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DEPARTMENT OF ECOLOGY
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December 22, 2011

Ms. Renee West
Verbeek Wrecking
18416 Bothell Everett Hwy
Bothell, WA 98012

RE: No Further Action At A Property Associated With A Site:

- Property Address: 18416 Bothell Everett Hwy, Bothell, WA 98012
- Facility/Site No.: 51544175
- VCP Project No.: NW1982

Dear Ms. West:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of a property associated with the Verbeek 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.

Issues Presented and Opinion

1. Is further remedial action necessary at the property to clean up contamination associated with the site?

   NO. Ecology has determined that no further remedial action is necessary at the property to clean up contamination associated with the site.

2. Is further remedial action still necessary elsewhere at the site?

   YES. Ecology has determined that further remedial action is still necessary elsewhere 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 its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Property and the Site

This opinion applies only to the property and the site described below. This opinion does not apply to any other sites that may affect the property. Any such sites, if known, are identified separately below.

1. Description of the Property.

The property includes the following tax parcels, which were affected by the site and addressed by your cleanup:

- 27051800103900.
- 27051800101800.
- 27051800103700.

Enclosure A includes a legal description of the property. The location of the property within the site is illustrated in **Enclosure B**.

2. Description of the Site.

The site is defined by the nature and extent of contamination associated with the following releases:

- Gasoline-range petroleum hydrocarbons (TPH-G), diesel-range petroleum hydrocarbons (TPH-D), motor oil-range petroleum hydrocarbons (TPH-O) in soil.

- Hydrocarbon and coal-tar related volatile aromatics - benzene, toluene, ethylbenzene, xylenes (BTEX) in soil.

- Polycyclic aromatic hydrocarbons (PAHs), including carcinogenic PAHs (cPAHs), in Soil.

- Arsenic, Cadmium in soil.

- TPH-G, TPH-D, BETX, various methyl and butyl benzenes, methyl ethyl ketone, and PAHs in Ground Water.

These releases have affected more than one parcel of real property, including the parcels identified above. **Enclosure B** includes a detailed description and diagram of the site, as currently known to Ecology.

Note that the contaminants at this site comprise two groupings; one is composed of those associated with automobile wrecking yards, and the other associated with gas manufacturing wastes derived from Gas Works Park. The term "coal tar" is used throughout this letter as a general reference to the gas manufacturing wastes, although other kinds of tar may also be

present. The acronym "GWP fill" is also used to denote fill containing the Gas Works Park waste.

3. Identification of Other Sites That May Affect the Property.

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

Basis for the Opinion

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

1. September 21, 2011. *UST System Closure Report, Verbeek Wrecking Facility.* prepared by Stantec Consulting Corporation

2. June 23, 2011. *Subject: Results – Push-probe Groundwater Sampling, Site B – Former Verbeek Wrecking Yard, VCP No. Site NW 1982.* memorandum prepared by Dalton , Olmsted & Fuglevand, Inc.

3. January 10, 2011. *Cleanup Action Report, Verbeek Wrecking Property, 18416 Bothell-Everett-Highway, Bothell, Washington.* prepared by Landau Associates

4. January 7, 2011. *Interim Remedial Action Report, Site B- Verbeek Wrecking Yard, Bothell, Washington.* prepared by Dalton, Olmsted & Fuglevand, Inc

5. May 26, 2010. *Re: Opinion on Proposed Cleanup of the following Site: Name: Verbeek Wrecking.* letter from Mark Adams, Department of Ecology to Ms. Renee West, Verbeek Wrecking

6. January 15, 2010. *Interim Remedial Action Plan, Site B Portion of Verbeek Wrecking Yard, Bothell, Washington.* prepared by Dalton, Olmsted & Fuglevand, Inc.

7. December 24, 2009. *Ecology Review Draft, Cleanup Action Plan, Verbeek Wrecking Property, 18416 Bothell-Everett Highway, Bothell, Washington.* prepared by Landau Associates

8. July 21, 2009. *Re: Opinion pursuant to WAC 173-340-515(5) on June 15, 2009, Remedial Investigation Work Plan for the following Hazardous Waste Site: Verbeek Wrecking.* letter from Department of Ecology to Ms. Renee West, Verbeek Wrecking

9. June 15, 2009. *Remedial Investigation Work Plan, Verbeek Wrecking Site, Bothell, Washington.* prepared by Landau Associates.

10. May 20, 2009. *Interim Action Cleanup Report, Verbeek WreckingProperty, 18416 Bothell-Everett Highway, Bothell, Washington.* prepared by Landau Associates.

11. January 29, 2009. *Re: Further Action Determination under WAC 173-340-515(5) on*

Proposed Remedial Action for the following Hazardous Waste Site: Name: Verbeek Wrecking. letter from Department of Ecology to Ms. Renee West, Verbeek Wrecking

12. August 22, 2007. *Initial Investigation Field Report.* prepared by Geoffrey Crofoot, Snohomish Health District for Ecology

13. April 13, 2007. letter from Steve Britsch, Snohomish County Surface Water Management, to Steve White, Cascade Auto Wrecking, regarding results of a 3/28/07 inspection.

14. 2007. various emails, correspondence, and field records in Ecology files regarding surface water and process water disposal practices at the Verbeek property.

Those documents are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by calling the NWRO resource contact, Sally Perkins, at 425 649-7190.

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

Analysis of the Cleanup

1. Cleanup of the Property Located Within the Site.

Ecology has concluded that **no further remedial action** is necessary at the property to clean up contamination associated with the site. That conclusion is based on the following analysis:

a. Characterization of the Site.

Ecology has determined your characterization of the site **is sufficient** to establish cleanup standards for the site and select a cleanup for the property. The site is described above and in **Enclosure B**. Enclosure B also includes Ecology's analysis of and conclusions regarding site characterization.

b. Establishment of Cleanup Standards for the Site.

Ecology has determined the cleanup levels and points of compliance you established for the site **meet** the substantive requirements of MTCA.

a. Soil

Cleanup Levels

The site is located in an area of mixed commercial and residential use. It is also located near terrestrial habitat. As such, human health cleanup levels protective of unrestricted use are necessary, as well as ecological cleanup levels protective of terrestrial wildlife. The soil cleanup levels also need to be protective of leaching to

ground water. For any given contaminant, the more stringent of the three cleanup levels (human and ecological health, or ground water protection) generally applies to this site.

For protection of human health, either Method A or Method B cleanup levels can be used, although Method B is more appropriate and was chosen given the complexity of the site.

For protection of terrestrial wildlife, the necessity for cleanup levels was evaluated using the terrestrial ecological evaluation process (TEE) (WAC 1730340-7492). The first limiting criterion in the TEE is whether the site is industrial or commercial property, in which case only protection of terrestrial wildlife need be considered. Although, the property has in fact, been used for industrial purposes, there is a significant potential it may be redeveloped for multi-family housing purposes in the near future. The first limiting criterion, therefore, does not apply. A second group of limiting criteria consists of five exclusions. None of these apply. In particular, there is extensive undeveloped acreage adjoining the site, far exceeding the 1.5-acre threshold for exclusion. Since none of the exclusions apply, MTCA requires either a simplified or site-specific evaluation, and provides three criteria for choosing the site-specific alternative. None of these criteria are applicable to this site. A simplified TEE was therefore completed, and the cleanup levels used were those provided in Table 749-2.

For protection of ground water, cleanup levels were calculated using Ecology's three-phase model.

The table included in Enclosure C summarizes the accepted soil cleanup levels for this site.

Note that soil vapor cleanup levels protective of air quality are considered unnecessary because the only area with a potential vapor impact – the former fuel dispenser area (see Site Description, Attachment A) – contained mostly diesel at generally low concentrations.

Point of Compliance

The point of compliance for protection of human health (direct contact) and terrestrial wildlife is soil throughout the site to a depth of 15 feet below ground surface. The top of the ground surface is defined as that which currently exists.

The point of compliance for contaminants that are leaching to, and have been detected in, ground water is soil throughout the site.

b. Ground Water

Cleanup Levels

The highest beneficial use for ground water in the uppermost aquifer beneath the site is as a source of drinking water. Cleanup levels protective of this use can be based on Method A, Method B, or applicable state and federal laws (e.g., Federal MCLs). The most stringent of these was generally chosen as the selected cleanup level for a given compound or metal.

The table included in Enclosure C summarizes the accepted ground water cleanup levels for this site.

Point of Compliance

The point of compliance for ground water is throughout the site, from the uppermost level of the saturated zone (the water table) to the lowest most depth which could potentially be affected.

c. Selection of Cleanup for the Property.

Ecology has determined the cleanup you selected for the Property **meets** the substantive requirements of MTCA. The selected cleanup was excavation and removal of all contaminated soils exceeding cleanup levels. This cleanup meets the minimum requirements under MTCA, and does not exacerbate conditions or preclude reasonable cleanup alternatives elsewhere at the site.

d. Cleanup of the Property.

Ecology has determined the cleanup you performed **meets** the applicable site cleanup standards within the property. Following is a summary description of the cleanup actions which have occurred at the property.

The contaminant nature and distribution was not well documented prior to beginning cleanup at the site, but did suggest the soil contamination attributable to wrecking yard operations was broadly distributed across the property and relatively shallow in depth (most concentrated at the surface and extending downward less than 10 feet).

Despite the lack of information, a substantial remedial action took place at the site from July to October 2008, and consisted of:

- Surface gravel removal and stockpiling

- Widespread shallow soil excavation throughout the wrecking yard guided primarily by visual signs of contamination. The depth of excavation is not well documented, but is reported to have been 4 to 9 feet.

- Deeper soil excavations to a depth of 12 feet at a couple of locations in the western portion of the wrecking yard.

- Excavated soil stockpiling and subsequent treatment via tilling and incorporation of an unidentified reagent.

- Performance sampling to show the excavated soils had reached cleanup levels, and placement of the treated soils back into the excavation. It is worth noting that the mixing process that occurred as part of excavation and treatment made it nearly impossible to discern whether cleanup levels were achieved through biodegradation, dilution, or both.

- Soil excavation in the GWP fill area. The depth of excavation in this area reached approximately 8 feet.

- GWP fill stockpiling for future disposal or treatment.

At the close of this work, several stockpiles of surface gravel remained, along with a large stockpile of GWP fill. A small area of treated soil from the GWP fill also remained at the north end of the GWP fill stockpile.

Because the original extent of soil and ground water contamination had not been fully documented, and because clear documentation on what exactly occurred during the 2008 remedial action was also lacking, additional investigations were undertaken in 2009 to clarify site conditions and to provide the basis for a final cleanup action. These investigations showed that only limited areas remained where soil or ground water exceeded cleanup levels (see figures in Enclosure B).

A final remedial action then took place in mid- to late-2010. The responsibility for doing the work was split, with contractors for Verbeek dealing with historical wrecking yard contamination, and contractors for Puget Sound Energy and the City of Seattle dealing with the GWP fill. The actions associated with each of the remaining areas of contamination were as follows:

Former Fuel Dispenser Area:
Petroleum-contaminated soil and ground water had been detected beneath the former fuel dispensers in the eastern part of the property (maximum 820 mg/kg TPH-G, 14,000 mg/kg TPH-D, and15,000 mg/kg TPH-O in soil; maximum 660 ug/L TPH-D in ground water).

Excavation activities in this area initially began by removing overburden soils expected to be clean. These were stockpiled and sampled to confirm they met cleanup levels. Excavation of contaminated soil then took place, and resulted in approximately 1,600 cubic yards being removed for off-property disposal. An additional 800 cubic yards of oil-contaminated soil were discovered at the western edge of the fuel dispenser excavation; these soils were associated with an oil filter burial area that was known to exist, but had not been located. The total excavation ultimately extended over an area measuring 120 by 140 feet in plan area and to a maximum depth of about 12 feet.

Confirmation soil samples obtained from the base and sides of the combined excavations showed either no detectable contamination or low levels of TPH-D, naphthalene, and 1, 2, 4-trimethylbenzene below cleanup levels.

The excavation extended about 3 feet below the water table, requiring dewatering. Approximately 70,000 gallons of water were ultimately pumped from the excavation and initially stored in a Baker tank. A sample of the tank water showed 410 ug/l diesel and 260 ug/l oil, which are below ground water cleanup levels. The water was therefore disposed of by discharging it to the depression present on the western side the property, and allowing it to infiltrate: A grab sample of ground water was also obtained directly from the excavation and showed 180 ug/l diesel, well below the 500 ug/l ground water cleanup level for TPH-D.

Further work was then undertaken utilizing properly installed monitoring wells to demonstrate that ground water in the area met cleanup levels (note that this was the only area at the site where ground water impacts had initially been noted, with the only constituent exceeding cleanup level being TPH-D). Two wells were installed at the down gradient edge of the excavation and sampled on two occasions (September, December 2010). No oil or diesel was detectable in any of the samples. This data, coupled with the construction dewatering data, is sufficient evidence that ground water beneath this portion of the site has not been impacted by the former diesel and oil contamination in soil.

Former USTs North of Shop Building:
Diesel-range petroleum contamination (2,400 mg/kg TPH-D) was detected below former fuel oil tanks north of the shop building. The elevated diesel detection was from a sample collected from an unknown depth below the USTs.
The 2010 "remediation" in this area began with an investigation to determine if any contamination remained - the initial sample showing contamination was taken in 1995. Seven soil samples were obtained as part of the investigation from depths ranging from 5 to 14 feet in and around the former UST excavation. These samples

were analyzed for oil and diesel-range hydrocarbons. No TPH was detected, except 260 mg/kg oil in one sample – this value is well below the cleanup level. These data indicate the initial 1995 results were not representative or that hydrocarbon concentrations have declined with time to below cleanup levels. As a result of the investigation, remediation was deemed unnecessary in the area.

Former 8,000-Gallon Waste Oil Tank:
An 8,000 gallon UST was removed in August, 2011 from beneath and adjacent to the western edge of the former shop building. The tank was rusted and pitted, but had no obvious holes. Approximately 1,900 gallons of oil and some additional sludge were removed and taken by Emerald Services for disposal. After tank removal, the excavation measured approximately18 feet wide by 31 feet long. There was no indication of soil contamination in the sides or base of the excavation. Confirmation soil samples were obtained from the sides and base, and analyzed for TPHg, TPHd, TPHo, BETX, EDB, EDC, MTBE, lead, cPAHs, PCBs, and halogenated volatile organics. Of the organics, only TPHo and ethylbenzene were detected; both at concentrations well below the cleanup levels for this site. Lead was also detected, but at concentrations typical of native soil.

Lead-Contaminated Gravel Stockpiles:
Lead-contaminated gravel stripped from the surface of the wrecking yard had been stockpiled in the southwest corner of the property. The gravel was also contaminated with TPH-D, TPH-O, and cPAHs, but only lead exceeded the cleanup level. Other volatile organics and PAH compounds were likely present, but were not analyzed for in gravel samples.

Approximately 2,013 tons of gravel and underlying surface soil were removed and disposed of off-property at a permitted solid waste landfill as part of the 2010 cleanup. Confirmation soil samples obtained from the exposed subgrade showed lead at less than the cleanup level.

GWP Fill and PAH-contaminated Surface Soil (in-place):
Coal tar-contaminated soil had been imported from Gas Works Park and placed as fill in the southwestern portion of the property (GWP fill), as described in the site Description attachment. About half of the fill was in-place and had not been excavated, and the other half had already been excavated and stockpiled as part of 2008 remediation (see below). PAH-contaminated surface soils were also present across a portion of the GWP fill area.

The fill and surface soil contamination was treated as one during the 2010 remediation. The GWP-contaminated soil in fill was typically present within a 1 to 3-foot thick layer spread over an area measuring approximately 300' by 350' in the southeast corner of the property. The contaminated layer dipped to the south from near land surface to a depth of over 10 feet. The PAH-contaminated surface soil occurred in a small area at the northern edge of the 300 by 350-foot area.

Contaminated soil was excavated from throughout the 300 by 350-foot area, although the main portion of the excavation measured 270 feet by 300 feet. The main excavation generally deepened to the south and west, reaching a maximum depth of 12 feet at the south property line. A total of 12,243 tons of soil were ultimately removed and disposed of off-property at one of three permitted facilities. The excavation was backfilled with imported fill, and with soils removed from the excavation that had been tested and shown to contain contaminants at less than cleanup levels.

Confirmation soil samples were obtained from the base and sides of the excavation and analyzed for PAHs (both carcinogenic and noncarcinogenic) and dibenzofuran. Where the analytical data showed a continuing exceedance of cleanup levels, the area was over-excavated and re-sampled. This process continued until all of the confirmation samples showed residual contamination as non-detectable or below cleanup levels within the property boundaries.

At the southern property line, a GWP fill layer was still evident in the excavation sidewall at a depth of about 6 feet extending off-property to the south. The GWP fill layer was about 1.5 feet thick and was visible for 130 feet along the property line within the excavation. This off-property portion of the site was not cleaned up.

Minor ground water seepage was encountered at the base of the excavation at depths of 8 to 10 feet below land surface, a depth essentially at the water table. This ground water mixed with storm water runoff, all of which was directed into the excavation from surrounding areas. A total of 9,300 gallons of water was removed for ultimate disposal to Emerald Services.

Ground water monitoring results from MW-1, located immediately down gradient from GWP fill area, had previously shown no impact from the PAHs, except for a slight naphthalene detection. However, MW-1 was screened too deeply in the aquifer (38 to 48 feet below ground surface) to be a reliable indicator for shallow ground water contamination. Two ground water grab samples were therefore obtained from the upper part of the aquifer immediately downgradient of the former GWP fill area. No PAHs or BETX were detected in these samples. Ecology considers this data, plus the fact that PAHs have a low solubility in water, to be sufficient evidence that the GWP fill has not impacted ground water at concentrations above cleanup levels.

GWP Fill Stockpile and Landfarm Soil:
A large stockpile of untreated GWP fill remained as described mentioned. In addition, an area where GWP fill treatment had been attempted was also present adjoining and immediately north of the GWP fill pile. These treated soils are referred to as the "landfarm soils".

These stockpiles and the surface soil beneath the stockpiles were removed and taken off-property for disposal as part of the 2010 remediation. The total removed was approximately 14,600 tons. Confirmation soil samples were taken from the exposed

subgrade, and showed no detectable contaminants or PAHs at concentrations below cleanup levels.

In summary, remedial actions at the site have resulted in soil and ground water meeting applicable cleanup standards within the property.

2. Cleanup of the Site as a Whole.

Ecology has concluded that **further remedial action** under MTCA is still necessary elsewhere at the site. In other words, while your cleanup constitutes the final action for the property, it constitutes only an **"interim action"** for the site as a whole.

Specifically, PAH contaminated soils extend off-property to the south. The extent of contamination in this direction has not been determined.

Listing of the Site

Based on this opinion, Ecology will update the status of remedial action at the site on our database of hazardous waste sites. However, because further remedial action is still necessary elsewhere at the site, we will not remove the site from our lists of hazardous waste sites. Furthermore, the property will remain listed as part of the site because the cleanup of the property does not change the boundaries of the site.

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**:

- Change the boundaries of the site.
- 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).

Termination of Agreement

Thank you for cleaning up your property under the Voluntary Cleanup Program (VCP). This opinion terminates the VCP Agreement governing this project (#NW1982). If you should decide to clean up the remainder of the site, please do not hesitate to reapply and request additional services under the VCP.

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 or the termination of the agreement, please contact me at 425 649-7107.

Sincerely,

Mark Adams, LHG
Toxics Cleanup Program

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Enclosures (3): A – Legal Description of the Property
B – Description and Diagram of the Site
C- Site Cleanup Levels

cc: Sno King Properties LLC
Dolores Mitchell, VCP Fiinancial Manager

ecc: Larry Beard, Landau Associates
Matt Dalton, Dalton, Olmsted & Fuglevand, Inc.
Jonelle Fenton-Wallace, Snohomish County

Enclosure A

Legal Description of the Property

Parcel 1
SEC 18 TWP 27 RGE 05 BEG INT OF N LN SE1/4 NE/14 & C/L ST HWY TH SLY ALG C/L HWY FOLG ARC OF CRV FOR 71FT M/L TO STA 523 & 21.9 TH S 03*52 00W 259.4FT TH S89*18 00W 30.1FT TO WLY R/W LN SD RD TPB TH CONT S89*18 00W FOR ADDITIONAL 117.6FT TH S03*52 00W 92.6FT TH N89*18 00E 117.6FT TO WLY R/W LN SD HWY TH N03*52 00E FOR 92.6FT TO TPB LESS R/W TO ST OF WA PER WD REC AF NO 9208130078

Parcel 2
SEC 18 TWP 27 RGE 05 WLY 289.08FT OF TH PTN OF SE1/4 NE1/4 LY NLY OF FDL BEG SW COR OF TH CERT PAR CONVYD TO FRED A. OLSEN & INA OLSEN BY DEED REC UND AF NO 800733TH N89*38 40W ALG N LN & ITS WLY PROJ OF TH CERT PAR DESC QCD REC UND AF NO 8008120266 TO W LN OF SD SUB TGW WLY 289.08FT OF TH PTN OF NE1/4 NE1/4 LY SLYOF 183RD ST SE PER BLA REC UND AF NO 9001220502

Parcel 3
SEC 18 TWP 27 RGE 05 TH PTN SE1/4 NE1/4 LY WLY OF SR 527 EXC TH PTN THOF LY SLY & ELY OF FDL BEG NE COR OF TH CERT PAR CONVYD TO FRED A. OLSON & INA OLSON BY DEED REC UND AF NO 800733 TH S89*18 00W 117.6FT TO NW COR OF SD OLSON PAR TH S03*52 00W 92.6FT TO SW COR OF SD OLSON PAR TH N89*38 40W ALG N LN & ITS WLY PROJ OF THCERT PAR DESC QCD REC UND AF NO 8008120266 TO W LN OF SD SUB TGW TH PTN OF NE1/4 NE1/4 OF SD SEC 18 LY WLY OF SR 527 & SLY OF 183RD ST SE EXC TH PTN THOF DAF BAAP TH IS 157FT W & 169FT S OFINTER OF S LN OF SD 183RD ST SE & W LN OF OLD PAC HWY (SR 527) AS THEY EXIST FEB OF 1972 SD PT BEING NE COR OF TH CERT PAR DESC IN SWD FR MARTIN TO VERBEEK DATED JULY 25, 1980 & REC UND AF NO 008120014 TH S 170FT TO SE COR OF SD MARTIN TO VERBEEK PAR TH ELY ALG S LN OF SD SUB TO W LN OF OLD PAC HWY TH NLY ALG SD WLY R/W LN TO INTER WITH LN THRU POB TH IS
PLW SD S LN OF 183RD ST SE TH WLY ALG SD PLL LN 184.87FT M/L TO POB ALSO EXC WLY 289.08FT OF SD SUB PER BLA REC UND AF NO 9001220502 LESS R/W TO ST OF WA PER WD REC AF NO 9208130078

Enclosure B

Description and Diagram of the Site

This enclosure provides Ecology's understanding and interpretation of site conditions, and forms the basis for the opinions expressed in the letter.

INTRODUCTION

Site Definition

The approximately thirteen-acre Verbeek property (the property) is located at 18332 Bothell-Everett Highway (SR 527), in an unincorporated part of Snohomish County. The property occupies the southwest corner of the intersection between the highway and 183rd St. SE. Soil and ground water that became contaminated due to wrecking yard operations at the property comprise the main portion of the Verbeek site (the site). A secondary "release" associated with the importing and placement of coal-tar contaminated fill (see below) is also part of the site. The attached map shows the approximate location of the site and the property.

Synopsis and Chronology of Investigations

In early 2008, Geotech Consultants conducted two initial investigations, including 12 test pits and 9 borings. Thirty eight soil samples were obtained for analysis from these explorations at depths of 1 to 9 feet below ground surface (bgs). The samples were analyzed for TPHd, TPHo, TPHg, BETX, PAHs, volatile organic compounds (VOCs), ethylene glycol, and metals (As, Pb, Ba, Hg, Cd, Se, Cr, Ag). Ground water grab samples were also obtained from 8 of the borings, and analyzed for TPHd, TPHo, TPHg, BETX, MTBE, naphthalene, cPAHs, and VOCs.

In mid to late 2008, a soil cleanup action was undertaken by GreenCo, involving the excavation and on-property treatment of surface soils from a large portion of the property. A large number of confirmation soil samples (133) were taken from the exposed excavation surface and analyzed for TPHg, TPHd, and TPHo. A portion of these samples were analyzed for BETX and lead.

In 2008, ESN installed two ground water monitoring wells (MW-1, MW-2) for GreenCo. Geologic logs were not prepared for these wells, although driller field notes are available.

In late 2008, Floyd/Snider obtained 18 soil samples from a GreenCo generated stockpile and 3 in-situ soil samples and analyzed them for primarily PAHs. The focus of the investigation was on coal-tar contaminated materials.

In 2009, Landau conducted further investigations (a Remedial Investigation) related to wrecking yard impacts, that included 29 borings. Sixty two soil samples were obtained from these borings, and from other surface soil and stockpile locations, from depths ranging between 0.5 and 30 feet bgs. The samples were analyzed for a variety of compounds and metals including: TPH-HCID, TPHd, TPHo, TPHg, BETX, PAHs, PCBs, and metals (As, Cd, Cr, Pb, Hg). Six of the borings were also converted to ground water monitoring wells, and these wells were sampled once, except MW-8, which was sampled twice. Ground water samples were analyzed for TPH-HCID, TPHd, TPHg, BETX, VOCs (Method SW8260B), PAHs (Method SW8270SIM), arsenic, lead, and total organic carbon. A sample of surface water was also obtained from a catch basin near the downgradient end

of the storm drain system at the property, and analyzed for the same compounds and metals, minus TPHd, TPHg, and total organic carbon.

In 2009, Dalton/Olmstead/Fuglevand (DOF) /Olmstead conducted an additional investigation focused on the GWP fill contaminated with coal tar. They obtained 77 soil samples from 27 test pits and 7 push probes, and analyzed most of the samples for semi-volatile organics (including PAHs), TPHg,TPHd, TPHo, BETX, and metals (As, Ba, Cd, Cr, Pb, Hg, Ni, Zn).

In 2010, a final remedial action was conducted involving soil excavation and removal. Confirmation soil and ground water samples were obtained, as described in the "Cleanup of the Property" section of this letter. Additional investigation activities were also completed including an evaluation of residual contamination in the sanitary sewer and in storm drain sediment. A video survey was made of the sewer, and a sediment sample was obtained from the point where the property drainage system discharges to a local unnamed stream. The sediment sample was analyzed for semi-volatile organics (SW8270) and metals.

In 2011, two additional ground water grab samples were obtained downgradient of the former GWP fill. These samples were analyzed for TPHg, TPHd, TPHo, BETX, carcinogenic and noncarcinogenic PAHs, dibenzofuran, carbazole, arsenic, barium, chromium, lead, and nickel.

A tank pull also occurred in 2011 (an 8,000 gallon waste oil tank). As part of the tank pull, additional data was obtained on subsurface conditions, and soils samples were obtained for chemical analysis.

THE BUILT ENVIRONMENT

Property History and Sources of Contamination

Verbeek Wrecking operated at the property between 1956 and 2008. During this 53-year period, a variety of automobile wrecking and salvage activities took place, including vehicle storage, vehicle refueling, body and engine disassembly, parts storage and sales, and automobile crushing and shearing. The automobile shearing, crushing, and part processing activities took place at two concrete-floored locations in the northern part of the property (it is not known when the concrete pads were poured), and in a building on the western part of the property. Automotive fluids were reportedly drained at these locations and stored in a tank (see discussion of 8,000 gallon tank below). Batteries were also processed and stored in these areas prior to disposal. Batteries were reportedly a valuable commodity, and were always sold to a commercial vendor for reprocessing at an off-property location.

Sources of contamination associated with the automotive wrecking and salvage operations include direct spills and discharge to ground, burial of waste materials (e.g. spent oil filters) in low-lying areas of the property, and spreading of waste fluids across the property in storm water flow. Both of the processing areas with concrete pads drained to central catch basins which discharged to an oil/water separator. Ecology and Snohomish County inspections at the property in 2007 noted that the oil/water separator did not appear to working, that automotive fluids had been spilled on the ground at various locations, and that waste fluids and storm water runoff in part of the processing area were being directly discharged to the storm drain system.

Several underground storage tanks were used at the property to temporarily hold waste fluids and to store fuel for vehicles and equipment. They were all in the eastern part of the property and included the following:

- One 8,000 gallon waste oil tank - located near and partially beneath the former shop building.
- Two diesel storage tanks – 5,000 and 6,000 gallons – located near a fuel dispenser. These tanks were removed in 1995.
- One 800-gallon lube oil tank, and 500-gallon and 550-gallon fuel oil tanks – located north of the former shop building. All of these tanks were also removed in 1995.

A second source of contamination, consisting of imported coal-tar contaminated fill, existed at the property. The fill was brought it from the City of Seattle's Gas Works Park in the 1970s, and placed in the southeast corner of the property. Coal tar wastes of various chemical compositions are typically found at manufactured gas plants, and are rich in polycyclic aromatic hydrocarbons (PAHs) and BETX. For convenience, this coal-tar-contaminated fill is termed "GWP fill".

Area Description
The area around the property is semi-rural, with low-density commercial and retail business extending north and south along both sides of the highway, and residential properties or undeveloped land to the east and west. Immediately south of the property is a Golds Gym facility and a storage area for Lease Crutcher Lewis Contractors; to the north are some homes and a dental office. An apparent former farmstead is located a few hundred feet northwest of the property, and beyond that a large regional park, the North Creek County Park.

Property Description
The property itself contains an existing home/office and a former shop building. A number of other buildings have historically been present at the property including a steam cleaner/part shed, a parts shed/office and shop, a third parts shed, and a processing building associated with automobile crushing and shearing. These have all been removed, as have all vehicles, vehicle parts, internal fencing and other structures.

Water Supply: Ground water supply wells likely exist in the area, given its' semi-rural nature. However, potable water is provided to the property by a local water district.

Other Utilities: Storm drainage facilities are described below.

THE NATURAL ENVIRONMENT

Physiographic and Surface Water Setting
The area around the site consists of somewhat hummocky terrain near Elevation 250 feet located between the North Creek valley on the west and the Silver Creek drainage on the east. North Creek is about 2,000 feet from the site, and Silver Creek about 1,000 feet. Silver Creek is a tributary of North Creek, and both flow south.

The property itself sits across a small north-south trending depression, with a total relief of approximately 22 feet. The highest area adjoins the highway at the east edge of the property; the lowest is within the depression. Natural runoff from the property originally flowed south in a gully present along the axis of the depression. The gully was filled in and storm drains now capture the runoff and maintain discharge to the south. The storm water ultimately discharges at the head of an unnamed stream approximately 900 feet south of the property.

Ecological Setting

Considerable terrestrial habitat exists around the property. The North Creek Park and farmstead contain mostly open grass and wetland areas, with lesser areas of forest. Other tracks of forest areas are located immediately west of the property. The closest aquatic habitat is the unnamed stream mentioned above.

Geology

Shallow geologic conditions across most of the site consist of fill overlying glacial outwash to the maximum depth explored, 35 feet below ground surface (bgs). The thickest fill (up to 20 feet) is in the depression in the southeastern corner of the property, where it was placed to raise the grade. It is not clear whether the outwash is a recessional deposit associated with the latest Fraser glaciation, or an earlier advance outwash. Regardless, it contains both clean and dirty (silty) outwash, some with an almost till-like character but with greater permeability. There is some indication that glacial till or a hard silt may actually underlie the outwash, but the data is inconclusive.

Ground Water

Shallow ground water occurs under generally unconfined conditions within the outwash. The depth to the water table is 6 to 8 feet bgs beneath lower areas of the property and 14 to 20 feet beneath higher areas. Ground water flow directions are westward towards the North Creek drainage.

NATURE AND EXTENT OF CONTAMINATION

Nature and Extent of Contamination Associated with Gas Works Park Fill (GWP fill)

The GWP fill mentioned earlier was brought in to raise grades in the southeastern corner of the property. Apparently this fill was mixed with cleaner material derived from other sources, because the GWP fill was often clearly discernable as a layer of dark odiferous material within otherwise normal-appearing silty sand fill material. The full vertical and lateral extent of contamination was not clarified until the 2010 cleanup work (see the "Cleanup of the Property" section of the letter).

The GWP fill contained elevated concentrations of carcinogenic and noncarcinogenic PAHs, diesel- and oil-range hydrocarbons, and benzene, ethylbenzne, toluene, and xylenes (BETX). Several metals (arsenic, barium, chromium, and lead) were also detected at a few locations at concentrations slightly over the applicable cleanup level. However, statistical analysis of the metals data in accordance with MTCA showed no exceedance of the cleanup levels. Many more compounds are actually present in coal-tar, but the PAHs provide a reasonable surrogate for the totality of contamination.

Only one ground water monitoring well is in a location to check GWP fill impact on water quality. This well (MW-1) is ideally located adjacent to the down gradient edge of the contaminated area, but is too deep to be suitable (water table at 10 to 15 feet feet bgs, completion depth 38 – 48 feet bgs). Data from the well showed no PAHs, except naphthalene at .027 ug/l, compared to the cleanup level of 160 ug/l. Two ground water grab samples were obtained to supplement the data from MW-1.

These samples were also obtained from immediately downgradient of the GWP fill, but from the upper part of the aquifer near the water table. No PAHs or BETX compounds were detected in these grab samples, indicating no ground water impact from the GWP fill.

Nature and Extent of Contamination Associated with Wrecking Yard Operations

Soil contamination attributable to wrecking yard operations was broadly distributed across the property and relatively shallow in depth (most concentrated at the surface and extending downward generally to between 4 and 9 feet). In a few areas the contamination extended deeper to a reported maximum depth of 12 feet. The contamination consisted mostly of lead, TPH-D and TPH-O, with subordinate TPH-G, BETX, and several petroleum-related volatiles (trimethylbenzenes, isopropylbenzenes, butylbenzenes). PAHs were also detected at one location, but the detection was likely associated with stray dirt from an adjoining Gas Works Park fill stockpile.

Initial ground water sampling results (from push probes) showed low-level contamination with TPH-G, benzene, xylenes, toluene, MTBE, and naphthalene at widely scattered locations around the property. However, ground water data subsequently collected from properly installed monitoring wells showed no detectable hydrocarbons, except near the former fuel dispenser (see below). The result was surprising given the widespread soil contamination at the property. It appears the diesel-oil combination was retained near the surface and was not able to penetrate downward in any significant way through the interlayered outwash deposits.

Surface water runoff was also impacted at the property. The Verbeek operation was visited on several occasions in 2007 by Ecology, King County, and Snohomish County staff in response to complaints about contaminated surface water and process waste water being discharged to the storm drain system, and about gasoline odors in the side sewer. Part of the problem appeared to be a poorly functioning oil-water separator and a "bus dump". An initial investigation was subsequently undertaken by the Toxics Cleanup Program, and an Early Notice Letter issued on January 23, 2008 indicating that the property would be placed on Ecology Confirmed and Suspected Contaminated sites list. Since then a video survey of the sanitary sewer has shown it no longer contains potentially contaminated sediment (if it ever did), and sediment sampling at the storm drain outfall south of the property shows no impact to sediment. The sediment sample was analyzed for semi-volatile organics (including PAHs) and metals; the semi-volatiles were not detected, and the metals were detected at low concentrations below site soil cleanup levels.

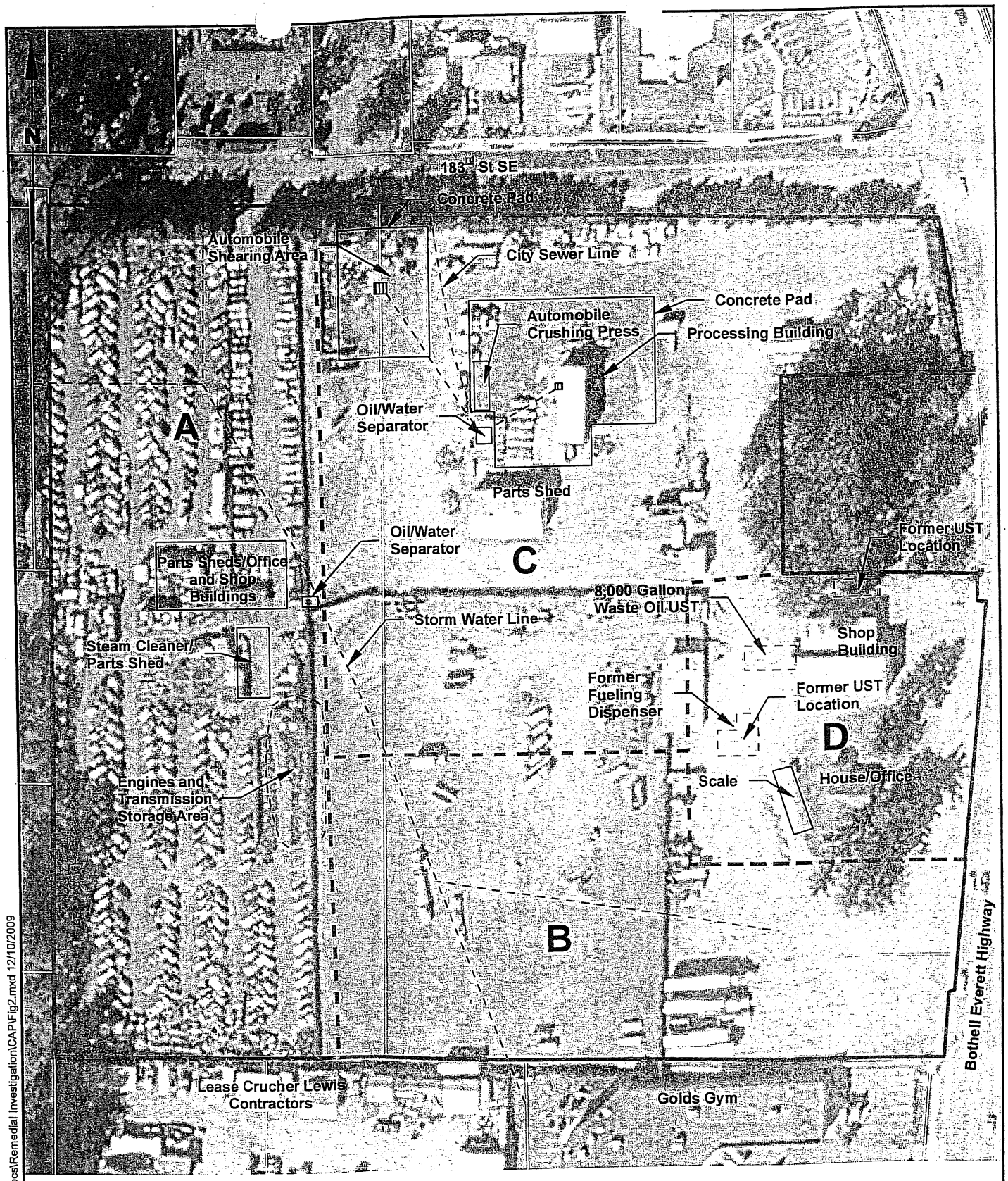
Nature and Extent of Contamination Associated with Former USTs North of Shop Building

Total diesel-range hydrocarbons were detected at 2,400 ppm in soil at an unknown depth beneath one of the former fuel oil tanks north of the former shop (these tanks were removed in 1995). The extent of this contamination was not known, but subsequent investigations in 2010 found no remaining indication of contamination (see the "Cleanup of the Property" section of the letter).

Nature and Extent of Contamination Associated with the Former Fuel Dispenser Area

Gasoline-, diesel- and oil-range hydrocarbons were detected in soils near the former fuel dispenser and associated 5,000- gallon and 6,000-gallon USTs. BETX and PAH compounds were also detected in this area. The area of fuel contamination overlaps a portion of the area impacted by GWP fill, which may explain why the PAH and oil-range petroleum hydrocarbons were detected. The fuel contamination near the former fuel dispenser was found to extend to the water table. The final boundaries of the area of contamination were determined during the 2010 remedial excavation work (see the "Cleanup of the Property" section of the letter).

Low concentrations of benzene, xylenes, and PAHs below cleanup levels were detected in ground water beneath the former fuel dispenser, along with TPH-D at concentrations below or slightly above the cleanup level. The extent of the impacted ground water was not determined prior to the start of the 2010 remediation, but it was thought likely that it extended downgradient to the west. However, the data obtained during the 2010 remediation and subsequent ground water monitoring showed no impact and no plume to the west.



Data Source: Snohomish County; ESRI

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LANDAU ASSOCIATES

Verbeek Wrecking CAP Bothell/Snohomish County Washington	Historic ~~Site~~ Plan PROPERTY	Figure 2

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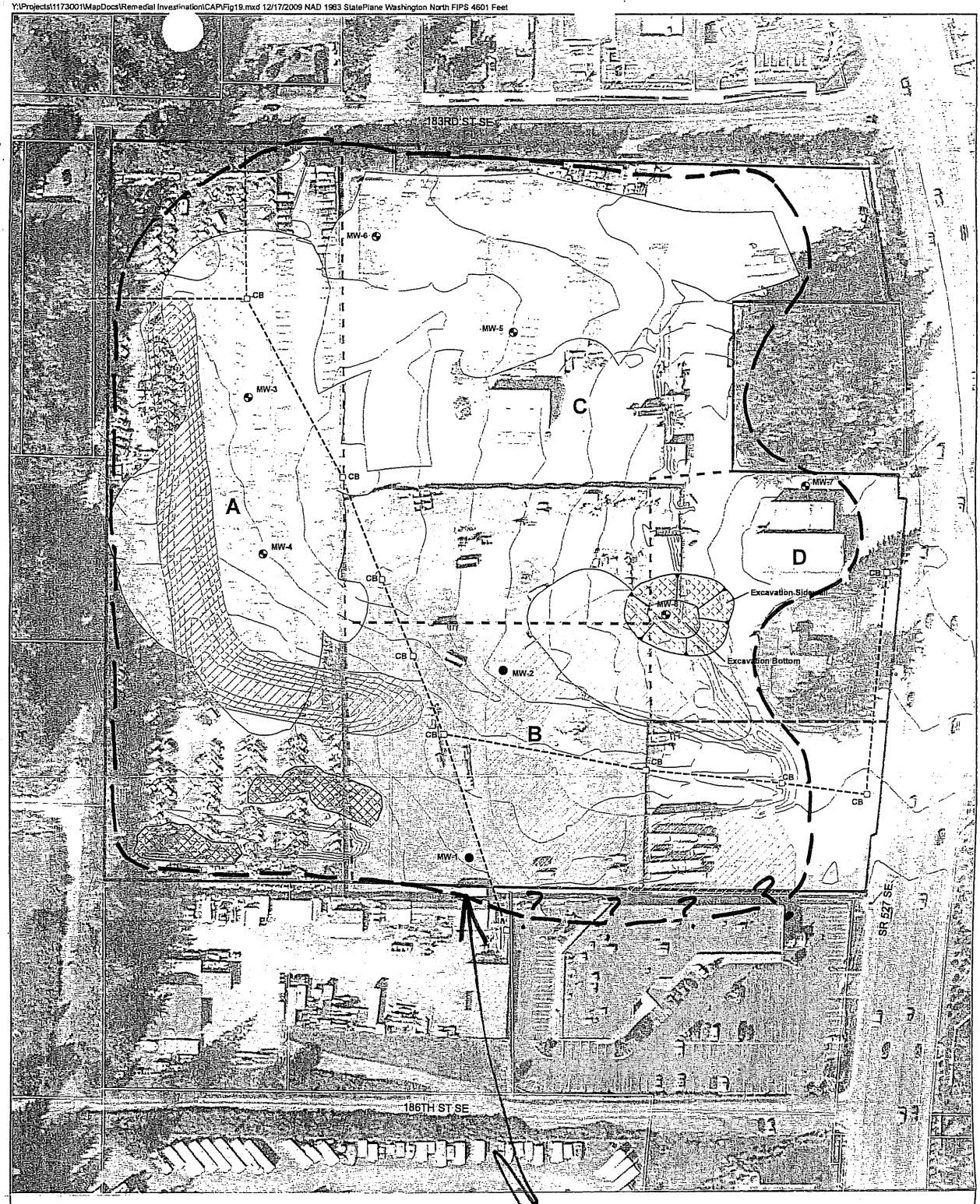

APPROXIMATE BOUNDARY OF MTCA SITE

Legend

- Existing Monitoring Well - Green Co. 2008
- RI Monitoring Well Location
- Elevation Contour
- Storm Drains and Sanitary Sewer Lines
- Gravel Stockpile
- Soil Stockpile
- cPAH Affected Area
- Soil cleanup action area (approximate limits)
- TPH Excavation Area
- Approximate Extent of Remaining GWP Fill

N

0 100 200

Scale in Feet

Data Source: Snohomish County; ESRI; Western Engineers Inc.

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

Verbeek Wrecking CAP Bothell/Snohomish County Washington	Cleanup Action Areas	Figure 19

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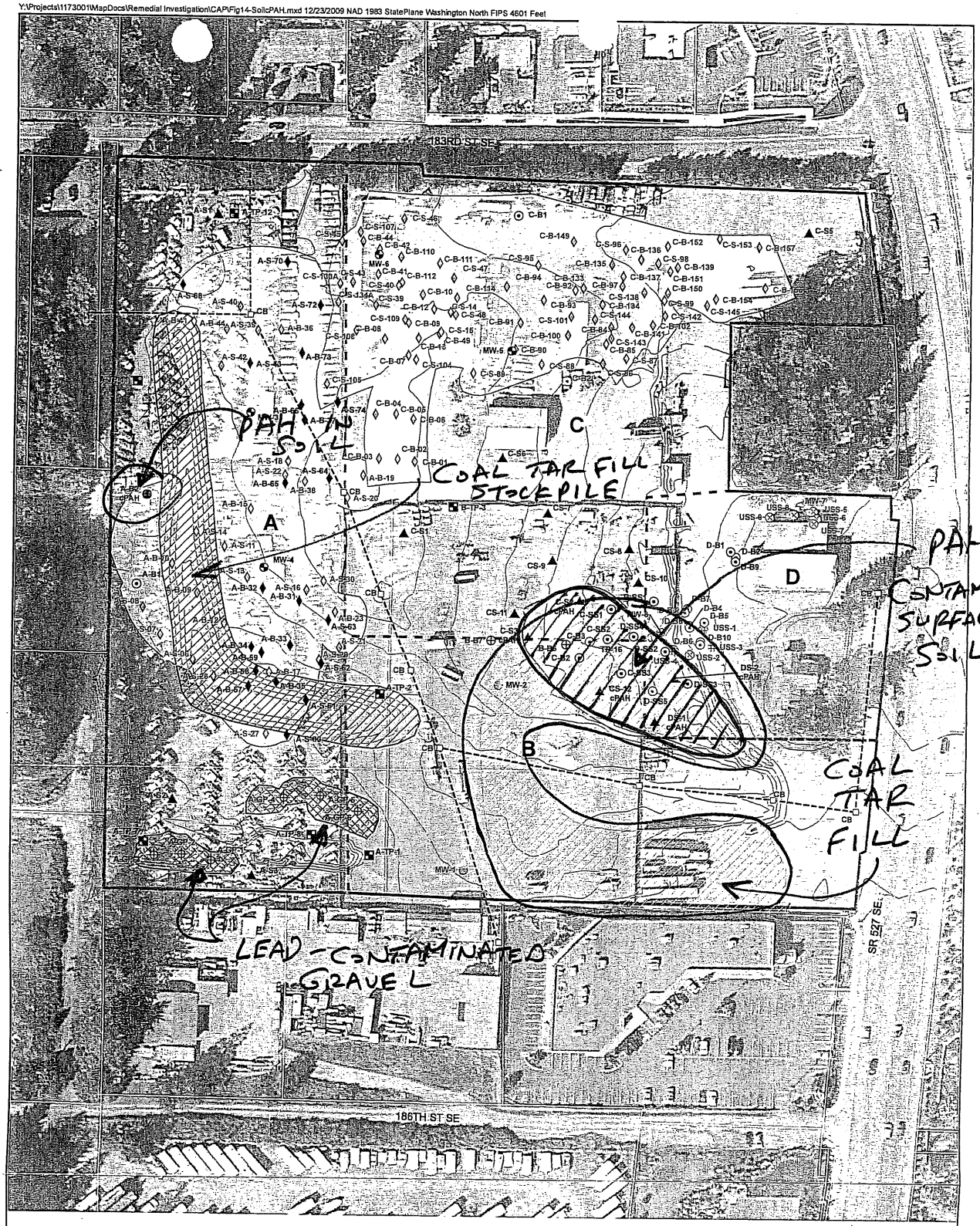


M. Adams Ecology

CLEANUP ACTION AREAS

Legend

- RI Boring Location
- RI Monitoring Well Location
- RI Surface Soil Sample Location
- RI Gravel Stockpile Sample
- Existing Monitoring Well - Green Co. 2008
- 2008 Test Pit Location - Geotech Consultants
- 1995 Excavation Sidewall Confirmation Soil Sample - Geotech Consultants
- 1995 Excavation Bottom Confirmation Soil Sample - Geotech Consultants
- 2008 Boring Location - Geotech Consultants
- Green Co. 2008 Excavation Sample
- Soil Sample Exceeds Cleanup Screening Level - Constituent that exceeds is noted below sample name.
- Sample Location Not Analyzed for cPAHs
- Storm Drains and Sanitary Sewer Lines
- Elevation Contour
- Gravel Stockpile
- Soil Stockpile
- Soil cleanup action area (approximate limits)
- cPAH Affected Area
- Approximate Extent of Remaining GWP Fill

N

0 100 200

Scale in Feet

Data Source: Snohomish County; ESRI; Western Engineers Inc.

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

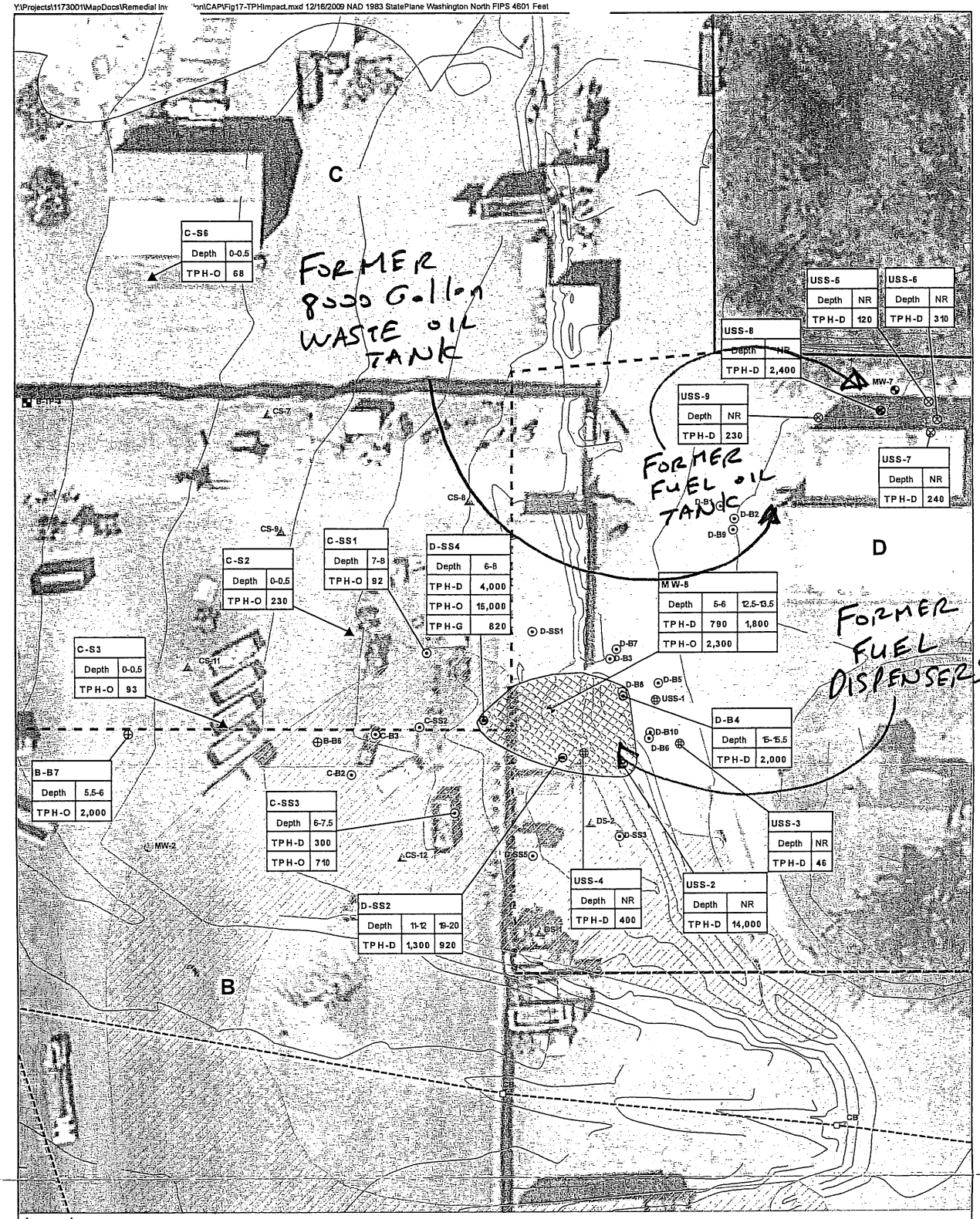
Verbeek Wrecking CAP
Bothell/Snohomish County
Washington

Current Soil Conditions - cPAHs

Figure 14

MADAMS, ECOLOGY

CLEANUP ACTION AREAS



Enclosure C

Site Cleanup Levels

TABLE 5
PRELIMINARY SOIL CLEANUP LEVELS
VERBEEK WRECKING
BOTHELL, WASHINGTON

Constituent	Protective of Direct Human Contact		Protective of Groundwater as Drinking Water	Protective of Terrestrial Ecological Receptors	Adjustments		
	MTCA Method B Unrestricted Land Use Carcinogen	MTCA Method B Unrestricted Land Use Non-Carcinogen	MTCA Method B (a)	Primary Contaminant Soil Concentrations Protective of Terrestrial Ecological Receptors Unrestricted Land Use	PQL (b)	Soil Background (c)	Preliminary Cleanup Level
METALS (mg/kg)							
Arsenic	0.67	24	20 (d)	95	5	7	20
Barium	--	16,000	1700 (k)	1,250	50	--	16,000/1,250 (e)
Cadmium	--	80	0.69 (k)	25	1	1.0	25
Chromium III	--	120,000	3,600,000	42	5	42	120,000/42 (e)
Lead	--	250 (f)	-- (g)	220	5	24	250/220 (e)
Mercury	--	24	2.1 (k)	0.7	0.05	0.07	24 / 0.7 (e)
TOTAL PETROLEUM HYDROCARBONS (mg/kg)							
Diesel-Range	--	2,000 (h)	2,000 (h)	460	20	--	2,000/460 (e,h)
Gasoline-Range	--	100/30 (h, i)	100/30 (h, i)	200	5.0	--	100/30 (h,i)
Oil-Range	--	2,000 (h)	2,000 (h)	--	50	--	2,000 (h)
BTEX (mg/kg)							
Benzene	18	320	0.03	--	0.02	--	0.03
Ethylbenzene	--	8,000	6.0	--	0.05	--	6.0
Toluene	--	6,400	4.7	--	0.05	--	4.7
Xylenes (total)	--	16,000	15	--	0.05	--	15
m,p-Xylene	--	160,000	84	--	0.05	--	84
o-Xylene	--	160,000	92	--	0.05	--	92
Ethylene Glycol	--	160,000	-- (g)	--	--	--	160,000
VOLATILES (mg/kg)							
1,2,4-Trimethylbenzene	--	4,000	-- (g)	--	0.05	--	4,000
1,3,5-Trimethylbenzene	--	4,000	-- (g)	--	0.05	--	4,000
Isopropylbenzene	--	--	--	--	0.05	--	--
Isopropyltoluene	--	--	--	--	0.05	--	--
n-Butylbenzene	--	--	--	--	0.05	--	--
n-Propylbenzene	--	--	--	--	0.05	--	--
tert-Butylbenzene	--	--	--	--	0.05	--	--
p-Isopropyltoluene	--	--	--	--	0.05	--	--
sec-Butylbenzene	--	--	--	--	0.05	--	--

TABLE 5
PRELIMINARY SOIL CLEANUP LEVELS
VERBEEK WRECKING
BOTHELL, WASHINGTON

Constituent	Protective of Direct Human Contact		Protective of Groundwater as Drinking Water	Protective of Terrestrial Ecological Receptors	Adjustments		
	MTCA Method B Unrestricted Land Use Carcinogen	MTCA Method B Unrestricted Land Use Non-Carcinogen	MTCA Method B (a)	Primary Contaminant Soil Concentrations Protective of Terrestrial Ecological Receptors Unrestricted Land Use	PQL (b)	Soil Background (c)	Preliminary Cleanup Level
SVOCs (mg/kg)							
Naphthalene	—	1,600	4.5	—		—	4.5
1-Methylnaphthalene	—	—	— (g)	—	0.10	—	—
2-Methylnaphthalene	—	320	— (g)	—	0.10	—	320
1,2-Methylnaphthalenes	—	—	—	—	—	—	—
Acenaphthylene	—	—	—	—	0.10		—
Acenaphthene	—	4,800	98	20	0.10	—	98 / 20 (e)
Anthracene	—	24,000	2,300 (k)	—	0.10	—	24,000
Carbazole	50	—	0.31 (k)	—	0.10	—	50
Dibenzofuran	—	160	—	—	0.10	—	160
Fluorene	—	3,200	101 (k)	30	0.10	—	3,200 / 30 (e)
Phenanthrene	—	—	—	—	0.10	—	—
Fluoranthene	—	3,200	630	—	0.10	—	630
Pyrene	—	2,400	650	—	0.10	—	650
Benzo(g,h,i)perylene	—	—	—	—	0.10	—	—
Benzo(a)pyrene	see total cPAHs	—	see total cPAHs	12	0.10	—	see total cPAHs
Benzo(a)anthracene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Benzo(b)fluoranthene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Benzo(k)fluoranthene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Chrysene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Dibenzo(a,h)anthracene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Indeno(1,2,3-cd)pyrene	see total cPAHs	—	see total cPAHs	—	0.10	—	see total cPAHs
Total cPAH - benzo(a)pyrene TEQ (l)	0.14	—	2.3 (k)		—	—	0.14

Shaded cell indicates basis for screening levels.

— Indicates no criterion available.

(a) Calculated using fixed parameter 3-phase partitioning model, WAC 173-340-747(4) and preliminary groundwater cleanup levels shown in Table 2 of this report.

(b) Practical quantitation limit based on analytical reporting limits.

(c) From Ecology's Natural Background Soil Metals Concentrations in Puget Sound (1994). Used 90th percentile for Puget Sound.

(d) The MTCA Method A soil cleanup level for unrestricted site use was used for arsenic because it was established based on adjustments for background. From Responsiveness Summary for the Amendments to the MTCA Cleanup Regulation Chapter 173-340 WAC 1991.

(e) Soil concentrations protective of terrestrial ecological receptors apply to soil above a depth of 15 feet below ground surface.

(f) No MTCA Method B criteria available. MTCA Method A criteria based on preventing unacceptable blood lead levels is presented.

(g) Value cannot be calculated because Koc value is not available for this constituent.

(h) MTCA Method A soil cleanup levels for unrestricted land use.

(i) MTCA Method A cleanup level is 30 mg/kg when benzene is present and 100 mg/kg when benzene is not present.

(j) A toxicity equivalency quotient (TEQ) will be completed for each sample containing carcinogenic PAHs above reporting limits and the sum of the TEQs will be compared to the benzo(a)pyrene cleanup level in accordance with 173-340-708(8)(e).

(k) Criteria based on protection of groundwater not applicable based on empirical demonstration that groundwater not affected

TABLE 6
PRELIMINARY GROUNDWATER CLEANUP LEVELS
VERBEEK WRECKING
BOTHELL, WASHINGTON

	Federal and State Criteria Protective of Drinking Water						MTCA Method B Unadjusted Site Screening Levels		MTCA Method B Adjusted Preliminary Cleanup Levels
Constituent	Federal MCL	State MCL	MTCA Method A	MTCA Method B (Formula Value) Carcinogen	MTCA Method B Non Carcinogen	Concentration Associated with 10^{-6} Risk (if carcinogen)	Protective of Drinking Water	PQL (a)	Protective of Drinking Water
TOTAL METALS (µg/L)									
Arsenic	10	10	5.0	0.058	4.8	0.58	0.58	0.20	5.0 (b)
Barium	2,000	2,000	–	–	3,200	–	2,000	0.50	2,000
Cadmium	5.0	5.0	5.0		8.0	–	5.0	0.20	5.0
Chromium (total)	100	100	50	–	–	–	100	0.50	100
Chromium (III)	–	100	–	–	24,000	–	100	–	100
Chromium (VI)	–	100	–	–	48	–	48	–	48
Lead	15	15	15	–	–	–	15	1.0	15
TOTAL PETROLEUM HYDROCARBONS (µg/L)									500
Diesel-Range	–	–	500	–	–	–			1,000/800 (c)
Gasoline-Range	–	–	1,000/800 (c)	–	–	–			500
Oil-Range	–	–	500	–	–	–			
BTEX (µg/L)									
Benzene	5.0	5.0		0.8	32	8.0	5	1.0	5
Ethylbenzene	700	700		–	800	–	700	1.0	700
Toluene	1,000	1,000		–	640	–	640	1.0	640
Xylenes (total)	10,000	10,000		–	1,800	–	1,600	1.0	1,600
VOLATILES (µg/L)									
Acetone	–	–	–	–	800	–	800	10.0	800
2- Butanone (MEK)	–	–	–	–	4,800	–	4,800	10.0	4,800
1,2,4-Trimethylbenzene	–	–	–	–	400	–	400	1.0	400
1,3,5-Trimethylbenzene	–	–	–	–	400	–	400	1.0	400
Isopropylbenzene	–	–	–	–	–	–	–	1.0	–
n-Propylbenzene	–	–	–	–	–	–	–	1.0	–
Methyl-t-butyl ether	–	–	–	24	8,000	–	24	1.0	24
tert-Butylbenzene	–	–	–	–	–	–			

TABLE 6
PRELIMINARY GROUNDWATER CLEANUP LEVELS
VERBEEK WRECKING
BOTHELL, WASHINGTON

Constituent	Federal and State Criteria Protective of Drinking Water: Federal MCL	State MCL	MTCA Method A	MTCA Method B (Formula Value) Carcinogen	MTCA Method B - Non Carcinogen	Concentration Associated with 10^{-5} Risk (if carcinogen)	MTCA Method B Unadjusted Site Screening Levels: Protective of Drinking Water	PQL (a)	MTCA Method B Adjusted Preliminary Cleanup Levels: Protective of Drinking Water
PAHs (µg/L)									
Naphthalene	--	--	160 (d)	--	160	--	160 (d)	0.38	160 (d)
2-Methylnaphthalene	--	--	160 (d)	--	32 (e)	--	32 (e)	0.32	32 (e)
1-Methylnaphthalene	--	--	160 (d)	--	--	--	160 (d)	0.41	160 (d)
Acenaphthene	--	--	--	--	960	--	960	0.42	960
Fluorene	--	--	--	--	640	--	640	0.39	640
Phenanthrene	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	4,800	--	4,800	0.35	4,800
Fluoranthene	--	--	--	--	640	--	640	0.26	640
Pyrene	--	--	--	--	480	--	480	0.35	480
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
cPAHs (µg/L)									
Benzo(a)pyrene	0.20	0.20	see total cPAHs	0.012	--	0.12	0.12	0.014	0.12
Benzo(a)anthracene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.020	see total cPAHs
Benzo(b)fluoranthene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.017	see total cPAHs
Benzo(k)fluoranthene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.038	see total cPAHs
Chrysene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.019	see total cPAHs
Dibenzo(a,h)anthracene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.014	see total cPAHs
Indeno(1,2,3-cd)pyrene	--	--	see total cPAHs	see total cPAHs	--	--	see total cPAHs	0.017	see total cPAHs
Total cPAHs - TEQ	--	--	0.10	0.012	--	0.12 (f)	0.12	--	0.12 (f)

Shaded cell indicates basis for screening levels.

-- Indicates no cleanup level criteria available.

(a) Practical quantitation limit based on reporting limit from previous investigation except for metals. Metals PQL is based on Analytical Resources, Inc. laboratory reporting limit for analytical method 6020.

(b) Ecology's potable groundwater Method A Cleanup Screening Level for arsenic is based on background concentrations of this metal in groundwater (WAC 173-340-900; Table 720-1. As such, the proposed Cleanup Screening Level for arsenic of 5 ug/L is based on the MTCA Method A level for potable groundwater.

(c) Preliminary cleanup level of gasoline-range petroleum hydrocarbons is 800 ug/L. If benzene is present, or is 1,000 ug/L if no detectable benzene is present in groundwater.

(d) Cleanup level is a total value for naphthalene, 1-methylnaphthalene; and 2-methylnaphthalene.

(e) The concentration of 2-methylnapthalene cannot exceed 32 ug/L. The total concentration of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene cannot exceed 160 ug/L.

(f) A toxicity equivalency quotient (TEQ) will be completed for each sample containing carcinogenic PAHs above reporting limits and compared to the benzo(a)pyrene cleanup level protective of drinking water in accordance with 173-340-708(8)(d).