, and heavy oil TPH was detected at concentrations ranging from 26.5 to 95 ppm. All of these concentrations are below the MTCA Method A cleanup level of 200 ppm.

4.0 GROUNDWATER INVESTIGATION

Because TPH contamination was detected at or near the water table in the excavation, an investigation of the local groundwater quality in Area A was initiated. This investigation included groundwater sampling by Strataprobe and installation of a groundwater monitoring well.

4.1 Strataprobe Sampling

Groundwater samples were collected from three Strataprobe borings conducted by TEG, Inc. on July 12, 1996. A groundwater sample was collected from G1, G3 and G4. These groundwater samples were analyzed for TPH as gasoline, BTEX, TPH as diesel and TPH as heavy oil. The depth-to-groundwater in each boring was approximately 5 feet bgs.

None of the groundwater samples contained detectable concentrations of TPH as gasoline or BTEX compounds above their respective MTCA cleanup levels (Table 1). Groundwater sample G1 was collected south of the former UST location fill port and contained only 886 ppb TPH as diesel fuel. This is below the MTCA Method A cleanup level of 1000 ppb for TPH. Groundwater sample G3 was collected off of the west end of the former UST and contained only 1,300 ppb TPH as diesel fuel. Groundwater sample G4 was collected from a boring in the swale south of the west end of the former UST. It contained 1,650 ppb TPH as diesel fuel and 2,110 ppb TPH as heavy oil. These concentrations are above the MTCA Method A cleanup level of 1000 ppb.

4.2 Monitoring Well Installation

Because the Strataprobe groundwater sample results indicated TPH concentrations above the MTCA Method A cleanup level of 1,000 ppb in the groundwater in Area A, a groundwater monitoring well was installed in the swale approximately 5 feet south of the west end of the former UST (Appendix C). The well is 2 inches in diameter and is approximately 14 feet deep with 10 feet of PVC screen. The well was installed on July 18, 1996. The monitoring well was installed according to the QA/QC procedures outlined in Section 5.0 of this report.

4.3 Groundwater Sampling

Groundwater from MW-1 was collected on July 22, 1996. The depth-to-water at the time of sampling was 5.07 feet bgs. The groundwater samples were analyzed for TPH as gasoline, BTEX, TPH as diesel and TPH as heavy oil. The sample was collected according to the QA/QC procedures outlined in Section 5.0 of this report. A groundwater sampling log is included in Appendix E.

4.4 Groundwater Sampling Results

Groundwater sample MW-1 did not contain detectable concentrations of gasoline-range TPH, BTEX compounds or heavy oil-range TPH above their respective MTCA Method A cleanup levels (Table 1). Sample MW-1 contained 1,380 ppb diesel-range TPH, above the 1,000 ppb MTCA Method A cleanup level.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

5.1 Soil Sampling Methods

Discrete soil samples were collected from the base and sidewalls of the excavation utilizing disposable plastic scoops. Samples were collected from undisturbed or freshly exposed soil. Soil samples were placed directly into clean glass jars provided by the contracted analytical laboratory. The location and depth interval of each sample was recorded.

5.2 Monitoring Well Installation

The monitoring well was constructed of a section of 2-inch I.D. schedule 40 polyvinyl chloride (PVC) casing 4 feet long threaded flush to a 10 foot length of schedule 40, 0.01-inch slotted PVC well screen (Appendix C). Washed 2/12 graded sand then was placed around the screened portion of the well during withdrawal of the augers to approximately 1-2 feet above the top of well screen. Above the screened portion of the well, the annulus of the boring was backfilled with approximately 2 feet of granular bentonite. At the surface, an approximately one-foot thick cap of concrete was placed. The well was completed with a locking, weatherproof well housing mounted flush to surface grade.

The monitoring well was developed by hand bailing methods. Water was removed from the well, allowed to recharge and the process continued until water entering the well was visibly clear of silt and sand. The well development process facilitates proper seating of the annular sand pack around the well screen and removal of fines.

5.3 Groundwater Sampling

Groundwater level measurement was performed in the well prior to removing any water. Groundwater from each well was purged of at least three well volumes to ensure collection of representative samples (Appendix E). The specific conductance, temperature, and pH of each well volume was measured and recorded until stabilization. Groundwater was collected from the well using a peristaltic pump and disposable plastic tubing directly into the sample containers. The samples were handled gently to prevent aeration.

5.4 Decontamination of Sampling Equipment

All reusable sampling equipment was decontaminated between sample collection points. The equipment was washed with a laboratory grade soap and water, rinsed with distilled water, rinsed with laboratory grade methanol and rinsed again with distilled water. The equipment then was allowed to air-dry before use.

5.5 Sample Handling

Discrete samples were collected and placed into clean glass jars with Teflon lined lids provided by the contracted laboratory. The type of analysis, name of facility, sample identification, name of sampler, date, time and preservative were recorded on the sample container. The sample containers were placed in an ice-filled cooler to be transported to the laboratory. The cooler was accompanied by a "Chain of Custody" form with all relevant information recorded on it for each sample.

5.6 Analytical Laboratory

The soil and groundwater samples from this investigation were analyzed by North Creek Analytical of Bothell, Washington.

5.7 Analytical Methods

Soil and groundwater samples collected during this investigation were analyzed for Total Petroleum Hydrocarbons as gasoline with BTEX by WTPG-G +BTEX, diesel and heavy oil by WTPH-D (extended), volatile organic compounds, semi-volatile organic compounds, chromium, copper, lead, zinc, and PCBs/pesticides.

6.0 CONCLUSIONS AND RECOMMENDATIONS

One 1,000 gallon and one 1,100 gallon underground storage tank were removed from 6155 NE 175th Street in Seattle on May 7, 1996. A site assessment was performed to check for the presence of petroleum hydrocarbons in the soil adjacent to the USTs.

No visible evidence of contamination was observed in the soils in Area B and no hydrocarbon contamination was detected in either the tank pit or the soil stockpile. Neither of the USTs were observed to have any corrosion holes or cracks.

Visual inspection of the soils in the excavation and analytical results indicated the presence of residual petroleum hydrocarbons in the soil surrounding the vent pipe on the west end of the tank and the fill port on the south sidewall of the tank pit in Area A. Analytical results from the initial sampling round indicate that the contamination in Area A was concentrated in the diesel and heavy oil range. Three of the four samples collected in the tank pit were tested and found to be in excess of the MTCA cleanup standards for soil. The highest concentration was found in the fill port area. Sample PX-4 taken from this area, showed a WTPH-G concentration of 981 ppm, TPH-D concentration of 4,100 ppm and a TPH-O concentration of 6,050 ppm.

Additional soil sampling indicated that there was TPH in the shallow soil in a small swale extending south from the west end of the UST in Area A. This area was excavated to remove soil containing TPH above the MTCA Method A cleanup level of 200 ppm. Post-excavation soil samples indicated complete removal of the TPH contaminated soil. No further action is recommended for soil at this site.

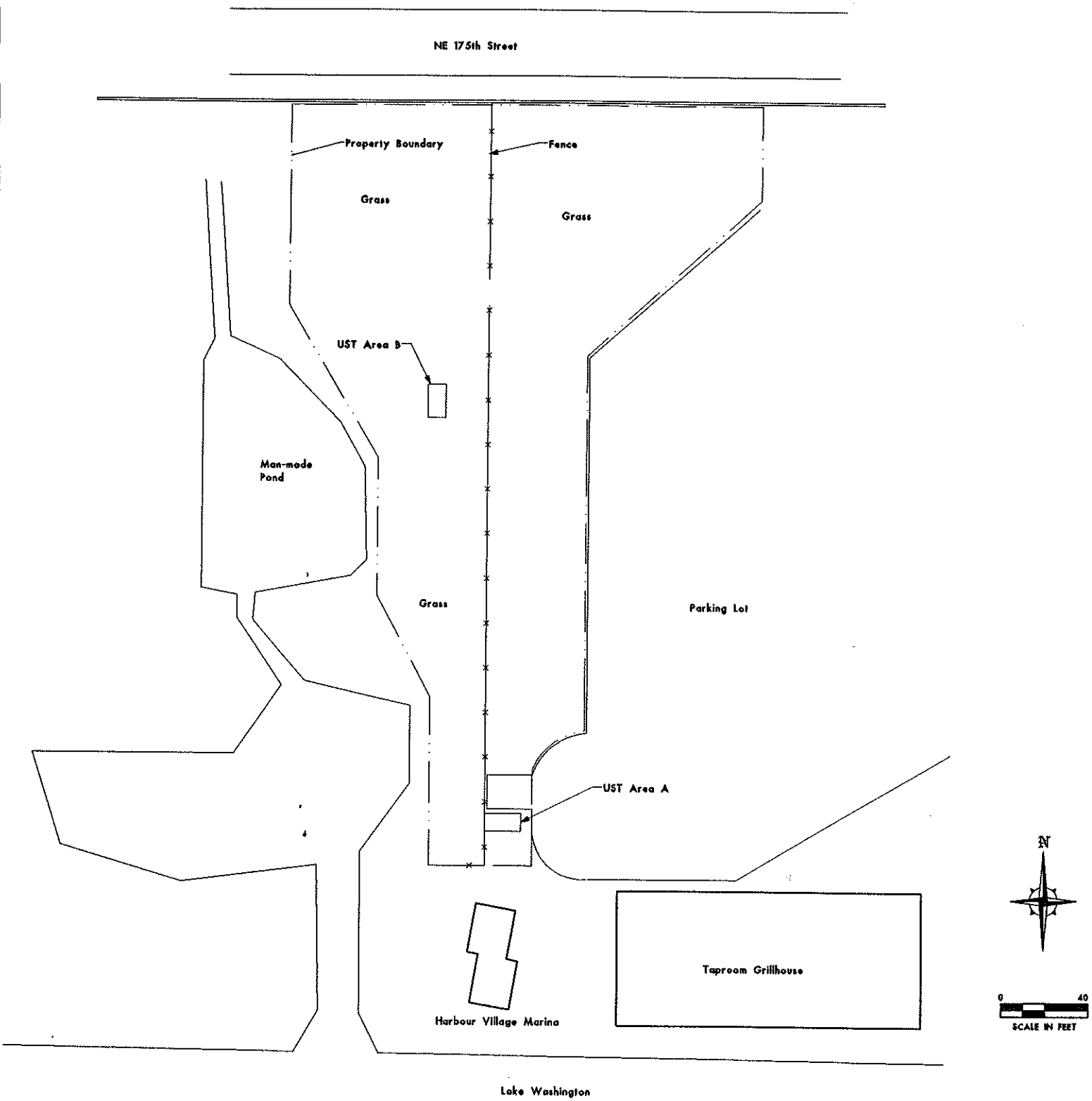
Strataprobe groundwater sampling indicated the possibility of TPH in the groundwater off the west end of the former UST in Area A. A groundwater monitoring well was installed to determine the impact to groundwater from the former UST. The groundwater sample contained 1,300 ppb TPH as diesel fuel, above the 1,000 ppb MTCA Method A cleanup level.

No further action is recommended for groundwater at this site. The groundwater TPH concentration is only slightly above the cleanup level. The UST and contaminated soil, which were the sources of TPH, have been removed. The groundwater in the area of the UST is not used. The groundwater is at a depth of 5 feet bgs and does not pose a potential risk for surface exposures. Because the sources of TPH have been removed, natural degradation of the TPH in the groundwater has begun and will continue to decrease the TPH concentrations with time.

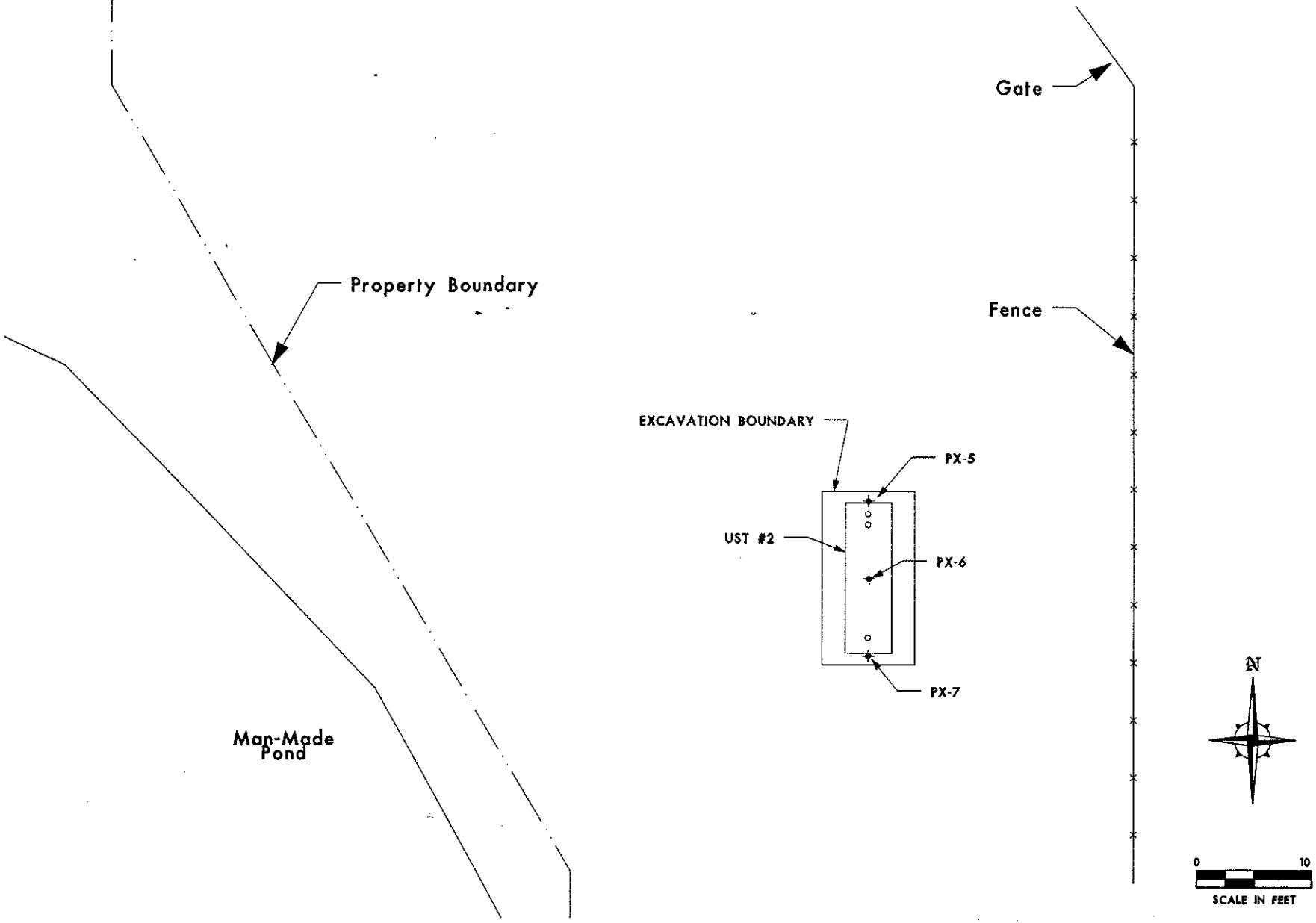
7.0 LIMITATIONS

This assessment was completed following generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. Geologic and soil formations are inherently random, variable and indeterminate in nature; therefore, the findings and conclusions stated herein must be considered not as scientific certainties, but as professional opinions concerning the significance of the limited data gathered during the assessment. No other warranty, expressed or implied, is made. EMR does not and cannot represent that the site contains no hazardous waste or material, petroleum products, or other latent condition beyond that noted by EMR during the period of site assessment. Reuse of any part of this assessment for any other purpose without EMR's written authorization shall be at Client's risk. The Client agrees to indemnify and hold harmless EMR from all actions, claims, damages, and expense, including attorney fees, arising out of any unauthorized reuse.

EMR INCORPORATED	Harbor Village Marina Seattle, Washington UST Closure Report Site Location Map	Design By: GMC Drawn By: DLW Checked By: JFK Project #: 1812	Revision No.: 1 Date: 5/13/96 Scale: 1:25,000 File Name: 1812-L.GCD	FIGURE 1



EMR INCORPORATED	*Washington Mutual Savings Bank* *Kenmore, WA* *UST Closure & Cleanup Report* *Site Plan*	Drawn By: JFK Checked By: TJP Project Number: 1812 File Name: 1812.GCD	Revision No.: 1 Date: 5/14/96 Scale:	FIGURE 2

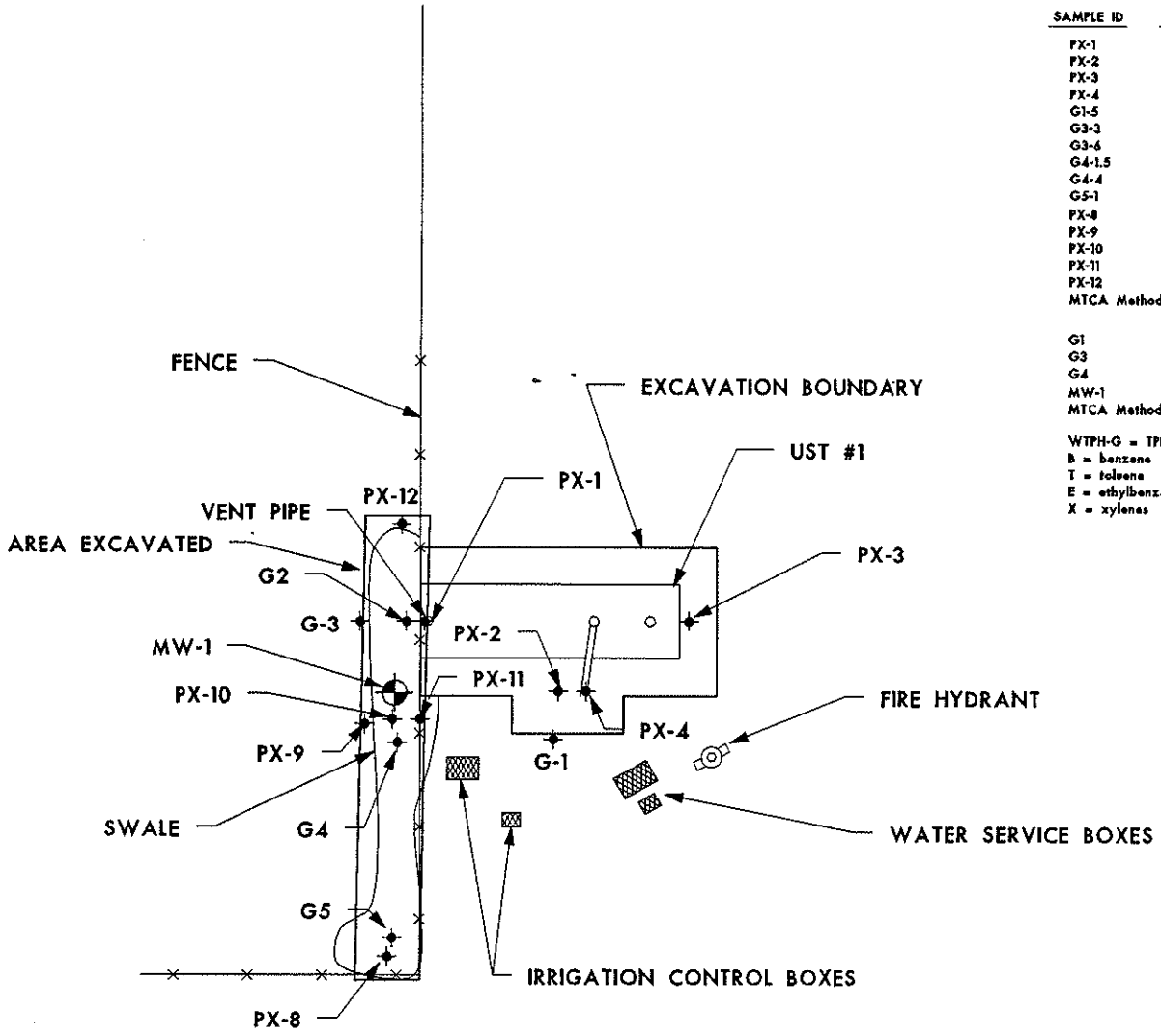


EMR INCORPORATED	*Washington Mutual Savings Bank* *Kenmore, WA* *UST Closure Report* *UST Area B and Sample Locations*	Drawn By: JFK Checked By: TJP Project Number: 1812 File Name: 1812.GCD	Revision No.: 1 Date: 5/14/96 Scale:	FIGURE 3

SAMPLE ID	MATRIX	WTPH-G	B	T	E	X	WTPH-D	WTPH-O	UNITS
PX-1	Soil	22.1	ND	ND	ND	ND	484	1110	ppm
PX-2	Soil	ND	ND	ND	ND	ND	318	976	ppm
PX-3	Soil	ND	ND	ND	ND	ND	16.2	75.6	ppm
PX-4	Soil	981	ND	ND	1.72	16.2	4100	6050	ppm
G1-5	Soil	ND	ND	ND	ND	ND	39.6	196	ppm
G3-3	Soil	ND	ND	ND	ND	ND	ND	31.1	ppm
G3-6	Soil	ND	ND	ND	ND	ND	ND	42.1	ppm
G4-1.5	Soil	33.1	ND	ND	ND	0.208	314	658	ppm
G4-4	Soil	ND	ND	ND	ND	ND	ND	ND	ppm
G5-1	Soil	40.2	ND	ND	ND	ND	10400	28800	ppm
PX-8	Soil	ND	ND	ND	ND	ND	10.6	26.5	ppm
PX-9	Soil	ND	ND	ND	ND	ND	18.3	95	ppm
PX-10	Soil	ND	ND	ND	ND	ND	11.7	65.1	ppm
PX-11	Soil	ND	ND	ND	ND	ND	18.7	89.2	ppm
PX-12	Soil	ND	ND	ND	ND	ND	12.1	42.4	ppm
MTCA Method A Level		100	0.5	40	20	20	200	200	ppm
G1	Water	65.9	ND	ND	ND	2.82	866	ND	ppb
G3	Water	ND	ND	ND	ND	ND	1300	ND	ppb
G4	Water	ND	0.679	0.943	ND	1.38	1650	2110	ppb
MW-1	Water	ND	ND	0.796	ND	2.09	1380	818	ppb
MTCA Method A Level		1000	1	40	30	20	1000	1000	ppb

WTPH-G = TPH as Gasoline
B = benzene
T = toluene
E = ethylbenzene
X = xylenes

WTPH-D = TPH as Diesel
WTPH-O = TPH as heavy oils
ppm = parts per million
ppb = parts per billion
ND = not detected



EMR INCORPORATED

Washington Mutual Savings Bank
Kenmore, WA

UST Closure Report
UST Area A and Sample Locations

Drawn By: JFK
Checked By: TJP
Project Number: 1812
File Name: 1812.GCD

Revision No.: 1
Date: 5/14/96
Scale:

FIGURE 4

TABLE 1
Washington Mutual Bank
Kenmore UST
EMR Project #1812

AREA A	MATRIX	WTPH-G	B	T	E	X	WTPH-D	WTPH-O	
PX-1	Soil	22.1	ND	ND	ND	ND	**484**	**1110**	ppm
PX-2	Soil	ND	ND	ND	ND	ND	**318**	**976**	ppm
PX-3	Soil	ND	ND	ND	ND	ND	16.2	75.6	ppm
PX-4	Soil	**981**	ND	ND	1.72	16.2	**4100**	**6050**	ppm
COMPOSITE-1	Soil	ND	ND	ND	ND	ND	**337**	**1040**	ppm
STP-4	Soil	13	ND	0.0698	ND	1.49	**630**	**1780**	ppm
G1-5	Soil	ND	ND	ND	ND	ND	39.6	196.0	ppm
G3-3	Soil	ND	ND	ND	ND	ND	ND	31.1	ppm
G3-6	Soil	ND	ND	ND	ND	ND	ND	42.1	ppm
G4-1.5	Soil	33.1	ND	ND	ND	0.208	**314**	**658**	ppm
G4-4	Soil	ND	ND	ND	ND	ND	ND	ND	ppm
G5-1	Soil	40.2	ND	ND	ND	ND	**10400**	**28800**	ppm
PX-8	Soil	ND	ND	ND	ND	ND	10.6	26.5	ppm
PX-9	Soil	ND	ND	ND	ND	ND	18.3	95.0	ppm
PX-10	Soil	ND	ND	ND	ND	ND	11.7	65.1	ppm
PX-11	Soil	ND	ND	ND	ND	ND	18.7	89.2	ppm
PX-12	Soil	ND	ND	ND	ND	ND	12.1	42.4	ppm
MTCA Cleanup Level		100	0.5	40	20	20	200	200	
G1	Groundwater	65.9	ND	ND	ND	2.82	886	ND	ppb
G3	Groundwater	ND	ND	ND	ND	ND	**1300**	ND	ppb
G4	Groundwater	ND	0.679	0.943	ND	1.38	**1650**	**2110**	ppb
MW-1	Groundwater	ND	ND	0.796	ND	2.09	**1380**	818	ppb
MTCA Cleanup Level		1000	1	40	30	20	1000	1000	ppb
AREA B									
PX-5	Soil	ND	ND	ND	ND	ND	ND	39.5	ppm
PX-6	Soil	ND	ND	ND	ND	ND	ND	ND	ppm
PX-7	Soil	ND	ND	ND	ND	ND	ND	ND	ppm
COMPOSITE-2	Soil	ND	ND	ND	ND	ND	ND	ND	ppm
MTCA Cleanup Level		100	0.5	40	20	20	200	200	ppm

WTPH-G = Gasoline-Range Total Petroleum Hydrocarbons
B = Benzene T = Toluene
X = Total Xylenes E = Ethylbenzene
WTPH-D = Diesel-Range Total Petroleum Hydrocarbons
WTPH-O = Heavy Oil-Range Total Petroleum Hydrocarbons
ND = Not Detected
ppm = Parts Per Million
ppb = Parts Per Billion