

Sent 11/25/97

CHECK LIST FOR PERMANENT CLOSURE OF UNDERGROUND STORAGE TANK(S)

If closure information is different for individual tanks, please use a separate form for each tank

T115D
Removal
no replace

Business Name: Terminal 115
Site Owner/Operator: Port of Seattle
Site Address: 6020 6730 W Marginal Way SW
Telephone: (206) 728-3000

Site Identification (on invoice or available from Ecology if tank was reported): 006275

Local closure permit (if any) obtained from: Seattle Fire Dept "Temporary Underground Storage Tank Removal Permit (Receipt # 145737)
(Always contact local authorities regarding permit requirements)

Date tank(s) were closed: 12-19-89

Tank closure performed by:
Company/Individual: Meridian Excavation + Wrecking (removed) Uw Enviro Service (pump + cleaned)
Telephone: (206) 364-4750

Method of Closure: Removal In-Place Closure

If closed-in-place, type of fill material used: _____

Tank(s) Closed			
Tank ID Number (on notification form)	Age	Size (Gal.)	Last Material Stored
T-115D	16	10,000	gasoline

If removed, how will the tank(s) be disposed of: Scrap Landfill Other _____
please specify

Will the tanks be replaced by new underground tanks? Yes No

NOTE: If YES, you need to submit a notification form for the new tanks.

Was a site assessment completed? Yes No

If yes, was contamination found? Yes No

If yes, was the appropriate Regional Ecology Office Notified? Yes No

NOTE: The appropriate regional office of the Washington Department of Ecology should be contacted for assistance if contamination is found (see attached map). Records of the site closure must also be maintained at the site and must be available upon an inspector's request for at least three years after closure.

Inspecting Agency: _____ Inspector Name: _____

NOTE: This is generally the local fire department or agency enforcing the Uniform Fire Code; in some cases (usually involving contamination) it may be Ecology. In some instances there may be no inspecting agency.

Owner's Signature (or designated representative): Kathy L. Balouch

Title: Tank consultant Date: 11-25-97

Please return the completed form to:

Underground Storage Tank Section
Department of Ecology
M/S PV-11
Olympia, WA 98504-8711

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PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
REMOVAL OF ABANDONED UNDERGROUND GASOLINE TANK

T-115D
DECEMBER 19, 1989

This form is intended to provide a complete record of all activity relating to tank removal and disposal or closure in place. It contains all information required by federal, state and local regulations.

NOTE: Tank removal and disposal must be conducted in accordance with the latest versions of: American Petroleum Institute (API) Recommended Practice 1604, Removal and Disposal of Used Underground Petroleum Storage Tanks; API Publication 2015, Cleaning Petroleum Storage Tanks; U.S.E.P.A Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks(UST), (40 CFR Part 280/Federal Register, Volume 53, pp. 37194-212)); Uniform Fire Code, Section 79; Seattle Fire Department Inspection Guidelines, No. 80.25; Abandonment of Tanks; SeaTac Fire Department Manual, Abandonment and Status of Tanks, dtd. 2/1/88; Chapter 173-03, WAC, Dangerous Waste Regulations; EPA Memo To Tank Owners, From Region 10 UST Manager, Permanent Tank Closure, undated and, WDOE Draft dated August 1, 1988, Policies and Procedures for Underground Storage Tank Removal. All of the above are on file in the Environmental Management Section.

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PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

PART I - TANK INFORMATION (repeat for each tank)

Date: January 30, 1989

Name of Individual Completing Form: Geo. Blomberg

Location: Terminal 115

POS Tank Inventory #: 115D

WDOE Inventory#: Registry Index #85

Tank Contents/Use: Tank 115D was formerly used for gasoline storage at Terminal 115 auto importing facility. Installed in 1973, the tank was used to fuel imported cars and other vehicles. Attached as-built drawings, 115-7103-A-13 and 115-7103-M-4 (ATTACHMENT A), indicate the installation features of the 10,000 gasoline tank and pump island east of Building C-2 (refer to ATTACHMENT B). The auto importing facility was vacated in 1977-1978 and the tank has been unused since that time. Note: tank pumped and cleaned prior to removal (contained approximately 750 gallons combined volume of gasoline and rinse water).

Location on Site (see diagram, Part IV): Refer to attached Marine Facilities drawing, MF-15, Terminal 115 (ATTACHMENT B).

Size of Tank (gals): Installation data indicates a gasoline tank of approximately 10,000 gallons capacity. Note that the tank measurements following removal were approximately nine feet diameter and 22 feet in length.

Tank Material: Steel tank, with bituminous protective coating.

Tank Age: Approximately 16 years

Corrosion Protection Method: None excepting protective coating.

Status: Active Temp Out of Svc XXX Abandoned

Date Rmvd from Svc: Approximately 1979

Empty: The tank was apparently pumped down before removed from service. Approximately 740 gallons of gasoline remained in the tank until pumped out, preparatory to removal activities. The tank was pumped out and rinsed on April 27, 1989. Total volume of gasoline and rinse—approximately 750 gallons (refer to Part II, Disposition of product).

Filled, Gals: N/A

Contents: N/A

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PART I, CONTINUED

Tank Testing History (attach or reference any available records): No data describing tank history is available. Refer to Part II: Pre-Closure Activity for tank-clean out and soils testing data.

Any documented spills or other incidents (attach or reference any available records): No information is available concerning operation of the tank at the former auto importing facility. A pump island, mounted on a concrete pad, was located approximately five feet north of the underground tank for servicing vehicles at the site. A line connecting the pump to the underground tank was uncovered and removed during tank excavation. No fuel was in the line. No lines connecting the tank to adjacent buildings or other structures were observed.

Reason for removal: Tank 115D is abandoned. Removal of the tank is for the purpose of compliance with underground tank regulations. Note that buildings and structures (Buildings C-1 and C-2, refer to ATTACHMENT B) in this area of Terminal 115 may be demolished in the coming years for the purpose of additional marine terminal development.

Project Name: Terminal 115, Underground Tank Removal, 1989 Tank Removal Contract

Work Order Number: D-4193

Project Engineer: T. Eckard

Resident Engineer: H. Hanson

Project Contractor: Meridian Excavation and Wrecking, Waterfront Tank Removal, Contract Number C-12902

If tank is being removed under other authority, describe briefly, indicate Work Order Number and Port staff in charge of activity: Removal of Tank 115D was removed under a small works contract. The contractor removed five tanks under Contract C-12902, work order number D-4193.

Contractor for tank removal: Meridian Excavation and Wrecking.

Small works engineer/coordinator: H. Hanson.

PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

PART II - PRE-CLOSURE ACTIVITY

WDOE must be notified in writing at least 30 days prior to beginning of closure process. Attach copy of letter, any response received and describe any additional contacts.

Name of Individual Completing Form: Geo. Blomberg

Tank and piping emptied and cleaned by: Northwest EnviroService

Date: April 27, 1989

Amount of Product: The tank was not in service and contained approximately 740 gallons of fuel remaining from the active period of tank use (approximately 8 percent of the tank volume). This material was pumped from the tank via vacuum truck. The tank was then rinsed with high pressure water and detergent. The product and rinse water was combined in the vacuum truck. The total disposal volume was approximately 750 gallons (refer to ATTACHMENT C).

Amount of sludge: No sludge was evident in tank.

Disposition of product, sludge and wash water (include Hazardous Waste Manifest if applicable and other documentation): Attached are documents detailing testing of product remaining in the out-of-service tank and pump out and rinse of tank. ATTACHMENT D is the Waste Product Questionnaire, dated April 12, 1989, reporting analysis of liquid obtained from the tank for testing prior to pump out and cleaning. This data indicates that gasoline, methyl ethyl ketone, and water were contained in the tank. ATTACHMENT C reports that the tank was pumped out and rinsed on April 27, 1989.

Costs: Small works contract C-12902 included \$21,900 for removal of five underground storage tanks.

Soils Sampling and Testing: (Refer to Part V, Soils Testing for pre- and post-tank removal soils data)

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PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

PART III - TANK REMOVAL AND DISPOSAL

Name of Individual Completing Form: Geo. Blomberg

Fire Department Permit Number: Meridian Excavation and Wrecking removed Tank T-115D under small works contract. Meridian Excavation arranged for inerting of the underground tank by means of CO2 gas and obtained a "Temporary Underground Storage Tank Removal Permit" (Receipt Number 145737, dated 12-19-89, ATTACHMENT E) from the Seattle Fire Department.

Tank Inerted by: Meridan Excavation contracted with a certified marine chemist to inert the tank with compressed CO2. The Seattle Fire Department removal permit acknowledges that the tank contained no explosive vapors.

Fire Dept. Inspection by: Lieutenant Nigretto Date: December 19, 1989

Results: Fire Department inspector approved tank for removal, certifying that tank atmosphere was safe for work by heavy equipment.

Tank Removed By (name and address of contractor): Meridan Excavation and Wrecking

Disposition of tank, piping and related equipment: Tank removed to Northwest EnviroService for steam cleaning. Following cleaning, tank shell scraped. Note that the Fire Department tank removal permit also verified that the tank had been pumped and flushed and, as such, was acceptable for transport over public right-of-way (refer to ATTACHMENT E).

Visual indication of Soil or Groundwater Contamination (include photos if appropriate): No odor was evident in soils excavated from tank area. Following removal of tank no odor or discoloration was observed in soils adjacent to tank walls or beneath tank. A small amount of ground water was observed in the excavation; however, no odor or sheen of any kind was observed. Soil encountered in excavation was entirely imported fill material. No native soils were observed. Note that soil samples from the excavation were obtained and submitted for analysis (refer to Part V, Soils testing). Note that the tank was without rust or holes of any kind and the bituminous tank coating was intact.

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PAGE FIVE
PART III, CONTINUED

Costs:

Soils Testing: Refer to Part V

WDOE Inspection: No WDOE participation since no soils or ground water contamination was evident as a result of pre-removal testing or during tank excavation.

Additional Testing Required? N/A (If yes, Refer to Part V)

POS Inventory Updated

By Whom: Geo. Blomberg Date: 12-19-89

WDOE Notified of Change: Letter dated 9-20-89 (refer to attached copy, ATTACHMENT F)

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PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

NOTE: DOES NOT APPLY—Tank 115D removed from site.

PART IIIA – Closure in Place:

Name of Individual Completing Form: Geo. Blomberg

Fire Department Permit Number (copy attached):

Tank and Piping Emptied and Cleaned By:

Date:

Amount of Product:

Amount of Sludge:

Disposition of Product, Sludge, Wash Water (include Hazardous Waste Manifest if applicable, and other documentation):

Tank Inerted By:

(must be licensed Marine Engineer)

Date:

Fire Department Inspection By:

Date:

Results:

Costs of above:

Fire Department Approval to Fill Tank in Place (attach correspondence):

WDOE Approval (include correspondence):

Tank Filled By:

Type and Amount of Fill Material:

Lines, Vents and Related Equipment Secured By:

Date:

Above Ground Equipment Removed and Disposed of By:

Date:

Disposition:

Costs of above:

POS Inventory Updated

Date:

By:

WDOE Notified of Change

Date:

By:

(Attach copy of Notification)

PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

PART IV - ADDITIONAL NOTES, DESCRIPTIONS, & INFORMATION

Name of Individual Completing Form: Geo. Blomberg

Include sketch showing tank(s) location, sampling sites, etc. Attach photos.

The attached drawing, from MF-20 (ATTACHMENT B), illustrates the location of Tank 115D and the orientation of the tank in relation to Building C-2. Tank excavation notes:

- o Tank measurements (made following removal) approximately nine feet diameter and 22 feet in length.
- o No holes or rust evident on tank
- o Tank on ground outside of excavation did not leak any material
- o Bituminous coating on tank was intact, no corrosion evident. Two straps holding tank in place on concrete pad (approximately ten feet wide and 24 feet in length) exhibited no rust or corrosion.
- o Tank excavation begun at 1400 hrs and tank removed at 1500.
- o Tank oriented north/south
- o Entire excavation in sand fill material, no soil horizons observed, no color or staining evident in soils. No debris observed in soils.
- o Following excavation and removal of tank small amount of groundwater was observed in hole. Note that the excavation area is approximately 950 feet west of the Duwamish Waterway and that the tide level during excavation was approximately six feet above MLLW.
- o Excavation accomplished with backhoe.
- o Weather—40-45 degrees, overcast, light wind from southwest
- o Excavation sediment samples obtained immediately following tank removal:
 - Sample One—west side of excavation, at base of excavation
 - Sample Two—east side of excavation, at base of excavation
 - Sample Three—south end of excavation, at base of excavation
 - Sample Four—north end of excavation, at base of excavation
 - Sample Five—center of excavation, at bottom of excavation

PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

PART V - SOILS TESTING

Name of Individual Completing Form: Geo. Blomberg

PRE-REMOVAL SOILS TESTING:

Date of Sampling: June 30, 1989

Who took Samples: Samples obtained from excavation made at south end of tank and at east side of tank (note: east side of tank is on side nearest Duwamish Waterway, approximately 950 feet distant). Port maintenance crew accomplished sampling excavations with backhoe.

Number of Samples/Locations: Two samples from excavations: one at south end and a second soil sample at east side of tank. All samples at level of tank bottom.

Analysis By: Laucks Testing Laboratories

Date Submitted: June 30, 1989 (ATTACHMENT G is the Chain of Custody Record)

Results (include documentation): Analytical results are attached (ATTACHMENT H): Note that Tank 115D samples are identified as sample numbers 1 and 2.

	<u>Sample One</u> <u>(south end)</u>	<u>Sample Two</u> <u>(east side)</u>
Total solids (percent)	86.0	86.1
Total petroleum hydrocarbons (WDOE limit 200 ppm)	under 20 ppm	under 20 ppm
BETX		
benzene (limit 660 ppm)	under 12 ppm	under 12 ppm
ethylbenzene (limit 14 ppm)	under 12 ppm	under 12 ppm
toluene (limit 143 ppm)	under 12 ppm	under 12 ppm
xylene	under 12 ppm	under 12 ppm

Note: All soil samples below WDOE established limits

If standards are exceeded, WDOE must be notified. Attach correspondence or describe who was contacted, by whom, when and results.

Costs of Above: \$360.00

SOILS TESTING DURING TANK REMOVAL:

Any visual or other indications of soils or water contamination?: Refer to notes in Part IV, above. Briefly, no evidence of soil contamination was observed (i.e., no discoloration, no odor, and no sheen or odor in the small amount of groundwater that appeared in the excavation following removal of the tank).

Samples (number/type/location/ by whom?): Five soils samples were obtained by Geo. Blomberg immediately after tank removal by Meridian Excavation and Wrecking. Attached chain of custody record (ATTACHMENT I) indicates samples submitted on December 19, 1989: (1) Sample One—west side of excavation, at base of excavation; (2) Sample Two—east side of excavation, at base of

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PART V, CONTINUED

excavation; (3) Sample Three—south end of excavation, at base of excavation; (4) Sample Four—north end of excavation, at base of excavation; and, (5) Sample Five—center of excavation, at bottom of excavation.

Date of Sampling: December 19, 1989

Analysis By: Laucks Testing Laboratories

Date Submitted: December 19, 1989 (ATTACHMENT I is the Chain of Custody Record)

Results (include documentation): Analytical results are attached (ATTACHMENT J): Note that Tank 115D samples are identified as sample numbers 1 through 5.

	No. 1 (west)	No. 2 (east)	No. 3 (south)	No. 4 (north)	No. 5 (btm)
<u>Total petroleum hydrocarbons</u> (WDOE limit 200 ppm)	under 20 ppm	under 20 ppm	under 20 ppm	28 ppm	under 20 ppm
<u>BETX</u>					
benzene (limit 660 ppm)	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm
ethylbenzene (limit 14 ppm)	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm
toluene (limit 143 ppm)	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm
xylene	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm	under 10 ppm

Note: All soil samples below WDOE established limits.

If standards are exceeded, WDOE must be notified. Attach correspondence or describe who was contacted, by whom, when and results.

Costs of Above: \$875.00

If standards are exceeded, WDOE must be notified. NA See above.

ADDITIONAL TESTING REQUIRED

Describe requirements, indicate who did what, when, results and costs. Include all appropriate documentation. NA

REMEDIAL ACTION REQUIRED? If yes, See Part VI. NA

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PORT OF SEATTLE
RECORD OF CLOSURE OF UNDERGROUND STORAGE TANK

TERMINAL 115
TANK 115D

NOTE: DOES NOT APPLY. NO REMEDIATION REQUIRED

PART VI -- REMEDIATION

Name of Individual Completing Form:

Summarize remediation requirements, actions taken from beginning to end and costs. Attach appropriate documentation.

6244(25-35)V



UNDERGROUND STORAGE TANK Permanent Closure/Change-In-Service Checklist

The purpose of this form is to certify the proper closure/change-in-service of underground storage tank (UST) systems. These activities must be conducted in accordance with Chapter 173.360 WAC. Washington State UST rules require the tank owner or operator to notify Ecology in writing 30 days prior to closure or change-in-service of tanks. This must be done by completing the 30 Day Notice form (ECY 010-155).

This Permanent Closure Checklist shall be completed and signed by a Licensed Decommissioning Supervisor. The supervisor shall be on site when all tank permanent closure/change-in-service activities are being conducted. The firm which employs the licensed supervisor shall also be licensed by the Washington State Department of Ecology as a Service Provider. If any of the activities listed below have been supervised by a different licensed supervisor, a separate checklist must be filled out and signed by the licensed supervisor performing those activities.

For further information about completing this form, please contact the Department of Ecology UST Program.

A separate checklist must be completed for each UST system (tank and associated piping), except that UST systems at one site may be reported together by completing page 2 of this form separately for each system. The completed checklist should be mailed to the following address within 30 days of the completion of the closure or change-in-service.

Underground Storage Tank Section
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504-8711

1. UST SYSTEM OWNER AND LOCATION

Site Owner/Operator: Port of Seattle

Owners Address: P O Box 1209
Street P.O. Box
Seattle Wa 98111
City State ZIP-Code

Telephone: ()

Site ID Number (on invoice or available from Ecology if tank is registered): 606275

Site/Business Name: Terminal 115

Site Address: 6020 - 6730 W Marginal Way SW King
Street County
Seattle Wa 98106
City State ZIP-Code

2. TANK PERMANENT CLOSURE/CHANGE-IN-SERVICE PERFORMED BY:

Firm: _____ License Number: N/A

Address: _____
Street P.O. Box
City State ZIP-Code

Telephone: ()

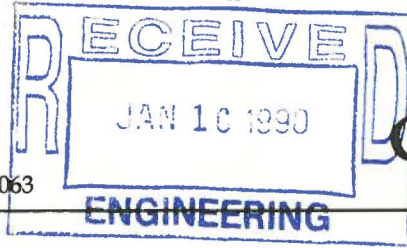
Licensed Supervisor: N/A pre licensing by the state Decommissioning License Number: N/A

Laucks ⁸² years

Testing Laboratories, Inc.

940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063

Chemistry Microbiology and Technical Services



Certificate

CLIENT: Port of Seattle, Engineering Dept.
 P.O. Box 1209
 Seattle, WA 98111
 ATTN: George Blomberg
 REPORT ON: SOIL

LABORATORY NO. 20042
 DATE: Jan 12, 1990
 PROF. SERVICE AGREEMENT
 NO. P-023670

SAMPLE IDENTIFICATION: Submitted 12/19/89 and identified as shown:

- 1) #1 12/19 tank 115D (w. side)
- 2) #2 12/19 tank 115D (e. side)
- 3) #3 12/19 tank 115D (s. side)
- 4) #4 12/19 tank 115D (n. side)
- 5) #5 12/19 tank 115D (bottom)

Prior to sieving soil samples, splits were removed for the volatile organics portions of the analysis. The remainder of the samples were then passed through a No. 10 sieve, with percent retained and description of retained matter shown below. Only material passing the sieve was analyzed for the remainder of the analyses.

<u>Sample No.</u>	<u>% Retained</u>	<u>Major Description</u>	<u>Minor Description</u>
1	57.	rock	---
2	49.	rock	---
3	34.	rock	---
4	47.	rock	---
5	40.	rock	---
		<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	
Total Solids, %		89.2 87.7 85.8 89.0 84.4	



This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

Laucks ⁸² years

Testing Laboratories, Inc.

940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063

Certificate

Chemistry, Microbiology, and Technical Services

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Port of Seattle

LABORATORY NO. 20042

parts per million (mg/kg), dry basis

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Total Petroleum Hydrocarbon Oil & Grease	<20.	<20.	<20.	28.	<20.

Lab
Blank

Total Petroleum Hydrocarbon Oil & Grease	<20.
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parts per billion (ug/kg), dry basis

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	Lab Blank
Benzene	<10.	<10.	<10.	<10.	<10.	<10.
Ethylbenzene	<10.	<10.	<10.	<10.	<10.	<10.
Toluene	<10.	<10.	<10.	<10.	<10.	<10.
Xylene	<10.	<10.	<10.	<10.	<10.	<10.

Key

< = less than

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens
J. M. Owens

JMO:veg



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LABORATORY NO. 20042

APPENDIX A

Replicate Quality Control Report

<u>Sample #</u>	<u>Analyte</u>	<u>Replicate 1</u>	<u>Replicate 2</u>	<u>Relative Error, %</u>
2	O&G (mg/kg DB)	<20.	<20.	NC
2	TS (% AR)	87.7	87.5	0.2

DB = Dry Basis
AR = As Received
NC = Not Calculable



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Port of Seattle

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APPENDIX B

Surrogate Recovery Quality Control Report

Attached are surrogate (chemically similar) compounds utilized in the analysis of organic compounds. The surrogates are added to every sample prior to extraction and analysis to monitor for matrix effects, purging efficiency, and sample processing errors. The control limits represent the 95% confidence interval established in our laboratory through repetitive analysis of these sample types.



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JOB No. 20042 DATE: 01/10/90

Sample No. B0108GVD.WC1	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	102		70 - 130

Sample No. 1	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	111		70 - 130

Sample No. 2	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	103		70 - 130

Sample No. 3	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	110		70 - 130

Sample No. 4	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	90		70 - 130

Sample No. 5	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	111		70 - 130

Sample No. 1MS	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	111		70 - 130

Sample No. 1MSD	Matrix: Soil	Analysis: GC-FID	
Surrogate Compound	Percent Recovery	Comment	Control Limits
N-propylbenzene	111		70 - 130

Chemistry, Microbiology, and Technical Services

APPENDIX C

Matrix Spike/Duplicate Spike Quality Control

Attached are the results of additional QC compounds utilized in the analysis of organic compounds. Compounds of interest are spiked into two additional sample aliquots prior to extraction and/or analysis to monitor for matrix effects, sample processing errors, and to calculate percent recoveries of compounds of interest and relative error in the analysis. The control limits represent the 95% confidence interval established in the laboratory through repetitive analysis of samples.



This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

Job No. 20042

Group No.

DATE: 01/10/90

Sample No. 1

Matrix: Soil

Analysis: GC-FID

Spiking Analyte	Percent Recovery		Comment			Recovery Control Limits	%RPD Control Limit	
	MS	MSD	MS	MSD	%RPD			
Benzene	99	103				5	62-126	8
Toluene	102	106				4	73-116	10