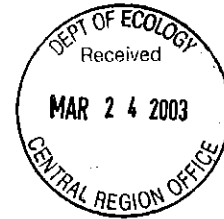




February 6, 2003

Mr. John Vornbrock
Senior Vice President
Yakima Valley Memorial Hospital (YVMH)
2811 Tieton Drive
Yakima, WA 98902



PORTLAND
SEATTLE
VANCOUVER
EUGENE
BEND
TRI-CITIES

**Re: RESULTS OF HEATING OIL CLEANUP/RISK ASSESSMENT, 3.8 ACRE
HOSPITAL PROPERTY, NORTHWEST OF YVMH, YAKIMA, WASHINGTON
PBS PROJECT NUMBER #60641.00**

Dear Mr. Vornbrock:

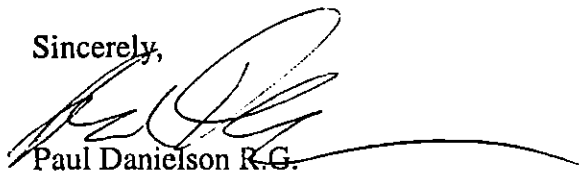
On November 19, 2002, at the request of Yakima Valley Memorial Hospital, PBS Environmental (PBS) began environmental site characterization and remedial action activities at the above referenced location in Yakima, Washington. The project has been completed, with three copies of the report enclosed with this letter.

No further environmental assessment is recommended for the subject property at this time; PBS also recommends that, based on the results of risk assessment, existing contaminated soil in the Southwest Excavation may remain in place. The report does, however, provide recommendations to address increased risk for worker contact with petroleum products near the Southwest Excavation, if trenching is planned in that area. Other recommendations are also listed in the attached report.

As requested, PBS has contacted the Washington State Department of Ecology (WDOE) to report the contamination associated with this property. A copy of an attached report should be submitted to WDOE (Yakima Office) as a record of the voluntary cleanup action on this property. If you would like PBS to send a separate report to WDOE please contact me.

PBS appreciates the opportunity to provide services to YVMH. If you have any questions or require additional information or services, please do not hesitate to contact me at (509) 735-2698.

Sincerely,


Paul Danielson R.G.
Project Manager

Attachments (3): Three Copies of Report

3311 W. Clearwater Ave.
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ENGINEERING AND ENVIRONMENTAL

www.pbsehv.com



HEATING OIL UNDERGROUND STORAGE TANK (UST) REMEDIAL ACTION AND RISK ASSESSMENT

S. 30th Ave. and Walnut St.
Yakima, Washington

Prepared for:

Yakima Valley Memorial Hospital
Yakima, Washington

February 2003
Project #: 60641.00

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HEATING OIL REMEDIAL ACTION AND RISK ASSESSMENT

S. 30th Ave. and Walnut St.
Yakima, Washington

Prepared for
Yakima Valley Hospital
Yakima, Washington

This report is for the exclusive use of the client and any potential lenders considering making a loan on the property for the above client, and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced in total or in part without the expressed written consent of the client and PBS.

Prepared by
PBS Engineering and Environmental
3311 West Clearwater Avenue, Suite 145
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(509) 735-2698

PBS Project No: 60641.00

February 2003

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BACKGROUND

In October 2001, a Phase One Environmental Site Assessment was performed on the subject property, at S. 30th Avenue and Walnut Street, Yakima, Washington (Figure 1). Underground storage tank (UST) assessments were recommended by that report for investigation of heating oil USTs observed on the site. PBS completed the UST Assessment and a total of five leaking USTs were located on the property. An interim report was provided to YVMH, concerning remedial options for the subject property on February 6, 2003. This report provides details of the UST assessment and remedial action on the property.

FIELD METHODS

PBS began field work for this project in November 2002, when backhoe trenching was completed next to each known UST on the subject property (within the subject property area indicated in the October 2002 Phase One Environmental Site Assessment). A long handled hand auger was used at each excavation to collect soil from beneath the base of each known UST. In January and February 2003, after most residence moving and demolition activities had been completed, Tri-Valley Construction (Tri-Valley) removed all of the remaining USTs on the subject property. Excavation was completed where contaminated soils were found below USTs.

Soils were screened for contamination by smell and color; fuel smell was present in all visibly contaminated and some uncontaminated soils. Contaminated soil had a dark gray color due to the induced low oxygen (reducing) conditions caused by the tendency of soil high in organic matter (such as fuel) to use up oxygen. Laboratory analyses confirmed that all dark gray soils (below USTs) on the site were contaminated with heating oil.

During the remedial action, soil samples were collected from a backhoe bucket provided by the contractor or with a hand auger. Samples were collected with decontaminated sampling tools to minimize sample cross-contamination, with soil placed in laboratory cleaned 4-ounce glass containers and designated with a discrete sample number. All samples were cooled in iced coolers until released to a certified environmental laboratory within the holding time for the specified constituent. Soils in each excavation were logged according to ASTM/Unified Soil Classification system standards.

Remedial action occurred in each of four contaminated zones (218 South 30th Avenue, 400 South 30th Avenue, 219 South 31st Avenue and 407/409 South 31st Avenue (Figure 1). An effort was made to remove only contaminated soil, with samples collected from the excavation boundaries to provide data indicating that all contaminated soil was removed. It was necessary to curtail excavation at the Southwest Excavation to protect an offsite residence (see Figure 1). Due to analytical results indicating remaining contamination at the Southwest Excavation, risk assessment was performed at this location.

LABORATORY ANALYSIS

Laboratory analysis for this investigation was completed by Friedman and Brueya Laboratory and Northcreek Analytical, both of Seattle, Washington. Most analysis was completed for total

petroleum hydrocarbon – diesel (NWTPHdx), the most pertinent analytical method for detecting heating oil. One extractable petroleum hydrocarbon (EPH, Washington State Policy Method) and naphthalene (EPA Method 8260B) was completed on the most contaminated soil sample from the Southwest Excavation, to support MTCA risk assessment. Other analysis completed includes benzene, toluene, ethylbenzene and xylene (BTEX) and Methyl tert-butyl ether (MTBE); these Method 8260B analyses were completed on the most impacted sample to more fully characterize the contaminants.

FINDINGS

The UST assessment was performed on November 19, 2002, when PBS, with a representative of Dotey Construction and a backhoe, excavated adjacent to all USTs known to be on the subject property at that time. During that assessment two locations were found where heating oil contamination appeared to be present below the USTs (400 South 30th Avenue and 219 South 31st Avenue). Plans were formulated with YVMH, following the initial UST assessment, to complete more assessment and remedial action at the time the tanks were to be removed by Tri-Valley.

In late January 2003, Tri-Valley began removing the heating oil USTs on the property and notified PBS that environmental oversight and sampling could be completed concurrent with the UST removals. During the excavation and removal process, heating oil-impacted soil was observed at two additional locations (407/409 South 31st Avenue and 218 South 30th Avenue), with a total of four remedial action locations on the subject property.

PBS was onsite during the excavation process at each of the four locations. Excavation was attempted in each remedial site until visual or olfactory indications suggested the remaining soil was below the MTCA Level A Cleanup Level of 2,000 mg/kg diesel (heating oil). In some cases when sampling indicated excessive remaining contamination, PBS and Tri-Valley returned to excavate more soil. All contaminated soil appears to have been removed at the Northwest, Northeast and Southeast Excavations (see Figure 1).

At the Southwest Excavation (407/409 South 31st Avenue), where two heating oil USTs were located at one duplex, full excavation of all contaminated soil could not be completed. It was necessary, due to the need to protect a residence to the south (411 South 31st Avenue), to end excavation prior to causing potential structural instability to the structure. Samples collected at several places along the excavation boundary indicated remaining contamination. There is a possibility that the contamination from the Southwest Excavation has traveled off the subject property, since existing contamination is less than 5 feet from the south property line.

Similar soil profiles were encountered at each excavation on the subject property. Surface soils at each excavation generally consist of Ashue loam, a deep well-drained soil formed on alluvium. In all excavations, approximately 6 feet of surface soil was observed (SILT, with fine sand, slightly moist, firm, slightly plastic and brown). At the northwest, northeast and southeast excavations a calcareous ashfall tuff was observed from approximately 6 to 10 feet below ground surface (bgs); tuff was not observed in the southwest excavation. Below 10 feet bgs, a fine through medium GRAVEL, with sand (slightly moist, dense, non-plastic, gray-red brown) was observed to the base of each excavation.

Laboratory analysis indicated the presence of heating oil components in soil at all of the leaking heating oil UST sites. No water samples were collected as groundwater was not observed in any of the excavations. Laboratory results are provided in Table 1, below. (Laboratory reports are provided following this report).

TABLE 1
ANAYLICAL RESULTS - FORMER HEATING OIL UST AREAS

Sample #	Date	Location	Depth	Naphthalene (mg/kg)	BTEX mg/kg	NWTPH -HCID	NWTPH-Dx (mg/kg)
60641.00-1	11/19/02	404 S. 30 th (NE of UST)	-7'			Detect D	7,900*
60641.00-2	11/19/02	Same (SE of UST)	-8'			Detect D	7,800*
60641.00-3	11/19/03	Same (SW of UST @ piping)	-6'			Detect D	16,000*
60641.00-4	11/19/03	222 S. 30 th (base center UST)	-5.5'			ND	
60641.00-5	11/19/02	218 S. 30 th (base center UST)	-6'			ND	
60641.00-6	11/19/02	Same (below lines, N of UST)	-5'			ND	
60641.00-7	11/19/02	405 S. 31 st (E. base UST)	-7'			ND	
60641.00-8	11/19/02	401 S. 31 st (base center UST)	-8'			ND	
60641.00-9	11/19/02	219 S. 31 st (base west UST)	-7'			Detect D	15,000*
60641.00-10	11/19/02	Same (base west UST)	-10'			Detect D	8,400*
60641.00-11	11/19/02	Same (base piping N)	-8'			Detect D	20,000*
60641.00-12	11/19/02	Same (base piping N)	-10.5'			Detect D	8,700*
60641.00-01A	1/20/03	219 S. 31 st Pit (center base)	-14'				380
60641.00-02A	1/20/03	Same (NE sidewall)	-11'				ND
60641.00-03A	1/20/03	Same (NW sidewall)	-11'				ND
60641.00-04	1/24/03	407/409 S 31 st Pit (S sidewall E)	-9'				28,000*#
60641.00-05	1/24/03	Same (S sidewall W)	-7'				8,900*#
60641.00-06	1/24/03	Same (SW sidewall)	-7'				7,400*#
60641.00-07	1/24/03	Same (NW sidewall)	-8'				3,700*#
60641.00-08	1/24/03	Same (N sidewall)	-8'				ND
60641.00-09	1/24/03	Same (NE sidewall)	-8'				1,600
60641.00-10	1/24/03	Same (E sidewall)	-8'				ND
60641.00-11	1/24/03	Same (base)	-10'				5,700*#
60641.00-12	1/24/03	404 S. 30 th Pit (W sidewall)	-6'				1,700
60641.00-13	1/24/03	Same (S sidewall)	-6'				82
60641.00-14	1/24/03	Same (center base)	-7'				21
60641.00-15	1/24/03	Same (N sidewall)	-5'				ND
60641.00-16	1/24/03	218 S 30 th Pit (S sidewall)	-8'				2,500*
60641.00-17	1/24/03	Same (N sidewall)	-10'				ND
60641.00-18	1/27/03	Same (SW sidewall)	-20'				3,900*
60641.00-19	1/27/03	Same (base)	-21'				7,800*
60641.00-20	1/27/03	Same (E sidewall)	-12'				7,300*
60641.00-21	1/27/03	Same (NW sidewall)	-10'				510
60641.00-22	1/27/03	219 S 31 st Pit (S sidewall)	-7'				1,700
60641.00-23	1/27/03	Same (N sidewall)	-10'				32
60641.00-22	2/4/03	207/209 S 31 st (resample 04)	-9'	49*#	<.5/1.3/1.5/5.2*#		
60641.00-7A	2/4/03	Same (resample 07)	-8'				7,000*#
60641.00-23	2/4/03	218 S 30 th Pit (base)	-32'				ND
60641.00-24	2/4/03	Same (W sidewall)	-23'				ND
60641.00-25	2/4/03	Same (S sidewall)	-28'				ND
60641.00-26	2/4/03	Same (E sidewall)	-28'				1,100

TABLE 2
ANALYTICAL RESULTS, EXTRACTABLE PETROLEUM HYDROCARBONS & METHYL TERT-BUTYL ETHER

60641.00-22, SW Excavation*#	Result (mg/kg)
C8-C10 Aliphatics	90.7
C10-C12 Aliphatics	721
C12-C16 Aliphatics	2570
C16-C21 Aliphatics	2540
C21-C34 Aliphatics	296
C10-12 Aromatics	197
C12-16 Aromatics	840
C16-21 Aromatics	1770
C21-34 Aromatics	55.1
Total Extractable Hydrocarbons	9080
Methyl tert-butyl ether (MTBE)	<0.5

Notes (both tables):

Soil Samples = milligrams/kilogram (mg/kg)

D = Diesel

* Exceeds MTCA Method A Action Levels for Diesel (2,000 mg/kg)

Blank cells indicate parameter not analyzed

Samples with carbon numbers indicated show EPH carbon fraction counts (aliphatics and aromatics)

NWTPH-HCID = total petroleum hydrocarbon identification method

indicates sample contamination remaining onsite after excavation, addressed by Method B risk assessment in this report.

Contaminated soil was required to be disposed offsite. PBS contacted the Yakima County Health Department, Yakima, Washington to obtain a permit to dispose of contaminated soil at the Anderson Petroleum Contaminated Soil facility (Anderson PCS), Summitview and Cowiche Road, Cowiche, Washington. The permit was completed on January 21, 2003, by Mr. Art McEwen (see attached letters). Following permitting, Tri-Valley began moving contaminated soil from the site to Anderson PCS.

A total of 1,245 tons of contaminated soil has been hauled to Anderson PCS by Tri-Valley. Tri-Valley is responsible for providing the client with disposal receipts for tanks, residual fuel oil and contaminated soil. The approximate tonnage of soil, and percentage ascribed to each excavation, are provided in the table below:

TABLE 3: EXCAVATION LOCATION - APPROXIMATE TONNAGES

LOCATION	TONNAGE
219 South 31 st Avenue (NW Excavation)	187 tons (15%)
407/409 South 31 st Avenue (SW Excavation)	436 tons (35%)
404 South 30 th Avenue (SE Excavation)	62 tons (5%)
218 South 30 th Avenue (NE Excavation)	560 tons (45%)

Due to data suggesting that all known contaminated soil was removed from the Northwest, Northeast and Southeast excavations to below MTCA Level A Cleanup Levels, no further work is considered necessary at those locations. The Southwest Excavation could not be remediated due to the possibility of causing structural problems in the residence to the south. In order to evaluate leaving contaminated soil in-place at this location, a risk assessment was performed.

RISK-BASED CONCEPTUAL SITE MODEL – SOUTHWEST EXCAVATION

The contaminant data for the site and depth to groundwater forms the basis for the conceptual site model used to guide the risk evaluation of the Southwest Excavation. The key components of the conceptual site model are 1) inferred contaminant release mechanism, 2) identification of contaminants of potential concern, 3) potential contaminant migration pathways, 4) identification of potential receptors, and 5) potential exposure pathways.

Contaminant Release Mechanism

The release mechanism for the observed contamination was the release of fuel from two approximately 250-gallon heating oil tanks. The USTs were apparently used from the 1940s or 1950s to early 2001. It appears that holes rusted into the base of each UST caused the loss of fuel to the soil. The contaminated zone does not suggest any surface spillage. The south UST at the Southwest Excavation contained fuel (approximately 5 gallons) at the time the tanks were removed in January 2003; the north UST appeared empty.

Contaminants of Potential Concern

According to the Model Toxic Control Act Cleanup Regulations (MTCA), the common contaminants of potential concern for heating oil releases are total petroleum hydrocarbons-diesel (NWTPHdx), naphthalene and the extractable petroleum hydrocarbons (carbon ranges C₈ through C₃₄) listed earlier (see Table 2). Analytical results were very low for BTEX and MTBE, therefore these compounds are not considered contaminants of concern for the subject site.

Potential Contaminant Migration Pathway

The following contaminant migration pathways were evaluated for applicability to the subject property:

- Direct contact with soil (ingestion and absorption)
- Leaching from soil to groundwater
- Volatilization from soil to air (indoor and outdoor)

Each of these pathways was evaluated based on the understanding of the contaminants of concern, predicted contaminant release mechanism, and the known magnitude and distribution of contaminants.

The remaining petroleum contamination (in the Southwest Excavation) is covered by approximately 10 feet of clean soil, suggesting the migration of contaminants as fugitive dust or surface water runoff is eliminated from further consideration. Direct soil contact and ingestion are considered, however, for an onsite excavation scenario.

Since fuel hydrocarbon components are considered to be a source of volatile organic compounds and the volatile constituents of concern (EPH compounds) were detected by sample analysis, the soil volatilization to air pathways is analyzed, for an onsite trenching and adjacent basement scenario.

The leaching from soil to groundwater contaminant migration pathway is also evaluated, since the unconfined groundwater table elevation is expected to be located approximately 60 feet below ground surface (bgs).

Potential Receptors

Volatilization to air: The subject property is currently in a residential area; PBS assumes land use will change to commercial (hospital use) when the new medical facility is constructed on the site. Since the planned new medical facility is expected to be approximately 100 feet northeast of the Southwest Excavation, volatile petroleum hydrocarbon infiltration through utility excavations or cracks into a hospital basement area is not expected in the near future. Volatilization into the nearby offsite residence is a potentially complete pathway, due to proximity.

Leaching from soil to groundwater: The uppermost-unconfined groundwater zone is considered with human consumption as highest and best use of that resource. PBS requested a copy of all well logs from Washington Department of Ecology for the SW ¼ Sections 23, Township 13 North, Range 18 East WM. According to well logs provided by WDOE, there are no known wells in close proximity to the Southwest Excavation.

Potential ecological receptors: A Terrestrial Ecological Evaluation was not completed for the subject property to consider plant and animal receptors, because less than 350 square feet of contamination remains on the subject property (WAC 173-340-7492).

Exposure Pathway Analysis

Exposure is defined as the contact of an organism with a chemical of concern. The magnitude of exposure is determined by measuring or estimating the amount of a contaminant of concern where exposure occurs.

A complete exposure pathway has four components, and is completed only where all four components are met: 1) a source and mechanism of chemical release to the environment; 2) an environmental transport medium for the released chemical; 3) a point of potential human or biota contact with the contaminated medium (exposure point); and 4) a route of uptake at the exposure point (e.g. ingestion, inhalation, or dermal contact).

Based on the analyses discussed under previous sections, the following exposure pathway scenarios will be carried forward for further evaluation:

- 1) Soil contaminants that are directly ingested, inhaled, or dermally contacted either by a trench worker or by a receptor exposed by excavated soil placed on the ground surface.
- 2) Soil contaminants that percolate to groundwater and are directly ingested by a receptor from a water supply well.
- 3) Human inhalation of volatile components of the contaminant from collection of vapors in an open trench or through the walls of a basement.

RISK ASSESSMENT - SOUTHWEST EXCAVATION

MTCA allows cleanup levels for a site to be established in three different ways (Methods A, B, and C). Method A levels are pre-determined by WDOE, are obtained directly from tables, and are the most conservative levels. Most of the soils on the subject property were remediated to Method A cleanup levels. The Method B (unrestricted) and Method C (industrial) levels are calculated with worksheet computer models using default and/or site-specific data and formulas provided in MTCA (Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under the Model Toxic Control Act Cleanup Regulations, User's Guide, August 2001; Publication #01-09-073). Methods B and C provide a mechanism for the development of risk-based, site-specific cleanup standards for evaluating current and future potential risks to human health based on the predicted exposure scenarios and the type and concentrations of contaminants.

The risks presented by the soil contamination at this site were evaluated by the WDOE risk programs as per the "Worksheet for Calculating Soil Cleanup Level for Soil Direct Contact Pathway: Method B Unrestricted Land Use" (Equation 740-1 and 740-2, default approach). For air quality, the "Worksheet for Calculating Soil Cleanup Level for the Protection of Air Quality: Method B - Air Cleanup Level" (Equation 750-1 and 750-2, unrestricted default approach) was used. To address groundwater the "Worksheet for Calculating Soil Cleanup Levels for the Protection of Groundwater (Equation 747-7, default approach)" was used.

The soil sample selected for analysis from the Southwest Excavation (60641.00-22) was representative of the most contaminated soil remaining on the subject property. The completed worksheets for the soil sample are included with the results of the risk evaluation attached to this report. The results of these MTCA Method B - Unrestricted risk evaluations are provided below.

Contaminated Soil - Direct Contact Pathway

To calculate risk for direct contact with the soils on the site, the worksheet calculates the hazard quotients (HQ) for each petroleum hydrocarbon fraction (aliphatic and aromatic), naphthalene, MTBE and BTEX compounds. The data inputted into the worksheet consists of the soil concentrations for naphthalene, BTEX, MTBE and/or EPH compounds, which includes the concentrations of the aliphatic/aromatic fractions of the petroleum hydrocarbons. The worksheet calculates and sums the individual HQs, giving an overall hazard quotient HQ for the pathway.

For individual non-carcinogenic compounds, cleanup levels are set at concentrations which are anticipated to result in no acute or chronic toxic effects on human health (i.e. HQ of less than 1.0), and the total HQ may not exceed 1.0.

Carcinogenic risk is calculated individually for each component, and an overall carcinogenic risk for the site is calculated as the sum of the individual carcinogenic risks. For benzene risk, levels cannot exceed the upper bound of the estimated excess lifetime cancer risk of one in one million (1×10^{-6}) for unrestricted receptors, and one in 100,000 (1×10^{-5}) for industrial receptors. The total excess lifetime cancer risk for a site may not exceed one in 100,000 (1×10^{-5}), regardless of land use.

The results of the direct soil contact and ingestion risk evaluation (using default parameters) indicate that the overall HQ for total aliphatic and aromatic compounds exceeds the reference level of 1.0 for an unrestricted land use receptor in the tested sample (see attached worksheet). The HQ for the Southwest Excavation regarding soil contact is 3.38, well in excess of 1.0. This information indicates that trench workers, working in the soil from the contaminated area of the Southwest Excavation, would be at excess risk when working in that zone.

From the WDOE Workbook, the TPH concentration (from EPH) of sample number 60641.00-22 (from the Southwest Excavation) was 9079.8 mg/kg; the initial laboratory analyzed NWTPH-Dx level for that sample was 28,000 mg/kg. For comparison to laboratory analytical results, back-calculating was completed from the WDOE Workbook, with the HQ = 1, a TPH level of over 2,682.83 mg/kg is indicated to exceed the HQ. The fraction $2,682.83/9079.8$ multiplied by the initial 28,000 is equal to 8,273.22 (the approximated field sampled NWTPH-Dx analytical level that marks the cutoff exceeding a HQ = 1.0 for this site). This information suggests, only samples from the extreme south side of the Southwest Excavation (near the property line) exceed the approximate value of 8,273.22 mg/kg NWTPHdx and would exceed risk values. Since benzene was not detected in the soil sample, no carcinogenic risk is indicated (see attached worksheet).

Soil Contaminants – For the Protection of Groundwater

The toxicity worksheet for calculation of soil cleanup levels for the protection of potable groundwater predicts contaminant concentrations within a hypothetical water well installed downgradient of the contaminant source area. To be considered protective of human health, the predicted concentration of TPH in groundwater must be less than the MTCA Method A cleanup level of 1 mg/L. In addition, the HQ for toxicity must be less than one (1) and the total carcinogenic risk for the unrestricted scenario must be less than 1×10^{-6} . These parameters were evaluated using the WDOE worksheets.

The worksheets (using default parameters) indicated an HQ of less than one (toxicity risk) with no carcinogenic risk (see attached worksheets). The toxicity risk result from this evaluation was HQ = 0.163, with the calculated TPH levels in a downgradient well indicated to be 0.008 mg/kg. Based on this information, groundwater contamination from constituents leached from contaminated soil on the site do not appear to present excess risk. To further support this premise, PBS expects that the surface groundwater table elevation is expected approximately 60 feet below ground surface, which suggests a high dilution factor (20) and a reduced chance of groundwater contamination from the site.

Soil Cleanup Standards to Protect Air Quality

To address potential volatilization, the "Worksheet for Calculating Soil Cleanup Level for the Protection of the Method B – Air Cleanup Level" (Equation 750-1 and 750-2), default approach, was applied. Air quality applies to ambient (outdoor) air or air within a building, trench, manhole or vault in the area of the soil contamination. In order to be protective of air quality, the HQ for toxicity must be less than 1 and the total carcinogenic risk for the unrestricted scenario must be less than 1×10^{-5} . Since the residence located approximately 10 feet south of the Southwest Excavation (411 South 31st Avenue) has no basement, it is unlikely that indoor air quality at that location would be affected by volatiles from YVMH site contaminated soils. PBS expects that a worker trenching through contaminated soil exposed to volatiles, is the most likely scenarios for human exposure.

The results of the default workbook calculations do not indicate excess toxic risk for volatiles from soil contamination on the subject property or adjoining property. The Workbook calculations indicate an air quality toxicity risk of HQ = 0.841, where the HQ cannot exceed 1.0; no carcinogenic risk is indicated by the calculations (see attached worksheets).

CONCLUSIONS

All known heating oil contaminated soil from UST leakage on the subject property, with the exception of soil in the south portion of the Southwest Excavation, has been successfully remediated through excavation and disposal of contaminated soil. Based on soil standards for the protection of air quality and water quality, leaving contamination in place in the Southwest Excavation is an acceptable risk.

Excess risk does remain for leaving the contaminated soil in place regarding direct contact with heating oil contaminated soil remaining in the south end of the Southwest Excavation. PBS concludes that, although it may normally be recommended to remove the contaminated soil to reduce institutional controls on the property, protect trench worker safety and reduce general environmental liability of the site, that action cannot occur because of the possibility of damaging an offsite structure. PBS further concludes that there is a possibility that soil contamination may have traveled south of the south boundary of the subject property, adjacent to the Southwest Excavation.

RECOMMEDATIONS

PBS recommends that remaining soil contamination in the south portion of the Southwest Excavation, be left in place at this time due to the possibility of causing structural problems to an offsite residence. If the residence to the south is ever removed, further environmental investigation is recommended to designate the south boundary of the contamination. If soil at the Southwest Excavation is excavated in the future for any reason, it should be reevaluated for contaminants of concern at that time, with consideration given to disposal.

PBS recommends that any excavation along the southwest property boundary, exceeding the depth of approximately 6 feet, address trench worker safety concerning the excess risk of direct soil

contact in that area. Safety concerns should be addressed to mitigate possible human soil contact/ingestion for work in that area. Future site occupants and workers should be made aware of the location of contamination and the engineering and management restrictions involved with working in contaminated soils in the area of the Southeast Excavation.

Although the risk to air quality from exposure through volatilization of soil contamination is low, PBS recommends considering the location of proposed construction on the property. Planning and mitigation should occur if construction is expected that will place a below grade basement structure in contact with remaining contaminated soil. Even soil shown not to be at risk to air quality may have an odor, reducing the quality of a working environment in a below grade building adjacent to petroleum impacted soil.

PBS recommends that the excavations on the subject property be backfilled and compacted with clean soil or structural fill.

PBS recommends following MTCA (WAC 173-340) rules concerning submitting this report to WDOE as a record of the discovery of contamination exceeding Method A Action Levels and the subsequent voluntary cleanup action. No further environmental assessment is recommended for the area of the subject property at this time.

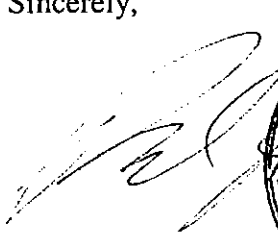
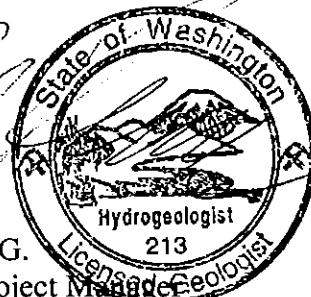
LIMITATIONS



This work was performed in accordance with generally accepted practices of other consultants undertaking similar studies during the same time period and geographical area. PBS observed the same degree of care and skill generally exercised by other consultants under similar circumstances and conditions. The findings and conclusions of this report are not scientific certainties, but rather, are based on professional judgement concerning the significance of data gathered during the course of this assessment. The recommendations of this report, or lack thereof, are not considered a legal opinion as to the clients duty concerning due diligence relating to potential liabilities in leasing, owning, or purchasing real estate.

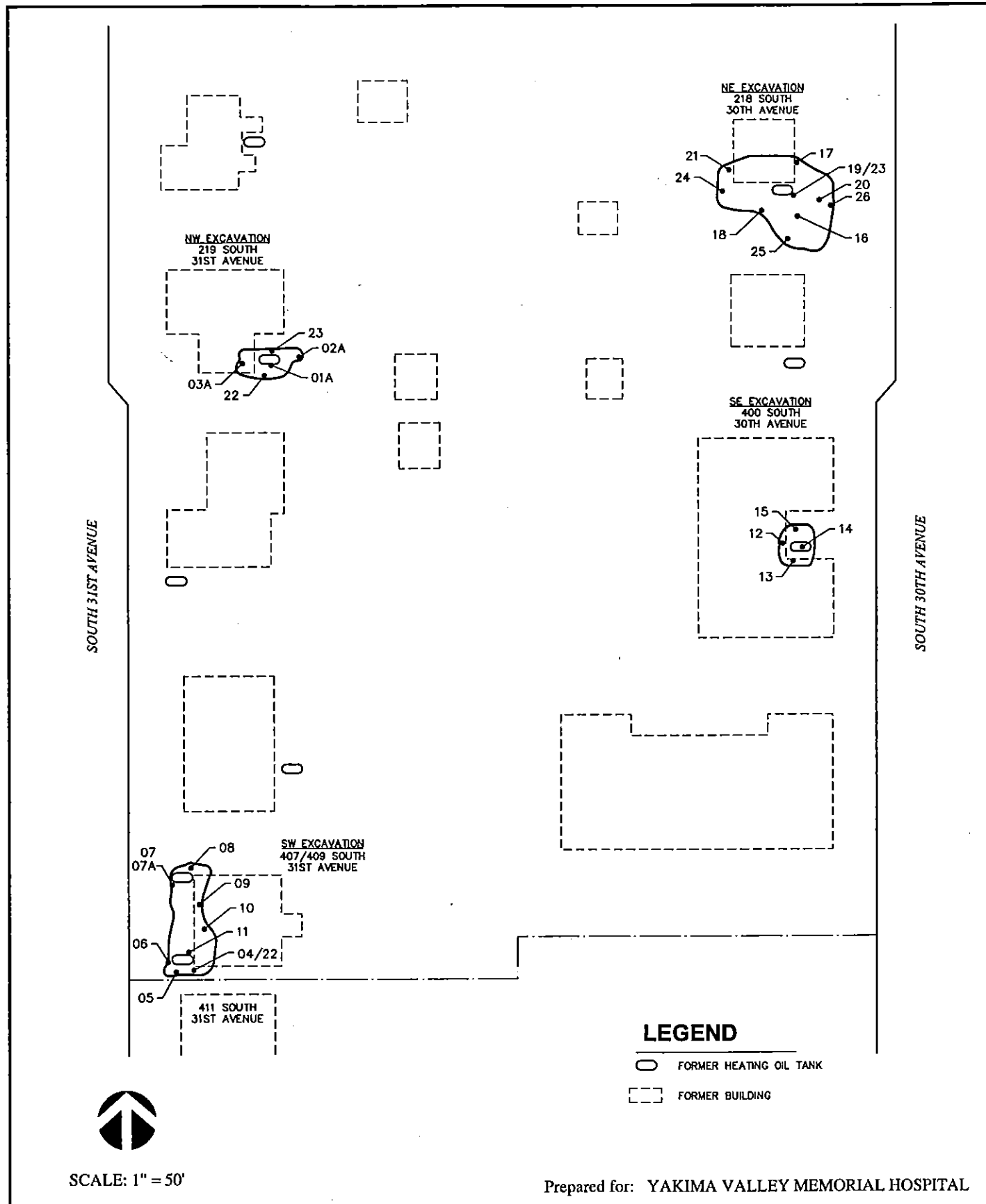
PBS is not able to represent that the site or adjoining land contains no hazardous waste, oil or other latent conditions beyond that detected or observed by PBS during this study. The possibility always exists for contaminants to migrate through surface water, air, or groundwater. The ability to accurately address the environmental risk associated with transport in these media is beyond the scope of this investigation.

PBS very much appreciates the opportunity to provide this information to the Yakima Valley Memorial Hospital. If you have any questions concerning this report or need further information, please feel free to contact me at (509) 735-2698.

Sincerely,


Paul Danielson, R.G.
Hydrogeologist/Project Manager

Paul E. Danielson


Dulcy A. Berri, R.G.
Principal/Senior Hydrogeologist

DULCY A. BERRI



Project #:
60641.000

Date:
FEB. 2003

PHASE III REMEDIAL ACTION - YVMH PROPERTY
EXCAVATION PLAN
SOUTH 30TH AVENUE AND WALNUT STREET
YAKIMA, WASHINGTON

FIGURE

1



PHOTO 1: LOOKING NORTH, BEGINNING SOUTHWEST EXCAVATION



PHOTO 2: SOUTHWEST EXCAVATION LOOKING NORTH

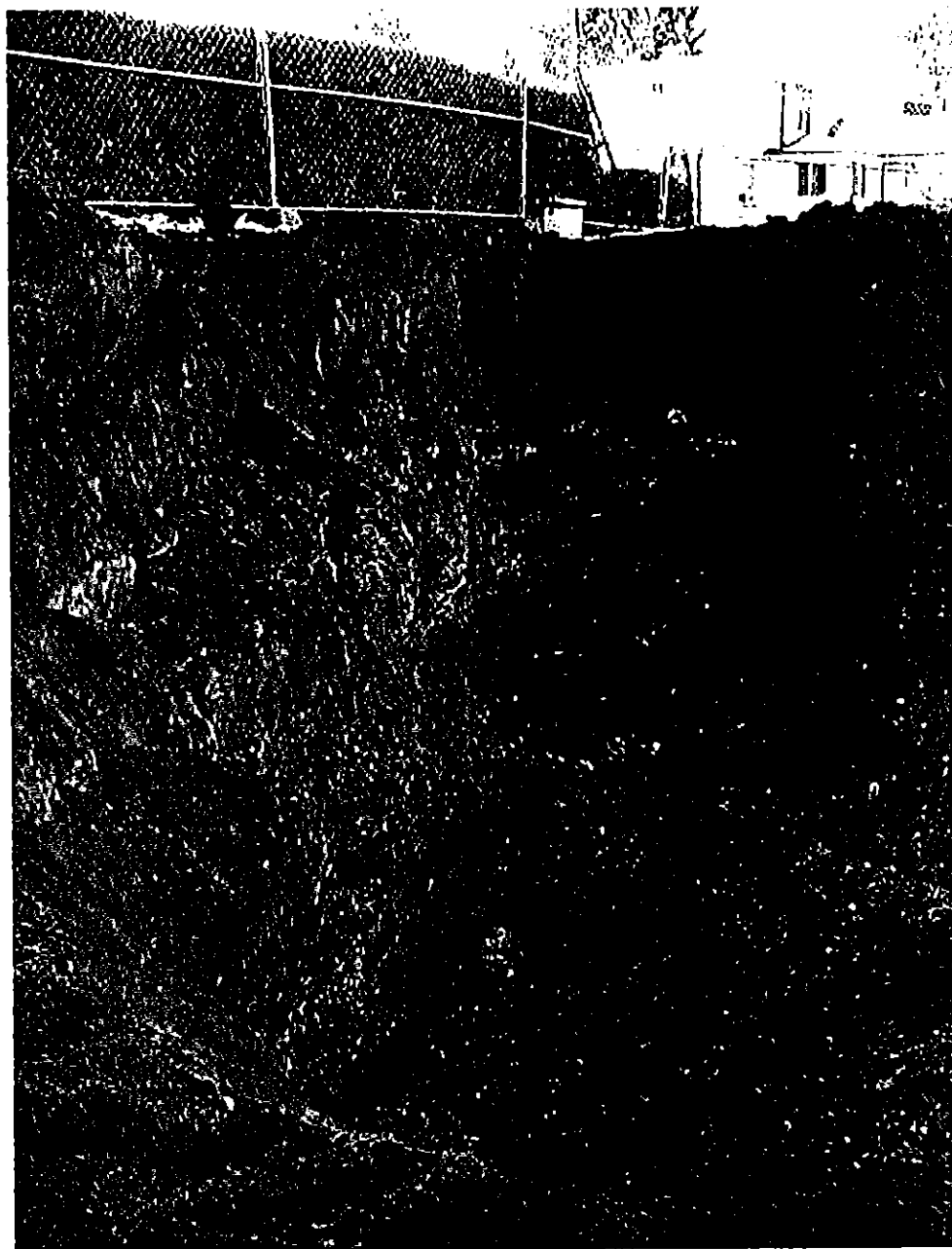


PHOTO 3: SOUTHWEST EXCAVATION LOOKING WEST NEAR PROPERTY BOUNDARY

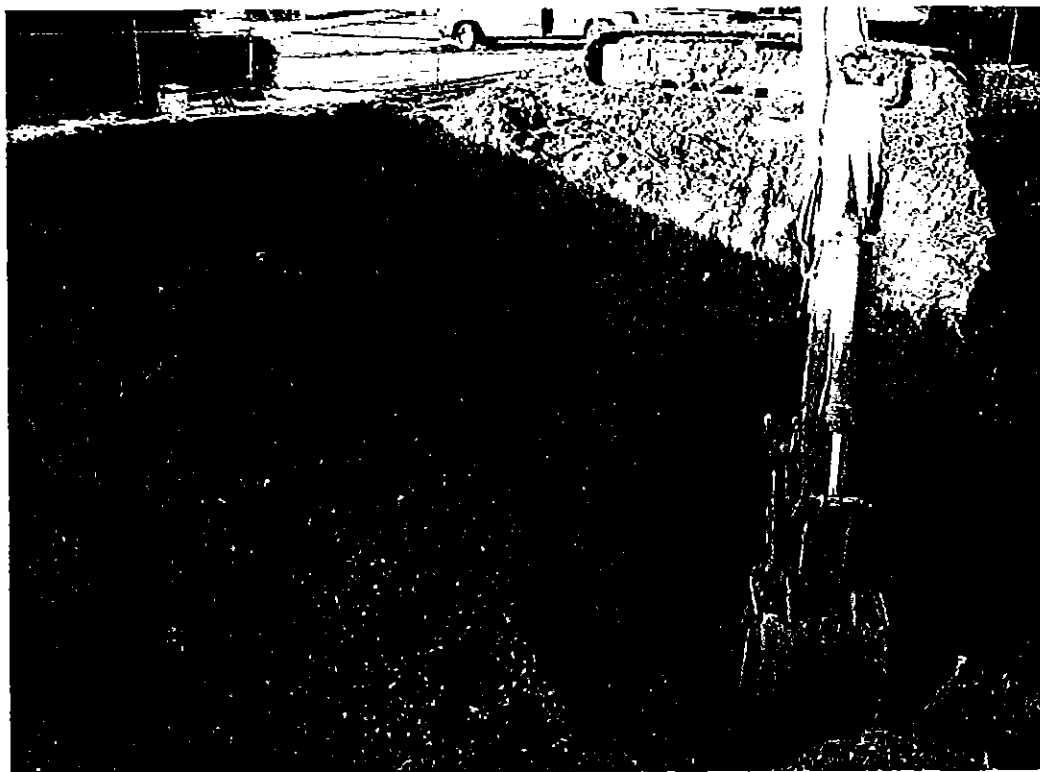


PHOTO 4: EXCAVATING SOUTHWEST EXCAVATION



PHOTO 5: EXCAVATING NORTHWEST EXCAVATION SHOWING CONTAMINATED SOIL



PHOTO 6: STOCKPILING CONTAMINATED SOIL AT NORTHWEST EXCAVATION, LOOKING SOUTH



PHOTO 7: LOOKING SOUTH AT SOUTHEAST EXCAVATION



PHOTO 8: EXCAVATING NORTHEAST EXCAVATION, LOOKING NORTH



PHOTO 9: LOOKING NORTHEAST AT NORTHEAST EXCAVATION



PHOTO 10: LOOKING EAST AT NORTHEAST EXCAVATION

Worksheet for Calculating Soil Cleanup Level for the Protection of Method B - Air Cleanup Level (Refer to WAC 173-340-740 and 750)

Date: 2/17/03

Site Name: YVMH (30th and Walnut)

Sample Name: 60641.00-22

Warning: This Worksheet is provided for informational purposes only!

Chemical of Concern or EC Group	Measured Soil Conc dry basis mg/kg	Enter Air Background Levels ug/m ³	Adjusted Condition				Pass or Fail?
			Soil Conc being tested mg/kg	Predicted Air Conc @ Indoor ug/m ³	HQ of Air @ Indoor unitless	RISK of Air @ Indoor unitless	
Petroleum EC Fraction							
AL_EC>5-6	0	50	0.00E+00	0.00E+00	0.00E+00		
AL_EC>6-8	0	50	0.00E+00	0.00E+00	0.00E+00		
AL_EC>8-10	90.7	50	9.07E+01	5.34E+01	3.93E-01		
AL_EC>10-12	721	0	7.21E+02	4.10E+01	3.01E-01		
AL_EC>12-16	2570	0	2.57E+03	1.13E+01	0.00E+00		
AL_EC>16-21	2540	0	2.54E+03	1.34E-01	0.00E+00		
AL_EC>21-34	296	0	2.96E+02	2.48E-06	0.00E+00		
AR_EC>8-10	0	50	0.00E+00	0.00E+00	0.00E+00		
AR_EC>10-12	197	50	1.97E+02	1.17E+01	1.46E-01		
AR_EC>12-16	840	0	8.40E+02	3.83E+00	0.00E+00		
AR_EC>16-21	1770	0	1.77E+03	1.38E-01	0.00E+00		
AR_EC>21-34	55.1	0	5.51E+01	2.27E-06	0.00E+00		
Benzene	0	10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Toluene	0	0	0.00E+00	0.00E+00	0.00E+00		
Ethylbenzene	0	0	0.00E+00	0.00E+00	0.00E+00		
Total Xylenes	0	0	0.00E+00	0.00E+00	0.00E+00		
Total Naphthalenes	0	0	0.00E+00	0.00E+00	0.00E+00		
n-Hexane	0	1	0.00E+00	0.00E+00	0.00E+00		
MTBE	0	0	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	for all cPAHs
Benzo(b)fluoranthene	0	0	0.00E+00	0.00E+00		0.00E+00	
Benzo(k)fluoranthene	0	0	0.00E+00	0.00E+00		0.00E+00	
Benzo(a)pyrene	0	0	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	0	0.00E+00	0.00E+00		0.00E+00	
Dibenzo(a,h)anthracene	0	0	0.00E+00	0.00E+00		0.00E+00	
Indeno(1,2,3-cd)pyrene	0	0	0.00E+00	0.00E+00		0.00E+00	
Sum	9.080E+03		9.08E+03	1.22E+02	8.41E-01	0.00E+00	
Testing Total Soil Conc (mg/kg) is: 9079.800							

Note: Source of Default Air Background Level:

*Petroleum Equivalent Carbon Fractions: State of Massachusetts, Department of Environmental Protection, 1997.

*Characterizing risk posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach

*Benzene and n-Hexane: Washington State Department of Ecology, 1997, "Memorandum: Washington State Air Toxic Monitoring Data Documentation"

Enter Vapor Attenuation Factor for all TPH components: **10,000**

Note: Vapor Attenuation Factor is the ratio of vapor-phase contaminant concentration within the soil at the source to the air concentration at the exposure point (e.g., within the building)

Site-Specific Hydrogeological Characteristics

Item	Symbol	Value	Units
Total soil porosity: default is 0.43	n	0.43	unitless
Volumetric water content: default is 0.3	Θ_w	0.3	unitless
Initial volumetric air content: default is 0.13	Θ_a	0.13	unitless
Soil bulk density measured: default is 1.5	ρ_b	1.5	kg/l
Fraction Organic Carbon: default is 0.001	f_{oc}	0.001	unitless

Back-Calculate Target Soil TPH Cleanup Levels

Based on HI=1.0 @Indoor air:

Based on total Cancer RISK=1.0E-5 @Indoor Air:

a. "TPH Test" button below is for testing adjusted condition at a specified TPH concentration.

b. Check columns at left for Pass/Fail detail.

TPH OUTPUT

Total Soil Concentration (mg/kg) tested: **9079.800**

Pass or Fail? **Pass**

Predicted TPH (ug/m³) @Indoor air: **1.22E+02**

Hazard Index @ Indoor air: **8.41E-01**

Cancer Risk @ Indoor air: **0.00E+00**

Type of model used for computation: **4-Phase Model**

Computation completed? **Yes!**

Please Check Soil Residual Saturation TPH Levels: Refer to Table 747-5!

Worksheet for Calculating Soil Cleanup Level for the Protection of Potable Ground Water
(Refer to WAC 173-340-747)

Date: 2/17/03

Site Name: YVMH (30th and Walnut)

Sample Name: 60641.00-22

Chemical of Concern or EC Group	Measured Soil Conc dry basis	mg/kg	Ground Water Cleanup Level Method A	ug/l	Adjusted Condition		
					Soil Conc being tested	Predicted Conc @ Well	RISK @ Well
					mg/kg	ug/l	unitless
Petroleum EC Fraction							
AL_EC >5-6	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
AL_EC >6-8	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
AL_EC >8-10	90.7	9.07E+01			3.34E-01	1.39E-03	0.00E+00
AL_EC >10-12	721	7.21E+02			1.71E-01	7.12E-04	0.00E+00
AL_EC >12-16	2570	2.57E+03			1.09E-02	2.27E-05	0.00E+00
AL_EC >16-21	2540	2.54E+03			1.36E-05	4.26E-10	0.00E+00
AL_EC >21-34	296	2.96E+02			1.24E-11	3.87E-16	0.00E+00
AR_EC >8-10	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
AR_EC >10-12	197	1.97E+02			4.18E+01	1.05E-01	0.00E+00
AR_EC >12-16	840	8.40E+02			3.61E+01	4.51E-02	0.00E+00
AR_EC >16-21	1770	1.77E+03			5.30E+00	1.10E-02	0.00E+00
AR_EC >21-34	55.1	5.51E+01			1.69E-03	3.52E-06	0.00E+00
Benzene	0	0.00E+00	5		0.00E+00	0.00E+00	0.00E+00
Toluene	0	0.00E+00	1000		0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0	0.00E+00	700		0.00E+00	0.00E+00	0.00E+00
Total Xylenes	0	0.00E+00	1000		0.00E+00	0.00E+00	0.00E+00
Total Naphthalenes	0	0.00E+00	160		0.00E+00	0.00E+00	0.00E+00
n-Hexane	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
MTBE	0	0.00E+00	20		0.00E+00	0.00E+00	0.00E+00
Ethylene Dibromide (EDB)	0	0.00E+00	0.01		0.00E+00	0.00E+00	0.00E+00
1,2 Dichloroethane (EDC)	0	0.00E+00	5		0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Chrysene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Dibenzo(a,h)anthracene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0	0.00E+00			0.00E+00	0.00E+00	0.00E+00
Sum	9079.800	9.08E+03			8.37E+01	1.63E-01	0.00E+00
Testing Total Soil Conc (mg/kg) is: 9079.80							

a. "TPH Test" button below is for testing adjusted condition at a specified TPH concentration.

b. Check columns at left for Pass/Fail detail.

Site-Specific Hydrogeological Characteristics

Item	Symbol	Value	Units
Total soil porosity: default is 0.43	n	0.43	unitless
Volumetric water content: default is 0.3	θ_w	0.3	unitless
Initial volumetric air content: default is 0.13	θ_a	0.13	unitless
Soil bulk density measured: default is 1.5	ρ_b	1.5	kg/l
Fraction Organic Carbon: default is 0.001	f_{oc}	0.001	unitless
Dilution Factor: default is 20	DF	20	unitless

Back-Calculate Target Soil TPH Cleanup Levels

Based on $Hf=1.0$ @ Ground Water:Based on total Cancer RISK = $1.0E-5$ @ Ground Water:

Based on Benzene Ground Water Cleanup Level:

TPH OUTPUT

Total Soil Concentration (mg/kg) tested:	9079.800
Pass or Fail?	Pass
Predicted TPH (ug/l) @ Well:	8.37E+01
Cancer Risk @ Well:	0.00E+00
Hazard Index @ Well:	1.63E-01
Initial Weighted Average MW of NAPL (g/mol):	202.4
Equilibrated Weighted Average MW of NAPL (g/mol):	202.4
Initial Weighted Average Density of NAPL (kg/l):	0.850
Volumetric NAPL Content, θ_{NAPL} :	0.016
NAPL Saturation (%), θ_{NAPL}/n :	3.72%
Type of model used for computation:	4-Phase Model
Computation completed?	Yes!
Mass Distribution Pattern @ 4-phase in soil pore system:	
Total Mass distributed in Water Phase: 0.00%	in Solid: 0.13%
Total Mass distributed in Air Phase: 0.00%	in NAPL: 99.86%

Please Check Soil Residual Saturation TPH Levels: Refer to Table 747-5!

Worksheet for Calculating Soil Cleanup Level for Soil Direct Contact pathway: Method B-Unrestricted Land use
(Refer to WAC 173-340-740)

Date: 2/17/03

Site Name: YVMH (30th and Walnut)

Sample Name: 60641.00-22

- a. "TPH Test" button below is for testing adjusted condition at a specified TPH concentration.
- b. Check columns at left for Pass/Fail detail.

Chemical of Concern or EC Group	Measured Soil Conc dry basis mg/kg	Exposure Parameters				Toxicity Parameters			Current Condition			Adjusted Condition		
		AB1 unitless	AF mg/cm ² -day	ABS _d unitless	GI unitless	RfD _d mg/kg-day	CPF _d kg-day/mg	HQ unitless	RISK unitless	Pass or Fail?	Soil Conc being tested mg/kg	HQ unitless	RISK unitless	Pass or Fail?
Petroleum EC Fraction														
AL_EC>5-6	0	1	0.2	0.03	0.8	5.7					0.00E+00			
AL_EC>6-8	0	1	0.2	0.03	0.8	5.7					0.00E+00			
AL_EC>8-10	90.7	1	0.2	0.03	0.8	0.03		4.09E-02			1.20E+00	5.41E-04		
AL_EC>10-12	721	1	0.2	0.03	0.8	0.03		3.25E-01			9.53E+00	4.30E-03		
AL_EC>12-16	2570	1	0.2	0.1	0.5	0.03		1.54E+00			3.40E+01	2.04E-02		
AL_EC>16-21	2540	1	0.2	0.1	0.5	2		2.29E-02			3.36E+01	3.02E-04		
AL_EC>21-34	296	1	0.2	0.1	0.5	2		2.66E-03			3.91E+00	3.52E-05		
AR_EC>8-10	0	1	0.2	0.03	0.8	0.05					0.00E+00			
AR_EC>10-12	197	1	0.2	0.03	0.8	0.05		5.33E-02			2.60E+00	7.05E-04		
AR_EC>12-16	840	1	0.2	0.1	0.5	0.05		3.02E-01			1.11E+01	4.00E-03		
AR_EC>16-21	1770	1	0.2	0.1	0.5	0.03		1.06E+00			2.34E+01	1.40E-02		
AR_EC>21-34	55.1	1	0.2	0.1	0.5	0.03		3.31E-02			7.28E-01	4.37E-04		
Benzene	0	1	0.2	0.0005	0.95	0.003	0.055		0.00E+00		0.00E+00			
Toluene	0	1	0.2	0.03	1	0.2					0.00E+00			
Ethylbenzene	0	1	0.2	0.03	0.92	0.1					0.00E+00			
Total Xylenes	0	1	0.2	0.03	0.9	2					0.00E+00			
Total Naphthalenes	0	1	0.2	0.13	0.89	0.02					0.00E+00	0.00E+00		
n-Hexane	0	1	0.2	0.03	0.8	0.06					0.00E+00	0.00E+00		
MTBE	0	1	0.2	0.03	0.8						0.00E+00			
Ethylene Dibromide (EDB)	0	1	0.2	0.03	0.8	0.000057	85		0.00E+00		0.00E+00	0.00E+00		
1,2-Dichloroethane (EDC)	0	1	0.2	0.03	0.8	0.03	0.091		0.00E+00		0.00E+00	0.00E+00		
Benzo(a)anthracene	0	1	0.2	0.13	0.89		0.73		0.00E+00	for all cPAHs	0.00E+00		0.00E+00	for all cPAHs
Benzo(b)fluoranthene	0	1	0.2	0.13	0.89		0.73		0.00E+00		0.00E+00		0.00E+00	
Benzo(k)fluoranthene	0	1	0.2	0.13	0.89		0.73		0.00E+00		0.00E+00		0.00E+00	
Benzo(a)pyrene	0	1	0.2	0.13	0.89		7.3		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0	1	0.2	0.13	0.89		0.073		0.00E+00		0.00E+00		0.00E+00	
Dibenzo(a,h)anthracene	0	1	0.2	0.13	0.89		2.92		0.00E+00		0.00E+00		0.00E+00	
Indeno(1,2,3-cd)pyrene	0	1	0.2	0.13	0.89		0.73		0.00E+00		0.00E+00		0.00E+00	
Sum	9079.8							3.38E+00	0.00E+00	Fail	1.20E+02	4.47E-02	0.00E+00	

Current Condition	
TPH, mg/kg=	9079.800
HI=	3.384E+00
Cancer RISK=	0.000E+00
Pass or Fail?	Fail

Adjusted Condition	
TPH, mg/kg=	120.000
HI=	4.473E-02
Cancer RISK=	0.000E+00
Pass or Fail?	Pass

Exposure Parameters	
for Non-carcinogens	Units
Average Body Weight, ABW	kg
Averaging Time, AT	yr
Exposure Frequency, EF	1
Exposure Duration, ED	6
Soil Ingestion Rate, SIR	200
Dermal Surface Area, SA	2200
for Carcinogens	Units
Averaging time, AT_C	75
	yr

Soil Cleanup Levels: Worksheet for Data Entry

Refer to WAC 173-340-720, 740,745, 747, 750

Date: 02/17/03

Site Name: YVMH (30th and Walnut)

Sample Name: 60641.00-22

I. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	0	0.00%
AL_EC >6-8	0	0.00%
AL_EC >8-10	90.7	1.00%
AL_EC >10-12	721	7.94%
AL_EC >12-16	2570	28.30%
AL_EC >16-21	2540	27.97%
AL_EC >21-34	296	3.26%
AR_EC >8-10	0	0.00%
AR_EC >10-12	197	2.17%
AR_EC >12-16	840	9.25%
AR_EC >16-21	1770	19.49%
AR_EC >21-34	55.1	0.61%
Benzene	0	0.00%
Toluene	0	0.00%
Ethylbenzene	0	0.00%
Total Xylenes	0	0.00%
Total Naphthalenes	0	0.00%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenzo(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	9079.8	100.00%

2. Enter Site-Specific Hydrogeological Data

Total soil porosity: default is 0.43	0.43	Unitless
Volumetric water content: default is 0.3	0.3	Unitless
Volumetric air content: default is 0.13	0.13	Unitless
Soil bulk density measured: default is 1.5	1.5	kg/l
Fraction Organic Carbon: default is 0.001	0.001	Unitless
Dilution Factor: default is 20	20	Unitless

Exposure Pathway	Pass or Fail?	HI	RISK
Soil Direct Contact	Unrestricted Land use	Fail	3.38E+00
	Industrial Land use	Pass	2.68E-01
Method B Potable Ground Water Protection	Pass	1.63E-01	0.00E+00

Warning!!!

*Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required based on site-specific conditions and type of fuel (see WAC 173-340-7490-7494).
*Check Soil Residual Saturation Evaluation specified in WAC 173-340-747(10).

Note:

1. All data must be numeric values. Use of alphabetical characters (i.e., "ND", "NA", "<", ">", or "=") will cause an error.
2. Try to avoid double counting: The Petroleum Equivalent Carbon (EC) fractions include many individual substances that must be analyzed separately. When entering the concentration of petroleum EC fraction into the data entry cell, make sure you subtract the concentration of individual substances from the appropriate EC fraction. (See User's Guide)
3. For the values of soil measurement below the method detection limit, substitute one-half the method detection limit as required by WAC173-340-740-(7). For the values for soil measurement above the method detection limit but below the practical quantitation limit, substitute the method detection limit. However, for a hazardous substance or petroleum fraction which has never been detected in any sample at a site and these substances are not suspected of being present at the site based on site history and other knowledge, enter "0" for that hazardous substances or petroleum fraction for further calculation. Refer to WAC173-340-740(7) for detail.
4. For detail analytical testing requirements for petroleum contaminated sites, refer to WAC 173-340-820, 830 and 840, and Table 830-1.
5. For detail information on site-specific hydrogeological conditions, refer to WAC 173-340-747.

REMARK:

Enter site-specific information here.....

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/02/02
Date Received: 11/22/02
Project: 60641.00
Date Extracted: 11/22/02
Date Analyzed: 11/22/02 and 11/23/02

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY
THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO
PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION
OF ANY MATERIAL PRESENT**

<u>Sample ID</u> <u>Laboratory ID</u>	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u>
60641.00-4 211171-04	ND	D	D	99
60641.00-5 211171-05	ND	D	D	101
60641.00-6 211171-06	ND	ND	ND	92
60641.00-7 211171-07	ND	ND	ND	92
60641.00-8 211171-08	ND	ND	ND	88
60641.00-13 211171-13	ND	ND	ND	82
Method Blank	ND	ND	ND	100

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 100 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/02/02
Date Received: 11/22/02
Project: 60641.00
Date Extracted: 11/25/02
Date Analyzed: 11/25/02 and 11/26/02

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Extended</u> (C ₁₀ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 45-153)
60641.00-1 d 211171-01	7,400	142
60641.00-2 d 211171-02	7,300	ip
60641.00-3 d 211171-03	16,000	ip
60641.00-4 211171-04	280	104
60641.00-5 211171-05	1,800	99
60641.00-9 d 211171-09	15,000	ip
60641.00-10 d 211171-10	8,000	141
60641.00-11 d 211171-11	20,000	ip
60641.00-12 d 211171-12	8,200	146
Method Blank	<50	100

d - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/02

Date Received: 11/22/02

Project: 60641.00

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 211177-08 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Diesel Extended	µg/g (ppm)	1,700	1,700	0

Laboratory Code: 211177-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	1,700	117	62-142

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	102	66-132

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/28/03
Date Received: 01/21/03
Project: 60641.00, F&BI 301142
Date Extracted: 01/21/03
Date Analyzed: 01/21/03

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as µg/g (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 45-153)
60641.00-01A 301142-01	380	<50	91
60641.00-02A 301142-02	<10	<50	77
60641.00-03A 301142-03	<10	<50	77
Method Blank	<10	<50	78

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/31/03
Date Received: 01/27/03
Project: 60641.00, F&BI 301208
Date Extracted: 01/28/03
Date Analyzed: 01/28/03

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as µg/g (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 45-153)
60641.00-04 d 301208-01	28,000	<500	ip
60641.00-05 301208-02	8,900 ve	<50	63
60641.00-06 301208-03	7,400 ve	<50	107
60641.00-07 301208-04	3,700	<50	123
60641.00-08 301208-05	<10	<50	107
60641.00-09 301208-06	1,600	<50	107
60641.00-10 301208-07	<10	<50	101
60641.00-11 301208-08	5,700	<50	149

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration is an estimate.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

d - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/31/03
Date Received: 01/27/03
Project: 60641.00, F&BI 301208
Date Extracted: 01/28/03
Date Analyzed: 01/28/03

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as µg/g (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₆)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 45-153)
60641.00-12 301208-09	1,700	<50	119
60641.00-13 301208-10	82	<50	110
60641.00-14 301208-11	21	<50	105
60641.00-15 301208-12	<10	<50	102
60641.00-16 301208-13	2,500	<50	115
60641.00-17 301208-14	<10	<50	116
Method Blank	<10	<50	104

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/31/03
Date Received: 01/28/03
Project: 60641.00, F&BI 301211
Date Extracted: 01/29/03
Date Analyzed: 01/29/03

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 45-153)
60641.00-18 301211-01	3,900	<50	93
60641.00-19 d 301211-02	7,800	<500	103
60641.00-20 d 301211-03	7,300	<500	152
60641.00-21 301211-04	510	<50	92
60641.00-22 301211-05	1,700	<50	95
60641.00-23 301211-06	32	<50	89
Method Blank	<10	<50	91

d - The sample was diluted.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 02/17/03
Date Received: 02/05/03
Project: 60641.00, F&BI 302028
Date Extracted: 02/05/03
Date Analyzed: 02/05/03

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₆)	<u>Motor Oil Range</u> (C ₂₆ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 45-153)
60641.00-7A 302028-01	7,000 ve	<50	107
60641.00-23 302028-03	<10	<50	99
60641.00-24 302028-04	<10	<50	99
60641.00-25 302028-05	<10	<50	103
60641.00-26 302028-06	1,100	<50	104
Method Blank	<10	<50	108

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/28/03

Date Received: 01/21/03

Project: 60641.00, F&BI 301142

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 301035-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Diesel Extended	µg/g (ppm)	<50	<50	nm

Laboratory Code: 301035-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	µg/g (ppm)	500	<50	90	91	62-142	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	89	66-132

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/31/03

Date Received: 01/28/03

Project: 60641.00, F&BI 301211

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED
USING METHOD NWTPH-Dx**

Laboratory Code: 301216-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Diesel Extended	µg/g (ppm)	<50	62	nm

Laboratory Code: 301216-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	µg/g (ppm)	500	<50	100	118	62-142	17

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	89	66-132

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/31/03

Date Received: 01/27/03

Project: 60641.00, F&BI 301208

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED
USING METHOD NWTPH-Dx**

Laboratory Code: 301199-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Diesel Extended	µg/g (ppm)	<50	<50	nm

Laboratory Code: 301199-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	µg/g (ppm)	500	<50	103	100	62-142	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	108	66-132

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 31, 2003

Paul Danielson, Project Manager
PBS Engineering and Environmental, Inc.
3311 W. Clearwater Ave. Suite 145
Kennewick, WA 99336

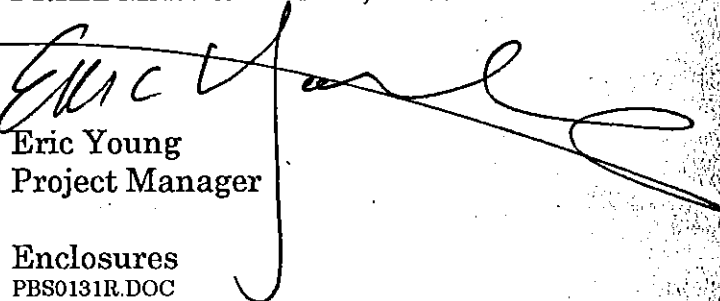
Dear Mr. Danielson:

Included are the results from the testing of material submitted on January 28, 2003 from the 60641.00, F&BI 301211 project. There are 2 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Eric Young
Project Manager

Enclosures
PBS0131R.DOC

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS****Analysis For Volatile Compounds By EPA Method 8260B**

Client Sample ID: 60641.00-22
Date Received: 02/05/03
Date Extracted: 02/05/03
Date Analyzed: 02/05/03
Matrix: Soil
Units: ug/g (ppm)

Client: PBS Environmental
Project: 60641.00, F&BI 302028
Lab ID: 302028-02
Data File: 020515.D
Instrument: 5972 -Ins
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	91	45	133
1,2-Dichloroethane-d4	94	45	128
Toluene-d8	99	36	131
4-Bromofluorobenzene	109	11	169

Compounds:	Concentration ug/g (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	1.2
m,p-Xylene	5.0
o-Xylene	2.3
Naphthalene	50 ve

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS****Analysis For Volatile Compounds By EPA Method 8260B**

Client Sample ID: 60641.00-22
Date Received: 02/05/03
Date Extracted: 02/05/03
Date Analyzed: 02/10/03
Matrix: Soil
Units: ug/g (ppm)

Client: PBS Environmental
Project: 60641.00, F&BI 302028
Lab ID: 302028.02 1/10
Data File: 020934.D
Instrument: 5972 -Ins
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	100	45	133
1,2-Dichloroethane-d4	87	45	128
Toluene-d8	92	36	131
4-Bromofluorobenzene	122	11	169

Compounds:	Concentration ug/g (ppm)
Methyl t-butyl ether (MTBE)	<0.5
Benzene	<0.3
Toluene	<0.5
Ethylbenzene	1.3
m,p-Xylene	5.2
o-Xylene	2.5
Naphthalene	49

Note: The sample was diluted due to the presence of high levels of material. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	PBS Environmental
Date Received:	02/05/03	Project:	60641.00, F&BI 302028
Date Extracted:	02/05/03	Lab ID:	03-195 mb
Date Analyzed:	02/05/03	Data File:	020514.D
Matrix:	Soil	Instrument:	5972 -Ins
Units:	ug/g (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	100	45	133
1,2-Dichloroethane-d4	104	45	128
Toluene-d8	97	36	131
4-Bromofluorobenzene	113	11	169

Compounds:	Concentration ug/g (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	<0.05
m,p-Xylene	<0.05
o-Xylene	<0.05
Naphthalene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/17/03

Date Received: 02/05/03

Project: 60641.00, F&BI 302028

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED
USING METHOD NWTPH-Dx**

Laboratory Code: 302020-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Diesel Extended	µg/g (ppm)	<50	<50	nm

Laboratory Code: 302020-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	µg/g (ppm)	500	<50	88	91	62-142	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	µg/g (ppm)	500	88	66-132

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/17/03

Date Received: 02/05/03

Project: 60641.00, F&BI 302028

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR VOLATILES BY EPA METHOD 8260B**

Laboratory Code: 302028-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	µg/g (ppm)	<0.03	<0.03	nm
Toluene	µg/g (ppm)	<0.05	<0.05	nm

Laboratory Code: 302028-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Benzene	µg/g (ppm)	2.2	<0.03	87	41-118
Toluene	µg/g (ppm)	2.2	<0.05	79	34-114

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	µg/g (ppm)	2.2	99	101	50-136	2
Toluene	µg/g (ppm)	2.2	90	89	57-121	1

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/17/03

Date Received: 02/05/03

Project: 60641.00, F&BI 302028

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR ETHERS AND
t-BUTYL ALCOHOL USING EPA METHOD 8260B**

Laboratory Code: 302028-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methyl t-butyl ether (MTBE)	µg/g (ppm)	<0.05	<0.05	nm

Laboratory Code: 302028-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	µg/g (ppm)	2.2	<0.05	91	58-100

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	µg/g (ppm)	2.2	99	99	64-109	0

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

302028

EU

2/5/03 - CO1

SAMPLE CHAIN OF CUSTODY

SAMPLES (Sealed)
PROJECT NAME/NO
60641.00
REMARKS

Page # of
TURNAROUND TIME
Standard (2 Weeks)
X (RUSH) - Notes Expedite - No Mac Lane
Rush charges authorized by
SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Call Report To: Paul Darrachon
Company: PLS Environmental
Address: 3311 W Clearwater Ave Suite 145
City: State: ZIP: Kennewick, WA 98346
Phone #: (509) 223-2096 Fax #: (509) 733-1857

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED							Notes
						TPH (Diesel)	TPH (Gasoline)	BTX by 8021R	AOCs by 8260	SVOCS by 8270	HPS	Map the lens	
60641.00 - 7A	01	2/3/03	noon	Soil	1	X						EPH	
-22	02	"	"	"	2							X	
-23	03	"	"	"	1	X						X	
-24	04	"	"	"	1	X							
-25	05	"	"	"	1	X							
-26	06	"	"	"	1	X							

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Paul Darrachon	PBS	2-3-03	1 PM
Received by: <i>[Signature]</i>	Grace Jarron	FBI	2/4/03	
Relinquished by:				
Received by:				

Friedman & Bryant, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-3011

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID: 60641.00-22
Date Received: 02/05/03
Date Extracted: 02/05/03
Date Analyzed: 02/10/03
Matrix: Soil
Units: ug/g (ppm)

Client: PBS Environmental
Project: 60641-00
Lab ID: 302028-02 1/10
Data File: 020934.D
Instrument: 5972 -Ins
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	100	45	133
1,2-Dichloroethane-d4	87	45	128
Toluene-d8	92	36	131
4-Bromofluorobenzene	122	11	169

Compounds:	Concentration ug/g (ppm)
Methyl t-butyl ether (MTBE)	<0.5
Benzene	<0.3
Toluene	<0.5
Ethylbenzene	1.3
m,p-Xylene	5.2
o-Xylene	2.5
Naphthalene	49

Note: The sample was diluted due to the presence of high levels of material. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID: 60641.00-22
Date Received: 02/05/03
Date Extracted: 02/05/03
Date Analyzed: 02/05/03
Matrix: Soil
Units: ug/g (ppm)

Client: PBS Environmental
Project: 60641-00
Lab ID: 302028-02
Data File: 020515.D
Instrument: 5972 -Ins
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	91	45	133
1,2-Dichloroethane-d4	94	45	128
Toluene-d8	99	36	131
4-Bromofluorobenzene	109	11	169

Compounds:	Concentration ug/g (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	1.2
m,p-Xylene	5.0
o-Xylene	2.3
Naphthalene	50 ve

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration is an estimate.



Seattle 11725 North Creek Pkwy N, Suite 400, Bothell WA 98011-8244
 425 420 9200 fax 425 420 9210
 Spokane 1515 N. Montgomery, Suite D, Spokane, WA 99208 4756
 509 974 9700 fax 509 924 9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503 968 9700 fax 503 969 9210
 Bend 20312 Empire Avenue, Suite 5-1, Bend OR 97701-5711
 541 383 9310 fax 541 382 7538
 Anchorage 3302 Alyce Street, Anchorage, AK 99503
 907 541 1200 fax 907 541 9210

Friedman & Briya
 3012 16th Ave W
 Seattle WA/USA, 98119-2029

Project: Eric Young
 Project Number: 60641.00
 Project Manager: Eric Young

Reported:
 02/17/03 09:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
60641 00-22	B380073-01	Soil	02/03/03 12:00	02/05/03 15:45

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jeanne Garthwaite

Jeanne Garthwaite, Project Manager

North Creek Analytical, Inc.
 Environmental Laboratory Network

Page 1 of 7



Seattle 11720 North Creek Pkwy N. Suite 400 Bothell, WA 98011 425-420-8200 fax 425-420-5210
 Spokane East 17115 Montgomery Suite B, Spokane, WA 99216 509-924-9200 fax 509-324-6330
 Portland 2435 SW Nimbus Avenue, Beaverton, OR 97005-7132 503-905-9200 fax 503-906-9210
 Bend 20132 Empire Avenue, Suite 4-1 Bend, OR 97701-5711 541-383-9210 fax 541-382-7358
 Anchorage 3203 Dutch Street Anchorage, AK 99503 907-526-1212 fax 907-526-9210

Friedman & Bruya
 3012 16th Ave W
 Seattle WA/USA. 98119-2029

Project: Eric Young
 Project Number: 60641.00
 Project Manager: Eric Young

Reported:
 02/17/03 09:13

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
60641.00-22 (B3B0073-01) Soil Sampled: 02/03/03 12:00 Received: 02/05/03 15:45									
C8-C10 Aliphatics	90.7	50.0	mg/kg dry	10	3B07023	02/07/03	02/14/03	WA MTCA-EPH	
C10-C12 Aliphatics	721	50.0	"	"	"	"	"	"	
C12-C16 Aliphatics	3570	50.0	"	"	"	"	"	"	
C16-C21 Aliphatics	2540	50.0	"	"	"	"	"	"	
C21-C34 Aliphatics	296	50.0	"	"	"	"	"	"	
C10-C12 Aromatics	197	50.0	"	"	"	"	02/14/03	"	
C12-C16 Aromatics	840	50.0	"	"	"	"	"	"	
C16-C21 Aromatics	1770	50.0	"	"	"	"	"	"	
C21-C34 Aromatics	55.1	50.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	9080	50.0	"	"	"	"	02/14/03	"	
Surrogate: 2-FBP	98.0 %	50-150			"	"	02/14/03	"	
Surrogate: Octacosane	92.1 %	50-150			"	"	02/14/03	"	
Surrogate: Undecane	%	50-150			"	"	"	"	3-01

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jeanne Garthwaite

Jeanne Garthwaite, Project Manager

North Creek Analytical, Inc.
 Environmental Laboratory Network

Page 2 of 7



Yakima Health District
104 North First Street
Yakima, Washington 98901
Phone (509) 575-4040

January 21, 2003

Paul Danielson
C/O PBS Environmental
3311 W. Clearwater Ave. Suite 145
Kennewick, WA 99336

RE: Memorial Hospital 2003, Chestnut Ave., Yakima, WA : Petroleum Contaminated Soil

Paul Danielson,

This office has reviewed the data on the above mentioned project. The data submitted indicates that the contaminant(s) which require(s) remediation is/are Diesel. Based on the data submitted it has been determined that the soil may be processed at the Anderson PCS Facility provided that all handling is in accordance with the procedure that has been approved by this office and Wa. State Dept. of Ecology. This letter is to notify you that currently the soil will be considered to be stored on the property and no treatment can begin until the total fee is paid. Waste material may be stored for up to 90 days. Anderson PCS Facility will notify me of the total number of tons delivered for treatment and I will bill you for the remainder of the fee at that time.

FEE ACCOUNT:

PBS Environmental

PROJECT NAME:

Memorial Hospital 2003
Chestnut Ave.
Yakima, WA

PRE-TREATMENT AUTHORIZATION:

(Based on time spent prior to soil delivery
to the site at \$98/hour)

TONNAGE FEE AT \$.42 PER TON:

To be determined after delivery

BALANCE OWED:

To be billed after delivery

If you have any questions regarding this letter please contact me at (509) 249-6543.

Sincerely,

Art McEwen
Environmental Health Specialist

cc: Anderson PCS Facility



Yakima Health District
104 North First Street
Yakima, Washington 98901
Phone (509) 575-4040

February 18, 2003

Paul Danielson
C/O: PBS Environmental
3311 W. Clearwater Ave. Suite 145
Kennewick, WA 99336

RE: Memorial Hospital 2003, Job 60641.00, Chestnut Ave., Yakima, WA: Petroleum Contaminated Soil

Paul Danielson,

This office has received verification from the Anderson PCS Facility that 1245.12 tons of soil was delivered for treatment. This letter is to notify you that currently the soil is considered to be stored on the property and no treatment can begin until the total fee is paid. Waste material may be stored for up to 90 days.

FEE ACCOUNT:

PBS Environmental

PROJECT NAME:

Memorial Hospital 2003, Job 60641.00
Chestnut Ave,
Yakima, WA

PRE-TREATMENT AUTHORIZATION: (25 minutes)
(Based on time spent prior to soil delivery to the site at \$98/hour)

\$ 40.83

TONNAGE FEE AT \$0.42 PER TON:

\$522.95

BALANCE OWED:

\$ 563.78

If you have any questions regarding this letter please contact me at (509) 249-6562. PLEASE ENCLOSE A COPY OF THIS LETTER WITH YOUR PAYMENT, MAKE CHECKS PAYABLE TO THE YAKIMA HEALTH DISTRICT, AND INCLUDE THE INVOICE NUMBER (SEE INCLOSED INVOICE) ON THE CHECK.

Sincerely,

Ted Silvestri, RS
Environmental Health Specialist

cc: Anderson PCS Facility

File Original and First Copy with
Department of EcologySecond Copy—Owner's Copy
Third Copy—Driller's Copy**WATER WELL REPORT**

STATE OF WASHINGTON

Start Card No. 016249

Water Right Permit No.

OWNER: Name P.L.S.A.Address 1120 West Lincoln, Yakima, WA 98902(2) LOCATION OF WELL: County YakimaSW 4 SW 4 Sec 23 T. 13 N. R18 W.M.(2a) CITY/STREET ADDRESS OF WELL (or nearest address) Yakima memorial hospital(3) PROPOSED USE: ☐ Domestic
☐ Irrigation ☐ Industrial ☐ Municipal ☐
☐ DeWater ☐ Test Well ☐ Other ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

(4) TYPE OF WORK: Owner's number of well
(if more than one) 1Abandoned ☒ New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 40 feet. Depth of completed well 40 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 0 * Diam. from 0 ft. to 0 ft.
Welded ☐ * Diam. from 0 ft. to 0 ft.
Liner installed ☐ * Diam. from 0 ft. to 0 ft.
Threaded ☐ * Diam. from 0 ft. to 0 ft.Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☒ To what depth? _____ ft.

Material used in seal _____

Did any strata contain unusable water? Yes ☐ No ☒

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type _____ H.P. _____

(8) WATER LEVELS: Land surface elevation _____ ft.

Static level 0 _____ ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____Yield: N/A gal./min. with _____ ft. drawdown after _____ hrs.

" " " " " "

" " " " " "

Recovery data (time taken as zero when pump turned on) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

" " " " " "

" " " " " "

" " " " " "

Date of test _____

Baker test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Air test _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

MATERIAL	FROM	TO
Top soil	0	5
Cemented Gravel, Medium	5	12
Sandstone, Medium	12	15
Cemented gravel	15	30
Cemented gravel w/clay, Brown	30	32
Sandstone w/gravel	32	40
No PVC liner Installed		
No Drive shoe Utilized		
Abandoned well.		

Work started 02/15/89, 19. Completed 02/15/89, 19

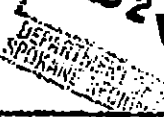
WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.
(PERSON, FIRM OR CORPORATION) (TYPE OR PRINT)Address E. 6010 BROADWAY, SPOKANE, WA 99212(Signed) [Signature] License No. 1472
(WELL DRILLER)Contractor's
Registration Louie E. HannerNo. PO-ND-EI-248-JE Date 02/15/89, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with
Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy



WATER WELL REPORT

STATE OF WASHINGTON

Start Case No. 016249

Water Right Permit No.

OWNER: Name P.L.S.A.Address 1120 West Lincoln Yakima, wa 98902(2) LOCATION OF WELL: County Yakima SW X SW X Sec 23 T. 13 N. R. 18 W.M.(2a) STREET ADDRESS OF WELL (or nearest address) Yakima memorial hospital

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐
☐ Irrigation ☐ Test Well ☐ Other ☒
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) 2
 Abandoned ☒ New well ☐ Method: Dug ☐ Bored ☐
 Deepened ☐ Cable ☐ Driven ☐
 Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 45 feet. Depth of completed well 45 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 0 ft. Diam. from 0 ft. to 0 ft.
 Welded ☐ ft. Diam. from 0 ft. to 0 ft.
 Liner installed ☐ ft. Diam. from 0 ft. to 0 ft.
 Threaded ☐ ft. Diam. from 0 ft. to 0 ft.

Perforations: Yes ☐ No ☒
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☒ To what depth? _____ ft.
 Material used in seal _____
 Did any strata contain unusable water? Yes ☐ No ☒
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 0 ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
 Yield: N/A gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
 Time Water Level Time Water Level Time Water Level

Date of test _____
 Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Abtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

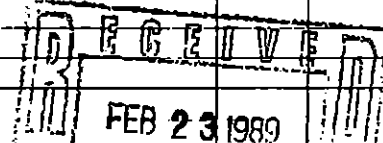
(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top soil	0	5
Cemented gravel, Medium	5	12
Sandstone, Medium	12	15
Cemented gravel	15	30
Cemented gravel w/clay, Brown	30	32
Sandstone w/gravel	32	45

No PVC Liner Installed
 No Drive shoe Utilized

Well Abandoned

Work started 02/15/89, 19. Completed 02/15/89, 10.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.

(PERSON, FIRM, OR CORPORATION)

(TYPE OR PRINT)

Address E. 6010 BROADWAY SPOKANE, WA 99212(Signed) [Signature] License No. 1472

(WELL DRILLER)

Contractor's Louie E. HannerRegistration No. PO-ND-EI*248 JE Date 02/15/89, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

WATER WELL REPORT

STATE OF WASHINGTON

Application No.
Permit No.

(1) OWNER: Name Glen R. Gardner Address 1901 Roosevelt, Yakima, WA 98902
(2) LOCATION OF WELL: County Yakima SW 1/4 SW 1/4 Sec 23 T. 13 N. R. 18 E. W.M.
Bearing and distance from section or subdivision corner N

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dig ☐ Bore ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 42 ft. Depth of completed well 42 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from +1 ft. to 37 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.
Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
..... perforations from ft. to ft.
..... perforations from ft. to ft.
..... perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name Model No.
Type Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: HP

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 15 ft. below top of well Date 3/20/85
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 10 gal./min. with ft. drawdown after hrs.
..... ESTIMATED AIRLIFT "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
.....
.....

Date of test
Ballot test: gal./min. with ft. drawdown after hrs.
Artesian flow: g.p.m. Date
Temperature of water: Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated. With at least one entry for each change of formation.

MATERIAL	FROM	TO
Sand & Gravel w/water	0	42

RECEIVED

MAR 28 1985

NO PVC Liner Installed
DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE
6" Drive shoe installed

RECEIVED

MAR 29 1985

Work started 3/19, 19 85 Completed 3/20, 19 85

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT, INC.
(Person, firm, or corporation) (Type or print)
Address E. 6010 Broadway, Spokane, WA 99212
[Signed] James M. Doyle (Well Driller)
James M. Doyle
License No. 1287 Date 3/20, 19 85

(USE ADDITIONAL SHEETS IF NECESSARY)