STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

January 3, 2013

Mr. Michael S. Chun
605 11th Ave SE, Suite 201
Olympia, WA 98501

Re: Further Action at the following Site:

- **Site Name:** Jumbos Car Wash & Gas
- **Site Address:** 6821 NE Highway 99, Vancouver, WA 98665
- **Facility/Site No.:** 96316853
- **Cleanup Site ID No.:** 6943
- **VCP Project No.:** SW1253

Dear Mr. Chun:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Jumbos Car Wash & Gas facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and it's implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Petroleum constituents into the soil and groundwater.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the Property is affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Subsurface Soil Investigation, by EVREN Northwest, dated January 16, 2003.
2. Groundwater Investigation, by EVREN Northwest, dated November 3, 2004.
3. Cleanup Action Work Plan for the Installation of a Soil Vapor Extraction System at Jumbos Car Wash, by EVREN Northwest, dated November 3, 2006.
4. Opinion Letter from Charles S. Cline (Ecology) to Ms. Mimi Chou, dated May 27, 2003.
5. Further Action Determination under WAC 173-340-515(5), by Charles S. Cline (Ecology), dated November 28, 2005.
6. Opinion under WAC 173-340-515(5) on Proposed Cleanup Action, by Charles S. Cline (Ecology), dated June 13, 2007.
7. Opinion under WAC 173-340-515(5) on Proposed Cleanup Action, by Charles S. Cline (Ecology), dated October 24, 2007.
8. Proposed Scope of Work-Interim Remedial Action, by Associated Environmental Group, LLC, dated October 3, 2012.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site **is not** sufficient to establish cleanup standards and select a cleanup action.

The Site is located at 6821 NE Highway 99 in Vancouver, WA on the northeast corner of NE Highway 99 and NE 69th Street (Fig.1). According to the Clark County Assessor, this approximately 0.9-acre, irregular shaped property is positioned in a commercially zoned area. The associated parcel number is 148370000 and the Site is located in Section 10 NE,

Township 2 North, and Range 1 East. The Site is currently closed to business but has operated as a retail gas station with a fully automated car wash and grocery store.

Four underground storage tanks (USTs), each with a 12,000 to 20,000-gallon capacity, were installed in 1980. One of the 20,000-gallon tanks was used to store diesel fuel, while the other 20,000-gallon and two 12,000-gallon tanks were used to store unleaded gasoline. The tanks are still listed as "Operational" on Ecology's UST database.

Petroleum-contaminated soil (PCS) was first encountered in 1994 when the Site was being upgraded to conform to new federal and state standards. During the upgrade, PCS was encountered with elevated detections of gasoline up to 4,860 milligrams per kilogram (mg/Kg) and diesel-range petroleum hydrocarbons up to 7,240 mg/Kg. No reports or records were submitted documenting additional investigation or remediation at the Site until Evren Northwest, Inc. (ENW) conducted a subsurface investigation in May 2002 in response to a request for additional information from Ecology.

During the 2002 subsurface investigation, seven soil borings were drilled (Fig. 3). Diesel and gasoline-range PCS, exceeding the MTCA Method A cleanup levels, was encountered in two of the borings, B5 and B7 (Fig. 4). In November 2002, ENW drilled eight additional borings to further delineate the PCS. The investigation showed that PCS extended to the soil/water interface at approximately 29 feet below ground surface (bgs) (Fig. 4). ENW assessed the potential risk from petroleum impacts using MTCA Methods B and C and concluded that, *"although impacts of gasoline and diesel range organics to soil below the fuel island were significant and exceeded MTCA Method A soil cleanup levels, further evaluation of potential risk from petroleum constituents did not indicate an unacceptable risk"*. Soil contamination levels exceeding MTCA Method A cleanup levels for soil ranged from 130 mg/Kg to 11,000 mg/Kg for gasoline. Diesel contamination levels for soil varied from 3,100 mg/Kg to 13,700 mg/Kg.

In the May 2003 Opinion Letter, Ecology addressed ENW's report, concluding that the characterization and risk assessment of the Site was not adequate. Ecology indicated that at least four groundwater monitoring wells would be needed to determine the Site's groundwater gradient and presence of contamination. Ecology stated that if contaminants are shown to be migrating off the property, additional work may be necessary.

In March 2004, ENW installed three of the four monitoring wells that had been requested by Ecology (Fig. 2). The depth to groundwater was recorded between 25.48 to 27.09 feet bgs. Laboratory analytical results indicated that historical releases of petroleum had impacted the two downgradient monitoring wells (MW2 and MW3). Gasoline and diesel-range organics, as well as benzene, toluene, ethylbenzene, and total xylenes (BTEX), exceeded the MTCA Method A cleanup levels for groundwater in both wells (Fig. 5). ENW believed that because shallow groundwater was unlikely to be used as drinking water, no current or future

unacceptable risk existed with this pathway. ENW requested regulatory closure and a determination of no further action from Ecology.

Ecology's response stated: *"The full extent of contamination will need to be determined for both soil and groundwater as delineated in WAC 173-340-350(7)(iii)(B) and (C). Additional boreholes and/or wells will be required to be placed south, north, and west of the fuel islands and in the area north of the carwash building to determine the full extent of contamination."* Ecology also stated that following the completed Site characterization, a feasibility study (FS) would be needed to create and evaluate alternative cleanup actions and choose the appropriate action for the Site. If a restrictive covenant was to be included as part of the FS, a disproportionate cost analysis would also be required as defined in WAC 173-340-360(3) (e).

No further investigative or remedial work was performed after 2007 and the Site was eventually terminated from Ecology's Voluntary Cleanup Program (VCP) on February 25, 2011. Other than the Site characterization, no actual cleanup work has been performed.

Associated Environmental Group, LLC (AEG) took over as the consultant for the Site in 2012. A "Proposed Scope of Work-Interim Action Plan" was received by Ecology on October 8, 2012 along with an application to re-enter the VCP.

Based on the previous studies and opinions generated, AEG plans to remove the four USTs and as much PCS as possible. Following the collection of confirmation soil samples, the excavation will be backfilled with clean fill material. Backfill may be mixed with a bioremediation product, Regenesis Oxygen Releasing Compounds (ORC), to expedite the biodegradation of petroleum hydrocarbons in the saturated soil and dissolved in shallow groundwater.

AEG recommends conducting a Supplemental Remedial Investigation after completion of the Interim Remedial Action if confirmation soil samples indicate presence of residual contamination above cleanup levels and if shallow groundwater is impacted.

Based on a review of the above-listed reports and proposed remedial action, Ecology has the following comments:

1. To date, no actual cleanup work has been performed at the Site. Ecology agrees with AEG's proposed plan to remove the four USTs and as much source PCS as possible as this is the direct link to the groundwater contamination. The proposed excavation has the potential to be quite deep at approximately 25 feet bgs. The Site has been an area where loitering has occurred so safety issues such as fencing, flagging, and cones need to be in place especially if the Site is left unattended. Any required "setbacks" from the street need to be complied with and Ecology recommends that the local jurisdiction(s) be contacted prior to commencing with the excavation.

2. As stated in AEG's "Proposed Scope of Work-Interim Action Plan", any stockpiled PCS should be placed on impermeable material if not transported immediately off Site. If left unattended, the stockpile should be covered and fenced to avoid any human contact or dispersal by wind or runoff. Local authorities should also be contacted to make sure that any requirements regarding the stockpiled PCS are complied with.

3. The local Fire Department has authority under the International Fire Code (2009 IFC, Section 3404.2.13.1.4) regarding decommissioning of out of service USTs. Ecology asks that Mr. Richard Martin, Assistant Fire Chief, be kept up to date on all activities at the Site regarding the removal and decommissioning of the USTs. Chief Martin can be reached at (360) 397-2186 ext. 3322 or by e-mail at richard.martin@clark.wa.gov.

4. As stated previously be Ecology, the full extent of contamination for both soil and groundwater still needs to be defined. If the full extent of soil contamination is not removed during the excavation process, Ecology recommends additional borings north of borings B5, B8, B10, B12, and B15 (Fig. 3) and south of boring B9. Both soil and groundwater samples should be collected as all of these borings showed contamination at the soil/groundwater interface above the MTCA Method A cleanup levels.

5. It has been previously noted that contamination may extend under NE Highway 99. Both boring B5 and monitoring well MW3 showed levels of gasoline and diesel contamination above MTCA Method A cleanup levels for both soil and groundwater. BTEX, Methyl-tert-butyl ether (MTBE), and Naphthalene were also present above the MTCA Method A cleanup levels for groundwater in MW3 (Fig. 5).

   At present, MW3 is the most downgradient well. The prospect of advancing additional borings across NE Highway 99 to collect both soil and groundwater samples should be evaluated.

6. Ecology recommends continuation of quarterly monitoring to further characterize and monitor the groundwater plume, and to ultimately demonstrate compliance. Ecology requires that at least four rounds of consecutive quarterly groundwater sampling be conducted showing concentrations of contaminants below the applicable cleanup levels to meet the substantive requirements of MTCA. The reason for this is to determine any seasonal variations in the contaminant concentration.
7. Soil and groundwater samples should be analyzed for the applicable parameters listed in the MTCA Cleanup Regulation 173-340-900 Table 830-1 Required Testing for Petroleum Releases.

8. Please note that any document submitted containing geologic, hydrologic, or engineering work must be under the seal of an appropriately licensed professional, as required by Chapters 18.43 and 18.220 RCW.

9. In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in both written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination. Be advised that Ecology requires up to two weeks to process the data once it is received.**

10. In accordance with WAC 173-340-7490, a Terrestrial Ecological Evaluation (TEE) needs to be completed for the Site. Please fill out the TEE form (and supporting documentation as appropriate) and submit it to Ecology. The form can be found on our website at http://www.ecy.wa.gov/biblio/ecy090300.html.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance established for the Site do not meet the substantive requirements of MTCA. MTCA Method A soil and groundwater cleanup levels for unrestricted land use are being used for the Site.

Standard points of compliance are being used for the Site. The point of compliance for protection of groundwater shall be established in the soils throughout the Site. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance shall be established in the soils throughout the Site from the ground surface to 15 feet bgs. In addition, the point of compliance for the groundwater shall be established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site.

3. Selection of cleanup action.

Ecology has determined the preliminary cleanup action you selected for the Site meets the substantive requirements of MTCA.

The removal of the four USTs and associated PCS will effectively remove the source of contamination. Further work will most likely be necessary to further define the extent of contamination, and to select a remedy to address the groundwater contamination and any soil contamination that is not able to be removed.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.

No cleanup has been conducted to date. The proposed work plan by AEG addresses the removal of the four USTs along with excavation and disposal of as much of the existing PCS as possible. Confirmation samples will be collected prior to backfilling the excavation. ORC may be introduced in an effort to help cleanup remaining contamination in the saturated zone.

Further investigation is planned consisting of soil and groundwater data collection to help determine the seasonal hydrogeologic regime and the extent of contamination. A Supplemental Remedial Investigation is planned following the Independent Remedial Action if confirmation soil samples indicate the presence of residual contamination.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040 (4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030 (1) (i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6179 or e-mail at ptur461@ecy.wa.gov.

Sincerely,

Paul Turner, L.HG
SWRO Toxics Cleanup Program

PBT/ksc:Jumbos SW1253 FA

Enclosures: A – (Fig. 1) Map and Aerial Photo of the Site
Fig. 2- Site Map Showing Structures and Groundwater Flow Direction
Fig. 3- Site Map Showing Boring Locations
Fig. 4- Summary of Analytical Results for Soil
Fig. 5- Summary of Analytical Results for Groundwater

cc: Ms. Yen-Vy T. Van
Ms. Mimi Chou
Richard Martin, Assistant Fire Marshal
Bryan DeDoncker, Clark County Public Health
Dolores Mitchell - Ecology
Scott Rose - Ecology

Enclosure A

Diagrams of the Site

Enclosure A

Diagrams of the Site

Figure 1

Map and Aerial Photo

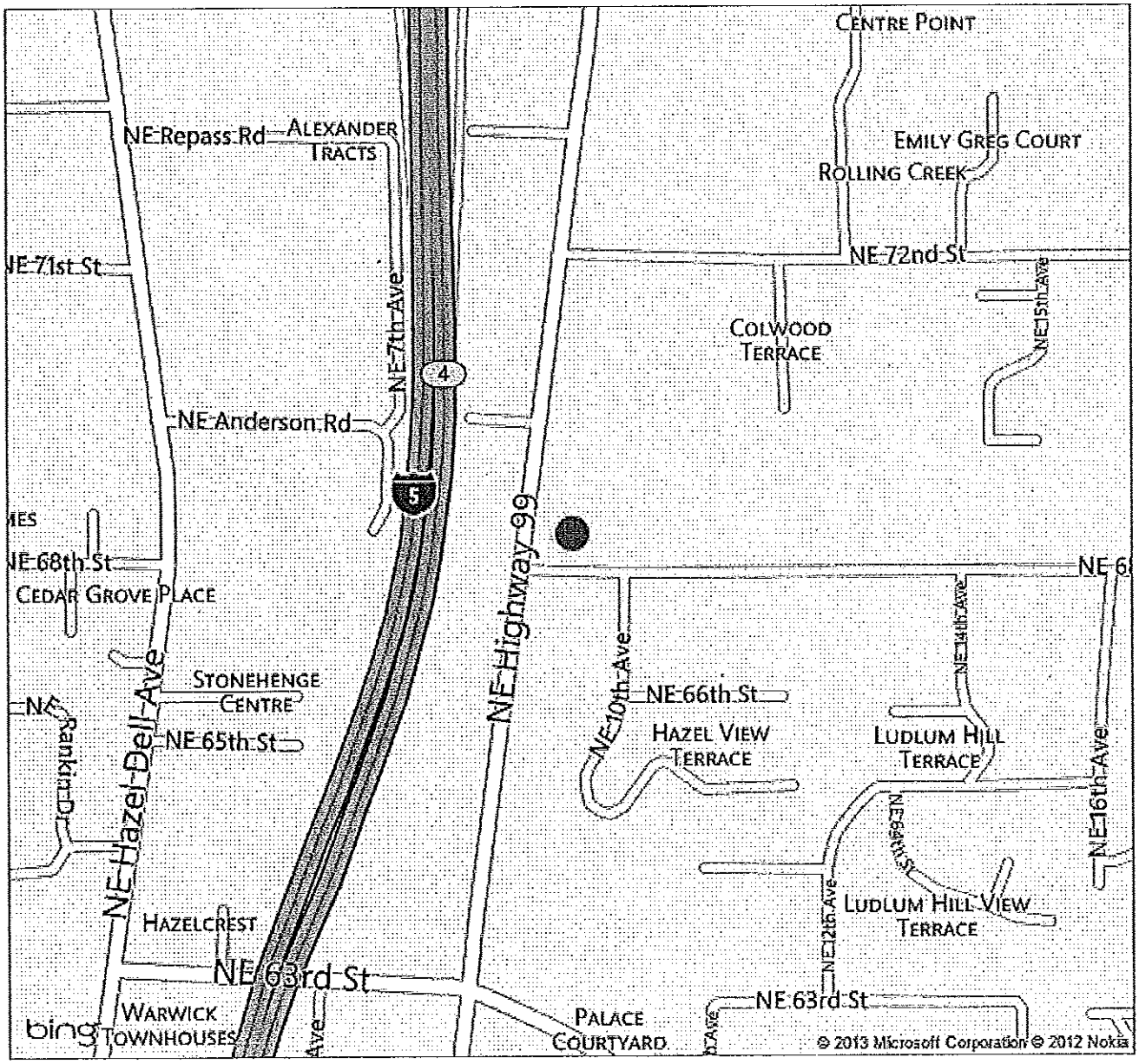
Of the Site

bing Maps

6821 NE Highway 99, Vancouver, WA 98665

My Notes

On the go? Use **m.bing.com** to find maps, directions, businesses, and more



bing Maps

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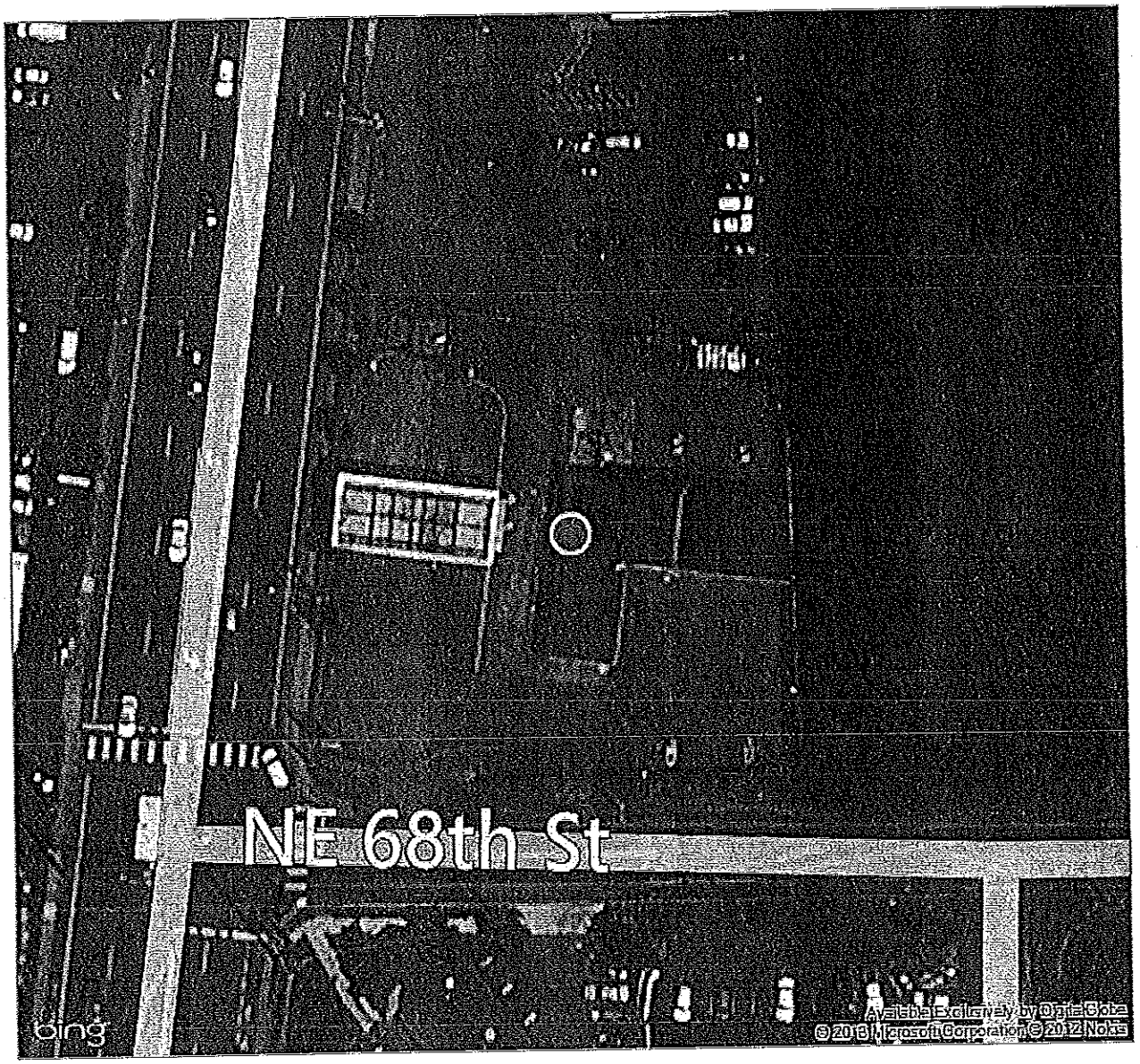
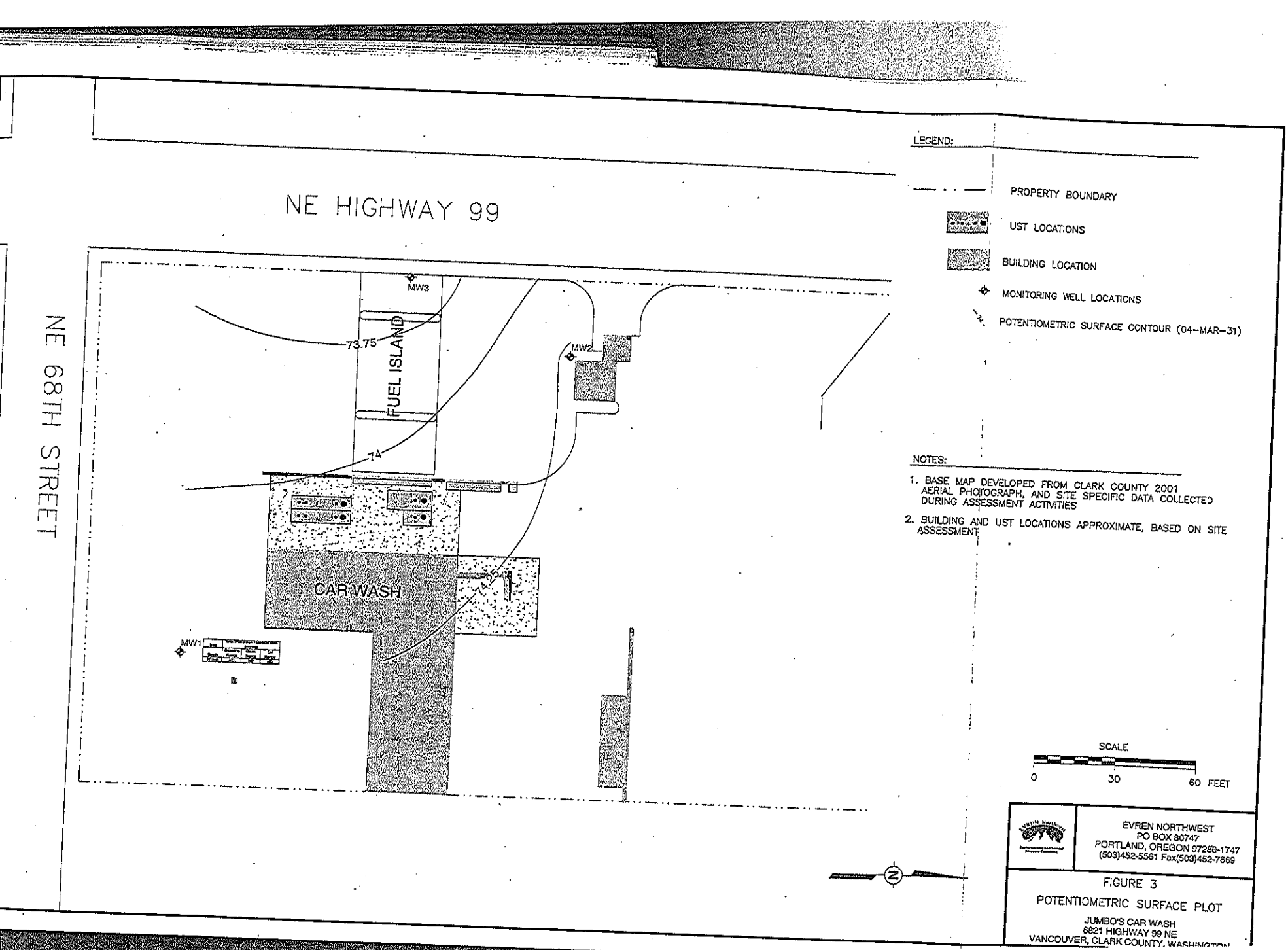


Bird's eye view maps can't be printed, so another map view has been substituted.

Figure 2

Site Map Showing Structures and Groundwater Flow Direction



EVREN NORTHWEST
PO BOX 80747
PORTLAND, OREGON 97280-1747
(503)452-5561 Fax(503)452-7669

FIGURE 3

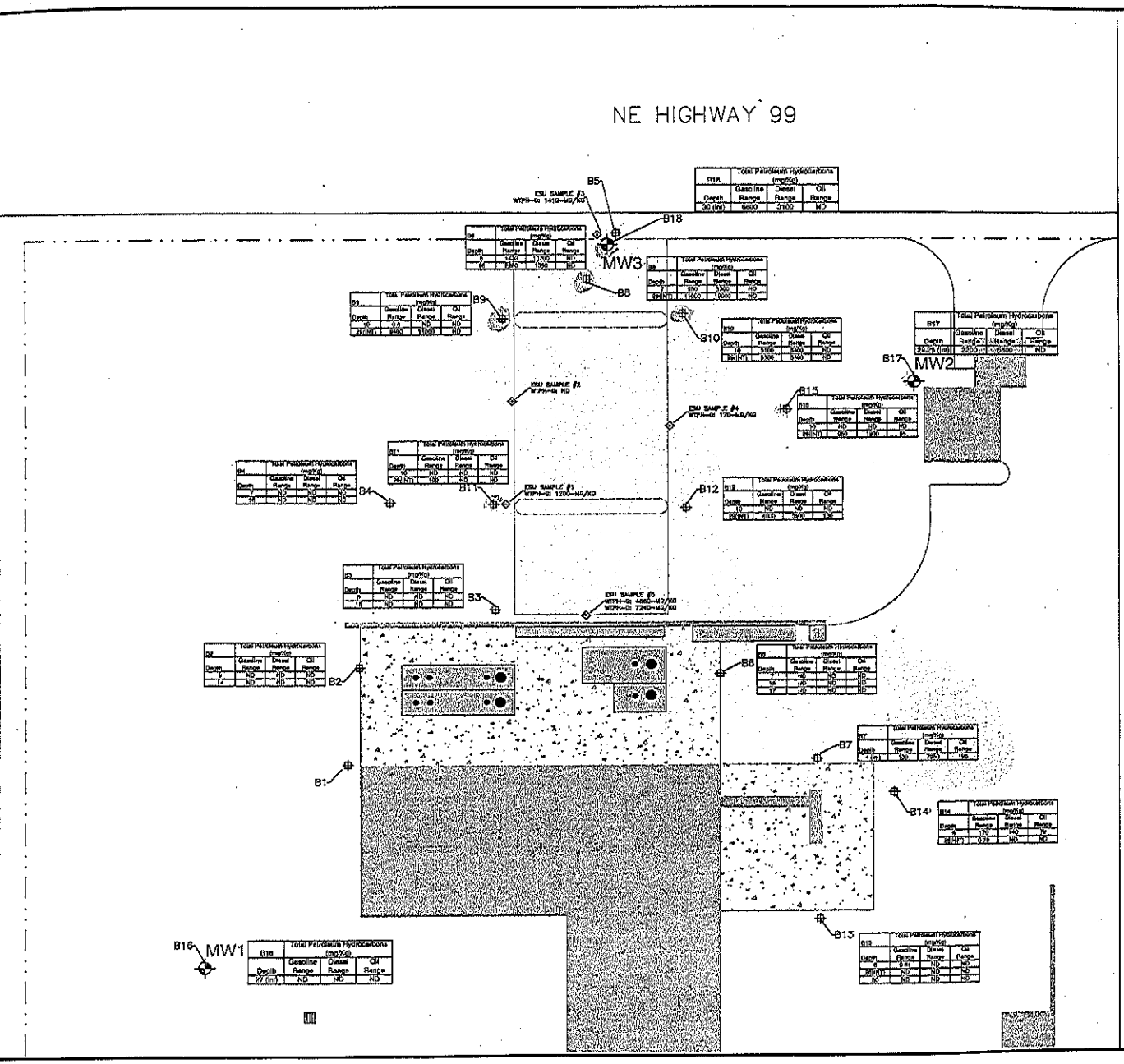
POTENTIOMETRIC SURFACE PLOT

JUMBO'S CAR WASH
6821 HIGHWAY 99 NE
VANCOUVER, CLARK COUNTY, WASHINGTON

Figure 3

Site Map Showing

Test Boring Locations



LEGEND:

- PROPERTY BOUNDARY
- ESU SOIL SAMPLING LOCATION
- UST LOCATIONS
- BUILDING LOCATION
- ENW GEOPROBE BORING LOCATION
- ESTIMATED EXTENT OF PETROLEUM IMPACTS TO SOIL (ASSUMING PETROLEUM IMPACTS AT SOIL/WATER INTERFACE DUE TO IMPACTED GROUND WATER)

NOTES:

1. BASE MAP DEVELOPED FROM CLARK COUNTY 2001 AERIAL PHOTOGRAPH, AND SITE SPECIFIC DATA COLLECTED DURING ASSESSMENT ACTIVITIES
2. BUILDING AND UST LOCATIONS APPROXIMATE, BASED ON SITE ASSESSMENT

N

SCALE

0 20 40 FEET

EVREN NORTHWEST, INC.
PO BOX 80747
PORTLAND, OREGON 97280-1747
(503)452-5561 Fax(503)452-7689

FIGURE 4
TEST BORING LOCATON DIAGRAM
(TPH RESULTS SHOWN)
JUMBO'S CAR WASH
6821 HIGHWAY 99 NE
VANCOUVER, CLARK COUNTY, WASHINGTON

Figure 4

Summary of Analytical Results for Soil

Table 3-2. Summary of Analytical Results for TPH in Soil

Location	Sample ID	Depth (feet)	Date	NWTPH-Gx GRO (mg/Kg)	NWTPH-Dx DRO (mg/Kg)	NWTPH-Dx RRO (mg/Kg)
MTCA Method A Soil Cleanup Level (Unrestricted Use)[1]				100	2000	2000
ESU (Assessment)						
1	---	---	---	**1200**	---	---
1 (dup)	---	---	---	**820**	---	---
2	---	---	---	ND	---	---
3	---	---	---	**1410**	---	---
4	---	---	---	**170**	---	---
5	---	---	---	**4860**	**7,240**	---
ENW (Characterization, Assessment, Delineation)						
B1	B1-10	10	30-May-02	ND	ND	ND
	B1-14	14	30-May-02	ND	ND	ND
B2	B2-9	9	30-May-02	ND	ND	ND
	B2-14-15	14.5	30-May-02	ND	ND	ND
B3	B3-8-9	8.5	30-May-02	ND	ND	ND
	B3-15	15	30-May-02	ND	ND	ND
B4	B4-7	7	30-May-02	ND	ND	ND
	B4-16	16	30-May-02	ND	ND	ND
B5	B5-6	6	30-May-02	**1430**	**13700**	ND
	B5-15	15	30-May-02	**2260**	1350	ND
B6	B6-7	7	30-May-02	ND	ND	ND
	B6-16	16	30-May-02	ND	ND	ND
	B6-17	17	30-May-02	ND	ND	ND
B7	B7-4(INT)	4	30-May-02	**130**	**7,950**	196
B8	B-8-7	7.5	11-Nov-02	**980**	**3200**	ND
	B-8-29 (INT)	29	11-Nov-02	**11000**	**12000**	ND
B9	B-9-10	10	11-Nov-02	0.8	ND	ND
	B-9-29	29	11-Nov-02	**9400**	**11000**	ND
B10	B-10-10	10	11-Nov-02	**3100**	**5400**	ND
	B-10-29 (INT)	29	11-Nov-02	**3300**	**3500**	ND
B11	B-11-10	10	11-Nov-02	ND	ND	ND
	B-11-29	29	11-Nov-02	190	ND	ND
B12	B-12-10	10	11-Nov-02	ND	ND	ND
	B-12-27 (INT)	27	11-Nov-02	**4000**	**3900**	130
B13	B-13-6	6	11-Nov-02	0.81	ND	ND
	B-13-26 (INT)	26	11-Nov-02	ND	ND	ND
	B-13-30	30	11-Nov-02	ND	ND	ND
B14	B-14-6	6	11-Nov-02	**170**	140	79
	B-14-28	28	11-Nov-02	0.79	ND	ND
B15	B-15-10	10	11-Nov-02	ND	ND	ND
	B-15-26 (INT)	26	11-Nov-02	**950**	1900	ND
B16 (MW1)	B16-27	27	26-Mar-04	ND	ND	ND
B17 (MW2)	B17-28.5-30	29.25	26-Mar-04	**2,200**	**5,600**	ND
B18 (MW3)	B18-30	30	26-Mar-04	**6,600**	**3,100**	ND

Notes

[1] The Washington MTCA Method A cleanup standards for gasoline-range petroleum hydrocarbons is 100-mg/Kg, except when harzardous petroleum constituents are present, then is is 30-mg/Kg.

GRO:	gasoline-range organics
DRO:	diesel-range organics
RRO:	residual-range organics
mg/Kg:	milligram per kilogram
ND:	not detected at or above the method reporting limit
P:	present
NP:	not present
---:	not analyzed
NA:	not available

Figure 5

Summary of Analytical Results

for Groundwater

Table 3-3. Summary of Analytical Results for Ground Water

Constituent of Potential Concern	MW-1 (ug/L)	MW-2 (ug/L)	MW-3 (ug/L)	MTCA Method A (ug/L)	EPA Region IX PRG (ug/L)
Gasoline by NWTPH-Gx	<1.00E+02	**2.41E+03**	**1.82E+04**	**8.00E+02**	---
Diesel by NWTPH-Dx	<1.19E-01	**1.76E+03**	**3.85E+03**	**5.00E+02**	---
Oil by NWTPH-Dx	<2.38E-01	<2.38E-01	<2.48E-01	5.00E+02	---
Benzene	<5.00E-01	**2.65E+01**	**5.30E+03**	**5.00E+00**	**3.40E-01**
Toluene	<5.00E-01	<2.50E+00	**2.59E+02**	1.00E+03	**7.20E+01**
Ethylbenzene	<5.00E-01	**1.34E+02**	**1.21E+03**	**7.00E+02**	**2.90E+00**
Xylenes	<1.00E+00	**1.40E+01**	**2.85E+03**	**1.00E+03**	**2.70E+02**
1,2-Dichloroethane	<5.00E-01	<2.50E+00	<2.50E+01	5.00E+00	1.20E-01
1,2-Dibromoethane	<5.00E-01	<2.50E+00	<2.50E+01	1.00E-02	7.60E-04
Methyl-tert-butyl ether (MTBE)	<5.00E-01	<2.50E+00	**4.22E+01**	**2.00E+01**	**1.30E+01**
Acenaphthene	<9.52E-03	3.95E-01	<9.69E-03	NE	3.70E+02
Acenaphthylene	<9.52E-03	<1.01E-02	<9.69E-03	NE	NE
Anthracene	<9.52E-03	<1.01E-02	<9.69E-03	NE	1.80E+03
Benz(a)anthracene	<9.52E-03	<1.01E-02	<9.69E-03	TEF	9.20E-02
Benzo(b)fluoranthene	<9.52E-03	<1.01E-02	<9.69E-03	TEF	9.20E-02
Benzo(k)fluoranthene	<5.00E-01	<1.01E-02	<9.69E-03	TEF	9.20E-02
Benzo(a)pyrene	<9.52E-03	<1.01E-02	<9.69E-03	1.00E-01	9.20E-03
Chrysene	<9.52E-03	<1.01E-02	<4.84E-02	NE	9.20E+00
Dibenz(a,h)anthracene	<9.52E-03	<1.01E-02	<9.69E-03	TEF	9.20E-03
Fluoranthene	<9.52E-03	<1.01E-02	<9.69E-03	NE	1.50E+03
Fluorene	<9.52E-03	1.42E+00	3.16E+00	NE	2.40E+02
Indeno(1,2,3-c,d)pyrene	<9.52E-03	<1.01E-02	<9.69E-03	TEF	9.20E-02
Naphthalene[1]	<2.38E-02	**6.96E+01**	**2.81E+02**	**1.60E+02**	**6.20E+00**
Pyrene	<9.52E-03	<1.01E-02	<9.69E-03	NE	1.80E+02
Phenanthrene	<9.52E-03	1.91E+00	1.81E+00	NE	NE
Benzo(g,h,i)perylene	<9.52E-03	<1.01E-02	<9.69E-03	TEF	NE
Lead	<2.00E+00	<2.00E+00	<2.00E+00	1.50E+01	NE
1-Methylnaphthalene[1]	<4.76E-02	1.00E+01	1.17E+01	1.60E+02	NE
2-Methylnaphthalene[1]	1.55E-02	4.76E+00	1.55E+01	1.60E+02	NE
2-Chloronaphtahlene[1]	<9.52E-03	<1.01E-02	<1.94E-02	1.60E+02	4.90E+02

Concetrations expressed as "<1E-02" were not detected at or above the indicated laboratory method reporting limit

TEF = Toxic equivalence factor is used to calculate toxicity of all carcinogenic PAHs, standard used is that of Benzo(a)pyrene.

NE = not established

[1] MTCA Method A Cleanup Level based on sum of naphthalenes present

Bolded concentrations exceed either MTCA Method A Cleanup Levels or EPA Region IX PRGs