INDEPENDENT REMEDIAL ACTION
SOIL BIOREMEDIATION
CLEANUP REPORT

BIRCHMOUNT ORCHARD FACILITY
3717 CRESTVIEW DRIVE
WENATCHEE, WASHINGTON

Prepared for

WELLS & WADE FRUIT COMPANY
DEPARTMENT OF PUBLIC WORKS

Prepared By

ERM-ENVIROCLEAN NORTHWEST, INCORPORATED

September 1994

ERM-Northwest, Inc.

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23 September 1994

Wells and Wade Fruit Company
P.O. Box 259
Wenatchee, Washington 98807

Attention: Mr. Martin Barron

SUBJECT: Independent Remedial Action - Soil Bioremediation Cleanup Report for the Birchmount Orchards Facility, Wenatchee, Washington

ERM

Dear Mr. Barron:

Attached, please find three copies of the Independent Remedial Action Report for the Birchmount leaking underground storage tank project. A copy of this report should be forwarded to the Central Division of the Washington State Department of Ecology Toxics Cleanup Program in Yakima, Washington.

Should you have any questions regarding this report, please call me at (206) 827-9574.

Sincerely,

ERM-ENVIROCLEAN NORTHWEST, INC.

Gary L. Galloway
President

BIRCHMOUNT ORCHARDS FACILITY
Wenatchee, Washington

INDEPENDENT REMEDIAL ACTION
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EXECUTIVE SUMMARY

The main elements of the remediation project are summarized as follows:

- The range of petroleum hydrocarbons in the soil had been chemically identified using Ecology hydrocarbon-speciation decision tree analysis commonly applied to Leaking Underground Storage Tank (LUST) sites. The analysis indicated that a 100 milligrams per kilogram (mg/kg) cleanup level for gasoline-range hydrocarbons (TPH-G) is appropriate at this site.

- Sampling and chemical analysis has confirmed that the petroleum hydrocarbon-affected soil has been successfully remediated to concentrations of petroleum hydrocarbons less than the MTCA Method A cleanup levels and that petroleum hydrocarbons have not migrated from the treatment pads during treatment.

- Petroleum hydrocarbon-affected soil was identified beneath the former location of a temporary soil stockpile at the site. The hydrocarbons present at this location are not related to release from the stockpile, and likely represent an earlier release in the former debris area cleared prior to the placement of the temporary stockpile.

- Site Health and Safety and Quality Assurance/Quality Control procedures and protocols have been followed and no exceptions have been identified.

1.0 *INTRODUCTION*

This Bioremediation Closure Report describes environmental restoration at the Wells and Wade Birchmount Orchard facility in Wenatchee, Washington. Three underground storage tanks (USTs) including one 550-gallon steel diesel UST and two 550-gallon steel gasoline USTs were removed from the site in 1993. Petroleum-impacted soil with concentrations of petroleum hydrocarbons greater than the Model Toxics Control Act (MTCA) Method A cleanup levels was encountered during the UST removal. On 22 November, 1993 an Interim Status Report documenting the removal of the USTs and excavation of petroleum-impacted soil was submitted to the Washington State Department of Ecology (WDOE) Central Region in Yakima, Washington [Sage Earth Sciences, Inc. (Sage), 1993].

Sage excavated approximately 600 cubic yards of petroleum-impacted soil from the vicinity of the USTs and stockpiled the soil at the site. In February, 1994 ERM-EnviroClean Northwest, Inc. (EC-NW) was contracted to provide additional site characterization and remedial services at the site. Additional site characterization activities completed by EC-NW are documented in the Interim Supplemental Site Characterization/Cleanup Report submitted to WDOE Central Region in July 1994 (EC-NW, 1994).

Bioremediation was chosen as the most feasible alternative for treatment of the excavated petroleum-impacted soils. EC-NW provided project management at the site, which included overall coordination and oversight during the environmental restoration and the documentation of the cleanup.

1.1 *GOALS AND OBJECTIVES*

In accordance with WDOE's restoration goals to provide a cost-effective, permanent solution to the contamination, the owner selected bioremediation as a remedial method. The on-site bioremediation of the petroleum-impacted soils was completed in engineered biotreatment cells designed to mitigate the migration of these contaminants to other areas. Also, the soil under these affected soils has been sampled and chemically analyzed to confirm that the soil beneath the treatment cell has not been adversely affected by these contaminants.

MTCA Method A soil cleanup standards (100 mg/kg [milligrams per kilogram] gasoline-range hydrocarbons) were targeted as the cleanup levels under this remedial action.

2.0 *SITE BACKGROUND*

2.1 *STIE LOCATION AND SETTING*

The site is approximately one mile north of U.S. Highway 97 on Crestview Road in Wenatchee, Washington(*Figure 1, Site Vicinity Map).* The facility's boundaries are Crestview Road on the west, orchard areas owned by Wells & Wade to the north and east, and American Fruit Road to the south.

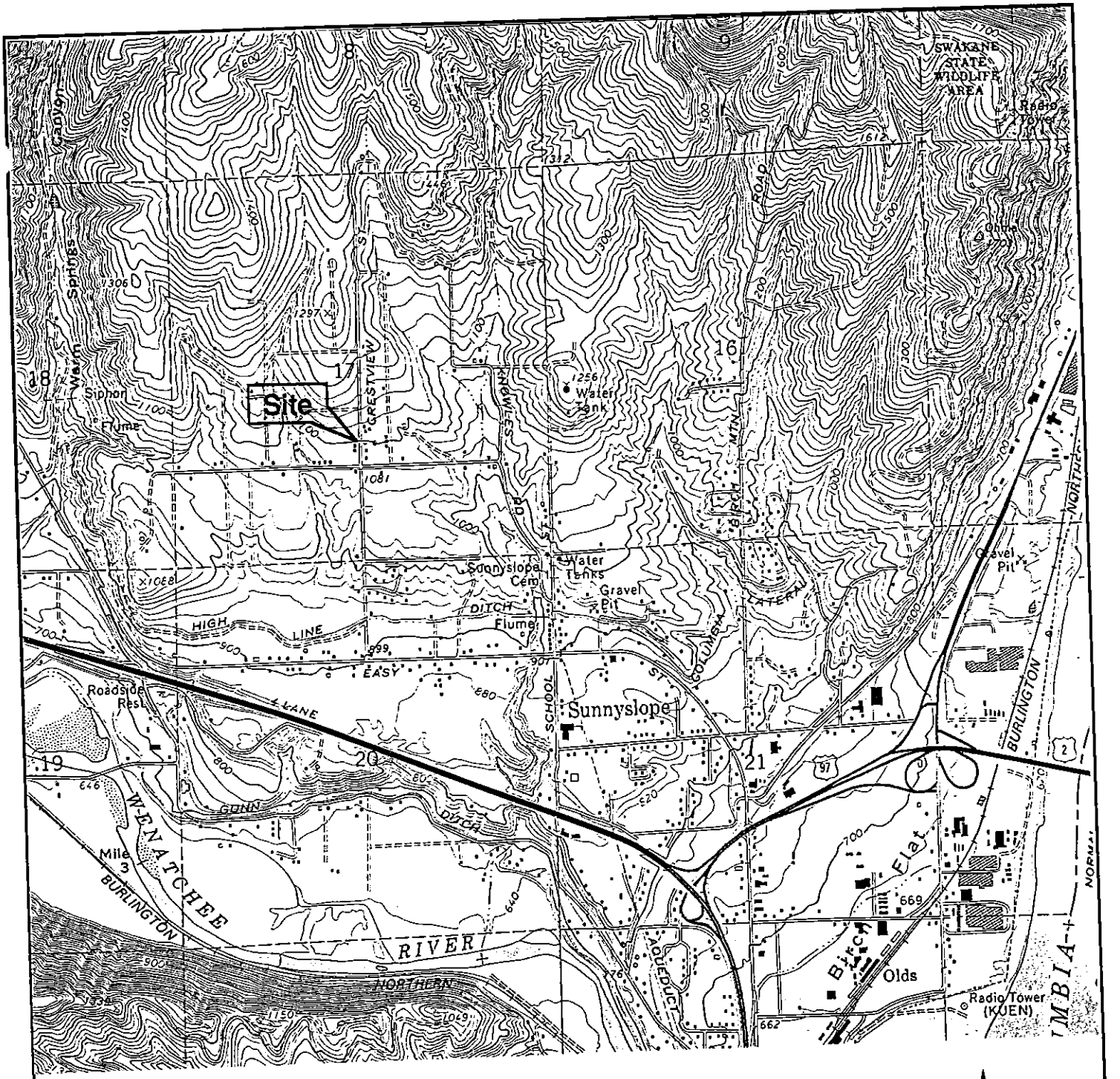
Structures at the site include an office building, maintenance shop, and equipment storage buildings. *Figure* 2 , *Site Plan Map* shows site features, including overhead and underground electrical lines, the location of former USTs, and the new (replacement) UST system. The site has been owned by Wells & Wade Fruit Company since its initial development. Site activities that may have contributed to petroleum impacts to soil and groundwater at the site are limited to the former USTs removed from the vicinity of boring B-4 (*Figure* 2). Adjacent land use consists of orchards and scattered residences.

Wells & Wade Fruit Company operates an agricultural orchard at the site where fruit trees are planted, grown and harvested. As a part of this operation, USTs are used to store fuel for agricultural equipment. The current UST is a vaulted system at the location shown on *Figure* 2.

2.2 *TOPOGRAPHY AND GEOLOGY*

Topography slopes moderately to the south within the facility area. Intermittent drainage in this semi-arid region is along shallow ditches and gullies. When present, surface water drainage flows toward the High Line Canal, approximately 0.7 miles south of the site. The Wenatchee River is approximately 1.5 miles south and the Columbia River is approximately 2 miles east of the site.

Up to 50 feet of unconsolidated silt, sand, and gravel deposits overlie bedrock in the site vicinity. Bedrock in the site vicinity consists of arkosic sandstone and siltstone.



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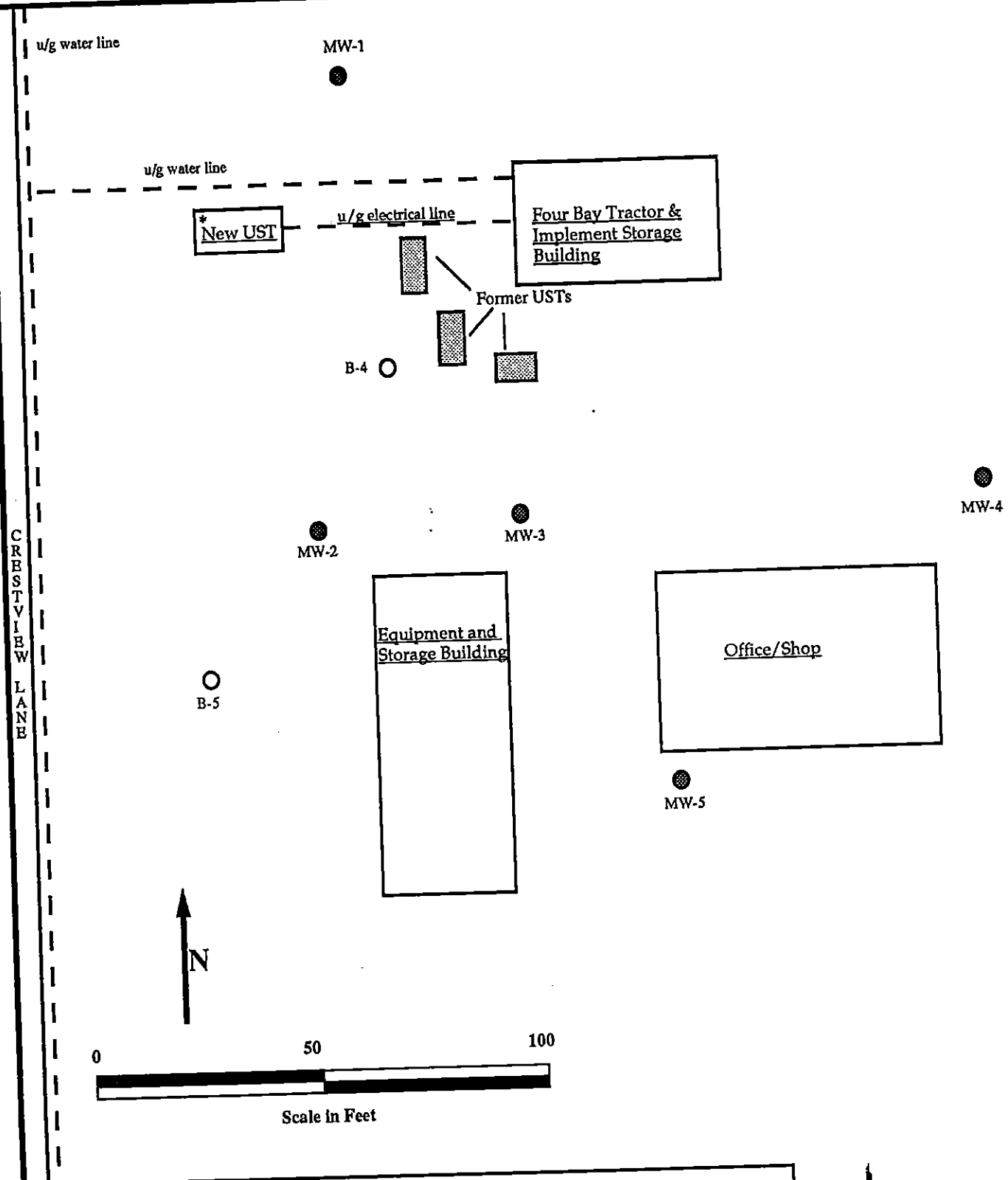
WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY: Wenatchee, Washington

Soil Bioremediation Project

By: ERM-Enviroclean Northwest, Inc. September, 1994

Figure 1. Site Vicinity Map

Base: USGS Wenatchee 7.5' Topographic Quadrangle (Photorevised 1988)



WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY; Wenatchee, Washington

Soil Bioremediation Project

By: ERM-Enviroclean Northwest, Inc. September, 1994

Figure 2. Site Plan Map. O = Soil Boring

⊗ = Monitoring Well

Note: All locations shown are approximate.

E R M

2.3 *PREVIOUS INVESTIGATIONS*

In the course of removing USTs, Sage discovered soil suspected to have been impacted by a petroleum release (Sage November, 1993). Sage sampled the soil and the laboratory results confirmed the presence of hydrocarbon-impacted soil.

Sage excavated in the vicinity of the former USTs to a depth of approximately 25 feet and temporarily stockpiled approximately 600 cubic yards of petroleum-impacted soil. No groundwater was encountered in the excavation. Two soil samples collected from the bottom of the excavation contained concentrations of gasoline-range hydrocarbons greater than the MTCA Method A soil cleanup level. Sage backfilled the excavation with clean soil because the available equipment could not excavate deeper, the remaining impacted soil volume appeared to be localized and minor, and the excavation was too deep to safely leave open.

To characterize the vertical extent and nature of the remaining impacted soil, Sage subsequently collected soil samples from borings drilled into and beneath the backfilled soil in the excavation. However, one of these borings unexpectedly encountered ground water.

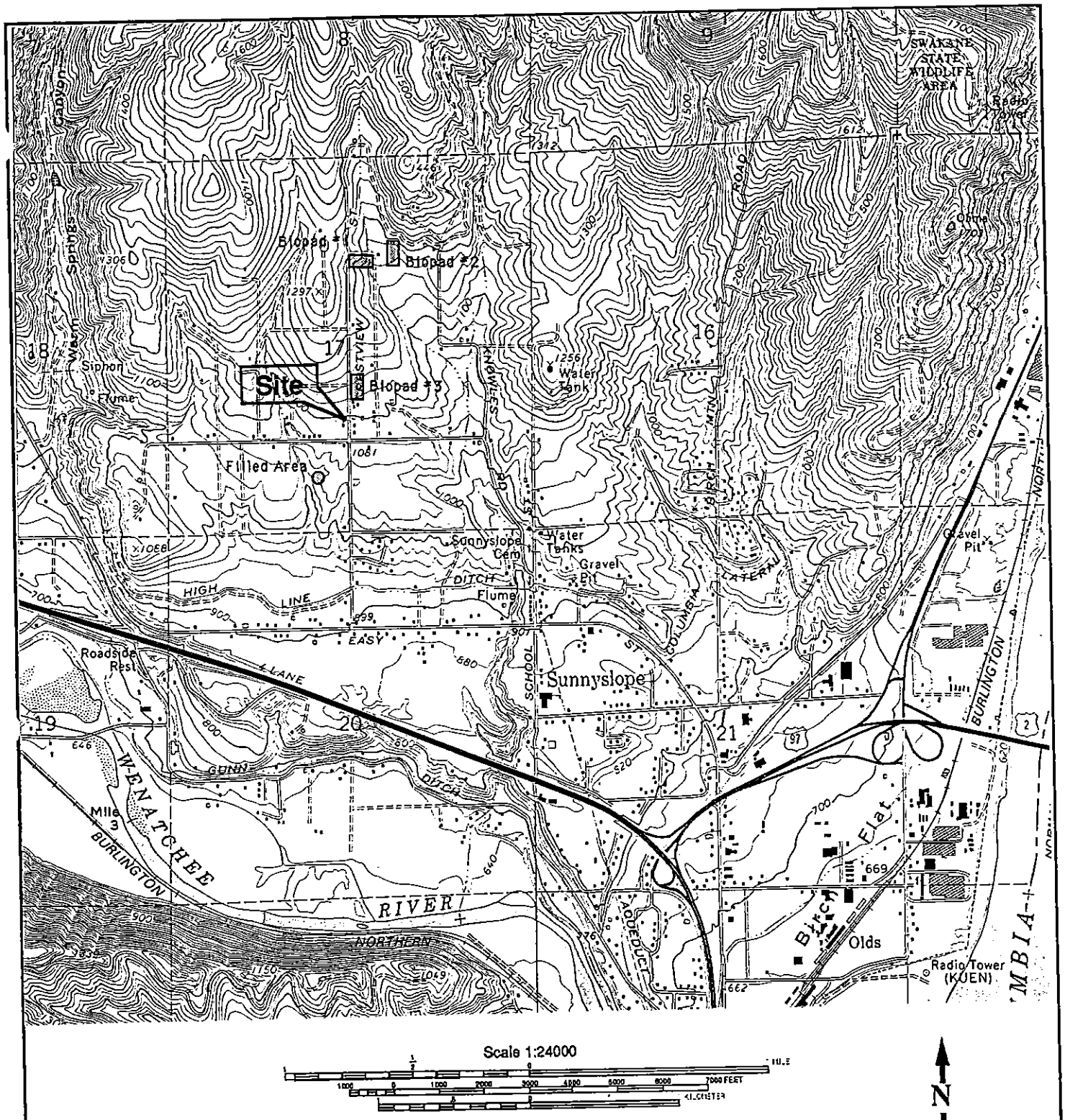
EC-NW completed a Supplemental Site Characterization in May, 1994. One soil boring (B-5) and two monitoring wells (MW-4 and MW-5) were installed at the site (*Figure* 2). Results of this investigation indicated that subsurface petroleum impacts were limited to the vicinity of the former USTs southward to the location of monitoring well MW-3.

3.0 SITE REMEDIATION

3.1 BIOTREATMENT PAD CONSTRUCTION

Three bioremediation pad areas (Biopad #1, Biopad #2, and Biopad #3) were constructed at the Birchmount Orchards facility to remediate the petroleum-impacted soil excavated from the vicinity of the USTs. *Figure* 3 shows the location of the bioremediation pads. A bermed revetment was constructed and a geotextile liner was spread over the surface in each area where the contaminated soils were to be placed for treatment. The ground surface below each treatment pad was graded toward the pad's center to effect water flow within the pad away from the perimeter. The earthen berms were constructed at the perimeter to reduce the possibility of overflow of water onto the ground at the perimeter of the pads during heavy precipitation events. The pad liners were fabricated without seams so that the potential for leaks would be minimized. Also, the liners were designed to be tear-resistent using a 3-ply reinforced design. The specifications of the liners used at this site were compared against the requirements for liners at soil remediation projects with similar site-specific environmental conditions and the nature of the contaminants to ensure the competence of the liner material.

Using a track dozer and a rubber tire loader, the contaminated material was evenly spread over the three impermeable geofabric liners. The dimensions of the containment units were 38 feet by 87 feet (Biopad #1), 48 feet by 80 feet (Biopad #2) and 45 feet by 95 feet (Biopad #3). Bioremediation-enhancing nutrients were added to the soil during placement on the liner. Water collected in the pad area because of rainfall was allowed to evaporate so that these liquids were not discharged to the ground surface. After the targeted cleanup levels were achieved, the remediated soils were used as fill material at various locations on the Birchmount Orchards property. Soil from Biopad #1 was graded and left in the location of the biopad. Biopad #2 soils were removed to the Biopad #1 area. Biopad #3 soils were used to fill a slope area approximately 1/4 mile southwest of the location of Biopad #3. The location of the filled area is indicated in *Figure* 3.



WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY: Wenatchee, Washington

Soil Bioremediation Project

By: ERM-Enviroclean Northwest, Inc. September, 1994

Figure 3. Bioremediation Stockpile Locations Map

Base: USGS Wenatchee 7.5' Topographic Quadrangle (Photorevised 1988)

3.2 *BIOREMEDIATION*

Baseline information regarding microbial activity and nutrient geochemistry of the contaminated soil at the property was collected prior to the initiation of this project. This information was used to determine the presence of sufficient numbers of hydrocarbon-degrading microbes to treat the soil and to determine what additional nutrient additives were necessary, if any, to optimize microbial action. Proper oxygen and nutrient levels in the soil maximize hydrocarbon degradation as microbes break down the contaminants to simpler non-toxic compounds, namely carbon dioxide and water.

The soils were mixed regularly to provide the necessary oxygen to the soils. Also, the soils were periodically chemically analyzed to monitor the decline of concentrations of petroleum compounds. Confirmation sampling and analysis was performed to verify that remediated soils were below the appropriate Ecology cleanup standard levels of 100 ppm gasoline-range hydrocarbons before this remediation program was considered completed. This Independent Remedial Action Report has been prepared to document that the restoration of the excavated soil has been successful and no further action is required under MTCA.

4.0 *SAMPLING AND ANALYSIS*

The objective of the sampling program was to verify through laboratory chemical analysis that all of the affected materials have been remediated to agency-acceptable levels. The sampling protocols and procedures followed appropriate state and federal guidance documents, primarily EPA SW-846 and Washington State MTCA and LUST recommendations.

Soil samples were collected to characterize soil prior to remediation, to document that the adjacent sediments have not been affected, and to document that the remediation has degraded the petroleum compounds to concentrations less than MTCA Method A cleanup levels. Based on our review of chemical analytical results of soil samples obtained at the site and our field observations, Ecology Method WTPH-G was chosen to characterize the soil during remediation.

4.1 *SOIL SAMPLING*

Four sets of samples were collected by EC-NW and submitted for laboratory analysis.

Pre-remediation Base Samples - Pre-remediation samples were collected from the soil beneath the location of the bioremediation pads to define the background hydrocarbon concentrations prior to construction and remediation. This data was compared to post-remediation samples to verify that the contamination had not leaked from the pad onto the underlying ground surface.

These samples were collected on April 4 and 6, 1994 using a hand auger or similar tool. The top 6 inches of soil at two to three sampling points at each pad location were sampled. The discrete samples were then composited into one sample at Biopads #1 and #2. The soil samples taken from the base of Biopad # 3 were not composited prior to analysis. Three discrete samples were collected from the location of Biopad #1 and two discrete samples were collected from the locations of Biopads #2 and #3.

Chemical analytical results are summarized in Table 1. Laboratory reports, chain-of-custody documentation and a review of laboratory quality assurance/quality control (QA/QC) procedures are included in Appendix A.

Temporary Stockpile Base Samples - Soil samples OP-1 through OP-6 were collected on April 6, 1994 from the top 6 inches of soil

TABLE 1
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
BIOREMEDIATION PAD BASE SAMPLES
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

Sample Number	Location	Date Sampled	Depth of Sample (feet)	Gasoline-range Hydrocarbons(1) (mg/kg)	BETX(2) (mg/kg)				Diesel-range Hydrocarbons(3) (mg/kg)
					B	E	T	X	
B1-C	Biopad #1 base	4/4/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-
B2-C	Biopad #2 base	4/4/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-
B3-1	Biopad #3 base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	<15
B3-2	Biopad #3 base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-
BP-1	Biopad #1 base	7/15/94	0-0.5	<2.5	-	-	-	-	-
BP-2	Biopad #2 base	7/15/94	0-0.5	<2.5	-	-	-	-	-
BP-3	Biopad #3 base	7/15/94	0-0.5	<2.5	-	-	-	-	-
MTCA Method A soil cleanup level				100	0.5	20	40	20	200

Notes:

Chemical analytical services provided by Pacific Northern Analytical, Inc. of Redmond, Washington.

(1) By Ecology Method WTPH-G.

(2) By EPA Method 8020. B = benzene, E = ethylbenzene, T = toluene, and X = total xylenes.

(3) By Ecology Method WTPH-D.

mg/kg = milligrams per kilogram

- = not tested

immediately beneath the location of the temporary soil stockpile north of the location of Biopad #1 (see *Figure 3*) to document that petroleum-related compounds had not leached from the stockpile into the underlying soil. Soil samples EP-1 and WP-1 were also obtained from beneath the location of temporary soil stockpiles near Biopad #3.

Heavy oil-range hydrocarbons were detected at concentrations greater than the MTCA Method A cleanup level in soil sample OP-5. The location of OP-5 was resampled on August 12, 1994 to characterize and confirm the presence of petroleum hydrocarbons. The type of petroleum hydrocarbons, the concentrations present and the presence of discolored soil at the location of OP-5 indicate that the petroleum-affected soil is not related to release from the temporary soil stockpile at that location. It is planned that this soil will be excavated and bioremediated on site in October-November, 1994. A cleanup report for this remedial action will be prepared at the conclusion of the task.

Chemical analytical results are summarized in Table 3. Laboratory reports, chain-of-custody documentation and a review of laboratory quality assurance/quality control (QA/QC) procedures are included in Appendix A.

Remediation Progress Samples - Monitoring of the soil on the bioremediation pads occurred approximately monthly, beginning one month after the soil had been placed on the treatment pad. Samples were collected using a hand auger or other similar method on May 29, June 17, and June 24, 1994. Each bioremediation pad was separated into four quadrants (northwest, southwest, northeast, and southeast), and four discrete samples were obtained from each quadrant. The four discrete samples were composited into one sample for each quadrant of each bioremediation pad. When the chemical analytical results for the soil samples indicated that the cleanup goals were met, the uppermost lift of approximately 1 foot thickness was removed from the treatment pads until 1 foot thickness or less of soil remained on each bioremediation pad.

Sage had reported arsenic concentrations greater than the MTCA Method A cleanup level in a portion of the soils excavated in November, 1993. The suspected arsenic-affected soil was stockpiled at the southern end of Biopad #3 and was sampled separately from the remainder of the stockpile (samples A-1 and A-2). Arsenic was not detected at a concentration greater than the MTCA Method A cleanup level in samples A-1 and A-2.

Chemical analytical results for the soil samples obtained from the bioremediation pads are summarized in Table 2. Laboratory reports,

TABLE 2
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
BIOREMEDIATION PROGRESS SAMPLES
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

Sample Number	Date Sampled	Depth of Sample (feet)	Gasoline-range Hydrocarbons(1) (mg/kg)	Total Arsenic(2) (mg/kg)
BP-1-NW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	3.5	-
BP-1-SW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	5.0	-
BP-1-NE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
BP-1-SE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	3.9	-
BP-2-NW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
BP-2-SW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	5.5	-
BP-2-NE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
BP-2-SE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
BP-3-NW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
	6/24/94	0-1	3.3	-
BP-3-SW	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
	6/24/94	0-1	<2.5	-
BP-3-NE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
	6/24/94	0-1	<2.5	-
BP-3-SE	5/29/94	0-1	<2.5	-
	6/17/94	0-1	<2.5	-
	6/24/94	0-1	<2.5	-
A-1	6/24/94	0-2.5	<2.5	8.28
A-2	6/24/94	0-2.5	<2.5	7.10
MTCA Method A soil cleanup level			100	20

Notes:

Chemical analytical services provided by Pacific Northern Analytical of Redmond, Washington.

(1) By Ecology Method WTPH-G.

(2) By EPA Method 7060.

mg/kg = milligrams per kilogram

- = not tested

TABLE 3
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
TEMPORARY SOIL STOCKPILE BASE SAMPLES
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

Sample Number	Location	Date Sampled	Sample Depth (feet)	Gasoline-range Hydrocarbons(1) (mg/kg)	BETX(2) (mg/kg)				Diesel-range Hydrocarbons(3) (mg/kg)	Heavy Oil-range Hydrocarbons(4) (mg/kg)
					B	E	T	X		
OP-1	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	99
OP-2	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	49
OP-3	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	57
OP-4	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	52
OP-5	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	576
		8/12/94	0-0.5	-	-	-	-	-	64	890(5)
OP-6	North stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	53
EP-1	East stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	<15	86
WP-1	West stockpile base	4/6/94	0-1	<2.5	<0.050	<0.050	<0.050	<0.050	-	180
MTCA Method A soil cleanup level				100	0.5	20	40	20	200	200

Notes:

Chemical analytical services provided by Pacific Northern Analytical, Inc. of Redmond, Washington

(1) By Ecology Method WTPH-G.

(2) By EPA Method 8020. B = benzene, E = ethylbenzene, T = toluene, and X = total xylenes.

(3) By Ecology Method WTPH-D.

(4) By Ecology Method WTPH-418.1 Modified.

(5) By Ecology Method WTPH-D Extended.

mg/kg = milligrams per kilogram

- = not tested

chain-of-custody documentation and a review of laboratory quality assurance/quality control (QA/QC) procedures are included in Appendix A.

Post-remediation Base Samples - Representative soil samples were collected from soil beneath the bioremediation pad areas on July 15, 1994 to confirm that petroleum-related compounds had not leached from the pads during remediation. The top 6 inches of soil at four sampling points at each pad location were sampled. The discrete samples were then composited into one sample for each pad location. Gasoline-range hydrocarbons were not detected in the samples obtained from the base of the bioremediation pads. Chemical analytical results are summarized in Table 1. Laboratory reports, chain-of-custody documentation and a review of laboratory quality assurance/quality control (QA/QC) procedures are included in Appendix A.

4.2 *CHEMICAL ANALYSIS*

Washington State-recommended hydrocarbon analyses were performed on representative samples. Since the contamination has been characterized as gasoline-range hydrocarbons, using the Ecology decision-tree method, the analytical method selected to monitor petroleum hydrocarbon concentrations in the bioremediation pads was WTPH-G, as required under Ecology's guidance for cleanups under MTCA.

4.3 *QUALITY ASSURANCE/QUALITY CONTROL*

A Quality Assurance/Quality Control (QA/QC) Program was established to ensure that environmental monitoring data of known and acceptable quality were provided. All field sampling and laboratory analysis followed proper quality assurance procedures and were conducted according to EPA guidelines for field test methods (SW-846, Vol. II), recommended Washington State procedures, and the ERM Corporate QA/QC Program.

4.4 *SAMPLING PROTOCOLS AND PROCEDURES*

Sampling Protocols and Procedures - All field sampling and laboratory analysis followed proper quality assurance procedures and were conducted following EPA guidelines for field test methods (SW-846, Vol. II) and the sampling program described above.

Soil samples were collected to investigate contaminant concentrations to determine whether additional remediation was necessary and that the restoration had been successful.

Samples were collected with a stainless-steel spoon from the bioremediation pad soils, placed in a plastic bag, mixed and placed directly into the sample container. All sampling equipment was decontaminated between sample intervals. The samples were stored in coolers, packed in ice, and hand-delivered to the Pacific Northern Analytical's laboratory in Redmond, Washington for chemical analysis (see Appendix A - Chemical Analytical Data).

5.0 *CONCLUSIONS AND RECOMMENDATIONS*

Based on field observations and chemical analytical results of soil samples obtained from the treated soil, the soil treated in the bioremediation pad areas has been remediated to concentrations of petroleum hydrocarbons less than MTCA Method A cleanup levels and that no further remedial action is required to achieve regulatory compliance for these soils.

We recommend the excavation and treatment or disposal of petroleum-affected soil at the location of the former temporary soil stockpile north of Biopad #1. We estimate that less than 5 cubic yards of petroleum-affected soil is present at this location.

APPENDIX A

CHEMICAL ANALYTICAL DATA

APPENDIX A

CHEMICAL ANALYTICAL DATA

Laboratory chemical analyses for samples included in this report were completed by Pacific Northern Analytical (PNA) in Redmond, Washington. Laboratory data sheets and chain-of-custody tracking forms are included in this Attachment.

PNA performed quality control/quality assurance (QA/QC) tests on all fuel sample batches completed for this report.

Our review of the QA/QC data provided by PNA did not identify any QA/QC concerns which would significantly affect our conclusions regarding the chemical analytical data. It is EC-NW's opinion that the laboratory data are acceptable for their intended use.

Pacific
Northern
Analytical, Inc.

April 15, 1994

Don Clabaugh
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Don:

Enclosed are the analytical results of samples submitted on April 08, 1994 from project Wade & Wells, 1022.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 4, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**B1-C**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	97%		65%-111%
4-Bromofluorobenzene	93%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 4, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**B2-C**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	94%		65%-111%
4-Bromofluorobenzene	88%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 6, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**B3-1**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	93%		65%-111%
4-Bromofluorobenzene	87%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 6, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**B3-2**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	89%		65%-111%
4-Bromofluorobenzene	83%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**RO-1**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	101%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**RO-2**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	89%		65%-111%
4-Bromofluorobenzene	85%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 8, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**WP-1**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	73%		65%-111%
4-Bromofluorobenzene	70%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-1**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	71%		65%-111%
4-Bromofluorobenzene	76%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-2**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	90%		65%-111%
4-Bromofluorobenzene	88%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-3**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		65%-111%
4-Bromofluorobenzene	77%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-4**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	90%		65%-111%
4-Bromofluorobenzene	85%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-5**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	90%		65%-111%
4-Bromofluorobenzene	88%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 11, 1994
Client Sample ID:	**OP-6**	Date Analyzed:	April 12, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	74%		65%-111%
4-Bromofluorobenzene	83%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Extracted:	April 11, 1994
Project Name:	Wade & Wells	Date Analyzed:	April 12, 1994
Project Number:	1022	Dilution Factor:	1
Sample ID:	**Method Blank**	**Units:**	**mg/kg**
Laboratory Batch #	01172		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	97%		65%-111%
4-Bromofluorobenzene	89%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Extracted:	April 11, 1994
Project Name:	Wade & Wells	Date Analyzed:	April 12, 1994
Project Number:	1022	Sample Matrix:	Soil
Batch Sample ID:	**01172 QA**	**Units:**	**mg/kg**
Laboratory Batch #	01172		

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	N.D.	N.D.	--	20%	
Benzene	0.050	N.D.	N.D.	--	20%	
Toluene	0.050	N.D.	N.D.	--	20%	
Ethylbenzene	0.050	N.D.	N.D.	--	20%	
m- & p-Xylene	0.050	N.D.	N.D.	--	20%	
o-Xylene	0.050	N.D.	N.D.	--	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	1.0	88%	60%-140%	88%	<1%	20%
o-Xylene	1.0	86%	60%-140%	86%	<1%	20%

Notes

N.D.-Not detected above the reporting limit.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 4, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15,1994
Client Sample ID:	**B1-C**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	37		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 4, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**B2-C**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	44		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 6, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**B3-1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	32		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 6, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**B3-2**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	34		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**HEC1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	40		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**RO-1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	32		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**RO-2**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	68		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 8, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**WP-1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	180		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 8, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**EP-1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	86		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-1**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	99		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-2**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	49		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-3**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	57		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-4**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	52		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-5**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	576		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Client:	ERM Northwest	Date Sampled:	April 7, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 14-15, 1994
Client Sample ID:	**OP-6**	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	53		30

Notes

Sample results have been corrected to their dry weight values.

WTPH-418.1

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wade & Wells	Date Extracted:	April 14-15, 1994
Project Number:	1022	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Sample ID:	**Method Blank**	**Units:**	**mg/kg**

Analyte	Dilution Factor	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	1	N.D.		30

Batch Sample ID:	**01172 QA**				**Units:**	**mg/kg**
Analyte	Reporting Limit	Dilution Factor	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons	30	1	86	78	10%	20%

Notes

N.D.-Not detected above the given reporting limit

WTPH-418.1
Quality Control Data

Client:	ERM Northwest		
Project Name:	Wade & Wells	Date Extracted:	April 14-15, 1994
Project Number:	1022	Date Analyzed:	April 15, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Sample ID:	**Method Blank**	**Units:**	**mg/kg**

Analyte	Dilution Factor	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons	1	N.D.		30

Batch Sample ID:	**01172 QA**				**Units:**	**mg/kg**
Analyte	Reporting Limit	Dilution Factor	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons	30	1	53	49	8%	20%

Notes

N.D.-Not detected above the given reporting limit

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-2-SE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	79%		65%-111%
4-Bromofluorobenzene	86%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-2-NE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	82%		65%-111%
4-Bromofluorobenzene	89%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-3-NW**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	74%		65%-111%
4-Bromofluorobenzene	78%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-3-SW**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	81%		65%-111%
4-Bromofluorobenzene	87%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-3-SE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	79%		65%-111%
4-Bromofluorobenzene	81%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-3-NE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	86%		65%-111%
4-Bromofluorobenzene	92%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 22, 1994
Project Number:	94023.00	Date Analyzed:	June 22, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01370	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	100%		65%-111%
4-Bromofluorobenzene	100%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 22, 1994
Project Number:	94023.00	Date Analyzed:	June 22, 1994
Batch Sample ID:	**01370 QA**	Sample Matrix:	Soil
Laboratory Batch #	01370	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	3.2	3.2	<1%	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Gasoline	50	100%	60%-140%	97%	3%	20%

Notes

N.D.-Not detected above the reporting limit.

Moisture Content Report

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	June 17, 1994
Project Number:	94023.00	Date Received:	June 20, 1994
Laboratory Batch #	01370	Date Analyzed:	June 22, 1994
Units:	% Moisture	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
BP-1-NW	9%		1%
BP-1-SW	12%		1%
BP-1-SE	15%		1%
BP-1-NE	9%		1%
BP-2-NW	6%		1%
BP-2-SW	7%		1%
BP-2-SE	9%		1%
BP-2-NE	13%		1%
BP-3-NW	20%		1%
BP-3-SW	9%		1%
BP-3-SE	13%		1%
BP-3-NE	9%		1%

Pacific Northern Analytical

Chain of Custody/Analysis Request Form
Laboratory Batch Number: 01378

Client: ERM-EC | Report to: Mike Arnold | Project Name: Birchmount | Project Number: 94023.00

Address: 2821 Northup Way, Suite 100, Bellevue, WA 98004
Phone Number: 206 827 9440
Fax Number: 206 827 2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
-1 BP-1-NW	6/17/94	0942	Soil	1									/							
-2 BP-1-SW		0945		1									/							
-3 BP-1-SE		0950		1									/							
-4 BP-1-NE		0953		1									/							
-5 BP-2-NW		0959		1									/							
-6 BP-2-SW		1001		1									/							
-7 BP-2-SE		1005		1									/							
-8 BP-2-NE		1008		1									/							
-9 BP-3-NW		1016		1									/							
-10 BP-3-SW	↓	1019	↓	1									/							

P.O.#
Bill to:

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed_____

Sample Receipt:
Condition_____
Cool? Yes No

Comments/Special Instructions:

Relinquished By: Date:
Company: Time:
Received By: Date:
Company: Time:

Relinquished By: Date:
Company: Time:
Received By: Date:
Company: Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pacific Northern Analytical

Chain of Custody/Analysis Request Form
Laboratory Batch Number: 01370

Client: ERM-EC Report to: Mike Arnold Project Name: Birchmount Project Number: 94023.00

Address:

Phone Number: 206 827-9440

Fax Number:

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
-1 BP-3-SE	6/17/94	1022	Soil	1									/							
-2 BP-3-NF	↓	1026	↓	1									/							
-3																				
-4																				
-5																				
-6																				
-7																				
-8																				
-9																				
-10																				

P.O.#
Bill to:

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed 6/27/94

Sample Receipt:
Condition
Cool? Yes No N/S

Comments/Special Instructions:

Relinquished By: [signature] Date: 6/20/94
Company: ERM-EC Time: 1200 noon
Received By: [signature] Date: 6/20/94
Company: DNA Time: 15:00

Relinquished By: Date:
Company: Time:
Received By: Date:
Company: Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pacific
Northern
Analytical, Inc.

July 7, 1994

Mike Arnold
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Mike:

Enclosed are the analytical results of samples submitted on June 28, 1994 from project Birchmount, 94023.00.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 24, 1994
Project Name:	Birchmount	Date Received:	June 28, 1994
Project Number:	94023.00	Date Extracted:	June 29, 1994
Client Sample ID:	**BP-3-SW**	Date Analyzed:	June 29, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	80%		65%-111%
4-Bromofluorobenzene	90%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 24, 1994
Project Name:	Birchmount	Date Received:	June 28, 1994
Project Number:	94023.00	Date Extracted:	June 29, 1994
Client Sample ID:	**BP-3-SE**	Date Analyzed:	June 29, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		65%-111%
4-Bromofluorobenzene	93%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 24, 1994
Project Name:	Birchmount	Date Received:	June 28, 1994
Project Number:	94023.00	Date Extracted:	June 29, 1994
Client Sample ID:	**BP-3-NE**	Date Analyzed:	June 29, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 24, 1994
Project Name:	Birchmount	Date Received:	June 28, 1994
Project Number:	94023.00	Date Extracted:	June 29, 1994
Client Sample ID:	**A-1**	Date Analyzed:	June 29, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	84%		65%-111%
4-Bromofluorobenzene	95%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 24, 1994
Project Name:	Birchmount	Date Received:	June 28, 1994
Project Number:	94023.00	Date Extracted:	June 29, 1994
Client Sample ID:	**A-2**	Date Analyzed:	June 29, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G
Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 29, 1994
Project Number:	94023.00	Date Analyzed:	June 29, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01394	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	93%		65%-111%
4-Bromofluorobenzene	95%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 29, 1994
Project Number:	94023.00	Date Analyzed:	June 29, 1994
Batch Sample ID:	**01403 QA**	Sample Matrix:	Soil
Laboratory Batch #	01394	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	36	52	36%	20%	L

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	1	90%	60%-140%	84%	7%	20%
o-Xylene	1	91%	60%-140%	84%	8%	20%

Notes

L-RPD outside control limits due to low analyte concentration.

Total Metals Analyses

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	June 24, 1994
Project Number:	94023.00	Date Received:	June 28, 1994
Client Sample ID:	**A-1**	Date Digested:	July 6, 1994
Laboratory Batch #	01394	Date Analyzed:	July 7, 1994
Units:	**mg/kg**	Sample Matrix:	Soil

Analyte	Method	Sample Result	Notes	Reporting Limit
Arsenic	7060	8.28		0.5

Total Metals Analyses

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	June 24, 1994
Project Number:	94023.00	Date Received:	June 28, 1994
Client Sample ID:	**A-2**	Date Digested:	July 6, 1994
Laboratory Batch #	01394	Date Analyzed:	July 7, 1994
Units:	mg/kg	Sample Matrix:	Soil

Analyte	Method	Sample Result	Notes	Reporting Limit
Arsenic	7060	7.10		0.5

Metals Analyses
Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount		
Project Number:	94023.00	Date Digested:	July 6, 1994
Laboratory Batch #	01394	Date Analyzed:	July 7, 1994
Sample ID:	**Method Blank**	**Units:**	**mg/kg**

Analyte	Method	Sample Result	Notes	Reporting Limit
Arsenic	7060	N.D.		0.5

Notes

N.D.-Not detected above the reporting limit.

Metals Analyses
Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Digested:	July 6, 1994
Project Number:	94023.00	Date Analyzed:	July 7, 1994
Laboratory Batch #	01394	Sample Matrix:	Soil
Sample ID:	**01394 QA**	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Spike Added	Percent Recovery	Acceptance Range
Arsenic	0.5	7.10	6.80	4.3%	20%	3.77	119%	75%-125%

Moisture Content Report

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	June 24, 1994
Project Number:	94023.00	Date Received:	June 28, 1994
Laboratory Batch #	01394	Date Analyzed:	June 30, 1994
Units:	**% Moisture**	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
BP-3-NW	9%		1%
BP-3-SW	8%		1%
BP-3-SE	9%		1%
BP-3-NE	10%		1%
A-1	8%		1%
A-2	8%		1%

01394

Pacific Northern Analytical

Chain of Custody/Analysis Request Form

Laboratory Batch Number: _____

Client: ERM-EC Report to: Mike Arnold Project Name: Birchmount Project Number: 94023.00

Address: 2821 Northup Way
Suite 100
Bellevue WA 98004

Phone Number: 206 827 9440

Fax Number: 206 827 2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/TOX/TX
-1 BP-3-NW	6/24/94	1518	Soil	1									/					Amt	Amt	
-2 BP-3-SW		1521		1									/					Amt	Amt	
-3 BP-3-SE		1525		1									/							
-4 BP-3-NE		1529		1									/							
-5 A-1		1535		2									/					/		
-6 A-2		1540		2									/					/		
-7																				
-8																				
-9																				
-10																				

P.O.#: _____
Bill to: _____

Turnaround Requested:
___ 24 hr (+100%)
___ 48 hr (+50%)
Date needed: 7/5/94

Sample Receipt:
Condition: _____
Cool? Yes No

Comments/Special Instructions:
Metals: Total Arsenic (samples A-1 and A-2 only)

Relinquished By: _____ Date: 6/28/94
Company: ERM-EC Time: 9:55 am
Received By: _____ Date: 6/28/94
Company: PNA Time: 9:55 am

Relinquished By: _____ Date: _____
Company: _____ Time: _____
Received By: Jeanne Dubert Date: 6/28/94
Company: PNA Time: 10:05 AM

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pacific
Northern
Analytical, Inc.

July 20, 1994

Mike Arnold
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Mike:

Enclosed are the analytical results of samples submitted on July 18, 1994 from project Birchmount, 94023.00.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	July 15, 1994
Project Name:	Birchmount	Date Received:	July 18, 1994
Project Number:	94023.00	Date Extracted:	July 18, 1994
Client Sample ID:	**BP-3**	Date Analyzed:	July 19, 1994
Laboratory Batch #	01454	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	84%		65%-111%
4-Bromofluorobenzene	93%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	July 15, 1994
Project Name:	Birchmount	Date Received:	July 18, 1994
Project Number:	94023.00	Date Extracted:	July 18, 1994
Client Sample ID:	**BP-2**	Date Analyzed:	July 19, 1994
Laboratory Batch #	01454	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	82%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	July 15, 1994
Project Name:	Birchmount	Date Received:	July 18, 1994
Project Number:	94023.00	Date Extracted:	July 18, 1994
Client Sample ID:	**BP-1**	Date Analyzed:	July 19, 1994
Laboratory Batch #	01454	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	88%		65%-111%
4-Bromofluorobenzene	100%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	July 18, 1994
Project Number:	94023.00	Date Analyzed:	July 18, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01454	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	99%		65%-111%
4-Bromofluorobenzene	109%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	July 18, 1994
Project Number:	94023.00	Date Analyzed:	July 18, 1994
Batch Sample ID:	**01454 QA**	Sample Matrix:	Soil
Laboratory Batch #	01454	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	N.D.	3.0	--	20%	L

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Gasoline	50	93%	60%-140%	95%	2%	20%

Notes

L-RPD unavailable due to low analyte concentration.

N.D.-Not detected above the reporting limit.

Pacific Northern Analytical

Chain of Custody/Analysis Request Form
Laboratory Batch Number: 01454

Client: ERM-EC | Report to: Mike Arnold | Project Name: Birchmount | Project Number: 94023.00

Address: 2821 Northup Way
Suite 100
Bellevue WA 98004

Phone Number: 827 9440
Fax Number: 827 2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
-1 BP-3	7/15/94	0730	Soil										/							
-2 BP-2	↓	1555	↓										/							
-3 BP-1	↓	0930	↓										/							
-4																				
-5																				
-6																				
-7																				
-8																				
-9																				
-10																				

P.O.#
Bill to:

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed 7/25/94

Sample Receipt:
Condition
Cool? Yes No

Comments/Special Instructions:

Relinquished By: [signature] Date: 7/18/94
Company: ERM-EC Time: 1325
Received By: [signature] Date: 7/18/94
Company: PNA Time: 1325

Relinquished By: Date:
Company: Time:
Received By: Date:
Company: Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pacific
Northern
Analytical, Inc.

August 30, 1994

Mike Arnold
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Mike:

Enclosed are the analytical results of samples submitted on August 18, 1994 from project Birchmount , 94023.00 .

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215

DOE WTPH-D Extended

Client:	ERM Northwest	Date Sampled:	August 12, 1994
Project Name:	Birchmount	Date Received:	August 18, 1994
Project Number:	94023	Date Extracted:	August 19, 1994
Client Sample ID:	**OP-5**	Date Analyzed:	August 27, 1994
Laboratory Batch #	01592	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	64		15
Total Petroleum Hydrocarbons as Motor Oil (Beyond tetracosane)	890		50

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	101%		50%-150%

Notes

Sample results have been corrected to their dry weight values.

Moisture Content Report

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	August 12, 1994
Project Number:	94023	Date Received:	August 18, 1994
Laboratory Batch #	01592	Date Analyzed:	August 23, 1994
Units:	**% Moisture**	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
OP-5	2%		1%

Pacific Northern Analytical

Chain of Custody/Analysis Request Form
Laboratory Batch Number:_____

Client: ERM-EC Report to: Mike Arnold Project Name: Birchmount Project Number: 94023.00

Address: 2821 Northup Way
Suite 100
Bellevue WA 98004-1439

Phone Number: 206 827 9440

Fax Number: 206 827 2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
-1 OP-5	8/12/94	1430	Soil	1													/			
-2																				
-3																				
-4																				
-5																				
-6																				
-7																				
-8																				
-9																				
-10																				

P.O.#_____
Bill to:_____

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed_____

Sample Receipt:
Condition_____
Cool? Yes No

Comments/Special Instructions:

Relinquished By: [signature] Date: 8/18/94
Company: ERM-EC Time: 9:30am
Received By: [signature] Date: 8/18/94
Company: DNA Time: 9:30a

Relinquished By:_____ Date:_____
Company:_____ Time:_____
Received By:_____ Date:_____
Company:_____ Time:_____

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator Ilow - Lab; Pink - Retained by Originator

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	April 6, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 13, 1994
Client Sample ID:	**B3-1**	Date Analyzed:	April 13, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	99%		50%-150%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	April 8, 1994
Project Name:	Wade & Wells	Date Received:	April 8, 1994
Project Number:	1022	Date Extracted:	April 13, 1994
Client Sample ID:	**EP-1**	Date Analyzed:	April 13, 1994
Laboratory Batch #	01172	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	105%		50%-150%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-D

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wade & Wells	Date Extracted:	April 13, 1994
Project Number:	1022	Date Analyzed:	April 13, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01172	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	135%		50%-150%

		Date Extracted:	April 13, 1994
Batch Sample ID:	**01172 QA**	Date Analyzed:	April 13, 1994
Units:	**mg/kg**	Sample Matrix:	Soil

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	15	N.D.	N.D.	--	24%

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	100	87%	60%-140%	79%	10%	27%

Notes

N.D.-Not detected above the reporting limit.

Moisture Content Report

Client:	ERM Northwest		
Project Name:	Wade & Wells	Date Sampled:	April 7, 1994
Project Number:	1022	Date Received:	April 8, 1994
Laboratory Batch #	01172	Date Analyzed:	April 12, 1994
Units:	**% Moisture**	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
B1-C	9%		1%
B2-C	6%		1%
B3-1	7%		1%
B3-2	12%		1%
HEC1	7%		1%
RO-1	5%		1%
RO-2	12%		1%
WP-1	11%		1%
EP-1	9%		1%
OP-1	21%		1%
OP-2	16%		1%
OP-3	15%		1%
OP-4	13%		1%
OP-5	13%		1%
OP-6	9%		1%

The ERM Group

SDG# _____ COMPLETE ☐ INCOMPLETE ☐

~~Sample~~ Chain of Custody

W.O.No.: 1022 | Project Name: Wadell + Wells

Sampler: Don Clabaugh

	ERM T.R. Number	Date	Time	COMP	GRAB	Sample Location	Number of Containers	WTPH-G/BTEX	WTPH-418.1					Remarks
-10	OP-1	4/7	3:00		X	Beneath old P.lc	1	X	X					
-11	OP-2	↓	↓		↓	↓	1	X	X					
-12	OP-3						1	X	X					
-13	OP-4						1	X	X					
-14	OP-5						1	X	X					
-15	OP-6						1	X	X					

Sample Relinquished	Date	Time	Sample Received by:	Date	Time	Reason for Transfer
Don Clabaugh	4/4	6:00	Clausing	4/8/14	5:50p	

copy ____ turned ____ M for ____ link cc ____ ned b ____ ler. C ____ py ext ____ ded (warehouse)

The ERM Group

SDG#________ COMPLETE ☐ INCOMPLETE ☐

~~Sample~~ Chain of Custody

W.O.No.: 1022

Project Name: Wade + wells

Sampler: Don Clabaugh

	ERM T.R. Number	Date	Time	COMP	GRAB	Sample Location	Number of Containers	WTPH-G/BTEX	WTPH-418.1	WTPH-D				Remarks
-1	B1-C	4/4	2:45	X		Prerem. beneath B1	1	✓	✓					
-2	B2-C	4/4	1:30	X		Prerem. beneath B2	1	✓	✓					
-3	B3-1	4/6	2:00		X	Prerem West B3	1	✓	✓	✓				
-4	B3-2	4/6	2:18		X	Prerem East B3	1	✓	✓					
-5	HEC1	4/~~8~~7	2:30	X		Bottom DSA exc. sample	1		✓					
-6	Ro-1	4/7	3:15		X	Runoff east OP	1	✓	✓					
-7	Ro-2	4/7	3:30		X	Runoff south OP	1	✓	✓					
-8	WP-1	4/8	9:30		X	soil beneath west pile	1	✓	✓					
-9	EP-1	4/8	9:40		X	soil beneath east pile	1		✓	✓				

Sample Relinquished	Date	Time	Sample Received by:	Date	Time	Reason for Transfer
Don Clabaugh	4/4	6:00	Chamsy	4/8/94	5:50 p	

COPIES: White ... Yellow copies accompany sample shipment to laboratory. Yellow copy retained by laboratory ... copy to be returned to ERM for files. Pink copy retained by sampler. Gold copy extra copy ... warehouse

Pacific
Northern
Analytical, Inc.

June 3, 1994

Mike Arnold
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Mike:

Enclosed are the analytical results of samples submitted on May 31, 1994 from project Birchmount, 94023.00.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-1-SW**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	87%		65%-111%
4-Bromofluorobenzene	97%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-1-NW**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	89%		65%-111%
4-Bromofluorobenzene	98%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-1-NE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	89%		65%-111%
4-Bromofluorobenzene	99%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-1-SE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	84%		65%-111%
4-Bromofluorobenzene	96%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-2-NW**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	90%		65%-111%
4-Bromofluorobenzene	101%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-2-NE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	87%		65%-111%
4-Bromofluorobenzene	97%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-2-SE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	87%		65%-111%
4-Bromofluorobenzene	99%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-2-SW**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	86%		65%-111%
4-Bromofluorobenzene	98%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-3-NW**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	86%		65%-111%
4-Bromofluorobenzene	96%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-3-SE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	83%		65%-111%
4-Bromofluorobenzene	95%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 29, 1994
Project Name:	Birchmount	Date Received:	May 31, 1994
Project Number:	94023.00	Date Extracted:	June 2, 1994
Client Sample ID:	**BP-3-NE**	Date Analyzed:	June 2, 1994
Laboratory Batch #	01302	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	84%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 2, 1994
Project Number:	94023.00	Date Analyzed:	June 2, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01302	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	93%		65%-111%
4-Bromofluorobenzene	98%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G

Quality Control Data

Client:	ERM Northwest		
Project Name:	Birchmount	Date Extracted:	June 2, 1994
Project Number:	94023.00	Date Analyzed:	June 2, 1994
Batch Sample ID:	**01300 QA**	Sample Matrix:	Soil
Laboratory Batch #	01302	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	80	62	25%	20%	L

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Gasoline	50	97%	60%-140%	84%	14%	20%

Notes

L-RPD outside control limits due to low analyte concentration.
N.D.-Not detected above the reporting limit.

Moisture Content Report

Client:	ERM Northwest		
Project Name:	Birchmount	Date Sampled:	May 29, 1994
Project Number:	94023.00	Date Received:	May 31, 1994
Laboratory Batch #	01302	Date Analyzed:	June 3, 1994
Units:	**% Moisture**	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
BP-1-SW	3%		1%
BP-1-NW	5%		1%
BP-1-NE	6%		1%
BP-1-SE	8%		1%
BP-2-NW	5%		1%
BP-2-NE	10%		1%
BP-2-SE	5%		1%
BP-2-SW	6%		1%
BP-3-NW	7%		1%
BP-3-SW	10%		1%
BP-3-SE	6%		1%
BP-3-NE	6%		1%

01302

Pacific Northern Analytical

Chain of Custody/Analysis Request Form

Laboratory Batch Number:_____

Client: ERM-EC | Report to: Mike Arnold | Project Name: Birchmount | Project Number: 94023.00

Address: 2821 Northup Way
Suite 100
Bellevue WA 98004-1439

Phone Number: (206) 827-9440

Fax Number: (206) 827-2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX	WTPH-G
-1 BP-1-SW	5/29/94	1515	So.:l																		/
-2 BP-1-NW		1520																			/
-3 BP-1-NE		1525																			/
-4 BP-1-SE		1528																			/
-5 BP-2-NW		1530																			/
-6 BP-2-NE		1533																			/
-7 BP-2-SE		1536																			/
-8 BP-2-SW		1540																			/
-9 BP-3-NW		1545																			/
-10 BP-3-SW	↓	1547	↓																		/

P.O.#_____
Bill to:_____

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed 6/7/94

Sample Receipt:
Condition_____
Cool? Yes No

Comments/Special Instructions:

Relinquished By: [signature] Date: 6/31/94
Company: ERM-EC Time: 1718
Received By: RJ Brown Date: 5/31/94
Company: PNA Time: 5:17 PM

Relinquished By:_____ Date:_____
Company:_____ Time:_____
Received By:_____ Date:_____
Company:_____ Time:_____

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator Yellow - Lab; Pink - Retained by Originator

01302

Pacific Northern Analytical

Chain of Custody/Analysis Request Form

Laboratory Batch Number:_____

Client: ERM-EC Report to: Mike Arnold Project Name: Birchmount Project Number: 94023-00

Address: 2821 Northup Way
Suite 100
Bellevue WA 98004-1439

Phone Number: (206) 827-9440

Fax Number: (206) 827-2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX	WTPH-G
-1 BP-3-SE	5/29/94	1551	Soil																		/
-2 BP-3-NE	5/29/94	1555	Soil																		/
-3																					
-4																					
-5																					
-6																					
-7																					
-8																					
-9																					
-10																					

P.O.#_____
Bill to:_____

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed 6/7/94

Sample Receipt:
Condition_____
_____
Cool? Yes No

Comments/Special Instructions:

Relinquished By: [signature] Date: 5/31/94
Company: ERM-EC Time: 1718
Received By: R.J. Brown Date: 5/31/94
Company: PNA Time: 5:17 PM

Relinquished By:_____ Date:_____
Company:_____ Time:_____
Received By:_____ Date:_____
Company:_____ Time:_____

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator Yellow - Lab; Pink - Retained by Originator

Pacific
Northern
Analytical, Inc.

June 23, 1994

Mike Arnold
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Mike:

Enclosed are the analytical results of samples submitted on June 20, 1994 from project Birchmount, 94023.00.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • FAX 881-8215

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-1-SW**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	5.0		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	82%		65%-111%
4-Bromofluorobenzene	88%		63%-111%

Notes

Sample results have been corrected to their dry weight values.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-1-SE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	3.9		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	75%		65%-111%
4-Bromofluorobenzene	82%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-1-NE**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	80%		65%-111%
4-Bromofluorobenzene	87%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-2-NW**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	87%		65%-111%
4-Bromofluorobenzene	93%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	June 17, 1994
Project Name:	Birchmount	Date Received:	June 20, 1994
Project Number:	94023.00	Date Extracted:	June 22, 1994
Client Sample ID:	**BP-2-SW**	Date Analyzed:	June 22, 1994
Laboratory Batch #	01370	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	5.5		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	83%		65%-111%
4-Bromofluorobenzene	91%		63%-111%

Notes

Sample results have been corrected to their dry weight values.