STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	)	**AGREED ORDER**
Mr. Man Kyu Pak	)	No. DE 02TCPSR-3902

To: Mr. Man Kyu Pak
Black Lake Grocery
4409 Black Lake Boulevard
Olympia, WA 98502-2250

I.

JURISDICTION

This Agreed Order ("Order") is issued pursuant to the authority of RCW 70.105D.050(1).

II.

FINDINGS OF FACT

The Department of Ecology (Ecology) makes the following Findings of Fact, without admission of such facts by Man Kyu Pak (Pak).

Pak is the owner of the Black Lake Grocery located at 4409 Black Lake Boulevard, Olympia, Washington (Site).

1. In "Addendum Report of Geotechnical Services, Black Lake Boulevard Expansion" (Dames and Moore, March 2, 1990), levels of petroleum contamination in soil and groundwater on-site and in areas adjacent to the site were found to be in excess of Model Toxics Control Act (MTCA) (Chapter 173-340 WAC) Method A cleanup standards.

2. Underground storage tanks (USTs) on-site were tightness tested on October 2, 1990. Although one tank failed the initial test, it was later re-tested on December 18, 1990, and found to be tight.

On October 16, 1990, the store's water supply well and a neighboring well were sampled. Analytical results showed benzene levels at 36.5 micrograms per liter (ug/l) for the store's well. The Method A cleanup level for benzene is 5.0 ug/l. Contaminants were not detected in samples collected from the neighboring well.

3. On March 13, 1992, tightness tests were performed on the in-use tanks. These tanks tested tight.

4. On April 22 and 23, 1992, two USTs no longer in use were removed and soil samples were collected from the tank excavation. Analytical results showed levels of total petroleum hydrocarbons (TPH) as gasoline of 650 and 530 milligrams per kilogram (mg/kg). The Method A standard for TPH as gasoline is 100 mg/kg.

5. In August 1993, Pak signed Agreed Order No. DE93TC-S171. At that time Pak was planning to remove all USTs at the site and remove petroleum contaminated soils. The Order required a Phase I Initial Site Investigation to determine the severity of the contamination prior to removing the tanks and contaminated soil. Based on the findings of Phase I, Phase II activities may be conducted. The Order also stated that if Phase I activities revealed that contamination was excessive, the Order would be amended or a new Order would be issued which would require a Remedial Investigation/Feasibility Study (RI/FS).

6. In February 1994, "Phase I Initial Site Investigation" was submitted to Ecology by Blazer Construction on behalf of Pak. This document concluded that severe contamination of both soil and ground water existed at the site and that an RI/FS would be necessary.

7. In January 1995, Agreed Order DE94TC-S202 was issued, requiring Pak to conduct an RI/FS at the site. A follow-up Agreed Order No. DE95S202, dated June 21, 1995, was also issued, requiring Pak to conduct an RI/FS at the site.

8. In June and July 1995, commensurate with the expansion and re-paving of Black Lake Boulevard, the UST and fuel dispensing system was upgraded and relocated. Three gasoline USTs were removed. In addition, two USTs and one septic tank, previously not known to exist, were also removed. Approximately 1200 cubic yards of contaminated soil was excavated and remediated on-site using bioremediation. Confirmation samples collected from the tank excavation revealed contamination in excess of MTCA Method A Cleanup Levels existed beyond the limits of the excavation.

9. In November 1995, a draft RI/FS was submitted to Ecology. It was determined that pilot scale testing was necessary to fully evaluated cleanup options for the site.

10. A dispute caused a delay in work at the site until December 1996 and January 1997 when pilot scale testing was conducted.

11. Before a final RI/FS could be completed, a second dispute caused all work to stop. Finally, in January 2000, a revised draft of the RI/FS was submitted to Ecology. Because a considerable of time had lapsed from the most recent groundwater monitoring data, Ecology requested more current data to be submitted. In May 2000, groundwater samples were collected at selected monitoring wells.

12. In August 2000, a revised Draft Final RI/FS was submitted to Ecology, which included the May 2000 groundwater monitoring data.

13. A Final RI/FS was received by Ecology on February 8, 2001. By letter dated February 13, 2001, Ecology determined that the requirements of Agreed Order #DE95-S202 were satisfied by that RI/FS.

III.
ECOLOGY DETERMINATIONS

1. Man Kyu Pak is an "owner or operator as defined at RCW 70.105D.020(11) of a "facility" as defined in RCW 70.105D.020(4).

2. The facility is known as Black Lake Grocery and is located at 4409 Black Lake Boulevard.

3. The substances found at the facility as described above are "hazardous substances" as defined at RCW 70.105D.020(7).

4. Based on the presence of these hazardous substances at the facility and all factors known to the Department, there is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(19).

5. By letter dated September 28, 1992, Ecology notified Pak of his status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.
WORK TO BE PERFORMED

Based on the foregoing Facts and Determinations, it is hereby ordered that Pak take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

1. Prepare a draft version of the appropriate engineering documents as discussed in WAC 173-340-400 (4) and a Compliance Monitoring Plan as discussed in WAC 173-340-410 to implement the Cleanup Action Plan (CAP) (Exhibit A). This shall also include a proposed schedule for implementing the preferred alternative. These documents shall be due to Ecology within four (4) weeks following the effective date of this Order for comment and approval.

2. Submit revised documents within four (4) weeks following receipt of Ecology's comments on the draft EDR

3. Implement the preferred alternative in accordance with the schedule submitted in the EDR.

4. Submit construction documentation as discussed WAC 173-340-400 (7) (b) through (10). These documents shall be submitted to Ecology for review within four (4) weeks following construction at the site.

5. Submit final versions of the construction documentation within four (4) weeks following receipt of Ecology's comments on the draft version.

6. Implement Performance Monitoring and submit quarterly sampling report.

V.

TERMS AND CONDITIONS OF ORDERs

1. Definitions. Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notices. RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs. Pak shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Pak shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided with each itemized statement. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges. This Agreed Order is in addition to and does not supersede the Memorandum of Agreement between the parties hereto, a copy which is attached as Exhibit B.

4. Designated Project Coordinators.

The project coordinator for Ecology is:

Name: Panjini Balaraju
Address: Department of Ecology
Toxics Cleanup Program
Southwest Regional Office
PO Box: 47775
Olympia, WA 98504-7775
Telephone Number: (360) 407-6243

The project coordinator for Mr. Man Kyu Pak is:

Name: Mr. John Dustman
Address: Summit Environmental, Inc.
1217 Bandana Boulevard North
St. Paul, MN 55108
Telephone Number: (651) 842-4203

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Pak, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or Pak change project coordinator(s), written notification shall be provided to Ecology or Pak at least ten (10) calendar days prior to the change.

5. Performance.

All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. Pak shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the site. Pak shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except where necessary to abate an emergency situation, Pak shall not perform any remedial actions at Black Lake Grocery outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions. WAC 173-340-400(7)(b)(i) requires that "construction" performed on the site must be under the supervision of a professional engineer registered in Washington.]

6. Access. Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Pak. By signing this Agreed Order, Pak agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the site at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by Pak during an inspection unless doing so interferes with Ecology's sampling. Pak shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

7. Retention of Records. Pak shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Pak, then Pak agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

8. Dispute Resolution.

Pak may request Ecology to resolve disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final, subject to the provisions of RCW 70.105D.060. Pak is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing, or by an Order from Superior Court of appropriate jurisdiction.

9. Reservation of Rights/No Settlement. This Agreed Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against Pak to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against Pak to require those remedial actions required by this Agreed Order, provided Pak complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the site should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from Black Lake Grocery.

In the event Ecology determines that conditions at the site are creating or have the potential to create a danger to the health or welfare of the people on the site or in the surrounding area or to the environment, Ecology may order Pak to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property. No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the site shall be consummated by Pak without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Pak may have in the site or any portions thereof, Pak shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, Pak shall notify Ecology of the contemplated transfer.

12. Compliance With Applicable Laws.

A. All actions carried out by Pak pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in paragraph B of this section.

B. Pursuant to RCW 70.105D.090(1), Pak is exempt from the procedural but not the substantive requirements of chapters 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals for the remedial action under this Order that are known to be applicable at the time of issuance of the Order have been included in Exhibit A and are binding and enforceable requirements of the Order.

Pak has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order. In the event Pak determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify Ecology of this determination. Ecology shall determine whether Ecology or Pak shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Pak shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Pak and on how Pak must meet those requirements in conformance with the applicable law. Ecology shall inform Pak in writing of these requirements within thirty (30) days of receipt of the agency documentation. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. Pak shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Ecology shall ensure that notice and opportunity for comment is provided to the public and appropriate agencies prior to establishing the substantive requirements under this section.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency which is necessary for the state to administer any federal law, the exemption shall not apply and Mr. Pak shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

VI.

SATISFACTION OF THIS ORDER

The provisions of this Order shall be deemed satisfied upon Pak's receipt of written notification from Ecology that Pak has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with. Such written notification shall not be unreasonably withheld or delayed when due.

VII.

ENFORCEMENT

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order, which shall be brought in Thurston County Superior Court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the site.

C. In the event Pak refuses, without sufficient cause, to comply with any term of this Order, Pak will be liable for:

(1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of Chapter 70.105D RCW.

Effective date of this Order: July 1, 2002

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Date 6/20/02

By Rebecca S. Lawson

Rebecca S. Lawson, P.E.
Regional Section Manager
Toxics Cleanup Program
Southwest Regional Office

BLACK LAKE GROCERY

Date 6/14/02

By

Mr. Man Kyu Pak

EXHIBIT - A

EXHIBIT A

CLEANUP ACTION PLAN
BLACK LAKE GROCERY
OLYMPIA, WASHINGTON

This Cleanup Action Plan (CAP) has been prepared to present the selected alternative for remediation at the Black Lake Grocery site (also referred to as "the site") located in Thurston County, Washington, near the city of Olympia. This CAP has been prepared to satisfy the requirements of the Model Toxics Control Act (MTCA) (Ch 70.105D RCW). The purposes of this CAP are to: (1) briefly describe the cleanup alternatives considered and evaluated in the Remedial Investigation and Feasibility Study (RI/FS), and (2) identify the selected alternative. Information is also presented to provide background information regarding site activities and monitoring, including a description of the site and the nature and extent of contaminants.

The initial RI/FS activities at the site were conducted pursuant to Enforcement Order No. DE 95-S202. This CAP summarizes four alternatives that were considered and presents the information supporting the selection of the preferred cleanup alternative.

SITE BACKGROUND

The Black Lake Grocery is located at 4409 Black Lake Boulevard in Olympia, Washington, approximately 100 feet west of Black Lake (Figure 1). The site is located in the northwest 1/4 of the northeast 1/4, Section 31, Township 18 North, Range 2 West, in Thurston County. The site is bounded on the east by Black Lake Boulevard, on the north by Goldsby Road, and on the south and west by residential property.

The Black Lake Grocery store functions as a retail grocery store and gasoline station. The UST system, formerly located north and east of the store, was removed in June 1995. A new UST system was installed south of the store in July 1995. The new system consists of two USTs and a pump island with three fuel dispensers.

The ground surface south of the store is paved asphalt. The former UST excavation area located north and east of the store has not been repaved. The ground surface north and east of the store beyond the limits of the UST excavation consists of asphaltic concrete, the majority of which is cracked or broken. The ground surface elsewhere is unpaved and supports little or no vegetation.

Results of a title search by Summit indicated the following person(s) as site owners:

- Ollie Wellman, prior to 1946;
- Jessie and Paul Malleck, 1946 to 1971;
- Robert and Donna Kissner, 1971 to 1979;
- Thomas and Jean Boone, 1979 to 1985; and,
- Man Pak, 1985 to present.

A telephone interview on May 22, 1995 between Summit and previous owners Mr. and Mrs. Kissner, provided the following information: Mr. and Mrs. Kissner owned the Black Lake Grocery for approximately 8-8 1/2 years, from 1971 to 1979. They understood the property was previously used as a house with a grocery store that sold gasoline and heating oil. Both Mr. and Mrs. Kissner do not remember other activities performed at the site. Prior to purchasing the property in 1971, the store was moved to the cement building which it currently occupies. Spills or releases which occurred during the ownership of Mr. and Mrs. Kissner were limited to small amounts of kerosene or heating oil.

History of Environmental Investigations

In 1989, Thurston County Department of Public Works (Thurston County) commissioned Dames and Moore of Seattle, Washington to perform an environmental assessment in conjunction with the planned expansion of Black Lake Boulevard. The environmental assessment included drilling three borings, installing temporary groundwater monitoring wells, and collecting soil samples for field-screening and chemical analysis (Dames and Moore, 1990). During this assessment, floating petroleum product was observed on the surface of water bailed from a boring installed east of the store.

In response to Dames & Moore's findings, USTs were tightness tested in October and December 1990 and found to be tight. The store's water supply well and a neighboring well located south of the site were also sampled in October 1990. Chemical analysis results indicated a benzene concentration of 36.5 micrograms per liter (ug/L) in the store's well. Chemical analysis results indicated no detectable concentrations of TPH or benzene in the neighboring well.

In 1992, two USTs, not currently in use, located between the grocery store and Black Lake Boulevard, were removed. Contamination was in excess of MTCA Method A Cleanup Levels was present.

In 1993, Ecology issued Agreed Order No. DE93TC-S 171, requiring Man K. Pak to conduct a Phase I Site Assessment to evaluate the nature and extent of TPH and BTEX concentrations in soil and groundwater. In response to the agreed order, Blazer Construction (Blazer) performed a preliminary soil and groundwater chemistry investigation of the site from October to November 1993. Blazer drilled, installed, and sampled three groundwater monitoring wells, excavated and sampled four test pits, and drilled one hand-auger boring. Soil and groundwater samples were submitted to an-analytical laboratory for TPH and BTEX analysis. Laboratory results detected TPH and BTEX concentrations in soil and groundwater samples at concentrations exceeding cleanup levels (Blazer, 1994). In June 1994, Mr. Pak contracted Summit Envirosolutions (Summit) to supervise drilling and sampling of three soil borings to supplement existing hydrogeologic and soil chemistry data.

Based on the conditions specified in Agreed Order DE93TC-S171, Mr. Pak was required to perform an RI/FS, therefore Ecology issued Agreed Order DE 95-S202. In January 1995, Mr. Pak contracted Summit to perform an RI/FS to further evaluate the nature and extent of petroleum hydrocarbon constituents in soil and groundwater, and to evaluate alternative

approaches for soil and groundwater remediation.

In June and July 1995, commensurate with the expansion and re-paving of Black Lake Boulevard, the UST and fuel dispensing system was upgraded and relocated. This UST system was previously located north and east of the store and consisted of three USTs, a pump island with three fuel dispensers, and associated piping. The capacities of these three gasoline USTs were 10,000, 8,000, and 5,000 gallons. One 500-gallon UST and one 300-gallon UST, unknown to exist, were also removed. It is not known what products were previously stored in these two USTs. A previously unknown 100-gallon septic tank was also removed.

Soil was removed within the property boundaries to the practical limits of the excavation based on structural concerns, location of utilities, and the presence of groundwater. The horizontal extent of the UST excavation included the northeast portion of the site, from north of the grocery store to the east property boundary (Black Lake Boulevard). In addition, the northeast corner of the excavation was expanded beneath Goldsby Road to excavate additional soil. The depth of the excavation ranged from 10 to 13 feet blow ground surface. Approximately 1200 cubic yards of gasoline contaminated soil was excavated and removed for treatment in a treatment cell located on the upper portion of the property. Confirmation samples collected from the walls and floor of the excavation revealed contamination exceed MTCA Method A Cleanup Levels remained. Monitoring well D-12 was installed in the center portion of the excavation prior to backfilling to provide additional data regarding groundwater flow conditions and chemistry.

After initial stockpiling and sampling, the soil in the treatment cell was enclosed in plastic sheeting and spread to a thickness of approximately one foot. Water was also added occassionally to keep the moisture content in the soil at optimum conditions. Soil samples were collected on in October 1995 to evaluate the performance of the bioremediation in the treatment cell.

In November 1995, a draft RI/FS was submitted to Ecology (Summit, 1995). This document presented a summary of site data and evaluated potential remedial alternatives. It was determined that pilot scale tests were necessary to fully evaluate the preferred remedial option.

In December 1996 and January 1997, an interception trench was installed near Black Lake, along with additional monitoring wells. A pilot pumping test was performed at the trench to evaluate groundwater flow conditions and the potential for groundwater extraction to remediate contaminated groundwater at the site.

Before a final RI/FS could be completed, a dispute between Summit and Pak caused work pertaining to completion of the RI/FS to cease. Finally, in January 2000, an agreement was reached and work resumed to complete the final RI/FS document. A revised draft RI/FS document was prepared and submitted to Ecology in February 2000. Because a considerable time had lapsed from the most recent groundwater analytical data, Ecology required additional groundwater sampling. On May 11, 2000, groundwater samples were collected at selected monitoring wells. A final RI/FS was submitted to Ecology on February 8, 2001

GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic maps and other data collected by Noble and Wallace (1966) and Wallace and Molenaar (1961) indicate that the site is underlain by Vashon glacial drift deposits. These deposits consist of (from youngest to oldest) recessional sand, glacial till, and advance outwash and extend from ground surface to a depth of approximately 60 to 80 feet below ground surface (bgs). Vashon deposits unconformably overlie recessional outwash deposits of the Salmon Springs Formation, which extend from approximately 60-80 feet bgs to approximately 130-140 feet bgs. Salmon Springs deposits are approximately 70-80 feet thick and lie unconformably on Tertiary volcanic rocks at or near the elevation of present-day sea level. In addition to Vashon glacial drift, lacustrine deposits of ancestral Lake Russell are also present in the area surrounding the site. Deposits of Lake Russell are underlain by Vashon glacial drift and exist as a relatively thin mantle of clay found up to an elevation of about 150 feet.

Test borings drilled on the lower portion of the site by Blazer and Summit indicate the site is underlain by fine-grained lacustrine deposits (silts and clays). Soil borings advanced at the site report clay and silty clay to be present from approximately 5 feet to 35 feet below ground surface. The upper portion of the property contains deposits of silt and fine sand, which are visible in the exposed bluff located west of the grocery store. These deposits are mapped by Noble and Wallace (1966) as recessional outwash. However, the location and texture of the deposits, especially the well-sorted nature of the sand, indicates the deposits may represent former shoreline deposits of glacial Lake Russell. A geologic cross-section showing subsurface deposits in the lower and upper portions of the site is illustrated on Figure 6. The position of the cross-section on ground surface is illustrated Figure 2.

Groundwater level measurements from December 19, 1996 were used to infer the direction of groundwater flow and establish a hydraulic gradient beneath the site. These data indicate the direction of groundwater flow is to the east, at a gradient of approximately 0.04 (Figure 7). Seasonal fluctuations range from approximately 2 feet to 1.3 feet

Prior to Summit's subsurface investigations, water levels measured in on-site monitoring wells were interpreted to represent unconfined flow conditions beneath the site. Observations during UST removal and subsequent to the installation of monitoring well D 12 suggest that this may not be the case. It appears that the shallow groundwater system may change spatially from confined conditions in the area of the former and present UST systems to unconfined conditions near the shore of Black Lake.

In the vicinity of D10, D11, and D12, the shallow groundwater flow regime appears to behave similar to a confined system, with the top of the water-bearing unit located at a depth of approximately 15 feet bgs. This condition was confirmed during Geoprobe exploration, which repeatedly encountered groundwater at a depth of approximately 15 feet. The potentiometric surface in the vicinity of D10, D11, and D12 appears to occur at a depth of approximately 4 feet, as observed in water level measurements. However, in the vicinity of D9 the shallow groundwater flow system resembles and behaves like an unconfined system. Because a distinct confining layer was not identified, these differences are interpreted, to be the result of differences in elevation and proximity to Black Lake. Based on the inferred groundwater flow direction,

Black Lake is the likely discharge area for groundwater beneath the site.

Although the regional occurrence of shallow groundwater in the area is associated with unconsolidated glacial deposits, aquifer units capable of providing sufficient groundwater for domestic use in the vicinity of the project site are associated with the underlying volcanic rocks. The well owned by Mr. Pak on the upper portion of the property is supplied by groundwater flowing through fractured bedrock at a depth of approximately 350 feet (Pak, 1995). It is likely that the shallow groundwater flow regime beneath the site is dominated by horizontal flow towards Black Lake. Although it is possible that deep, bedrock aquifers are hydraulically interconnected with the upper flow regime, the potential effects of shallow groundwater flow to deeper aquifers was considered to be insignificant, and was therefore not evaluated during this investigation.

NATURE AND EXTENT OF CONTAMINATION

Subsurface Soil

Although a significant source of petroleum hydrocarbons to soil and groundwater was removed during UST removal activities, chemical analyses results indicate that soils beyond the practical limit of excavation contain TPH concentrations exceeding cleanup levels. The extent of TPH concentrations in soil was not determined during UST excavation activities.

Chemical analysis results for UST excavation samples indicate that TPH concentrations that exceed cleanup levels exist near the former locations of USTs and pump islands. Samples containing TPH concentrations that exceed cleanup levels are generally located in the east portion of the excavation bottom from 10-12 feet bgs. Other locations include the south corner of the excavation at 4 feet bgs, and the northeast corner of the excavation at 5 feet bgs. The two highest TPH concentrations were detected in samples T3B and T4B at 2,300 mg/kg and 1,800 mg/kg, respectively. These samples were collected from the central portion of the excavation bottom at approximately 10 feet bgs. Locations of samples exceeding TPH cleanup levels are illustrated on Figure 4.

Soil analytical data from the test probes also indicate that the highest levels of soil contamination are located to the east and southeast of the excavation limits (Figure 3). The highest benzene concentrations in the test probe soil samples were east of the excavation in the sample at P4 at a depth of 14-16 feet (2,490 ppb, analyzed on-site). The only other sample that had concentrations exceeding cleanup standards was at P5, located between the excavation and Black Lake.

An estimate of the remaining volume of soil that may potentially contain TPH concentrations exceeding cleanup levels can be inferred from the areas shown on Figure 4 where TPH concentrations exceed cleanup levels. The estimate assumes the following:

- TPH concentrations exceeding cleanup levels occur in the bottom of the eastern portion of the UST excavation to a depth of 12 feet bgs, and in the sides of the excavation within a 10 foot radius of a sample which contains TPH concentrations exceeding cleanup levels;

- ·TPH concentrations range from 0-2,300 mg/kg;

Using the method and assumptions described above, Summit estimates that approximately 340cubic yards (cy) of soil below the UST excavation potentially contain TPH concentrations which exceed cleanup levels. Summit also estimates that approximately 29 cy of soil in or near the sides of the UST excavation potentially contain TPH concentrations which exceed cleanup levels.

Based on TPH concentrations detected in samples collected from the UST excavation, Summit expects TPH concentrations in residual source material to contain average concentrations of 500 to 600 mg/kg TPH.

Groundwater

Chemical analysis results for groundwater samples collected at monitoring wells are summarized in Table VI-1.

Chemical analysis results from the monitoring well sampling events in November 1993, April and August 1995, December 1996, and May 2000 indicate concentrations of TPH and BTEX exceeding cleanup levels exist at the monitoring wells except D12. The distribution of benzene in the groundwater for August 1995 and December 1996 is illustrated on Figure 8 and Figure 9, respectively.

It is likely that groundwater was affected after petroleum hydrocarbons in soil migrated vertically, came in contact with the groundwater, and then migrated laterally (through advective, disperse, and diffusive mechanisms) toward Black Lake. Subsurface soils located downgradient from the source area also became affected where soils were in contact with groundwater.

Groundwater samples were collected in June and August 1995 using a Geoprobe to further characterize the horizontal and vertical extent of TPH and BTEX in groundwater north and east of the site. Analytical results of the probe samples are summarized in Table VI-3. The highest benzene concentration was detected in a sample collected from P4 (20,900 ppb), with the concentrations at P3 (7,040 ppb) and P5 (2,920 ppb) also being elevated (Figure 3). The probe locations that had samples collected at multiple depths indicated concentrations decreased with depth, with concentrations in the samples from depths greater than 15 feet generally being below detection limits.

In December 1996, concentrations of TPH and BTEX were below the detection limit at well D 12, located in the center of the UST excavation. The highest benzene concentrations were at D10 (8,150 ppb) and in the shallow and intermediate depth wells near the lake (10,600 ppb at MW-I, 8,860 ppb at MW-2I, and 7,860 ppb at MW-3S). Benzene concentrations in groundwater decreased with depth in the well nests near the river, decreasing from 7,360 ppb at MW-2S to 3,040 ppb at MW-2D, and from 7,860 ppb at MW-3S to 132 ppb at MW-3D.

In May 2000, concentrations of TPH and BTEX were still below the detection limit at well D12. The highest benzene concentrations were at the shallow and intermediate depth wells near the

lake (8,860 ppb at MW-2I, and 7,930 ppb at MW-2S). Benzene concentrations in groundwater decreased with depth in the well nests near the river, decreasing from 7,930 ppb at MW-2S to 787 ppb at MW-2D.

Trends of benzene concentrations in wells D9, D10, D11, and D12 are shown on Figure VI-I. The plot shows that benzene concentrations in D9 decreased from 909 ppb in November 1993 to 164 ppb in December 1996. Concentrations at D10 and D11 have decreased an average of approximately 30% between December 1996 and May 2000.

Inorganic data are also available for the groundwater beneath the site (Table VI-2). The data available are for a limited range of parameters for August 1995, and for a larger number of parameters for December 1996. The December 1996 data shows a distinct difference in water quality parameters between wells in the upper and lower portions of the plume. Wells D 10 and D 11 have depressed nitrate and sulfate levels, and slightly elevated carbon dioxide levels relative to the wells near the lake. These data suggest that anaerobic degradation is occurring in the upper portion of the plume. Dissolved oxygen data near the lake is unavailable due to instrument malfunction, but it is likely that interaction between the lake and the groundwater in that area provides enough oxygen to the groundwater to keep biodegradation aerobic.

Fate and Transport Considerations

Based on the slow groundwater flow rates, it is unlikely that the distribution of petroleum hydrocarbons observed in groundwater is the result of simple, bulk advective flow of contaminants from the source area to the lake. It is likely that zones of preferential flow occur which have higher hydraulic conductivity values than those estimated from the single-well hydraulic tests. In addition, the presence of upward vertical gradients in the flow system between the site and the lake and the likely role of dispersion and diffusion complicate an interpretation of the petroleum hydrocarbon distribution and migration patterns. Therefore, estimates of distribution based on travel times and typical advective flow patterns from the source may not be reliable.

It is expected that petroleum constituents in groundwater will decrease naturally due to source removal and natural biodegradation. These effects will be most noticeable at the limits of the UST excavation, and will be expected to proceed downgradient over time. The time required for bioremediation to reduce contaminant concentrations to levels that do not exceed cleanup levels is expected to be longer than 10 years.

Mass Flux Estimates to Black Lake

Estimates of the mass flux of petroleum hydrocarbons to Black Lake were developed based on the calculated groundwater flow rate and the December 1996 analytical data. Approximately 1.64 pounds of benzene per year (0.0045 pounds per day) are estimated to be entering Black Lake. This estimate is based on an average benzene concentration of 5,700 ppb (trench wells and D9), a flow rate of 3.7 feet per year (upper bound), and an area of 1,000 ft^2 (10 feet deep by 100 feet long).

Data Gaps

Based on the information in the RI, the risk at the site is characterized by the potential of migration of dissolved constituents in groundwater to Black Lake. Currently, there is insufficient information to assess the impacts to Black Lake because water, sediment, or aquatic life located near the shore of Black Lake have not been sampled and analyzed to verify the presence or quantify potential impacts from petroleum hydrocarbons in groundwater. While information could be collected that could quantify the impact to Black Lake, the resources spent on the sampling and analysis may be better utilized by reducing the mass of petroleum hydrocarbons entering the lake.

There are insufficient data to assess the relationship between the aquifer used for water supply in the vicinity and the affected groundwater zone. Although the impacted area may be beyond the influence of the supply wells and upward gradients have been observed, additional data collection may be appropriate. This could be as simple as monitoring water levels in the wells during times when water supply wells are pumping. These data should be collected during the implementation of remedial actions at the site.

MTCA CLEANUP LEVELS

This section presents the cleanup standards to be achieved by the selected cleanup alternative. Development of cleanup standards includes selection of constituents of concern, identification of applicable state and federal laws, determination of cleanup levels, and establishment of points of compliance.

Constituents of Concern

The potential constituents of concern at the site are those hazardous substances that have been historically used at the site, based on a review of past site operations. Sampling data from soil and groundwater investigations at the site have confirmed the presence of the following constituents of concern:

- Gasoline-range total petroleum hydrocarbons
- Benzene
- Toluene
- Ethylbenzene
- Xylenes

These constituents of concern have been identified in both soil and groundwater at the site.

Applicable or Relevant and Appropriate Requirements

Cleanup levels developed under MTCA must "comply with applicable state and federal laws." This is the MTCA equivalent of applicable or relevant and appropriate requirements (ARARs) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is defined to include legally applicable requirements and those requirements that

are considered relevant and appropriate. This section identifies chemical and media specific laws and regulations potentially applicable to the development of cleanup levels at the site. MTCA also requires that cleanup standards include consideration of additional regulatory requirements that may apply to a cleanup because of the type of action or location of the site.

There are federal and state laws and implementing regulations, other than MTCA, that are potentially applicable to the establishment of cleanup levels or selection of a cleanup action at the site. These potentially applicable laws and implementing regulations are:

- Safe Drinking Water Act
- Clean Water Act
- Clean Air Act
- State of Washington Water Pollution Control Act.

Cleanup Standards

Under MTCA, site specific cleanup levels take into account the current and anticipated future land use of the site. The regulation specifies three "methods" for use in establishing site cleanup levels for specific environmental media. Briefly, these are:

- **Method A** cleanup levels are set by the State of Washington and are delineated in the regulation for a specific subset of chemicals for environmental media. These values can be used as cleanup levels during "routine" site cleanups (e.g., few contaminants at the site and all contaminants have Method A Cleanup Levels).

- **Method B** is the standard method for site cleanups under MTCA. Method B Cleanup Levels involve calculation of media specific values for a given chemical from specified formulae provided in the regulation. The formula require input of chemical-specific toxicological parameters, as well as physiological and exposure-based parameters. Parameter values and sources are explicitly stated in the regulation.

- **Method C** is the conditional method for site cleanups under MTCA. MTCA Method C levels involve calculations similar to Method B, with some modification of specific parameter values to meet special conditions associated with the site (i.e., industrial sites).

Methods B and C can be used to establish cleanup levels for TPH in soils under Ecology's Interim TPH Policy. The Interim TPH policy covers two pathways of exposure: (1) direct contact (e.g. soil ingestion) and (2) soil to groundwater. Since groundwater has been impacted, soil cleanup levels calculated using the Interim TPH Policy cannot be used. Therefore, Method A Soil and Groundwater Cleanup Levels shall apply at this site. A summary of the proposed cleanup levels is as follows:

Method A Soil Cleanup Levels

TPH Gasoline 100 mg/Kg

Benzene	0.5 mg/Kg
Toluene	40 mg/Kg
Ethylbenzene	20 mg/Kg
Xylenes	20 mg/Kg

Method A Groundwater Cleanup Levels

TPH Gasoline	1.0 mg/L
Benzene	5.0 ug/L
Toluene	40 ug/L
Ethylbenzene	30 ug/L
Xylenes	20 ug/L

Proposed Point of Compliance

The points of compliance are the locations where cleanup levels are to be attained. The final points of compliance for the site will be defined as throughout the site. The site shall be defined as those areas which were impacted by the petroleum release(s).

CLEANUP ACTION ALTERNATIVES

A total of nine potential remedial action alternatives were selected for preliminary screening, including a long-term monitoring alternative presented for comparative purposes. These alternatives were selected based on a potential to reduce TPH and BTEX concentrations in groundwater, and to reduce or eliminate the potential for migration of these constituents into Black Lake.

Based on previous work, three potential remedial alternatives were presented for further consideration. During the RI, data were collected which provided a basis for further evaluation of these alternatives. The three alternatives presented include:

1. Natural attenuation of TPH concentrations in groundwater;

2, In-situ groundwater treatment; and,

3. Passive groundwater extraction and treatment.

Common to each of these alternatives is excavation of accessible soils containing petroleum hydrocarbons. Since this component was common to each alternative, Ecology encouraged completion of this activity as an interim action in conjunction with removal of USTs. During the interim action, screening of technologies applicable to the treatment of excavated soils was performed. Results of the screening process indicated that natural bioremediation of the soil was preferable to off site treatment and disposal, and this alternative was implemented.

A total of nine potential remedial alternatives were developed for preliminary screening based on the three alternatives described above. The screening of the alternatives was based on

effectiveness, ease of implementation, and cost.

A summary of the preliminary screening process is presented in Table 5. Of the nine remedial alternatives screened, four were retained for detailed evaluation. In general, groundwater remediation alternatives that rely on the hydraulic conductivity of subsurface soils to transmit fluids (liquid or gas) through the affected media did not pass preliminary screening because they do not satisfy the criteria of effectiveness or provide for restoration within a reasonable time frame. Alternatives eliminated during the preliminary screening include:

- Enhanced bioremediation was eliminated due to the low effectiveness resulting from the slow groundwater flow rate, which would minimize the effective area of oxygen and/or nutrient introduction;
- Thermal desorption would be difficult to implement and very expensive;
- Groundwater extraction or AS/SVE over the entire plume area would also be difficult to implement and would be expensive because the low permeability of the soils would require a large number of wells; and
- Excavation of the soils between the area already excavated and the lake would be impractical due to the presence of Black Lake Boulevard.

Alternatives that passed the preliminary screen, and are evaluated in detail include the following:

- Alternative 1: Long-term Monitoring
- Alternative 2: Treatment Wall
- Alternative 3: AS/SVE Trench
- Alternative 4: Groundwater Extraction Trench

Detailed Evaluation of Remedial Alternatives

Remedial alternatives that passed preliminary screening included one form of passive groundwater treatment, and two forms of mass removal. All three of these alternatives would include installation of a trench near Black Lake. Remedial action would be focused on the distal portion of the groundwater plume prior to discharge to the lake, and would relyon the eventual depletion of residual contamination upgradient through natural mechanisms (biodegradation, and remobilization or dissolution with transport to the trench). In addition, an alternative considered long-term monitoring was retained for comparative purposes, although this measure would include monitoring and would involve natural attenuation mechanisms.

The retained alternatives are summarized below in terms of these criteria. A detailed summary of the costs for the alternatives is included on Table 6 through Table 9. Please note that yearly O&M costs are multiplied by 24.75 (not 25) to obtain the net cost for 25 years of operations because O&M is not assumed to be necessary at the end of the 25 year. The present value was calculated using an inflation rate of five percent. The evaluations for the alternatives are summarized in Table 10.

Alternative 1 - Long-term Monitoring

Mitigation of the groundwater plume would occur as a result of natural attenuation mechanisms, including dispersion, dilution, and biodegradation. This alternative is included for comparative purposes only because Ecology does not consider intrinsic bioremediation to be an acceptable remedy under MTCA due to the proximity of the site to Black Lake and the relatively high concentrations of petroleum hydrocarbons in groundwater.

This alternative would provide minimal protection of human health and the environment. natural attenuation mechanisms would be relied upon to mitigate the groundwater plume and to eventually deplete the residual soil contamination. Petroleum hydrocarbons would continue to be discharged to Black Lake. The mass flux would decrease over time as the groundwater plume moves toward the lake and residual soil contamination is depleted. Groundwater standards would eventually be attained. It is expected this would first occur in the vicinity of the excavation where the majority of the soil contamination was removed. Downgradient, standards would be attained much later. Due to the slow groundwater flow rates and nature of the soil, it could take over 25 years for the appropriate standards to be met.

Wells would be monitored quarterly to document the expected contaminant decrease. Samples would be collected of monitoring eight wells quarterly for the first 5 years, semi-annually for the next 5, and annually thereafter. Full protection would not be achieved until residual soil. contamination is depleted and groundwater concentrations decrease significantly. The timing for this is difficult to estimate, but would likely be on the order of 25-50 years.

The costs include an average annual O&M cost of $3,942. Using an anticipated monitoring period of 25 years, this results in a net cost of $97,565, which equates to a net present cost of $55,558.

Alternative 2 - Treatment Wall

This alternative uses a treatment wall to reduce TPH and BTEX concentrations in the groundwater plume as it passes through the treatment wall toward Black Lake. The wall would be excavated and backfilled with materials and/or engineering design components designed to absorb, degrade, or remediate petroleum constituents in groundwater. The wall may extend to a depth approximately 15 feet below the level of Black Lake Boulevard, which corresponds to the approximate vertical extent of TPH concentrations in soil, or to the maximum extent practical. While data collected during the subsurface assessments indicate that soil stability should enable excavation to a depth of 15 feet, sheet piling could be necessary if slumping occurs. The wall would be positioned east of Black Lake Boulevard to treat groundwater before it reaches Black Lake. Natural attenuation mechanisms would be relied upon to mitigate the groundwater plume upgradient of the wall.

A passive groundwater treatment system installed in the treatment wall may consist of one or more of the following components:

Nochar A620 Carbon Filtration Media: a blend of organic polymer and organic carbon commonly used in reducing TPH/BTEX concentrations in extracted groundwater. This medium is capable of adsorbing and bonding petroleum hydrocarbons at a ratio of approximately 4:1

(Nochar to hydrocarbon) by weight.

Granulated Peat: this has been shown to enhance biodegradation by adsorption of hydrocarbons into the organic media which provides conditions for the growth and propagation of microorganisms.

It is expected that four additional monitoring wells would be installed to monitor TPH/BTEX concentrations upgradient and downgradient of the wall.

Alternative 3 - AS/SVE Trench

Like alternative 2, this alternative would include the installation of a trench adjacent to Black Lake. In this case, the trench would include two sets of horizontal pipe and gravel backfill. A deep horizontal pipe would allow air to be injected, and a shallow pipe near ground surface would allow the extraction of petroleum hydrocarbon vapors.

Extracted vapors would be routed to a building for potential treatment prior to discharge to the atmosphere. The need for off-gas treatment will need to be evaluated during startup, and may not be necessary due to the low groundwater flow rates into the trench. The building would also house the air sparging and vapor extraction blowers. It is anticipated that four additional monitoring wells would need to be installed for this alternative to monitor the effectiveness of the trench.

Alternative 4 - Groundwater Extraction Trench

This alternative would also involve the installation of a trench near Black Lake. The trench would be backfilled with gravel and the bottom would be sloped towards a central sump. A float triggered pump within the sump would keep the trench dewatered. Groundwater extracted from the sump would be routed to a building for treatment prior to discharge to the sewer. It is anticipated that four additional monitoring wells would be necessary to monitor the effectiveness of the trench.

Summary of Remedial Action Alternatives

A summary of the detailed evaluation of the four remedial alternatives is presented in Table 10. All of the alternatives rely upon natural attenuation mechanisms to mitigate soil and groundwater contamination in the area near and upgradient of Black Lake Boulevard. The alternatives differ in the way groundwater contamination entering Black Lake is addressed.

It is anticipated that, aside from Alternative 1, all of the alternatives would be reliable and effective in terminating the discharge of petroleum hydrocarbons to Black Lake within one to two years. Alternative 2 is attractive in that it is passive in nature and would not require the level of O&M that would be necessary for the components of Alternative 3 and Alternative 4. The level of O&M is important, because although the estimated costs are for 25 years, it may take longer than that for groundwater standards to be attained over the entire affected area.

Costs range from a low of $55,558 for Alternative 1 to a high of $269,635 for Alternative 3. The costs for alternatives 3 and 4 are similar, with Alternative 3 having the highest capital/startup costs ($135,940). Alternative 2 has the lowest annual O&M costs ($3,906).

RECOMMENDED ALTERNATIVE

Because alternatives 2, 3, and 4 are anticipated to have the same degree of effectiveness and ease of implementation, the selection of the preferred alternative for the site may be based on cost. Alternative 2 has the lowest overall and annual O&M cost, and is therefore chosen as the preferred alternative. This alternative consists of the following components, which are described in further detail below:

- Excavation of a trench along Black Lake that intercepts the entire downgradient portion of. the plume;
- Backfilling the trench with a reactive material;
- Installation of four additional monitoring wells;
- Sampling and analysis of groundwater samples; and
- Regular reporting.

Trench. The trench will be excavated using a backhoe and will extend from an area to the southwest of well D9, through the existing pilot trench area, and angling to the north toward the storm water discharge area (Figure 10). Strong upward gradients in evidence in the pilot trench area indicate that a trench depth of roughly 10 feet would be sufficient. The trench would be lined with a geotextile membrane and backfilled with an appropriate reactive material, the type and relative volumes of which will be addressed in the EDR. It is anticipated that the substantive requirements of a permit may be required to work within the shoreline of Black Lake.

With groundwater velocities of approximately 4 feet per year, the residence time of water in the trench will be extremely long, allowing the reactive material to adsorb, absorb, and bond petroleum hydrocarbons. Chemical gradients will likely develop to further the attenuation of hydrocarbons in the trench. The permeability differences of the trench media-and the native soil should not be a factor if the trench is capped with a low-permeability material. Otherwise, mounding could occur within the trench as a result of precipitation events. Likewise the fluctuations of groundwater elevations and contaminant concentrations should not impact the effectiveness of the trench given the low permeability of native soil on both sides of the trench. The permeability of the trench will likely decrease over time, however, a geotextile and graded backfill should prevent plugging or preferential flow. It is unlikely that the permeability of the trench would be less than the native soil.

Well Installation. Wells will be installed to provide additional monitoring points in the trench and down gradient of the trench as shown on Figure 10. Two wells would be installed within the trench. The extremely long residence time of groundwater in the trench should enable equilibrium and relatively homogeneity within the trench, therefore, more that two wells may be redundant. Two additional wells will be installed down gradient of the trench. All wells will be resurveyed after the new wells have been installed.

Monitoring. Groundwater monitoring will be performed upgradient and downgradient of the trench, and in other existing monitoring wells. Wells to be sampled include the four new wells, wells MW-2D and MW-3D near the pilot trench, and existing wells D9, D10, D11, and D12. Sample analysis will be performed for TPH, BTEX, and bioremediation parameters (as warranted). Monitoring will be performed according to the schedule indicated on Table 7.

In addition, the integrity of existing well D 11 will be restored by purging approximately 30-50' well volumes. These purge volumes are arbitrary and represent a conservative estimate of the volume of water which Summit believes may be necessary to restore the integrity of groundwater chemistry at D 11.

Reporting. Upon approval of this alternative by Ecology, a Engineering and Design Report (EDR) will be developed providing greater detail for installation of the wall, evaluation of suitable wall materials, and well construction. Upon installation of the wall and wells and receipt of initial start up data, a report will be submitted summarizing the system. Thereafter, data reports will be developed summarizing and providing interpretations of the analytical data.

ANALYSIS OF SELECTED ALTERNATIVE

1. Protection of Human Health and the Environment

This alternative would not provide additional protection of human health and the environment up-gradient from the treatment wall, however, direct contact or consumption of groundwater in this area is not likely to occur. Natural attenuation mechanisms would be relied upon to mitigate the groundwater plume and to eventually deplete the residual soil contamination. Protection would be provided within one to two years down-gradient of the trench based on estimates of advective rates of groundwater transport.

2. Compliance with Cleanup Standards.

Groundwater standards would attained within one to two years downgradient of the trench. Upgradient of the trench, standards would eventually be attained, but over a much longer Period. It is expected this would first occur in the vicinity of the excavation where the majority of the soil contamination was removed. Between the excavation and the trench, standards would be attained much later. Due to the slow groundwater flow rates and nature of the soil, it could take over 25 years for the appropriate standards to be met for the entire affected area.

3. Compliance with Applicable or Relevant and Appropriate Requirements

The preferred alternative would comply with the state and federal ARARs. These would include, but not be limited to, obtaining a shorelines permit, if necessary, to construct the treatment wall.

4. Restoration Time Frame

Full protection between the trench and Black Lake would occur within one to two years. For the remainder of the plume, full protection would not be achieved until residual soil contamination is

depleted and groundwater concentrations decrease significantly. The timing for this is difficult to estimate, but would likely be on the order of 25-50 years.

5. Short Term Effectiveness

The preferred alternative is not expected to be effective in the short term.

6. Long Term Effectiveness

The preferred alternative is expected to be effective in the long term because groundwater flowing from the affected area would be forced to flow through the trench. The material in the trench will adsorb, degrade, or remediate contaminants. Groundwater standards would attained within one to two years downgradient of the trench. Upgradient of the trench, standards would eventually be attained, but over a much longer period. It is expected this would first occur in the vicinity of the excavation where the majority of the soil contamination was removed. Between the excavation and the trench, standards would be attained much later. Due to the slow groundwater flow rates and nature of the soil, it could take over 25 years for the appropriate standards to be met for the entire affected area.

Residual soil contamination will rely on natural processes to degrade the contaminants. Limited data available for the site indicates that bioremediation is already occurring. The ability of natural attenuation mechanisms to mitigate petroleum hydrocarbon plumes is well documented.

7. Reduction of Toxicity, Mobility, and Volume

The preferred alternative involves bioremediation and absorption, adsorption, or remediation of contaminants. Bioremediation will result in the natural destruction of the ontaminants.

8. Implementability

Implementation is expected to be easy. Installation will require readily available equipment, and the trench would be located in an area where traffic control and infrastructure disturbance would be minimal.

9. Cleanup Costs

The cost for the preferred alternative is summarized in Table 7: The costs include capital/startup costs of$113,900 (significantly less if a media other than Nochar is used), and an average annual operation and maintenance (O&M) cost of $3,906. Using an anticipated period of 25 years, this results in a net cost of $210,584, which equates to a net present cost of $168,961.

9. Community Concerns

Community concerns will be solicited during a 30 day public review period.

O&M Requirements. Operation and maintenance would consist of groundwater sampling and analysis. A viable sampling schedule for this alternative would consist of monitoring ten wells quarterly for the first five years, semi-annually for the next five, and annually thereafter. Monitoring data would be analyzed to evaluate if breakthrough is occurring and whether additional reactive material is needed. The potential for additional reactive material appears relatively low based on the assumption that over 1000 pounds of NoChar could bond 4000 pounds of hydrocarbons. A groundwater plume that has an 80-foot radius and a height of 13 feet and a WTPH concentration of 40,700 ppm (Well D10 in May 2000) would equate to 2,773 pounds of hydrocarbons. Because NoChar bonds the hydrocarbons, the material could be left in the ground indefinitely or disposed of at a waste-to-energy facility.

Protection of Black Lake. The discharge of petroleum hydrocarbons to Black Lake would be terminated within one to two years. The mass flux into the trench would decrease over time as the groundwater plume moves toward the lake and residual soil contamination is depleted.

Attain Groundwater Protection Standard.

Effectiveness of Remedy:

Ease of Implementation. It is not anticipated that implementation would be difficult. Installation would require readily available equipment, and the trench would be located in an area where traffic control and infrastructure disturbance would be minimal. A permanent power source would need to be installed near the treatment building. In addition, noise issues could require special engineering controls to be designed and installed.

O&M **Requirements.** Operation and maintenance would consist of regular system monitoring and maintenance, and grotmdwater and air sampling and analysis. A viable sampling schedule for this alternative would consist of monitoring ten wells quarterly for the first 5 years, semiannually for the next 5, and annually thereafter.

Time Until Full Protection is Achieved. Full protection between the trench and Black Lake would occur within one to two years. For the remainder of the plume, full protection would not be achieved until residual soil contamination is depleted and groundwater concentrations decrease significantly. The timing for this is difficult to estimate, but would likely be on the order of *25-50* years.

Cost. The cost for this alternative is summarized in Table 8. The costs i. nclude capital/startup costs of $135,940, and an average annual O&M cost of $9,486. Using an anticipated period of~ 25 years, this results in a net cost of $370,719, which equates to a net present cost of $269,635.

REFERENCES

Blazer, 1994. *Phase I Site Investigation of Black Lake Grocery, 4409 Black Lake Boulevard SW, Olympia, WA 98502, DOE Site 4100355. Agreed Order No. DE93TC-S! 71.* Prepared by Blazer Construction, Olympia, WA.

Dames and Moore, 1990. *Addendum Report of Geotechnical Services, Black Lake Boulevard Expansion for Thurston County Department of Public Works, Thurston County, Washington. Job No. 8538-003-016.* Prepared by Dames and Moore, Seattle, WA.

Summit, 1995. *Draft Remedial Investigation and Feasibility Study, Black Lake Grocery, Olympia, Washington.* Prepared by Summit Envirosolutions, Inc. for Man K. Pak. November, 1995.

USGS, 1959. *Tumwater Quadrangle.* Washington--Thurston Co. 7.5-minute series (topographic). Scale 1'24,000, photo-revised 1981. Prepared by the US Geological Survey.

Wallace, Eugene F., and D. Molenaar. 1961. *Geology and Ground-water Resources of Thurston County, Washington.* Volume 1. State of Washington, Dept of Conservation, Div of Water Resources. Water Supply Bulletin No. 10. Div of Water Resources, Olympia, WA. 254 p.

EXHIBIT - B

Christine O. Gregoire
ATTORNEY GENERAL OF WASHINGTON
Ecology Division
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January 3, 2002

Mr. Michael T. Schein
MALTMAN, REED, AHRENS & MALNATI, INC., P.S.
1415 Norton Building
801 2nd Avenue
Seattle, WA 98104-1522

RE: **Black Lake Grocery**
Memorandum of Agreement

Dear Mr. Schein:

Please find enclosed a conformed copy of the Memorandum of Agreement between the Department of Ecology and Black Lake Grocery for your files.

Very truly yours,

Sharon Nelson

SHARON NELSON
Legal Assistant to
KEN LEDERMAN
Assistant Attorney General

sn
Enclosure
cc: Jan Swanberg, SWRO
Rebecca Lawson, SWRO
Panjini Balaraju. SWRO

F:BLACK LAKE GROCERY\SCHEIN LETTER 1-3-02

MEMORANDUM OF AGREEMENT

Between the
Washington State Department of Ecology
and
Black Lake Grocery

1. Mr. Pak will pay the total unpaid principal amount of MTCA remedial action costs for the Black Lake Grocery Site to Ecology within thirty (30) days of the signing of this Memorandum of Agreement.

2. Mr. Pak will enter into an Agreed Order or Consent Decree for implementation of the Cleanup Action Plan for the Black Lake Grocery Site. Negotiations on the Agreed Order or Consent Decree will begin once Ecology has completed the drafting of the Cleanup Action Plan. The parties expect that the implementation of the final Cleanup Action Plan will include the installation of the operational barrier treatment wall at the Black Lake Grocery Site. However, the draft Cleanup Action Plan will be subject to public notice and comment prior to finalization, such that it is not possible to identify the final active remedial technology to be implemented at the Black Lake Grocery Site.

3. Mr. Pak will provide timely payments of all current and future quarterly invoices for all MTCA remedial action costs for the Black Lake Grocery Site within ninety (90) days of the billing date.

4. After 2 ½ years from the date of the installation of the operational barrier treatment wall or other active remedial technology required by the final Cleanup Action Plan, if Mr. Pak has complied with the terms of this Agreement and has provided timely payments of all quarterly invoices for all MTCA remedial action costs for the Black Lake Grocery Site, then Ecology will waive 50% of the outstanding unpaid interest charges.

5. After 5 years from the date of the installation of the operational barrier treatment wall or other active remedial technology required by the final Cleanup Action Plan, if Mr. Pak has complied with the terms of this Agreement and has provided timely payments of all quarterly invoices for all MTCA remedial action costs for the Black Lake Grocery Site, then Ecology will waive the remainder of the unpaid interest charges.

6. Ecology will not charge interest on any current or future MTCA remedial action costs during the five (5) year period following the installation of the operational barrier treatment wall or other active remedial technology required by the final Cleanup Action Plan, so long as Mr. Pak complies with the terms of this Memorandum of Agreement

7. If Mr. Pak fails to comply with the terms of this Memorandum of Agreement, then Ecology may reinstate any remaining unpaid interest

charges, reinstitute monthly interest charges pursuant to WAC 173-340-550(4), and/or pursue appropriate cost recovery pursuant to RCW 70.105D.050(4).

8. Ecology will provide appropriate and available information with the quarterly billing statements, including the period of expenditures, the due date for payment, the principal amounts currently owed to Ecology, and the current amount of accumulated interest. Ecology will provide this information with the quarterly invoices for Mr. Pak, and Ecology will provide copies of site logs with the aforementioned invoices.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REBECCA LAWSON, Supervisor
Toxics Cleanup Program
Southwest Regional Office

Dated: 12/19/01

BLACK LAKE GROCERY

MAN K. PAK

Dated: 12/6/01

CHRISTINE O. GREGOIRE
Attorney General

KEN LEDERMAN, WSBA #26515
Assistant Attorney General
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Department of Ecology
(360) 586-4607

Dated: 12/27/01

MALTMAN REED AHRENS &
MALNATI, PS

MICHAEL T. SCHEIN, WSBA #21646
Attorney for Black Lake Grocery
(206) 624-6271

Dated: Dec 6 2001

TABLES

Table VI-1
Groundwater Petroleum Hydrocarbon Analytical Data - Monitoring Wells
Black Lake Grocery RI/FS
Olympia, Washington
Summit Project No. 951202

Well	Date	Benzene		Toluene		Ethylbenzene		Xylenes		WTPH-G	
		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
D9	11/23/93	**909**		**3520**		**1720**		**6050**		**57570**	
	4/14/95	**830**		**1500**		**1300**		**2600**		**28000**	
	8/29/95	**570**		**680**		**510**		**1100**		**13000**	
	12/17/96	**164**		**190**		**170**		**418**		**3300**	
D10	11/23/93	**8450**		**8670**		**1450**		**5260**		**30680**	
	12/17/96	**8150**		**4830**		**2190**		**9680**		**45400**	
	5/11/00	**5580**		**931**		**1070**		**3660**		**40700**	
D11	11/23/93	**1020**		**2670**		**838**		**4180**		**32750**	
	4/14/95	**4700**		**4300**		**820**		**4000**		**24000**	
	8/29/95	**3500**		**2500**		**1200**		**4500**		**32000**	
	12/17/96	**3640**		**3950**		**1770**		**6740**		**49800**	
	5/11/00	**2690**		**988**		**1570**		**4220**		**24500**	
D12	8/29/95	0.51		0.5 U		0.67		1 U		50 U	
	12/17/96	0.5 U		0.5 U		0.5 U		1 U		50 U	
	5/11/00	0.5 U		0.5 U		0.5 U		1 U		50 U	
MW-1	12/17/96	**10600**		**17400**		**3160**		**16000**		**106000**	
MW-2S	12/17/96	**7360**		**16600**		**2960**		**16000**		**122000**	
	5/11/00	**7930**		**14300**		**2780**		**16300**		**104000**	
MW-2I	12/17/96	**8860**		**15200**		**2710**		**15500**		**110000**	
	5/11/00	**8860**		**1640**		**1300**		**2040**		**18000**	
MW-2D	12/17/96	**3040**		**7300**		**1830**		**10700**		**64000**	
	5/11/00	**787**		28.9		**41.6**		13.4		425	
MW-3S	12/17/96	**7860**		**11600**		**2730**		**13200**		**83600**	
MW-3D	12/17/96	**132**		**138**		**20.8**		**1440**		**11600**	
Sump	1/14/97	**7340**		**14500**		**2040**		**10200**		**82900**	
Hldg Tank	1/28/97	**2090**		**3620**		**86.8**		**2970**		**24200**	
MTCA Method A		5		40		30		20		1000	

All concentrations in parts per billion (ppb)
Bolded values exceed MTCA Method A Cleanup Levels

Table VI-2
Groundwater Inorganic Analytical Data - Monitoring Wells
Black Lake Grocery RI/FS
Olympia, Washington
Summit Project No. 951202

Well	Date	pH (SU)	Temp (F)	Sp Cond (uS/cm)	Iron	CO2	DO	Nitrate	Nitrite	Mn	Ammonia	TKN	Sulfide	Sulfate
D9	4/14/95	6.29	53.0	527	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	8/29/95	6.68	74.5	0.01	9.6	120	4.5	<0.10	-----	-----	-----	-----	-----	-----
	12/17/96	6.34	-----	-----	<0.150	91.5	-----	<0.05	<0.10	1.55	<0.10	<1.0	<10.0	1.46
D10	12/17/96	5.61	-----	-----	5.67	97.2	-----	<0.05	<0.50	3.12	0.280	11.1	<10.0	0.543
D11	4/14/95	6.06	52.7	709	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	8/29/95	6.59	72.3	0.02	17.0	230	6.5	<0.10	-----	-----	-----	-----	-----	-----
	12/17/96	5.79	-----	-----	<0.150	106	-----	<0.05	<1.0	6.98	1.09	<1.0	<10.0	0.572
D12	8/29/95	6.18	74.2	0.026	23.0	34	7	0.76	-----	-----	-----	-----	-----	-----
	12/17/96	7.43	-----	-----	<.150	44.9	-----	1.04	<0.20	0.0526	<0.10	<1.0	<10.0	30.7
MW-1	12/17/96	6.29	-----	-----	<0.150	65.1	-----	1.30	<10.0	2.12	<0.10	7.92	<10.0	68.1
MW-2S	12/17/96	5.95	-----	-----	<0.150	108	-----	0.182	<0.50	1.56	<0.10	9.07	<10.0	26.4
MW-2I	12/17/96	6.02	-----	-----	<0.150	92.8	-----	0.421	<0.20	1.27	<0.10	1.82	<10.0	44.0
MW-2D	12/17/96	6.20	-----	-----	<0.150	56.8	-----	0.121	<10.0	0.778	<0.10	<1.0	<10.0	26.7
MW-3S	12/17/96	5.82	-----	-----	<0.150	85.4	-----	1.31	<2.0	2.20	<0.10	4.20	<10.0	88.1
MW-3D	12/17/96	6.14	-----	-----	<0.150	72.2	-----	<0.05	<2.0	0.527	<0.10	<1.0	<10.0	30.9

All concentrations in parts per million (ppm), unless noted

----- Parameter not analyzed or measured

Table VI-3
On-Site Groundwater Analytical Results - Test Probes
Black Lake Grocery RI/FS
Olympia, Washington
Summit Project No. 951202

Well	Date	Depth (ft)	Benzene		Toluene		Ethylbenzene		Xylenes		WTPH-G	
			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
P1	6/29/95	15	4 U		4 U		4 U		4 U		NA	
	8/7/95	20	2 U		2 U		2 U		2 U		100 U	
P2	6/29/95	15	**980**		24		10		72		NA	
	8/7/95	20	2 U		2 U		2 U		3		100 U	
P3	6/29/95	6	**7040**		**450**		**383**		**663**		NA	
	8/7/95	11	5		8		2 U		10		91	
P4	6/29/95	15	**20900**		**11500**		**1640**		**14800**		NA	
	8/7/95	20	2 U		2 U		2 U		2 U		100 U	
	8/7/95	25	2 U		2 U		2 U		2 U		100 U	
P5	6/29/95	15	**2920**		**8460**		**7620**		**27800**		NA	
	8/7/95	20*	**379**		**826**		**971**		**2250**		**21800**	
	8/7/95	25*	**715**		**3180**		**36**		**48**		**14400**	
P6	6/29/95	15	4 U		4 U		4 U		4 U		NA	
P7	6/29/95	15	2 U		2 U		2 U		2 U		100 U	
P8	6/29/95	15	2 U		2 U		2 U		2 U		100 U	
MTCA Method A			5		40		30		20		1000	

* Sample integrity compromised during sampling, results questionable
All concentrations in parts per billion (ppb)
Bolded values exceed MTCA Method A Cleanup Levels

Table 5
Preliminary Screening of Remedial Alternatives
Black Lake Grocery RI/FS
Olympia, Washington
Summit Project No. 951202

Response Action	Technology	MTCA Compliance	ARAR Compliance	Implementability	Effectiveness	Relative Cost	Retained
Long-term Monitoring	Groundwater Monitoring	Possible over time	Possible, if below MTCA levels	High	Low	Low	Yes
In-Place Treatment	Enhanced Bioremediation	Possible	Possible, if below MTCA levels	Moderate	Low-Moderate	Moderate	No
	Treatment Wall	Yes, at point of compliance (Black Lake)	Yes	Moderate	Moderate-High	Moderate-High	Yes
	Thermal Desorption	Yes	Yes	Low	Low-Moderate	High	No
Removal	Air Sparging and Soil Vapor Extraction-Entire Plume	Yes	Yes, requires air treatment	Low	Moderate	High	No
	Air Sparging and Soil Vapor Extraction-Trench Downgradient	Yes	Yes, requires air treatment	Moderate	Moderate	Moderate-High	Yes
	Groundwater Extraction-Entire Plume	Yes	Yes, requires groundwater treatment	Low	Moderate	High	No
	Groundwater Extraction-Trench Downgradient	Yes	Yes, requires groundwater treatment	Moderate	Moderate	Moderate-High	Yes
	Soil Excavation	Possible over time	Yes	Low	High	High	No

Table 6
Estimated Cost for Alternative A
Long-term Monitoring

Item	Units	Rate ($)	Cost ($)
CAPITAL/STARTUP COSTS			
None			$0
Subtotal			**$0**
Engineering design, oversight and project management (20%)			$0
Administrative (10%)			$0
Contingency (10%)			$0
NET CAPITAL/STARTUP COST			$0
ANNUAL OPERATION AND MAINTENANCE COSTS			
Sampling and analysis*	1.8 average events	$2,190.00	$3,942
NET ANNUAL O&M COST			$3,942
NET COST FOR 25 YEAR OPERATION (O&M + STARTUP/CAPITAL)			$97,565
NET PRESENT COST OF 25 YEAR OPERATION Assume 5% inflation rate			$55,558

* Average annual cost based on the following::
8 wells sampled for BTEX, WTPH-G, nitrate, sulfate, dissolved iron ($190 each)
Quarterly sampling years 1-5
Semi-annual sampling yrs 6-10
Annual sampling years 11-25

Table 7
Estimated Cost for Alternative B
Treatment Wall

Item	Units	Rate ($)	Cost ($)
CAPITAL/STARTUP COSTS			
Treatment Wall Excavation and Backfilling	1 trench	$15,000	$15,000
Purchase NoChar/Ballast	2500 pounds	$20	$50,000
Install four new wells	4 wells	$2,000	$8,000
Resurvey wells	1 event	$5,000	$5,000
Subtotal			**$78,000**
Engineering design, oversight and project management (20%)			$15,600
Administrative (10%)			$7,800
Contingency (10%)			$7,800
Startup sampling and analysis (6 wells, mthly for 1 qtr)	3 events	$1,570	$4,710
NET CAPITAL/STARTUP COST			**$113,910**
ANNUAL OPERATION AND MAINTENANCE COSTS			
Sampling and analysis*	1.8 average events	$2,170	$3,906
NET ANNUAL O&M COST			**$3,906**
NET COST FOR 25 YEAR OPERATION (O&M + STARTUP/CAPITAL)			**$210,584**
NET PRESENT COST OF 25 YEAR OPERATION Assume 5% inflation rate			**$168,961**

* Average annual cost based on the following::

10 wells sampled for BTEX, WTPH-G ($150 each)
Quarterly sampling years 1-5
Semi-annual sampling yrs 6-10
Annual sampling years 11-25

Table 8
Estimated Cost for Alternative C
Air Sparging and Vapor Extraction Trench

Item	Units	Rate ($)	Cost ($)
CAPITAL/STARTUP COSTS			
Trench and backfilling	1 trench	$15,000	$15,000
Sparge and vapor extraction piping	200 feet	$10	$2,000
Blower and compressor			$20,000
Install four new wells	4 wells	$2,000	$8,000
Install lines connecting wells to building Includes trenching	50 ft	$10	$500
Concrete pad and building			$25,000
Misc. plumbing and wiring			$25,000
Subtotal			**$95,500**
Engineering design, oversight and project management (20%)			$19,100
Administrative (10%)			$9,550
Contingency (10%)			$9,550
Startup sampling and analysis (inf & eff weekly, 1 qtr)	4 events	$560	$2,240
NET CAPITAL/STARTUP COST			**$135,940**
ANNUAL OPERATION AND MAINTENANCE COSTS			
Blower/compressor maintenance	4 trips	$195	$780
Sampling and analysis			
air	4 quarters	$200	$800
groundwater*	1.8 average events	$2,170	$3,906
Electricity			$4,000
NET ANNUAL O&M COST			**$9,486**
NET COST FOR 25 YEAR OPERATION (O&M + STARTUP/CAPITAL) *			**$370,719**
NET PRESENT COST OF 25 YEAR OPERATION Assume 5% inflation rate			**$269,635**

* Average annual cost based on the following::
- 10 wells sampled for BTEX, WTPH-G ($150 each)
- Quarterly sampling years 1-5
- Semi-annual sampling yrs 6-10
- Annual sampling years 11-25

Table 9
Estimated Cost for Alternative D
Groundwater Extraction Trench

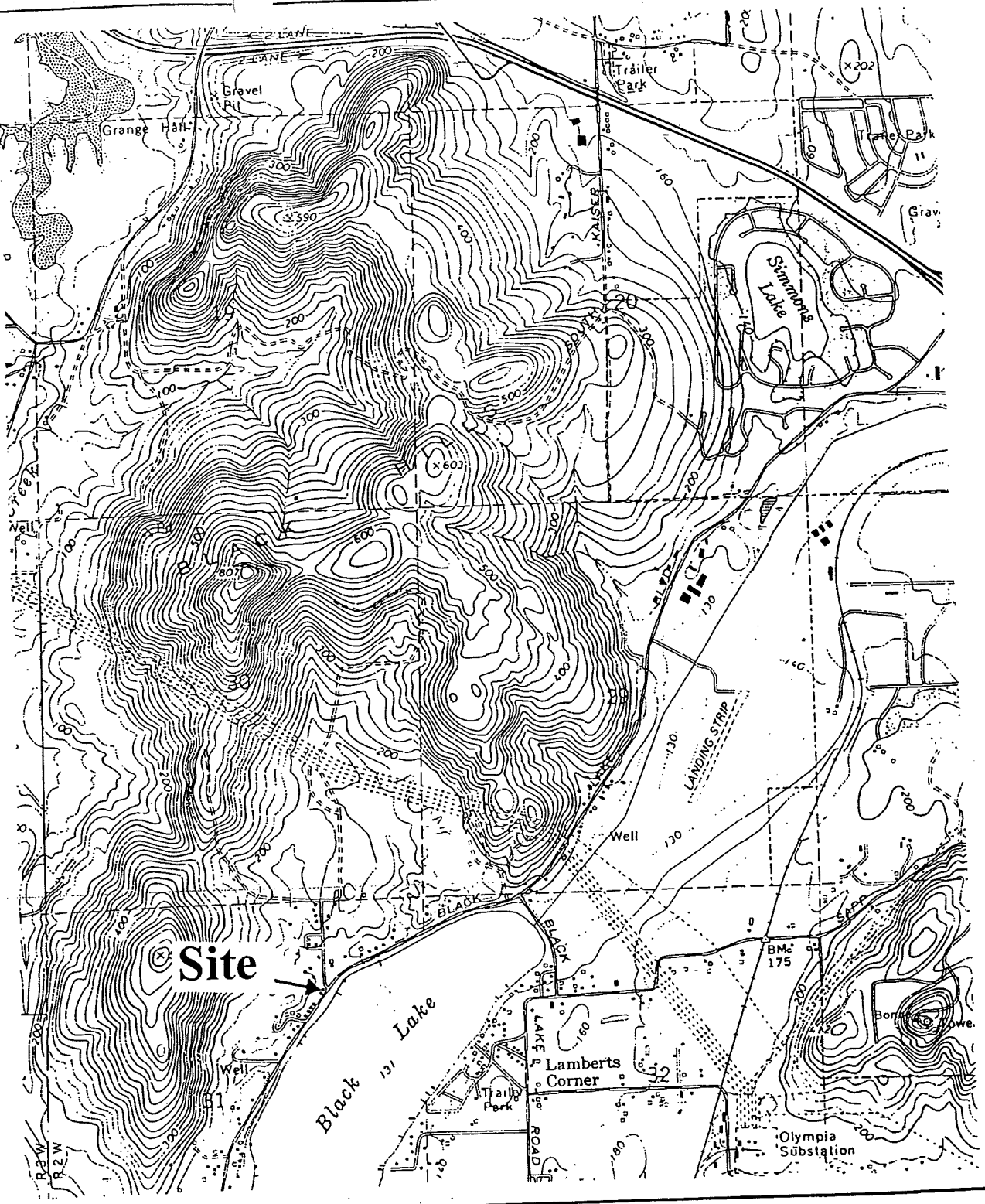
Item	Units	Rate ($)	Cost ($)
CAPITAL/STARTUP COSTS			
Trench Excavation and Backfilling	1 trench	$15,000	$15,000
Purchase treatment systems Carbrol 6 tray air stripper	1 stripper	$8,450	$8,450
Install four new wells	4 wells	$2,000	$8,000
Install piping Includes trenching	100 ft	$5	$500
Concrete pad and building			$10,000
Pumps & electrical supply installation			$20,000
Misc. plumbing and wiring			$15,000
Subtotal			**$76,950**
Engineering design, oversight and project management (20%)			$15,390
Administrative (10%)			$7,695
Contingency (10%)			$7,695
Startup sampling and analysis (inf & eff weekly, 1 qtr)	4 events	$560	$2,240
NET CAPITAL/STARTUP COST			**$109,970**
ANNUAL OPERATION AND MAINTENANCE COSTS			
Treatment system maintenance (avg 3 hrs/trip)	4 trips	$195	$780
Sampling and analysis*	1.8 average events	$2,470	$4,446
Electricity			$2,500
NET ANNUAL O&M COST			**$6,946**
NET COST FOR 25 YEAR OPERATION (O&M + STARTUP/CAPITAL)			**$281,884**
NET PRESENT COST OF 25 YEAR OPERATION Assume 5% inflation rate			**$207,867**

* Average annual cost based on the following::
10 wells, influent&effluent sampled for BTEX, WTPH-G ($150 each)
Quarterly sampling years 1-5
Semi-annual sampling yrs 6-10
Annual sampling years 11-25

Table 10
Comparative Analysis of Remedial Alternatives
Black Lake Grocery RI/FS
Olympia, Washington
Summit Project No. 951202

Assessment Factor	Alternative A Long-term Monitoring	Alternative B Treatment Wall	Alternative C AS/SVE Trench	Alternative D Groundwater Extraction Trench
Ability to Meet Required Standards				
Protection of Human Health and the Environment	Relies on natural attenuation mechanisms and eventual depletion of source material.	Significant protection downgradient of treatment wall. Much more protective than Alternative A.	Similar protectiveness to that for Alternative B.	Similar protectiveness to that for Alternative B.
Protection of Black Lake	Contaminant flux to lake would continue until source material depleted.	Contaminant flux to lake would be stopped.	Same as for Alternative B.	Same as for Alternative B.
Attain Groundwater Protection Standard	Not attainable until source material is depleted. 25-50 years at a minimum.	Within 2 years downgradient of wall. Not attained between wall and store until source material depleted.	Within 2 years downgradient of trench. Not attained between trench and store until source material depleted.	Within 2 years downgradient of trench. Not attained between trench and store until source material depleted.
Effectiveness of Remedy				
Reliability	Depends on nature of institutional controls.	Satisfactory with regular monitoring	Satisfactory with regular maintenance and routine repairs.	Same as for Alternative C
Ease of Implementation	Depends on nature of institutional controls.	Easily implemented.	Relatively easily implemented. Would require treatment shed.	Ease of implementation depends on discharge point for treated water. Discharge to lake would require NPDES permit.
O&M Requirements	Monitoring until standards achieved.	Greater than for Alternative A, and needed until source is depleted and remediation is no longer necessary.	Similar to Alternative A, but would require additional monitoring of treatment system and equipment repairs.	Similar to Alternative C
Time Until Full Protection is Achieved	Depends upon source depletion. 25-50 year minimum is estimated.	Protection of lake achieved within 2 years. Full protection time frame similar to Alternative A.	Similar to Alternative B.	Similar to Alternative B.
Cost of Remedy				
Capital/Startup	$0	$113,910	$135,940	$109,970
Annual O&M	$3,942	$3,906	$9,486	$6,946
Net Present Cost	$55,558	$168,961	$269,635	$207,867

FIGURES



Reference: USGS Topographic Quadrangle Map; Tumwater, Washington, 1959.

0 2,000 4,000

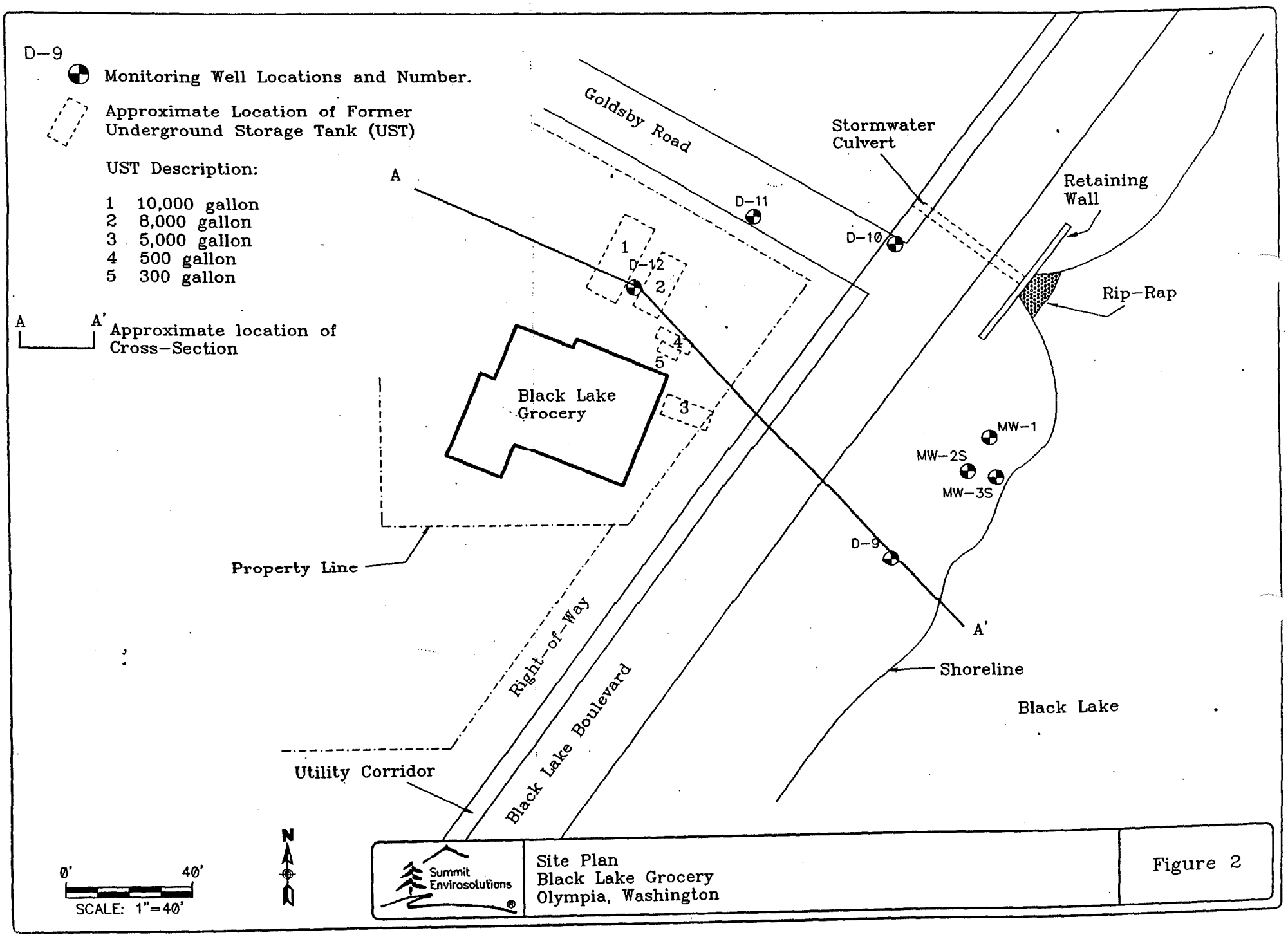
Scale in Feet

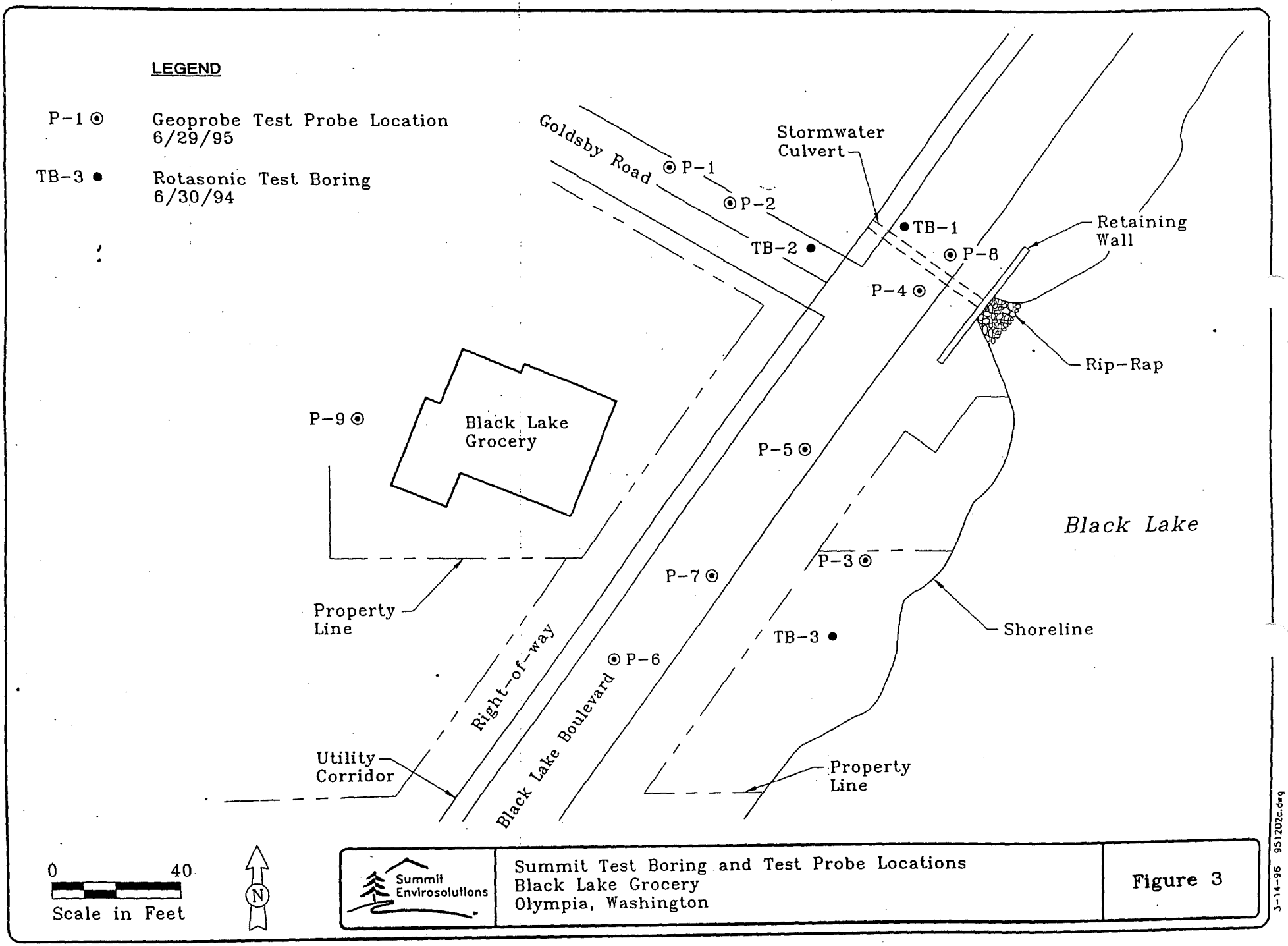
Summit Envirosolutions

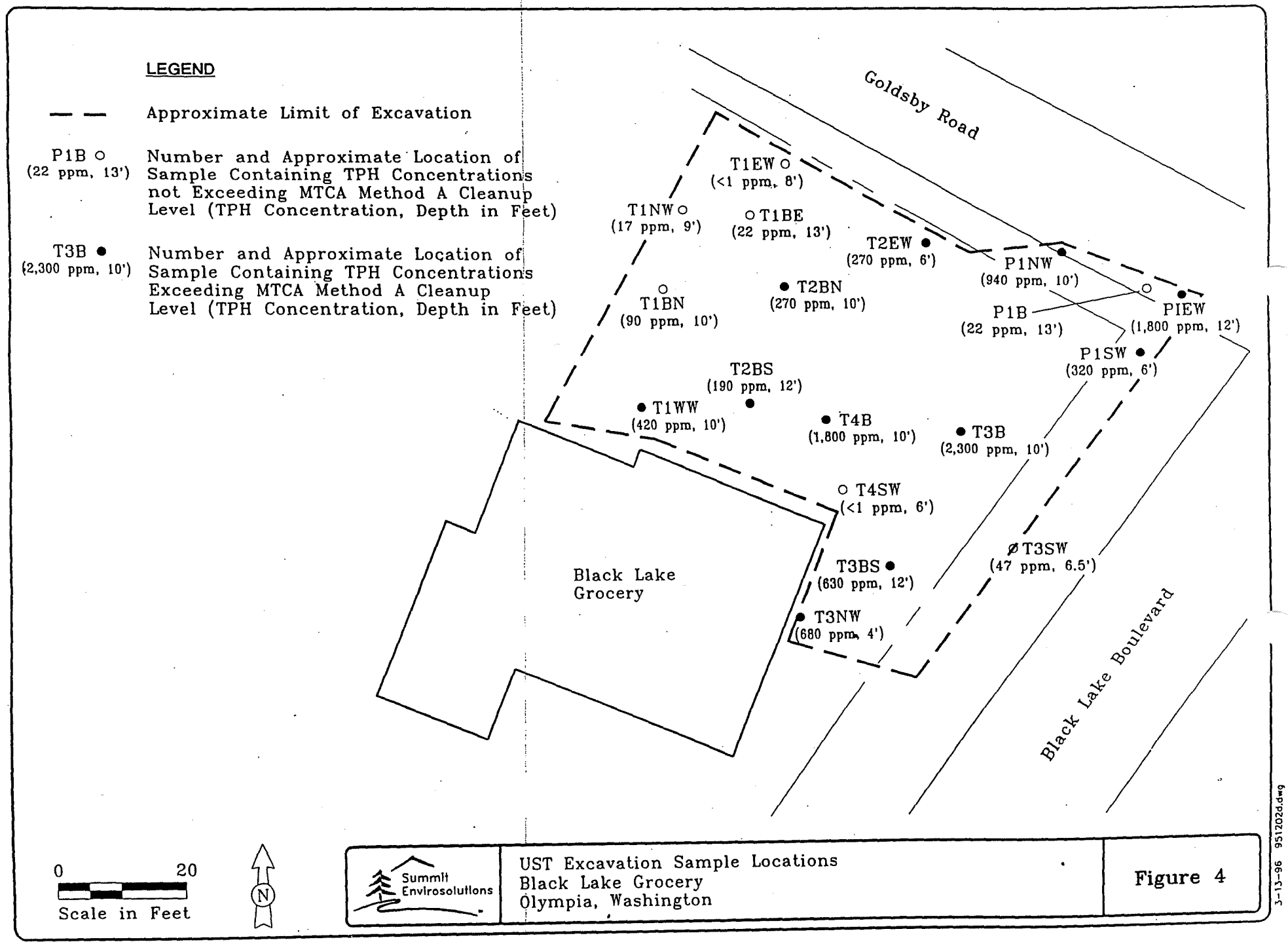
Vicinity Map
Black Lake Grocery
Olympia, Washington

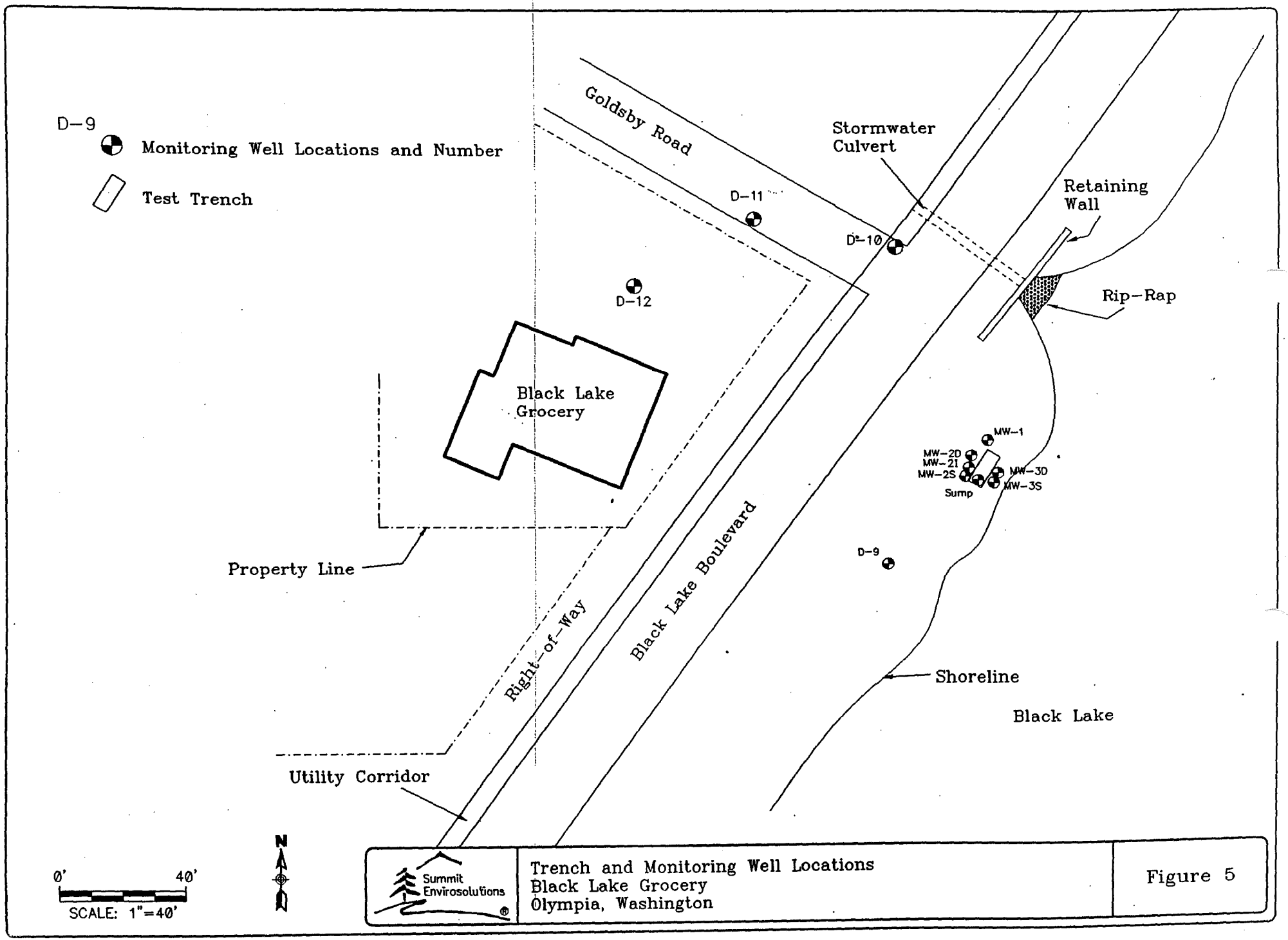
Figure 1

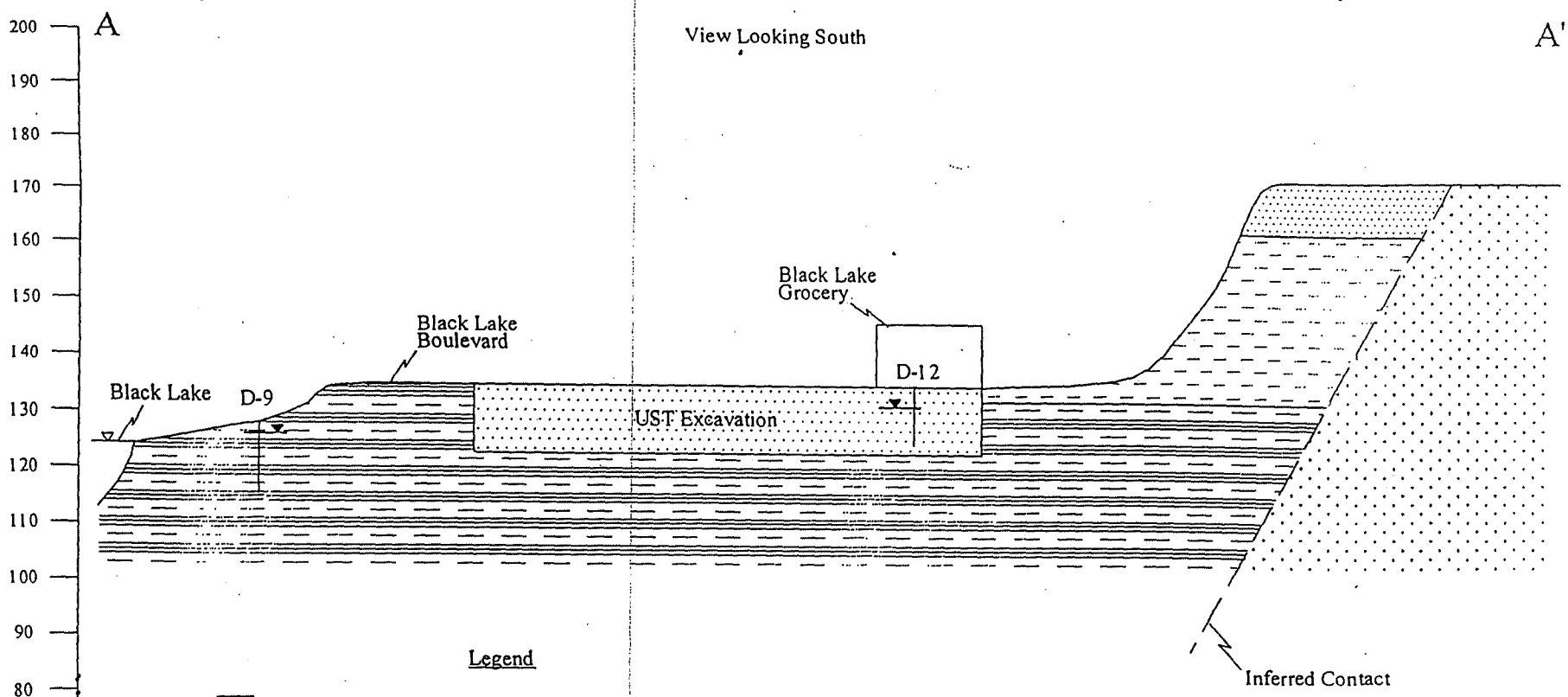
J-13-96 951202h.dwg


D-9
Monitoring Well Locations and Number.
Approximate Location of Former Underground Storage Tank (UST)
UST Description:
1 10,000 gallon
2 8,000 gallon
3 5,000 gallon
4 500 gallon
5 300 gallon
A A' Approximate location of Cross-Section
Goldsby Road
Stormwater Culvert
Retaining Wall
Rip-Rap
A
D-11
D-10
D-12
1
2
3
4
5
Black Lake Grocery
MW-1
MW-2S
MW-3S
D-9
A'
Property Line
Right-of-Way
Black Lake Boulevard
Shoreline
Black Lake
Utility Corridor
N
0' 40'
SCALE: 1"=40'
Summit Envirosolutions
Site Plan
Black Lake Grocery
Olympia, Washington
Figure 2


LEGEND
P-1 ⊙ Geoprobe Test Probe Location 6/29/95
TB-3 ● Rotasonic Test Boring 6/30/94
Goldsby Road
P-1
P-2
Stormwater Culvert
TB-1
TB-2
P-8
P-4
Retaining Wall
Rip-Rap
P-9
Black Lake Grocery
P-5
Black Lake
P-3
P-7
Property Line
Shoreline
TB-3
Right-of-way
Black Lake Boulevard
P-6
Utility Corridor
Property Line
0
40
Scale in Feet
N
Summit Envirosolutions
Summit Test Boring and Test Probe Locations
Black Lake Grocery
Olympia, Washington
Figure 3
3-14-96 951202c.dwg


LEGEND
Approximate Limit of Excavation
P1B ○ (22 ppm, 13') Number and Approximate Location of Sample Containing TPH Concentrations not Exceeding MTCA Method A Cleanup Level (TPH Concentration, Depth in Feet)
T3B ● (2,300 ppm, 10') Number and Approximate Location of Sample Containing TPH Concentrations Exceeding MTCA Method A Cleanup Level (TPH Concentration, Depth in Feet)
Goldsby Road
T1EW ○ (<1 ppm, 8')
T1NW ○ (17 ppm, 9')
○ T1BE (22 ppm, 13')
T2EW ● (270 ppm, 6')
P1NW (940 ppm, 10')
○ T1BN (90 ppm, 10')
● T2BN (270 ppm, 10')
P1B (22 ppm, 13')
P1EW (1,800 ppm, 12')
P1SW ● (320 ppm, 6')
T2BS (190 ppm, 12')
● T1WW (420 ppm, 10')
● T4B (1,800 ppm, 10')
● T3B (2,300 ppm, 10')
○ T4SW (<1 ppm, 6')
Black Lake Grocery
T3SW (47 ppm, 6.5')
T3BS ● (630 ppm, 12')
● T3NW (680 ppm, 4')
Black Lake Boulevard
0 20
Scale in Feet
N
Summit Envirosolutions
UST Excavation Sample Locations
Black Lake Grocery
Olympia, Washington
Figure 4
3-13-96 951202d.dwg


D-9
Monitoring Well Locations and Number
Test Trench
Goldsby Road
Stormwater Culvert
Retaining Wall
D-11
D-10
D-12
Rip-Rap
Black Lake Grocery
MW-1
MW-2D
MW-2I
MW-2S
MW-3D
MW-3S
Sump
D-9
Property Line
Black Lake Boulevard
Right-of-Way
Shoreline
Black Lake
Utility Corridor
N
0'
40'
SCALE: 1"=40'
Summit Envirosolutions
Trench and Monitoring Well Locations
Black Lake Grocery
Olympia, Washington
Figure 5

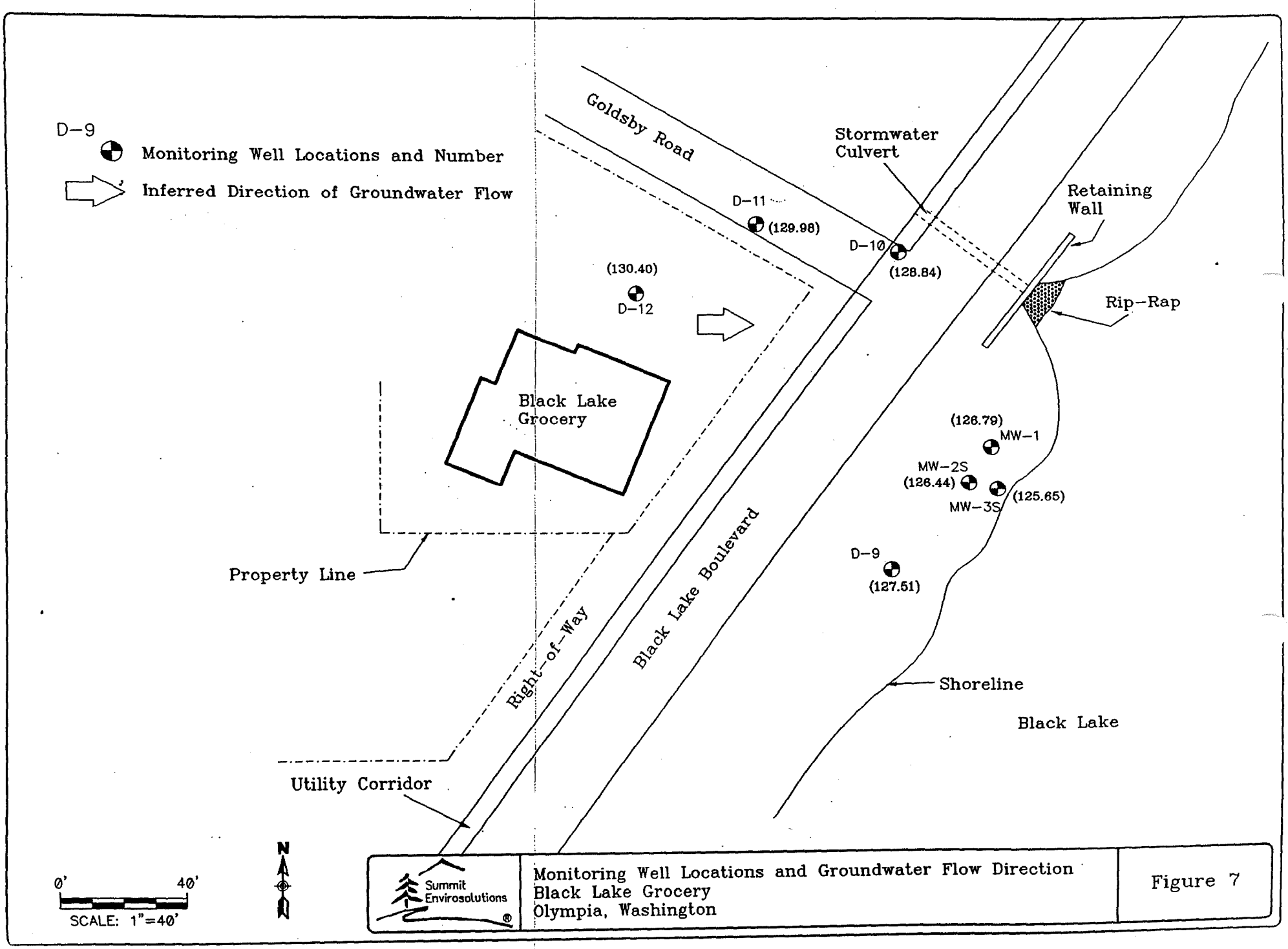


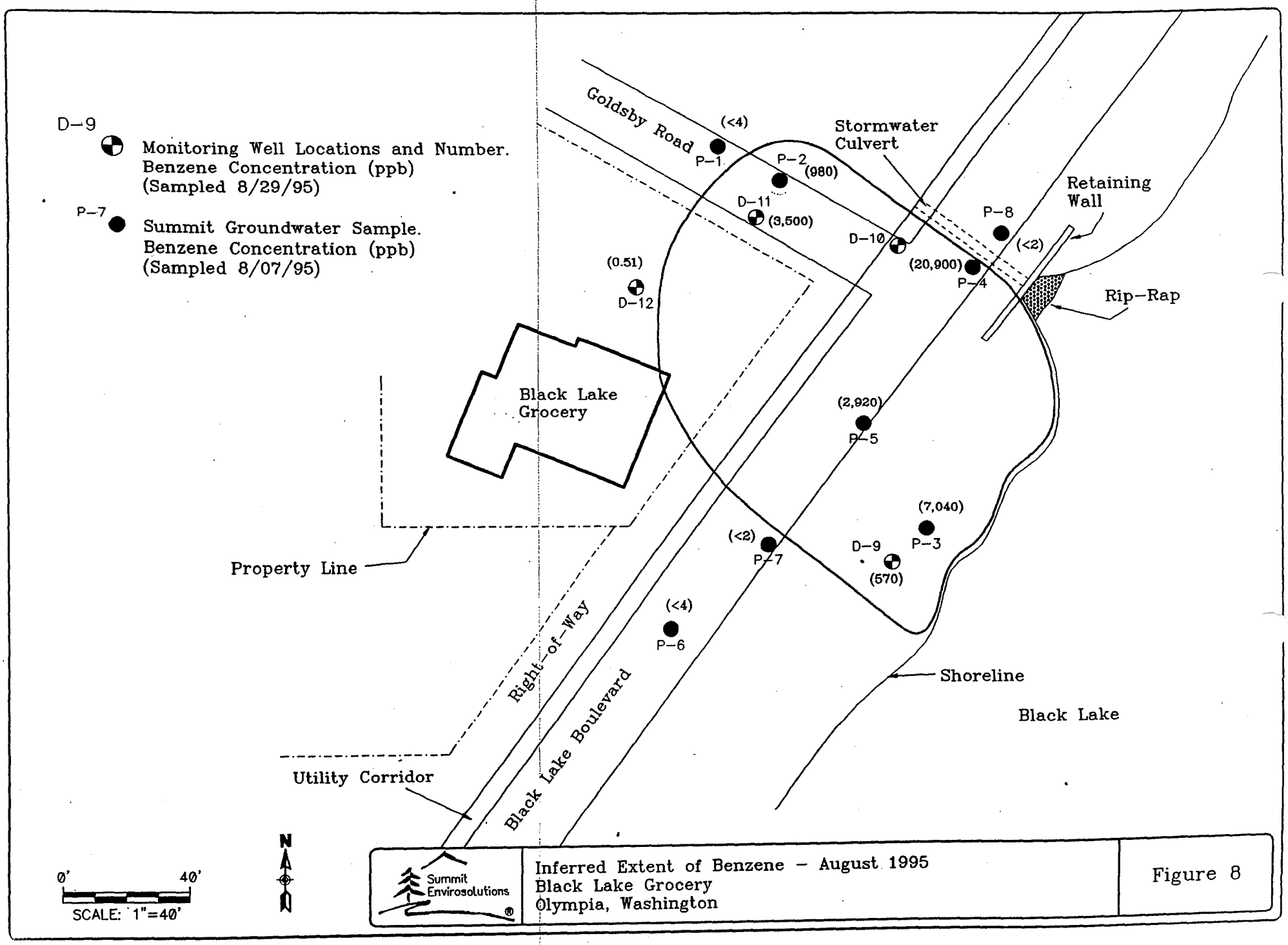
Summit Envirosolutions

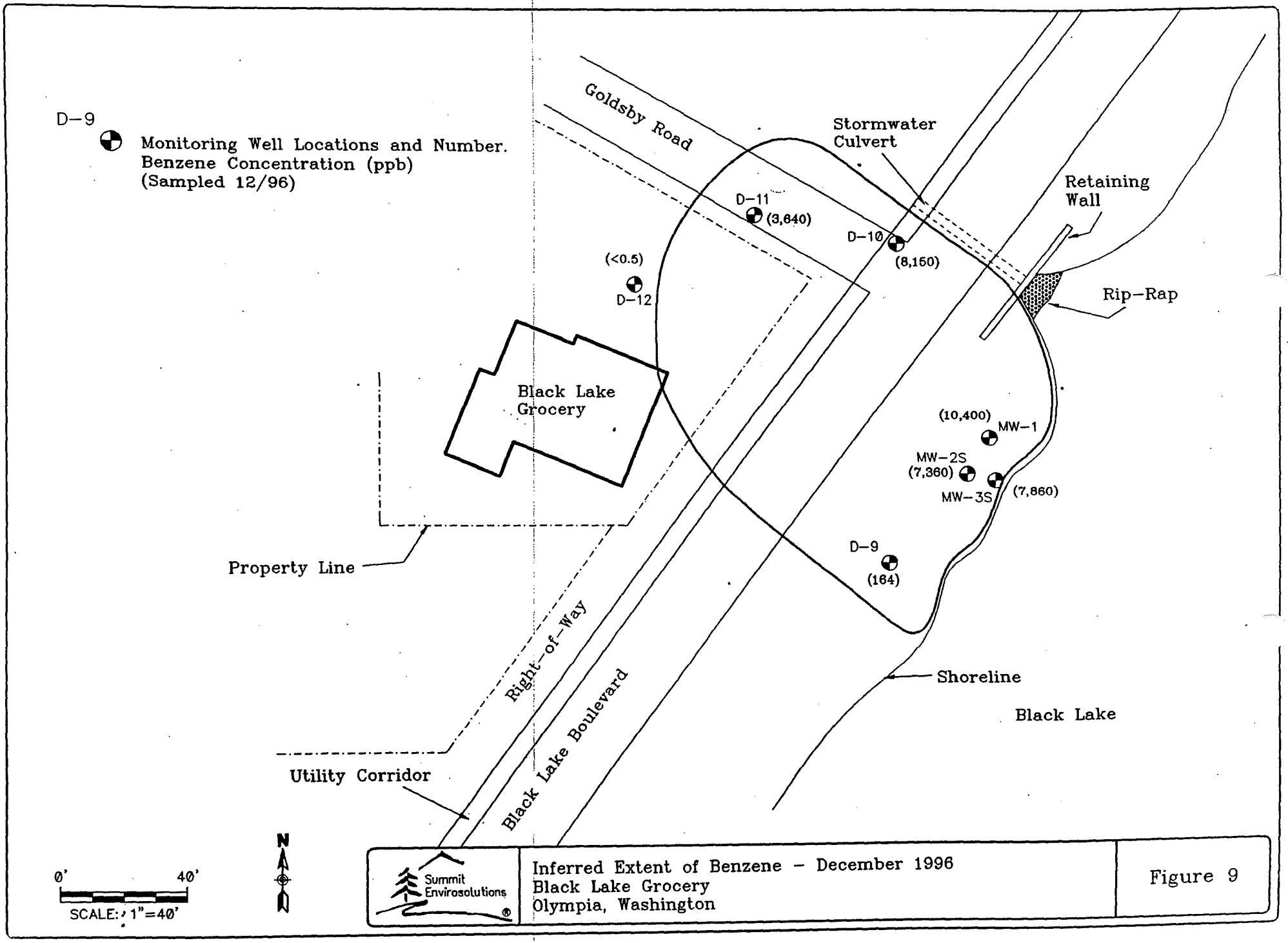
Geologic Cross-Section (East-West)
Black Lake Grocery
Olympia, Washington

Figure 6

J-13-96 9512029.dwg


D-9
Monitoring Well Locations and Number
Inferred Direction of Groundwater Flow
Goldsby Road
Stormwater Culvert
Retaining Wall
D-11
(129.98)
D-10
(128.84)
(130.40)
D-12
Rip-Rap
Black Lake Grocery
(126.79)
MW-1
MW-2S
(126.44)
(125.65)
MW-3S
D-9
(127.51)
Property Line
Right-of-Way
Black Lake Boulevard
Shoreline
Black Lake
Utility Corridor
N
0'
40'
SCALE: 1"=40'
Summit Envirosolutions
Monitoring Well Locations and Groundwater Flow Direction
Black Lake Grocery
Olympia, Washington
Figure 7


D–9
Monitoring Well Locations and Number.
Benzene Concentration (ppb)
(Sampled 8/29/95)
P–7
Summit Groundwater Sample.
Benzene Concentration (ppb)
(Sampled 8/07/95)
Goldsby Road
(<4)
P–1
P–2
(980)
D–11
(3,500)
Stormwater
Culvert
Retaining
Wall
P–8
(<2)
D–10
(20,900)
P–4
(0.51)
D–12
Rip–Rap
Black Lake
Grocery
(2,920)
P–5
(7,040)
P–3
(<2)
P–7
D–9
(570)
Property Line
(<4)
P–6
Right–of–Way
Black Lake Boulevard
Shoreline
Black Lake
Utility Corridor
N
0'
40'
SCALE: 1"=40'
Summit
Envirosolutions
Inferred Extent of Benzene – August 1995
Black Lake Grocery
Olympia, Washington
Figure 8


D–9
Monitoring Well Locations and Number.
Benzene Concentration (ppb)
(Sampled 12/96)
Goldsby Road
Stormwater Culvert
Retaining Wall
D–11
(3,640)
D–10
(8,160)
(<0.5)
D–12
Rip–Rap
Black Lake Grocery
(10,400)
MW–1
MW–2S
(7,360)
MW–3S
(7,860)
D–9
(164)
Property Line
Right–of–Way
Black Lake Boulevard
Shoreline
Black Lake
Utility Corridor
N
0'
40'
SCALE: 1"=40'
Summit Envirosolutions
Inferred Extent of Benzene – December 1996
Black Lake Grocery
Olympia, Washington
Figure 9

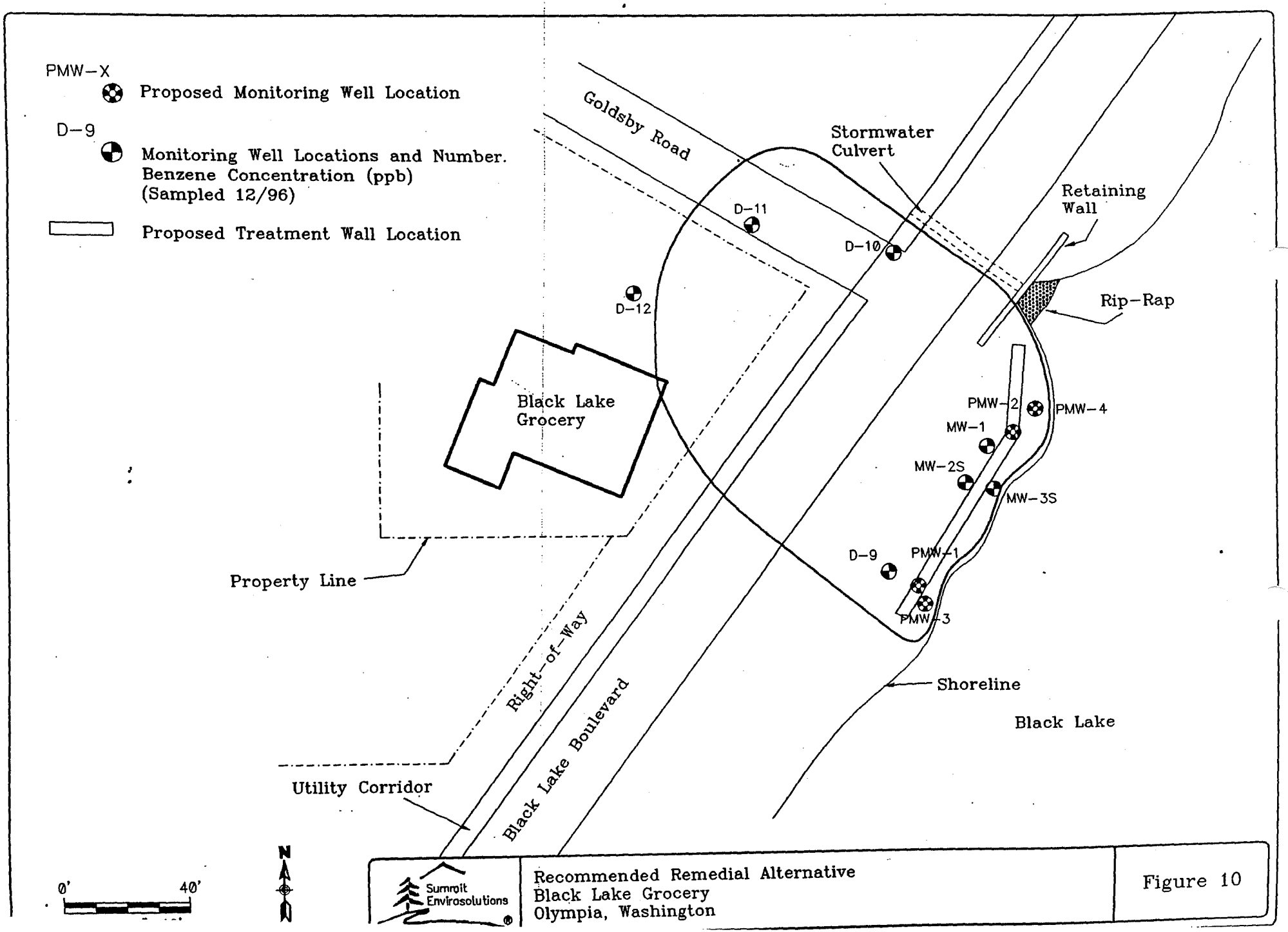
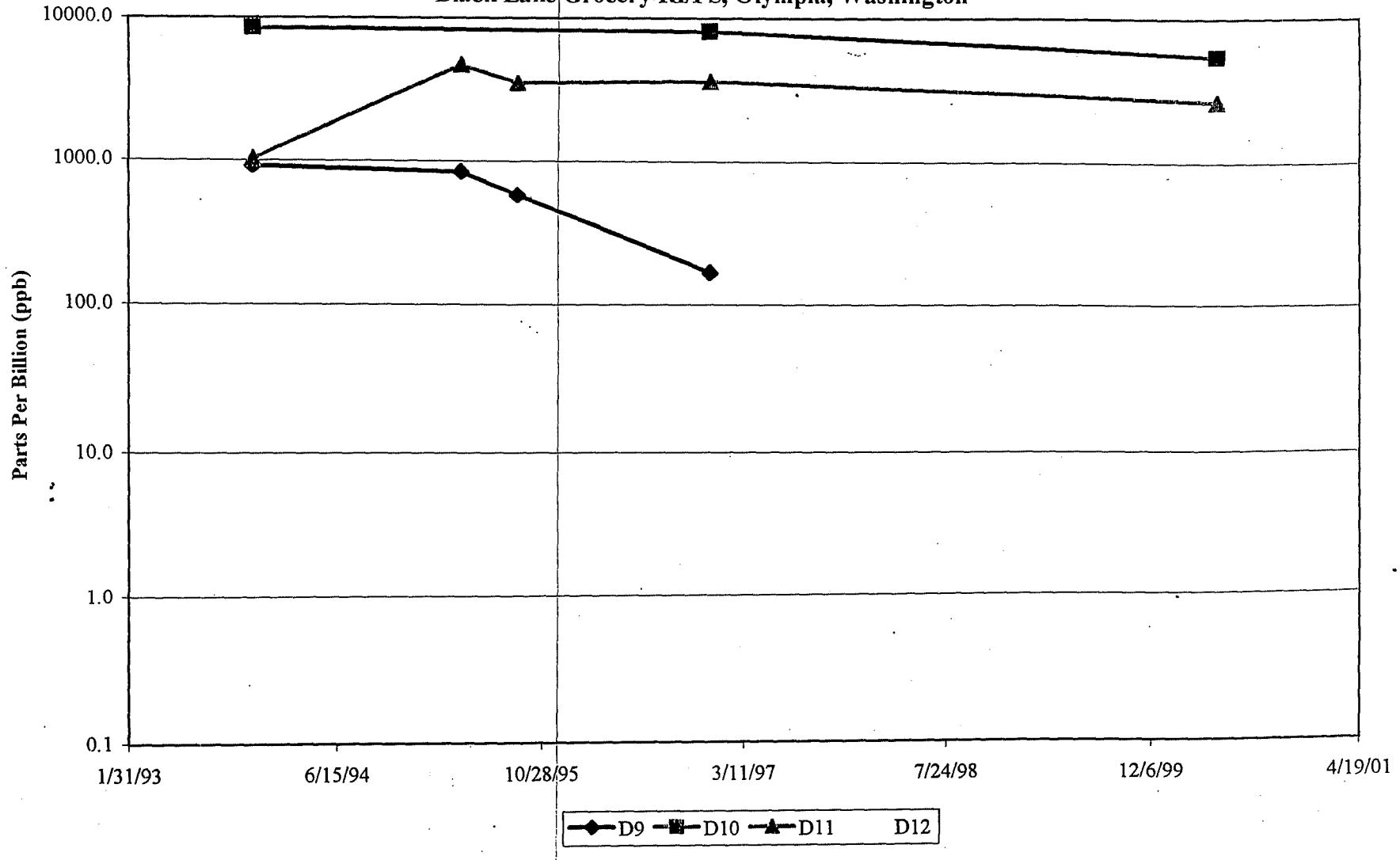
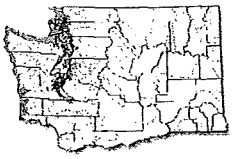

PMW–X
Proposed Monitoring Well Location
D–9
Monitoring Well Locations and Number.
Benzene Concentration (ppb)
(Sampled 12/96)
Proposed Treatment Wall Location
Goldsby Road
Stormwater Culvert
Retaining Wall
D–11
D–10
D–12
Rip–Rap
Black Lake Grocery
PMW–2
PMW–4
MW–1
MW–2S
MW–3S
D–9
PMW–1
PMW–3
Property Line
Right–of–Way
Black Lake Boulevard
Shoreline
Black Lake
Utility Corridor
0'
40'
N
Summit Envirosolutions
Recommended Remedial Alternative
Black Lake Grocery
Olympia, Washington
Figure 10

Figure VI-1
Benzene Concentrations - "D" Wells
Black Lake Grocery RI/FS, Olympia, Washington



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

July 9, 2002



Your address is in the **Deschutes** watershed

Mr. Michael Schein
Reed, Longyer, Malnati, Ahrens & Strickland, P.S.
1415 Norton Building
801 Second Avenue
Seattle, WA 98104-1522

Mr. Man Kyu Pak
Black Lake Grocery
4409 Black Lake Boulevard
Olympia, WA 98502-2250

Dear Mr. Schein and Pak:

Re: Black Lake Grocery Agreed Order No. DE 02TCPSR-3902

Enclosed please find a copy of the signed Agreed Order for implementing the Cleanup Action Plan at the Black Lake Grocery Site located at 4409 Black Lake Boulevard, Olympia, Washington 98502-2250.

The Agreed Order and the Cleanup Action Plan have been sent out for the public comment. The public comment period will end on July 31, 2002.

Based on the schedule presented in Section IV(1) of the Agreed Order, the Draft Engineering Design Report is due to Department of Ecology (Ecology) by August 15, 2002. However, Ecology requests your approval as soon as possible, to work directly with Summit Environmental. The purpose of Ecology's early involvement is to coordinate with Summit Environmental to assure that the design of the selected remedy meets the substantive requirements of any applicable permits for its implementation. Implementation of the remedy must be completed by December 31, 2002.

If you have any questions, please call me at (360) 407-6243.

Sincerely,

Panjini Balaraju
Project Manager
Toxics Cleanup Program
Southwest Regional Office

PB:as

Enclosures:

Cc: John Dustman, Summit Environmental (w/encl.)
Ken Lederman, AAG (w/encl.)
Katherine Scott, Ecology (Cost Recovery) (w/encl.)
Rebecca Lawson, Ecology (without/encl.)
Bob Warren, Ecology (without/encl.)

LAW OFFICES OF
REED, LONGYEAR, MALNATI, AHRENS & STRICKLAND, P.S.
A PROFESSIONAL SERVICE CORPORATION

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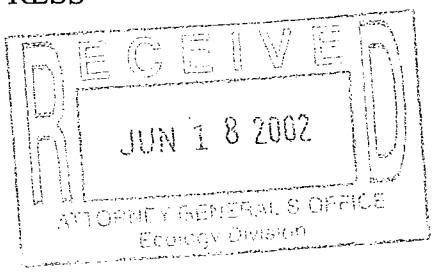
WILLIAM L. MALTMAN
MICHAEL T. SCHEIN
OF COUNSEL

LAWRENCE R. HENNINGS
1899-1993

e-mail: mschein@
reedlongyearlaw.com

June 17, 2002
VIA FACSIMILE & FEDERAL EXPRESS



Ken Lederman
Assistant Attorney General
2425 Bristol Court SW
PO Box 40117
Olympia WA 98504-0117

Re: Black Lake Grocery

Dear Ken:

Enclosed please find the original executed Agreed Order in this matter.

If you have any questions or comments, please do not hesitate to contact me.

Very truly yours,
REED LONGYEAR MALNATI
AHRENS & STRICKLAND, P.S.

Michael T. Schein

encl.: Agreed Order No. DE 02TCPSR-3902

cc: Panjini Balaraju (w/ encl.)
John Dustman (w/ encl.)
Man K. Pak (w/o encl.)

DOCUMENT4