AGRA
ENGINEERING GLOBAL SOLUTIONS

AGRA Earth & Environmental, Inc.
11335 NE 122nd Way
Suite 100
Kirkland, Washington
USA 98034-6918
Tel (425) 820-4669
Fax (425) 821-3914

June 17, 1999
9-91M-12004-B

Pierce County
Department of Public Works and Utilities
Transportation Services
1420 – 112th Street E.
Tacoma, WA, 98445-3716

Attention: Pete Scarafiotti

Subject: **Petroleum Impacted Soil Stockpile Sampling Results (May 1999)**
Purdy Shop
13209 Goodnough Drive.
Purdy, Washington

Dear Mr. Scarafiotti:

On May 20, 1999 AGRA Earth & Environmental, Inc. (AGRA) revisited the subject site and collected five discrete soil samples from the contaminated soil stockpile. The soil samples were collected from random locations at depths ranging between 6 to 8 inches below stockpile surface. All samples were placed into prepared glass containers using dedicated nitrile gloves, and a decontaminated hand spade. Following collection samples were placed in an iced cooler, and subsequently shipped to AGRA's Portland laboratory for analysis following AGRA's chain-of-custody protocol. The laboratory analytical results are shown in Table 1.

TABLE 1
LABORATORY ANALYTICAL RESULTS

Sample	PS-1	PS-2	PS-3	PS-4	PS-5	Soil Classifications	
						Class 2 soils	Class 3 soils
Gasoline	12(a)	22(a)	ND	32(a)	10(a)	5-100	100-250
Benzene	ND	ND	ND	ND	ND	0.005-0.5	≤0.5
Toluene	ND	ND	ND	ND	ND	0.005-40	≤40
Ethylbenzene	ND	ND	ND	ND	ND	0.005-20	≤20
Total Xylene	ND	ND	ND	ND	ND	0.005-20	≤20
Diesel	93	110	75	110	100	25-200	200-500
Fuel/Lube Oil	<100	<100	<100	<100	<100	60-200	200-2000

Notes: All concentrations are in parts per million (ppm).
ND denotes non-detect.
(a) = Results are quantified as gasoline, but the chromatographic pattern does not match that of the standard.

Based on the soil analytical data, the soils at the Purdy Public Works Site are currently classified as Class 2 soils. Appropriate uses for Class 2 soils as detailed by MTCA standards include backfill at the cleanup site, fill in commercial or industrial areas, cover or fill in permitted landfills, or as a road subgrade or other road construction fill. The soils may not be placed near wetlands, surface water bodies, groundwater aquifer recharge areas, drinking water wells, or utility trenches.

AGRA recommends that a copy of this letter be submitted to both the Washington Department of Ecology and the Tacoma Pierce County Health Department. These agencies should also be notified of the final destination of the Class 2 soil stockpile. AGRA would be pleased to submit this information to these agencies if requested.

If you have any further questions or concerns please feel free to contact us at 425-820-4669.

Sincerely,

Derek B. Pulvino
Staff Scientist

Jeffrey Kasper
Project Environmental Geologist

Enclosures: Laboratory Analytical Test Certificates
Appropriate End Uses for Petroleum Contaminated Soil

DBP/JK/beh

AGRA
ENGINEERING GLOBAL SOLUTIONS

AGRA Earth & Environmental, Inc.
7477 SW Tech Center Drive
Portland, Oregon
USA 97223-8025
Tel (503) 639-3400
Fax (503) 620-7892

June 2, 1999

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, WA 98034

Attention: Jeffery Kaspar

Dear: Mr. Kaspar:

RE: Analytical Results For Project 9-91M-12004-~~A~~ B

Attached are the results for the samples submitted on May 21, 1999 from the above referenced project. For your reference, our project number associated with these samples is WA990459.

The samples were analyzed at the AGRA Earth & Environmental Portland Chemistry Laboratory.

All analyses were conducted in accordance with applicable QA/QC guidelines. The results apply only to the samples submitted.

Please feel free to contact me if you have any questions regarding this report, or if I can be of any assistance in any other matter.

Respectfully submitted,

AGRA Earth & Environmental

Sean Gormley
Laboratory Manager

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 6/1/99
Report No.: 99045905
C.O.C. No.: 5518

Semi-Volatile Petroleum Hydrocarbons
NWTPH-Dx
mg/kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	Sample Date	Extraction Date	Analysis Date	Diesel Result	Fuel/Lube Oil Result	Surrogate Recovery O-Terphenyl
EP-1	459-1	5/20/99	5/25/99	5/28/99	230(a)	100	(b)
EP-2	459-2	5/20/99	5/25/99	5/28/99	180(a)	110	142
EP-3	459-3	5/20/99	5/25/99	5/29/99	200(a)	140	136
EP-4	459-4	5/20/99	5/25/99	5/29/99	200(a)	190	136
EP-5	459-5	5/20/99	5/25/99	5/29/99	190(a)	140	133
Lab Blank	459-MB	5/25/99	5/25/99	5/27/99	<25	<100	82

Acceptance Criteria: 50%-150%

(a) Peaks were present in the diesel range, but the chromatographic pattern suggests the possible presence of hydraulic fluid, rather than diesel.
(b) Not applicable due to the presence of interfering chromatographic peaks from elevated concentrations of target compounds which prevented determination of the surrogate.

Signature of Chemist

QA/QC Review

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 6/1/99
Report No.: 99045906
C.O.C. No.: 5518

QC Data Report - Duplicate Summary
Semi-Volatile Petroleum Hydrocarbons
NWTPH-Dx
mg/kg(ppm)
Dry Weight Basis

Sample Name:	EP-1	Sample	Relative Percent
Lab Code:	459-1	Duplicate	Difference
Diesel:	230	220	4
Fuel/Lube Oil:	100	110	10
Acceptance Limits:	~	~	<25
Sample Date:	5/20/99	5/20/99	~
Extraction Date:	5/25/99	5/25/99	~
Analysis Date:	5/28/99	5/29/99	~
Surrogate Recovery:			**Control Limits**
O-Terphenyl:	(a)	148%	50%-150%

(a) Not applicable due to the presence of chromatographic peaks from target and nontarget compounds which prevented determination of the surrogate.

Signature of Chemist

QA/QC Review

AGRA
ENGINEERING GLOBAL SOLUTIONS

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 5/27/99
Report No.: 990459
C.O.C. No.:

Gasoline Range Petroleum Hydrocarbons & BTEX
EPA Methods 5030/8021B and WDOE/ODEQ Method NWTPH-Gx
mg/kg(ppm)
Dry Weight Basis

Sample Name:	EP-1	EP-2	EP-3	EP-4	EP-5	Lab Blank	**Method Reporting Limit**
Lab Code:	459-1	459-2	459-3	459-4	459-5	459-MB	
Gasoline:	ND	ND	ND	ND	ND	ND	5.0
Benzene:	ND	ND	ND	ND	ND	ND	0.05
Toluene:	ND	ND	ND	ND	ND	ND	0.05
Ethylbenzene:	ND	ND	ND	ND	ND	ND	0.05
Total Xylenes:	ND	ND	ND	ND	ND	ND	0.15
Sample Date:	5/20/99	5/20/99	5/20/99	5/20/99	5/20/99	5/24/99	
Extraction Date:	5/24/99	5/24/99	5/24/99	5/24/99	5/24/99	5/24/99	
Analysis Date:	5/26/99	5/26/99	5/26/99	5/26/99	5/26/99	5/25/99	**AEE Acceptance Limits**
Surrogate Recovery: (a,a,a-Trifluorotoluene):							
Gasoline Analysis(FID):	92%	83%	85%	82%	84%	98%	57%-143%
BTEX Analysis(PID):	86%	76%	78%	77%	77%	104%	47%-136%

ND Not Detected

Signature of Chemist

QA/QC Review

AGRA
ENGINEERING GLOBAL SOLUTIONS

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 5/27/99
Report No.: 99045902
C.O.C. No.: 5518

QC Data Report
Blank Spike Recoveries
Gasoline Range Petroleum Hydrocarbons & BTEX
EPA Methods 5030/8021B & WDOE/ODEQ Method NWTPH-Gx
mg/kg(ppm)
As Received Basis

Sample Name: / **Lab Code:**	Lab Blank 459-MB	Spike Level (mg/kg)	Blank Spike (BS)	Percent Recovery (BS)	Blank Spike Duplicate (BSD)	Percent Recovery (BSD)	Relative Percent Difference	AEE Acceptance Limits
Gasoline:	<5.0	25	23(a)	92	21(a)	84	9	66%-119%
Benzene:	<0.05	1.0	0.99	99	1.0	100	1	63%-130%
Toluene:	<0.05	1.0	1.0	100	1.1	110	10	67%-122%
Ethylbenzene:	<0.05	1.0	0.97	97	1.0	100	3	67%-121%
Total Xylenes:	<0.15	3.0	3.2	107	3.4	113	6	71%-124%
Sample Date:	5/24/99	~	5/24/99	~	5/24/99	~	~	
Extraction Date:	5/25/99	~	5/25/99	~	5/25/99	~	~	
Analysis Date:	5/25/99	~	5/26/99	~	5/26/99	~	**AEE Acceptance Limits**	
Surrogate Recovery (a,a,a-Trifluorotoluene):								
Gasoline Analysis(FID):	94%	~	104%(a)	~	99%(a)	~	57% - 143%	
BTEX Analysis(PID):	104%	~	86%	~	87%	~	47% - 136%	

ND Not Detected
Spike Source: Ultra Scientific RGO-601, Lot # M-0910
Spike Source: Accustandard WA-VPH Lot # A7060438

(a) Results from blank spikes analyzed on 5/25/99.

Signature of Chemist

QA/QC Review

AGRA
ENGINEERING GLOBAL SOLUTIONS

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 5/27/99
Report No.: 99045903
C.O.C. No.: 5518

QC Data Report
Duplicate Recoveries
Gasoline Range Organics
WDOE/ODEQ Method NWTPH-Gx
mg/kg(ppm)
Dry Weight Basis

Sample Name:	EP-1	Duplicate Sample	Relative Percent
Lab Code:	459-1	(mg/kg)	Difference
Gasoline:	<5.0	<5.0	(a)
Acceptance Limits:	~	~	<25
Sample Date:	5/20/99	5/20/99	~
Extraction Date:	5/24/99	5/24/99	~
Analysis Date:	5/26/99	5/26/99	**AEE**
Surrogate Recovery:			**Acceptance Limits**
a,a,a-Trifluorotoluene:	92%	95%	57%-143%

(a) Not applicable when sample concentration is less than the method reporting limit.

ND Not Detected

Signature of Chemist

QA/QC Review

AGRA
ENGINEERING GLOBAL SOLUTIONS

Project: Elk Plain Shop
Project No.: 9-91M-12004-A
Project Manager: Jeff Kaspar
Sample Matrix: Soil

Service Request No.: WA990459
Report Date: 5/27/99
Report No.: 99045904
C.O.C. No.: 5518

QC Data Report
Matrix Spike Recoveries
BTEX Compounds
EPA Methods 5030/8021B
mg/kg(ppm)

Sample Name: / **Lab Code:**	EP-1 459-1	Spike Level (mg/kg)	Matrix Spike (MS)	Percent Recovery (MS)	Matrix Spike Duplicate (DMS)	Percent Recovery (DMS)	AEE % Recovery Acceptance Limits	Relative Percent Difference (RPD)
Benzene	<0.05	1.0	0.91	91	0.90	90	59%-124%	1
Toluene	<0.05	1.0	0.93	93	0.92	92	62%-120%	1
Ethylbenzene	<0.05	1.0	0.89	89	0.88	88	54%-125%	1
Total Xylenes	<0.15	3.0	2.9	97	2.9	97	56%-130%	<1
Sample Date:	5/20/99	~	5/20/99	~	5/20/99	~	~	
Extraction Date:	5/24/99	~	5/24/99	~	5/24/99	~	~	
Analysis Date:	5/26/99	~	5/26/99	~	5/26/99	~	~	
Surrogate Recovery:							**AEE Acceptance Limits**	
a,a,a-Trifluorotoluene:	86%	~	79%	~	80%	~	47% - 136%	
4-Bromofluorobenzene:	93%	~	84%	~	83%	~	66% - 120%	

ND Not Detected
Spike Source: Accustandard WA-VPH Lot # A7060438

Signature of Chemist

QA/QC Review

AGRA
ENGINEERING GLOBAL SOLUTIONS

AGRA Earth & Environmental Portland Chemistry Laboratory
Sample Receipt Documentation Form

Project: Elk Plain Shop	Cooler Temperatures
SR No.:	3.8 4.8
Date: 5/21/99	3.1
Time: 10:35	
Temperature of Cooler Upon Receipt (Record to the Right):	3.7 5.3
Received By:	

Section One: Shipping/Delivery Issues

1.	Method of Sample Delivery: UPS			
2.	Airbill or Courier Receipt Number: 1Z8E12560140881000			
3.	Is a copy of the airbill or courier receipt available to be placed in the job file?	Yes	No	NA

Section Two: Sample Custody Issues

4.	Are custody seals on the shipping container intact?	Yes	No	NA
5.	Is a COC or other sample transmittal document present?	Yes	No	NA
6.	Is the COC complete?	Yes	No	NA
7.	Are the sample seals intact?	Yes	No	NA
8.	Does the COC match the samples received?	Yes	No	NA

Section Three: Sample Integrity Issues

9.	Are all sample containers intact and not leaking?	Yes	No	NA
10.	Are all samples preserved properly?	Yes	No	NA
11.	Are all samples within holding time for the required tests?	Yes	No	NA
12.	*Were all samples received at the proper temperature?	Yes	No	NA
13.	Are samples for volatiles and other headspace sensitive parameters free of headspace or bubbles?	Yes	No	NA

Section Four: Sample Containers Received:

14.	4 oz. glass jars: 10	19.	2oz. amber (MeOH):
15.	8 oz. glass jars: 10	20.	Encore samplers:
16.	40ml VOA vials:	21.	500ml plastic:
17.	1 liter glass:	22.	1liter plastic:
18.	Other (describe):		

*Temperatures for: water and soil samples = 4°C-6°C, MeOH jars = 25°C, air = not required

Reviewed By:

Laboratory Manager or Designee

5518

AGRA
ENGINEERING / GLOBAL SOLUTIONS
7477 SW Tech Center Drive
Portland, Oregon, U.S.A. 97223-8025
Tel (503)639-3400 Fax (503) 620-7892

CHAIN OF CUSTODY

PROJECT: Elk Plain Shop	PROJECT No.: 9-91M-12004-A
REPORT TO: Derek Pulvino	PHONE No.: 425-820-4669
PROJECT MANGER: Jeff Kasper	PHONE No.: Same
SAMPLER'S NAME (please print): Derek Pulvino	PHONE No.: Same
SAMPLER'S SIGNATURE:	

ANALYSIS REQUESTED (circle, check box or write preferred method in box)

SAMPLE I.D.	DATE	TIME	MATRIX	PRESERVATIVE	CONTAINERS No.	CONTAINERS VOL.	BTEX by EPA 602 / 8021	TPH-G	BTEX / TPH-G	TPH-HCID	TPH-D EXTENDED	TPH by EPA 8015 MODIFIED / 8015B	TPH-418.1 MODIFIED	TPH by EPA 418.1	GC / MS EPA 624 / EPA 8260 Volatiles	GC / MS EPA 625 / 8270 Semi-volatiles	VOCS EPA 601 / 602 or EPA 8021	PCBs EPA 608 / 8081 / 8082	LEAD EPA 6010 / EPA 7421 Total / Dissolved	TOTAL METALS	TCLP
1. EP-1	5-20	11:04	Soil	4°C	2	4oz Jar			X		X										
2. EP-2		11:07																			
3. EP-3		11:14																			
4. EP-4		11:20																			
5. EP-5		11:25																			
6.																					
7.																					
8.																					
9.																					
10.																					

SAMPLE RECEIPT	LABORATORY	TURNAROUND TIME	QC Reporting Requirements (Add'l charges may apply)	COMMENTS / INSTRUCTIONS
TOTAL # CONTAINERS: 10	SHIPPING I.D. / AIRBILL #	☐ 8 HOUR	☐ LEVEL I	
CONDITION OF CONTAINERS: Good	CARRIER	☐ 24 HOUR	☐ LEVEL II	
CONDITION OF SEALS: —	DOT DESIGNATION	☑ 1 WEEK	☐ LEVEL II w/project specific Duplicates/Spikes	
		☐ 2 WEEK (standard)	☐ Level III (Full validation package)	
		☐ OTHER ____		

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1. Derek Pulvino / Agra	May 6 99	3:25	1.		
2.			2.		
3.			3. AGRA	5/21/99	10:35

PAGE 1 OF 2

AGRA Earth & Environmental, Inc. (10/97)

TABLE V. END USE CRITERIA FOR PETROLEUM-CONTAMINATED SOILS

Analyte	Analytical Method	Soil Class (ppm) 1	2	3	4
Heavy fuel hydrocarbons (C24-C30)	WTPH-418.1 mod.	<60	60-200	200-2000	>2000
Diesel (C12-C24)	WTPH-D	<25	25-200	200-500	>500
Gasoline (C6-C12)	WTPH-G	<5	5-100	100-250	>250
Benzene	8020	<0.005	0.005-0.5	≤0.5	>0.5
Ethylbenzene	8020	<0.005	0.005-20	≤20	>20
Toluene	8020	<0.005	0.005-40	≤40	>40
Xylenes (total)	8020	<0.005	0.005-20	≤20	>20

Treatment is recommended for all Class 3 and 4 soils.

NOTES:

Class 1 Soil Uses:

Any use which will not cause threat to human health or the environment.

Class 2 Soil Uses:

Backfill at the cleanup site
Fill in commercial or industrial areas
Cover or fill in permitted landfills
Road subgrade or other road construction fill
Fill in or near: wetlands, surface water, ground water, drinking water wells or utility trenches is NOT recommended. Use as residential topsoil is also NOT recommended.

Class 3 Soil Uses:

Treatment
Disposal at the original site (no solid waste diposal permit needed)
Road construction (no solid waste diposal permit needed)
Use or disposal in permitted, municipal landfills
Permitted as a new PCS landfill
(An evaluation should be made to ensure that disposal will not cause a threat to human health or the environment, e.g. use near water bodies)

Class 4 Soil Uses:

Treatment
Disposal in a permitted, municipal landfill
Permitted as a new PCS landfill

4.4 RECORDKEEPING

Detailed records should be kept on treatment and disposal/placement of all PCS. Because the MTCA assigns liability to owners and operators of properties/facilities, these records are necessary to provide information concerning the treatment and final disposition of these soils. Items 1-8 should be documented prior to treatment. Items 9-10 are documented after treatment and disposal.

Specific items that should be documented include:

1. Origin owner and address of contaminated soil;
2. Owner name, address and phone number;
3. Engineering consultant name, project manager, address and phone;
4. Type of facility (e.g., gas station, spill);
5. Total volume of contaminated soil;
6. Type(s) and concentration of contaminant originally in soil (include analytical results from lab);
7. Name, address and contact name of firm providing treatment;
8. Type of treatment (e.g., bioremediation, thermal desorption, soil venting, asphalt incorporation);
9. Final concentrations of contaminants in soil (include analytical results from the lab); and
10. Final disposition of soil including address, property owner and operator, exact location of soil with map showing placement and depth.